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SUPPLEMENTAL GROUNDWATER REMEDIAL INVESTIGATION REPORT (1997)

IOWA ARMY AMMUNITION PLANT (IAAAP)
Middletown, Iowa

Volume I
REPORT
and
APPENDICES A-G

REVISED DRAFT-FINAL

Prepared for:

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August 2001

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Supplemental Groundwater Remedial Investigation Report (1997)
Draft-Final

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1.0 INTRODUCTION

1.1 Purpose

This report was prepared by Montgomery Watson Harza (formerly Harza Engineering Company) for the U. S. Army Corps of Engineers, Omaha District (USACE) under Contract DACW45-94-D-0044, Delivery Order #015. The purpose of the report is to describe results of field sampling and associated activities conducted in spring and summer of 1997, during a supplemental remedial investigation (RI) at the Iowa Army Ammunition Plant (IAAAP), Middletown, Iowa and to provide an evaluation of basewide groundwater conditions and potential groundwater/surface water contaminant migration pathways. The supplemental groundwater RI augments and addresses data gaps in a previous RI completed by JAYCOR (1996) and presented in *Revised Draft Final Remedial Investigation/Risk Assessment, Iowa Army Ammunition Plant, Middletown, Iowa*. A Baseline Risk Assessment prepared by ICAIR Life Systems, Inc. is contained in the JAYCOR report (Volume 11).

This Supplemental RI Report was issued initially in draft form in December 1997 to assess and define appropriate remedial requirements at multiple sites. Review comments received from USACE, U. S. Environmental Protection Agency, Region VII (USEPA), and IAAAP were addressed and consequent activities were planned and implemented, as appropriate. However, the draft-final report was never reissued. Data derived from the subsequent activities has been reported separately and is outlined in Section 1.5 for general reference. This report is intended only to document the 1997 supplemental RI activities and results.

The work conducted in the 1997 supplemental RI was organized in 16 tasks addressing specific and/or basewide data needs. The work was completed in accordance with final project work plans dated April 1997 as approved by USACE and USEPA. Section 1.0 of the report provides site background/history and project details/task objectives. Section 2.0 outlines investigation methods with reference to the approved project work plans. Section 3.0 details results of study area investigations for each of the 16 tasks, including physical characteristics and results of sampling and analysis in the individual study areas, where applicable. Section 4.0 summarizes the physical characteristics of the IAAAP installation, drawing upon data collected in this supplemental RI and reported previously by JAYCOR (1996). Section 5.0 discusses the nature and extent of contamination based on findings of this supplemental RI and data reported previously by JAYCOR and by Mason & Hanger (American Ordnance), the current facility operating contractor. Section 6.0 discusses basewide contaminant fate and transport drawing upon information presented by JAYCOR. Section 7.0 summarizes findings of the Baseline Risk Assessment prepared by ICAIR Life Systems, as they relate to groundwater. Section 8 provides a summary and principal conclusions, both task-specific and basewide.

1.2 Site Background

1.2.1 Site Location and Features

The IAAAP occupies 19,127 acres in the town of Middletown in Des Moines County, Iowa (Figure 1-1). The IAAAP property is bordered by U. S. Highway 34 to the north, upland agricultural farms to the east and west, and the Skunk River Valley to the south. Surface topography is characterized by flat to gently rolling uplands dissected by entrenched streams and rivers. Approximately a third of the IAAAP property is occupied by active or formerly active production or storage facilities. The remaining land is approximately evenly divided between leased agricultural usage and woodlands. General topography and site features are shown on 1-2.

1.2.2 Geology

The IAAAP is located in the Dissected Till Plain section of the Central Lowland Province of the Southern Iowa Drift Plain Region. The site is underlain by a sequence of unconsolidated deposits of Pleistocene age overlying sedimentary bedrock units. The glacial tills consist primarily of silty clay and clayey silt with thin sand seams and lenses and are assigned to the Kellersville Till Member (Illinoisan Age) of the Glasford Formation of southeastern Iowa. The tills extend to depths in excess of 100 feet in portions of the north half of the IAAAP, but are thin or absent locally in deeper stream valleys in the south, around Mathes Lake, and in the northeast. The bedrock underlying IAAAP consists of a sequence of limestones interbedded with varying thicknesses of shales and sandstones, ranging in age from Cambrian to Mississippian. The uppermost bedrock unit beneath the site is associated with the Mississippian Osage Series of southeastern Iowa, composed predominantly of cherty limestones interstratified with minor amounts of shale. The Osage series is divided into three members: the Warsaw Formation, Keokuk Limestone, and Burlington Limestone. The Warsaw Formation consists primarily of blue-gray calcareous shales, fragmental, fossiliferous, dolomitic limestone, and calcarenites.

1.2.3 Hydrogeology

In Des Moines County, Iowa, there are four principal aquifers: glacial drift and bedrock aquifers of Mississippian, Devonian, and Cambro-Ordovician age. The uppermost aquifer is a discontinuous surficial aquifer of unconsolidated loess and glacial till, with thin fluvial deposits of Pleistocene age in the stream beds. These occupy the upland till terrace and are predominantly clayey glacial tills that exhibit low hydraulic conductivities and yield only small quantities of groundwater to wells. Depth to groundwater in the drift is generally less than 10 feet and shallow groundwater flow parallels surface topography. Groundwater discharges to the more deeply incised surface drainages (e.g. streams) with additional discharge downward to deeper drift sections and the bedrock aquifer. However, low permeabilities in the drift restrict downward flow. Recharge to the drift aquifer also is slow and is derived from infiltration of precipitation and, perhaps, inflow from adjacent areas.

Information on hydrogeological conditions in the bedrock aquifer underlying the drift is sparse. Generally, groundwater in the limestones would be contained primarily within open bedding planes and/or joints and flow would be expected to be influenced by the presence and orientation of these

features. Also, it is common in the upper midwest for much of the groundwater in these bedrock units to be found in the more fractured and weathered upper sequence, just under the drift. Where this is the case, the lower drift and upper bedrock aquifers may comprise a single hydraulic system. Sitewide, available groundwater levels suggest that overall flow direction in the bedrock is to the south and east, toward the Skunk and Mississippi Rivers.

1.2.4 Surface Water

The IAAAP is drained by five water courses, delineated on Figure 1-2. Little Flint Creek drains a small area in the north of the site. The rest of the base is drained by, west to east, the Skunk River, Long Creek, Brush Creek and Spring Creek. Long Creek is a tributary of the Skunk River, which flows to the Mississippi River. Brush and Spring Creeks are tributaries of the Mississippi River.

1.3 Site History

The IAAAP is a government-owned, contractor-operated facility. The operating contractor is Mason and Hanger-Silas Mason Co., Inc. (now American Ordnance) under the command of the U. S. Army Armament, Munitions, and Chemical Command (now operations Support Command) Rock Island, Illinois. Production of ammunition items began in 1941 and the facility remains in operation. Production activities at IAAAP currently include loading, assembling and packaging of ammunition items, including projectiles, mortar rounds, warheads, demolition charges, anti-tank mines and anti-personnel mines. The loading, assembling and packaging operations use explosive materials and lead-based initiating compounds. Wastewater generated at various plant facilities and effluent from plant wastewater treatment plants are discharged to surface streams under provisions of a National Pollutant Discharge Elimination (NPDES) permit. The munitions production at the IAAAP has resulted in contamination of soil and groundwater and discharge of wastewater containing explosives and explosive by-products.

In 1980, a Preliminary Assessment and Site Inspection (PA/SI) at the IAAAP was conducted. Pursuant to the Resource Conservation and Recovery Act (RCRA) Hazardous and Solid Waste Amendments (HSWA) of 1984, the USEPA completed an assessment of the facility in 1987 and reported that releases had occurred. In 1988, a Federal Facilities Compliance Agreement was signed by the Army and USEPA. The IAAAP was subsequently proposed for the National Priorities List (NPL) and, in August 1990, the installation was placed on the NPL with a Hazard Ranking Score (HRS) of 29.73. In 1991, a subsequent PA/SI identified 40 sites of possible contamination. Of the 40 sites, 33 required further studies and an Interagency Agreement between the Department of Defense and the EPA was negotiated, dated September 20,1990. Under the agreement, the site was to be cleaned up under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The permit allows RCRA and CERCLA activities at the site to be coordinated (EPA National Priorities List , USEPA, Office of Emergency and Remedial Response, 3/36/97, 0700413n.htm and Fact Sheet: Iowa Army Ammunition Plant, EPA, Region 7, USEPA, Nov. 1, 1996, http://www.epa.gov/programs/artd/rcra/ factsheets/iaapfs.html).

In 1992, Remedial Investigation and Feasibility Study (RI/FS) activities began. In 1993, the

installation completed supplemental subsurface soil and groundwater studies for the RI/FS. Results of the RI were documented in the report *Revised Draft Final Remedial Investigation/Risk Assessment, Iowa Army Ammunition Plant, Middletown, Iowa* (JAYCOR, 1996), which included results of a Baseline Risk Assessment prepared by ICAIR Life Systems, Inc. Harza was contracted by USACE in August 1996 to perform a basewide hydrogeologic evaluation at the IAAAP, based on the JAYCOR report. The purpose was to identify data gaps pertaining to groundwater, and recommend studies to address the data gaps. The 90% draft Basewide Hydrogeologic Evaluation was submitted in November 1996 and, in late 1996, Harza was contracted by USACE to conduct a supplemental RI aimed at addressing the identified data gaps. The final Work Plan and Sampling and Analysis Plan was submitted in April 1997 and field work completed during the Spring and Summer 1997. Concurrently, the soils FS was completed and several removal actions were completed or initiated.

1.4 Objectives and Scope

1.4.1 Basewide Objectives and Scope

The overall objective of this study was to obtain additional data on site geology, hydrogeology, surface water, and contamination and to evaluate basewide groundwater conditions as they might effect site remediation. Principal emphasis was placed on identifying and evaluating off-site migration pathways for contaminants generated within the site. Thus, the data collection activities focused on the groundwater and surface water migration pathways. Additional emphasis was placed on obtaining supplemental data at specific locations within the IAAAP to assess potential impacts on soil, groundwater or surface water. Results of this study supplement and draw upon information provided in the Draft Final RI Report (JAYCOR, 1996), which is referenced where appropriate.

1.4.2 Task-Specific Objectives and Scope

Field and laboratory activities conducted during the supplemental groundwater RI were developed to address data gaps identified by USEPA, USACE, and Harza based on review of the previous RI. The general types of field and laboratory activities completed at the site are as follows:

- Field surveys, reconnaissance, and geologic mapping
- Completion of borings in soil and bedrock
- Installation of monitoring wells and piezometers
- Installation and reading of mini-piezometers
- Installation and reading of stream flow meters and a rain gauge
- Field permeability tests
- Direct push (Hydropunch) groundwater sampling
- Sampling of soil, sediment, surface water and groundwater
- On-site and fixed laboratory analysis of samples

These activities were implemented in a series of 16 tasks, each scoped to address one or more specific data gaps. The 16 tasks are listed below:

Task 1. Evaluation of available NPDES data.
Task 2. Groundwater monitoring well inventory
Task 3. Basewide groundwater level measurements
Task 4. Resurvey existing monitoring wells.
Task 5. Hydraulic integrity review, existing monitoring wells.
Task 6. Ammunition Box Chipper Disposal Pit.
Task 7. Sediment and surface water sampling, site drainages.
Task 8. Mini-piezometer testing, Brush Creek.
Task 9. Stream flow meters, site drainages.
Task 10. Aquifer pumping tests, Line 2.
Task 11. Soil and groundwater sampling for VOCs
Task 12. Additional groundwater data, Line 2.
Task 13. Additional groundwater data, downstream reach of Brush Creek.
Task 14. Additional bedrock topography data.
Task 15. Evaluation of vertical hydraulic gradients.
Task 16. Additional groundwater data, Line 3.

The background, rationale, and scope of each task are outlined in the following sections with reference to the documents: *Basewide Hydrogeologic Evaluation, Iowa Army Ammunition Plant* (Harza, 90% draft, November, 1996); and *Final Work Plan for Site Groundwater Investigations, Iowa Army Ammunition Plant* (Harza, April 1997). Methods are discussed in Section 2.0 and findings of each task in Section 3.0. The locations of general investigation areas are shown on Figure 1-3 and specific locations are discussed and illustrated in Section 3.0.

1.4.2.1 Evaluation of Available NPDES Data.

Discharges from site facilities permitted under NPDES contribute to contaminants entering streams and are important in evaluating potential off-site migration of contaminants via surface water. Discharge data is collected by IAAAP and reported to the State of Iowa, but had not previously been evaluated to determine to what extent, if any, current or past discharges contribute to contaminant loading in the streams. Such an evaluation was necessary to determine the extent to which groundwater contributes to contaminants in the stream and to help assess the degree to which surface water constitutes an off-site migration pathway. Existing data on the discharge system, changes over time, precipitation, discharge quantities, and testing results since monitoring began were obtained from IAAAP and the State of Iowa. The data were limited to the period 1986 to the present, generally reflecting present plant operational conditions. Therefore, prior conditions representative of greater plant activity and contaminant release could not be evaluated directly. The average monthly flows and concentrations were tabulated and then the mass loading introduced to the streams was estimated and compared to stream flows and results of surface water sampling. The relative contribution of NPDES discharges was computed, compared to total stream flows determined in Task 9 *(Stream Flow Meters, Site Drainages)*. Details and results are provided in Section 3.1.

1.4.2.2 Groundwater Monitoring Well Inventory.

Several hundred wells have been installed at IAAAP over the years for various purposes. The accuracy of existing well inventories was questionable, the condition of some wells, particularly older wells, was unclear and some wells may have been mislocated. Therefore, the objective of this task was to update existing well inventories and identify wells which may be available for groundwater monitoring or which should be replaced or abandoned. Well data available from IAAAP were reviewed and known wells identified. Records and maps were checked to note discrepancies or inaccuracies. A field survey then was conducted to inspect known wells and attempt to locate missing wells. Well location maps and inventories were updated appropriately. In all, 335 wells were identified as potentially existing at IAAAP, including 25 installed in this investigation. Attempts were made to locate and inspect each of these wells. Of the total, 57 wells either could not be found and are presumed to have been abandoned, or were determined to be unsuitable for monitoring (e.g. water supply wells, gas probes, etc.). The well inventory is discussed in Section 3.2.

1.4.2.3 Basewide Groundwater Level Measurements.

Accurate analysis of basewide groundwater flow at IAAAP required that groundwater levels in existing and new monitoring wells be measured within short time frames. Previous reported data tend to be site-specific rather than base-wide, do not utilize all wells, and were made at different times. These data, although relevant to evaluation of flow in local areas, could not be used to assess basewide hydrogeologic conditions. Therefore, the objective of this task was to obtain a "one-time" set of groundwater level measurements sufficient for evaluation of site and basewide groundwater flow and assessment of existing monitoring programs. To this end, one (1) round of groundwater level measurements was made in a total of 263 existing and new monitoring wells, observation wells, and piezometers during the week of May 19, 1997. Measurements attempted in some wells were unsuccessful due to various problems with specific wells, which were noted on the well inventory. Measurements were made using electronic water level meters, decontaminated between each use. Measurements were made relative to the top of casing or, in the case of wells with dedicated sampling pumps, the lower edge of the pump mounting device. Prior to measuring water levels in each well, a photoionization detector (PID) was used to measure total volatile organic vapor readings in the well casing. Basewide and local groundwater elevation maps were prepared for the drift and bedrock aquifers, from which groundwater flow patterns, occurrence, gradients and rates could be evaluated. Results are discussed in Section 3.3.

1.4.2.4 Survey Existing Monitoring Wells.

Survey data available for existing monitoring wells had indicated errors or inconsistencies in some well elevations and/or locations. Reliable and consistent elevations and locations were required so that data from the monitoring wells could be reliably interpreted and used. Therefore, the objective of this task was to obtain current surveyed elevations and locations on monitoring wells throughout the IAAAP. Existing wells identified in the well inventory were resurveyed by American Surveying

Consultants, P.C. (ASC) using Global Positioning System (GPS) methods and traditional survey methods. Surveying included elevation (ground and top of casing, or lower edge of pump mounting device, measuring point) and location (state plane coordinate). New wells installed in this investigation were surveyed concurrently. Results of the resurveying are discussed in Section 3.4. In all, more than 300 existing and new wells and piezometers were surveyed and new data entered in the well inventory.

1.4.2.5 Hydraulic Integrity Review, Existing Monitoring Wells.

Many existing monitoring wells at the IAAAP are not routinely used for sampling, but may be valuable for groundwater level measurements. The well inventory in Task 2 *(Basewide Groundwater Level Measurements)* was designed to provide a current listing of wells and piezometers potentially available at the site. Since some of these wells had not been used routinely, no information was available as to their integrity and, therefore, their potential usefulness. Therefore, the objective of this task was to assess the hydraulic integrity of selected existing monitoring wells that might be used in on-going basewide monitoring programs. Based on the well inventory, a list of 28 wells was developed focusing on: older wells or wells not used for long periods; wells of questionable condition; wells to be used for long-term monitoring; representative base locations; wells for which historic groundwater level data appear anomalous, and wells representative of the principal aquifer units. Short term field tests of the slug type then were conducted and the test data were plotted and reviewed to assess the hydraulic integrity of the tested wells. The principal determining factor was observation of water level response during the tests which would indicate hydraulic communication between the well screen and the adjacent aquifer. Results are presented in Section 3.5 and were incorporated into the well inventory, identifying wells suitable for use or which should be abandoned or maintained.

1.4.2.6 Ammunition Box Chipper Disposal Pit.

The Ammunition Box Chipper Disposal Pit reportedly was used for disposal of shredded ammunition boxes, which may have contained residual explosives. Several previous rounds of exploration by others, including borings and surface samples, failed to locate the pit or demonstrate significant contamination. Interviews with past employees reportedly have resulted in conflicting information regarding the location or existence of the pit. Therefore, the objective of this task was to delineate significant subsurface disposal areas, if any, and determine whether groundwater has been impacted. This task included a review of historic aerial photographs followed by groundwater sampling. The review did not identify clear evidence of any past disposal. A set of groundwater elevations was measured in the three existing monitoring wells and indicated that shallow groundwater flow at this site was nearly due south. Based on the direction of groundwater flow and the location, if any, of significant past disposal areas, one direct push groundwater sample, six temporary well samples, and samples from three existing wells were collected during June 16 through 18, 1997. The general study area is shown on Figure 1-3. Specific sample locations, depths, and results are discussed in Section 3.6 and were placed within, upgradient and downgradient of the suspect area to determine whether groundwater has been impacted. Samples were analyzed in the

fixed laboratory for explosives and semi-volatile organic compounds (SVOCs).

1.4.2.7 Sediment and Surface Water Sampling, Site Drainages.

Previous sediment and surface water sampling provided information on surficial sediments along the principal drainages. However, no data were available on the presence of contaminants at depth within the sediment sequence, some key locations had not been sampled, and recent samples had not been obtained in many areas. Therefore, the significance of the streams as historic or continuing migration pathways was incompletely understood. The objective of this task was to further evaluate site streams as historic migration pathways and/or as continuing sources of contamination and verify whether they act as the primary off-base migration pathways. Appropriate sediment sampling areas were identified initially from topographic maps and verified in a field reconnaissance. Sampling areas included those which, based on morphology, were judged likely to contain sufficient sediment thicknesses for meaningful sampling with depth and were distributed along the site streams and downstream from potential contaminant sources. The appropriateness of each sampling area was verified and specific sampling locations were staked during a ground reconnaissance, which verified that: the area is placed to achieve the sampling objectives (e.g. a location intended to be downstream from a source or outfall should be so located); sediment thicknesses are sufficient for meaningful sampling with depth; and safe access is available. General locations are shown on Figure 1-3, determined by measurements from nearby landmarks such as bridges and roads. Specific locations are discussed and illustrated in Section 3.7. Sampling was conducted between May 29 and June 11, 1997. A total of sixty- nine (69) sediment samples, at multiple depths up to 6 feet, and seventeen (17) surface water samples were provided for in the Work Plan. However, at most sediment sample locations, penetration refusal was encountered at depths of 4 feet or less due to dense soils and/or bedrock. Therefore, a total of 38 sediment and the 17 surface water samples were collected. Sediment and surface water samples were analyzed in the fixed laboratory variably for explosives, Target Analyte List (TAL) metals, volatile organic compounds (VOCs), and SVOCs. Locations, depths and analytical results are presented in Section 3.7.

1.4.2.8 Mini-Piezometer Testing, Brush Creek.

Previous site studies had concluded that Brush Creek is the significant migration pathway for contaminants potentially leaving the IAAAP. The purpose of this task was to identify reaches of Brush Creek which may be gaining (effluent) due to recharge from groundwater or losing (influent) due to discharge to groundwater. These data will assist in identifying remedies for potential off-site migration of contaminants and in characterizing the creek as a contaminant migration pathway. Field tests were conducted using the concept of "mini-piezometers" developed by Lee and Cherry *("A Field Exercise on Groundwater Flow Using Seepage Meters and Mini-piezometers, Journal of Geological Education, 1978, v. 27).* This is a method by which gaining or losing streams can be identified by measuring differentials between the creek water surface and piezometric levels in the underlying creek bed. Prior to installing the mini-piezometers, a reconnaissance of Brush Creek was conducted to select final test locations, assure accessibility, and verify that sufficient sediment was present. Nine (9) general locations (Figure 1-3) were identified for testing along Brush Creek,

coinciding with planned flow meters and road access, supplemented by intermediate points. Specific locations and results are discussed in Section 3.8. Between April 29 and May 9, 1997, one to two lines of three "mini-piezometers" were installed across the creek in each general location, providing lateral profiles of piezometric conditions. A total of 52 "mini-piezometers" were installed. Subsequently, USEPA requested that additional "mini-piezometers" be installed at selected locations on Spring Creek and Long Creek. An additional six (6) piezometers were installed during the week of June 8 to 14 at two locations on Spring Creek. An attempt was made to install three piezometers at one location on Long Creek. However, bedrock was within one foot of the surface and the piezometers could not be installed. Visible groundwater seeps in this area suggest that Long Creek is gaining. "Mini-piezometers" on Brush Creek were measured on May 27, 1997. Other piezometers were measured on June 13, 1997.

1.4.2.9 Stream Flow Meters, Site Drainages.

Principal drainages at the IAAAP are, from west to east, the Skunk River, Long Creek, Brush Creek and Spring Creek (Little Flint Creek also drains a small area in the north). Existing data on these streams was limited to water levels in Brush Creek. No flow estimates had been made and contributions from different sources and total discharge from the site were not known. The objective of this task was to obtain data on surface water flows in the principal site drainages and to assess contributions of groundwater to these flows. Results were used to evaluate the drainages as off-site contaminant migration pathways. Based on review of site drainage, seven (7) stream flow meters were installed at general locations shown on Figure 1-3. Specific locations and data are discussed in Section 3.9. Two were installed on Spring Creek, near P and K Roads, respectively, and five (5) on Brush Creek, two at D Road, where flow has been diverted through two culverts, and three at I, H, and K Roads, respectively. These locations differentiate flows from the various lines, to the extent possible given topographic limitations. An eighth meter had been planned on an existing, but unused flume near Line 1. However, recent remedial actions in this area have impacted stream flow to the extent that a meter at this location would not have provided usable data. Therefore, it was not installed.

Prior to installation, each site was inspected to obtain site-specific information for installation, including preferred location or alignment, site constraints, and use of existing facilities, such as culverts or bridges. A runoff computer model was developed for each watershed to determine the range of flows to be measured. Generally, the meters will accurately measure flows up to about four to five times the average base flow. Larger flows will be estimated using site rainfall measurements and the computer hydrologic models. The flow meters automatically record data on water depth, using a transducer, and flow velocity, using ultrasonic doppler technology. These data were downloaded on May 12, June 9 and 27, and August 11, 1997.

1.4.2.10 Aquifer Pumping Tests, Line 2.

Groundwater extraction using wells may be considered for clay tills in several plant areas (i.e. Line 1, Line 2, Line 800). However, available data on the hydraulic properties of the till had been limited

to permeability estimates from "slug" tests in monitoring wells and from laboratory tests on Shelby Tube samples. These may overstate the potential effectiveness of extraction wells in removing contaminated groundwater. Therefore, the objective of this task was to obtain more accurate data on aquifer properties needed to evaluate pumping as a potential remedial technology. The original scope of this task included construction of a pumping test facility comprising a pumping well and 8 observation wells screened variably in the shallow, deep, or full till zones, followed by pumping tests. Placement of the test facility within Line 2 was based on providing: a) geology generally representative of the tills at IAAAP; b) areas where groundwater is contaminated and extraction may be considered; c) relatively flat hydraulic gradients to simplify measurement of drawdown and data analysis; d) absence of surface water which complicates interpretation; e) ready equipment access; and f) locations inside the Line fence to avoid environmental or archeological impacts. The general location of the test facility is shown on Figure 1-3.

The planned pumping well and initial observation well (10A and 10B) were installed to depths of 50 feet on May 5 and May 1, 1997, respectively. During drilling of 10B, geologic logging determined the presence of dense, clay tills through the planned 50 foot depth of the well with only a few thin sand seams in the upper portion. After constructing well 10B, as planned, it was determined that groundwater recharge to the well was insufficient to conduct pumping tests. In consultation with USACE and USEPA, it was decided that the test well, 10A, would be installed as planned, but that the remainder of the observation wells would not be completed. A reduced program of well evaluation tests then was completed during purging and sampling on June 11, 1997. These consisted of pumping in 10A at variable rates and monitoring drawdown in 10A, 10B, and existing well JAW-70, screened in the upper zone, about 30 feet from the test well. Although pumping tests suitable for quantitative aquifer analysis were not feasible, these data are sufficient for evaluating well conditions at this site. The layout of the facility and results are discussed in Section 3.10. Sample data are discussed in Section 3.12 with other sample data from Line 2.

1.4.2.11 Soil and Groundwater Sampling for VOCs.

Previous screening had identified VOCs in soil gas at six site areas: 1) Building 1-03-05; 2) Line 1 Tank Farm; 3) Buildings 2-02 and 2-03; 4) Building 3-03; 5) Building 3A-03-01; and 6) Building 9-57. Each of these sites had total VOC concentrations in soil gas reported to exceed 1,000 parts per billion (ppb) and "hits" in at least two locations. These occurrences had not been previously evaluated and, at least in some cases, VOCs had not been detected in follow-on soil sampling. Therefore, the purpose of this task was to determine the presence of VOC contamination in soil and groundwater at these six sites. In the initial sampling round, a total of 82 soil samples and 10 groundwater samples were collected using hydropunch and hollow stem auger methods and several temporary monitoring wells. Based on results, 21 follow-on soil samples and 9 groundwater samples were collected in three of the site areas. In general, sample locations were selected to examine the presence of VOCs at "hot spot" locations suggested by the soil gas screening and at depths equivalent to and deeper than the soil gas samples. General sample areas are shown on Figure 1-3 and specific locations and results discussed in Section 3.11. Samples were analyzed on-site for VOCs using a mobile laboratory facility.

1.4.2.12 Additional Groundwater Data, Line 2.

The objectives of this task were to further characterize the vertical and lateral extent of groundwater contamination in affected portions of Line 2 and assess the extent to which contaminants may be reaching Brush Creek. Groundwater contamination by explosives and metals had been reported at Line 2 and extraction was being considered. However, existing wells did not delineate the extent of contamination toward Brush Creek or vertically. Seven monitoring wells (12A through 12G) were installed at locations downgradient and lateral to groundwater flow and one piezometer (12H) on the opposite (west) side of Brush Creek to evaluate groundwater flow with respect to the creek. One well, 12F, was dry after completion and could not be slug tested or sampled.

The wells were screened variably in the shallow till or the deep till/bedrock. Wells 12B, C, and D are a three-well cluster (shallow and deep till and bedrock). The piezometer (12H) was placed west of Brush Creek to monitor groundwater levels from both sides of the creek. One round of groundwater samples was collected from six of the new wells (excluding well 12F and the piezometer) and from existing wells JAW-70, 71, 72 and 73 (total of 10 samples). Samples were analyzed for explosives, metals, VOCs, SVOCs, and groundwater quality parameters by the fixed laboratory. In conjunction with sampling in Task 10 *(Aquifer Pumping Tests, Line 2)*, results were used to determine the presence of groundwater contamination in this area and the likelihood that the creek is a significant contaminant migration pathway. Piezometric data were used to identify flow patterns to or from the creek and vertical gradients. Results of this task are discussed in Section 3.12.

1.4.2.13 Additional Groundwater Data, Downstream Reach of Brush Creek.

Previous site reports had hypothesized that site drainages, primarily Brush Creek, are the significant off-site contaminant migration pathways at IAAAP. Although a few monitoring wells had been installed along the downstream reaches of Brush Creek, none were outside the immediate vicinity of the creek and they did not permit monitoring of groundwater zones in adjacent areas. The available subsurface geologic data in this area also was not sufficient to verify seepage routes beneath or near the creek. The objective of this task was to further investigate groundwater flow and interaction with Brush Creek, provide monitoring capability in the downstream reach of Brush Creek, further characterize the creek as a potential off-site migration pathway, and generate data supporting possible remedial actions. Four (4) monitoring wells were installed in this task, shown as wells 13B, 13D, 13E, and 13F on Figure 1-3. With existing wells G54/G55, these form a profile across Brush Creek at "H" road, near the south site boundary. Six (6) wells had been planned. However, 13A and 13C, west of the creek, were not installed because shallow (<10 feet) bedrock was encountered in 13B. Subsequently, Harza, USACE, and USEPA agreed that additional wells were not needed west of the creek. Well 13B is a single well west of the creek. 13D and 13E are a well pair screened in shallower and deeper zones, respectively. 13F is a single well east of the creek. One round of groundwater samples was collected from the four new and two existing wells (total of 6 samples) and analyzed in the fixed laboratory for explosives, metals, and groundwater quality parameters. Results of this task are discussed in Section 3.13.

1.4.2.14 Additional Bedrock Topography Data.

Existing data on the bedrock surface at IAAAP had been sparse, considering the size of the facility, and generally concentrated within specific lines. The previous RI postulated that groundwater in the till is discharging to surface drainages rather than infiltrating to bedrock. More accurate definition of the bedrock surface was needed to assess this possibility. The objective of this task was to obtain additional data on the till/bedrock surface and evaluate any impacts on potential off-site contaminant migration pathways. This task included surface geologic mapping and completion of six (6) piezometers (14A through 14F on Figure 1-3) to further define the bedrock surface around the plant. Locations were selected to provide data in broad areas where bedrock data were absent, mostly in the south half of the plant, and also are supplemented by wells installed in other tasks. Borings for the piezometers extended about 20 feet into bedrock and were completed with porous plastic piezometer tips for measuring groundwater levels. Surface geologic mapping was conducted across the south part of the IAAAP to locate exposures of the bedrock and the bedrock/drift contact. Map interpretation and field surveys were used to establish the locations and elevations of the exposures, which augment available subsurface data in evaluating the bedrock surface. A bedrock exposure and top of rock contour map was prepared using the surface and subsurface data. Results of this task are discussed in Section 3.14.

1.4.2.15 Evaluation of Vertical Hydraulic Gradients.

Previous studies at the site had not specifically examined the presence or magnitude of possible vertical gradients within the glacial till unit and between the till and bedrock. Vertical gradients may effect the rate and direction of contaminant migration. The objective of this task was to evaluate vertical hydraulic gradients as they may impact groundwater flow and contaminant migration. This evaluation consisted of comparing potentiometric elevations measured in available monitoring well pairs and determining the direction and magnitude of gradient represented by these data, discussed in Section 3.15.

Additional Groundwater Data, Line 3.

Groundwater contamination, primarily by explosives, had been reported at Line 3 and VOCs had been detected in soil gas samples. The six existing monitoring wells are shallow and concentrated in the center of the Line, not fully delineating the lateral or vertical extent of contamination. Groundwater data suggested shallow flow in the shallow zone to the south, probably discharging to Brush Creek where a tributary enters from the west, but additional data were needed to verify transport to Brush Creek or potential migration to deeper zones. The objective of this task was to further characterize the vertical and lateral extent of groundwater contamination in portions of Line 3 and assess the extent to which contaminants may be reaching Brush Creek. Five (5) new monitoring wells, 16A through 16E, were installed and one round of groundwater samples were collected from the new wells and from existing wells JAW-53, 54 and 55 (total of 8 samples). Samples were analyzed in the fixed laboratory for explosives, TAL metals, VOCs, SVOCs, and groundwater quality parameters. Results are discussed in Section 3.16.

1.5 Subsequent Investigations and Evaluations

This report specifically is limited to the 1997 supplemental RI and is intended to represent conditions current at that time. Additional investigation activities and evaluations were initiated and completed based on the initial results of the draft Supplemental RI Report of December 1997. These separate, but related, documents are outlined below, but are not a part of this draft-final report.

- ***Ecological Risk Assessment Addendum*** (Harza, March 1998). Summarizes results of watershed based ERAA.
- ***Monitoring Well Management Plan*** (Harza, September 1999). Reviews monitoring wells and monitoring objectives and recommends the initial GWM program completed in fall 1999.
- ***Line 800/Pink Water Lagoon Supplemental RI*** (Harza, July 2001a): Following the Jaycor RI, this facility was the site of extensive removal actions and other remedial activities. Groundwater flow and the extent of contamination were identified as data gaps, but removal actions at the time required that supplemental investigations be deferred until after the basewide supplemental RI. Activities included installation and sampling of additional monitoring wells and sampling of groundwater, surface water and sediment in a drainage to the north.
- ***Long-Term Monitoring Report, Fall 1999*** (Harza, June 2000c): This report summarizes results of the first round of comprehensive monitoring conducted in December 1999 and January 2000, including 215 existing and new monitoring wells throughout the base. Facilities are discussed individually with selected historic data. Recommendations for Spring 2000 monitoring are developed based on results.
- ***Monitoring Well Completion Report*** (Harza, June 2000d). Presents information on new monitoring wells installed in conjunction with the fall 1999 GWM event.
- ***Groundwater Monitoring Report, Spring 2000*** (Harza, October 2000e): This report follows the Fall 1999 report and summarizes results of the second round of more comprehensive monitoring conducted in May 2000. Sampling included 191 existing and new monitoring wells. Surface water sampling included hourly sampling over 8 hours spanning a rainfall event.
- ***Technical Memorandum, Supplemental Investigation, Off-Site Groundwater, Surface Water & Sediment*** (Harza, January 2000a): Summarizes results of off-site investigations in summer and in fall 1999. Groundwater samples included 63 direct push samples from 44 locations and one monitoring well.
- ***Technical Memorandum, Supplemental Investigation, Off-Site Groundwater, Phase III*** (Harza, July 2000b): Summarizes results of additional off-site investigations conducted in Spring 2000. Groundwater samples included 18 additional direct push samples from 10 locations and one residential well sample.
- ***Sampling Data, Sanitary Waste Water Treatment Plant*** (TN & Associates, 2000). Results of daily sampling of water at the WWTP between June 12 and July 16, 2000. Samples were analyzed for explosives.
- ***Technical Memorandum, Supplemental Investigation, Off-Site Groundwater, Phase IV*** (Harza, July 2001c). This report summarizes additional investigations conducted in Spring 2001, including 15 direct push groundwater samples from 10 locations, installation and sampling of 4 new monitoring wells (a fifth well had been installed in conjunction with groundwater

monitoring), and sampling of 6 private water wells.

- ***Groundwater Monitoring Program*** (MWH, July 2001). Summarizes the basewide GWM program based on the fall 1999 and spring 2000 rounds and is intended to be routinely updated as monitoring continues.
- ***Evaluation of Contaminant Sources to Surface Streams*** (Harza, July 2001b). Presents results of evaluations to identify potential groundwater sources of explosive contaminants to surface streams.
- ***Installation-Wide Ecological Risk Assessment (pending).*** The ERA, on-going at the time of this submittal, includes two rounds of surface water and sediment sampling, identification of ecological chemicals of concern, and evaluation of ecological risks.

FIGURES

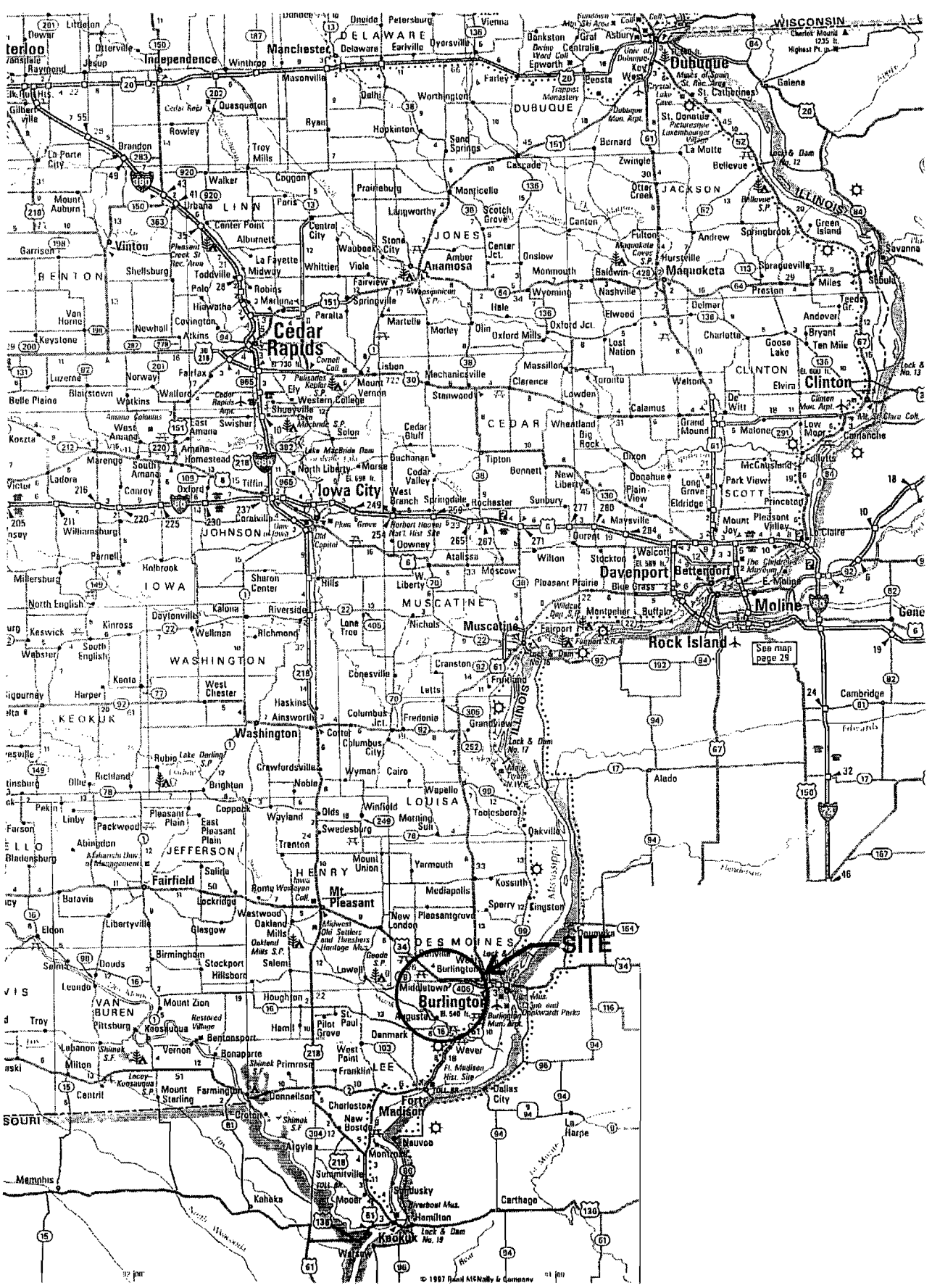

Figure 1-1
SITE LOCATION MAP
SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

HARZA ENGINEERING COMPANY
WATER & ENVIRONMENT

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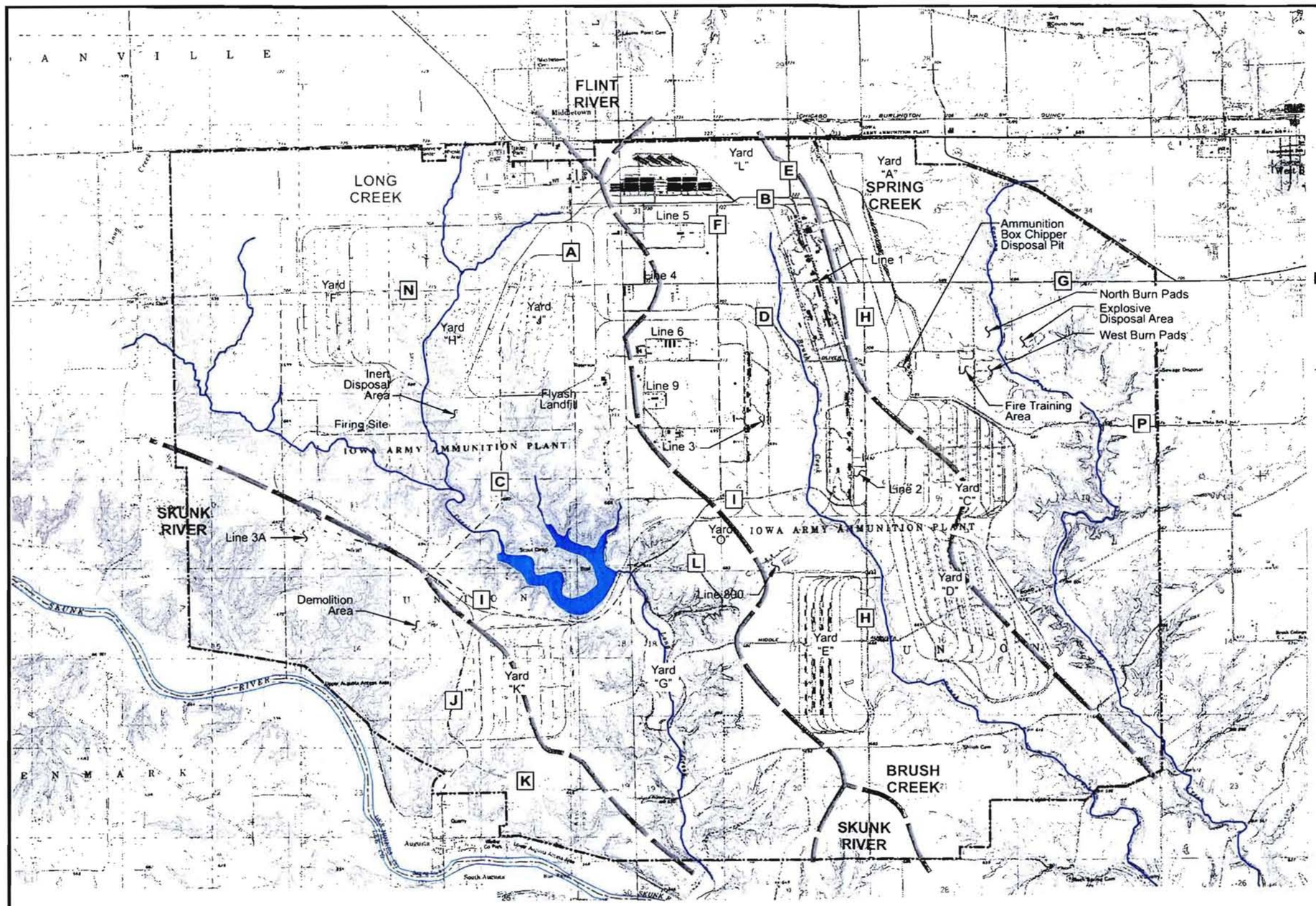

N

LEGEND:

- A — ROAD NAME
- PLANT PROPERTY BOUNDARY
- DRAINAGE BASIN BOUNDARY
- RIVER / STREAM

Scale 0 2000 4000 6000 8000 Feet

HARZA *Consulting Engineers and Scientists*

Figure 1-2
DRAINAGE BASINS AND SITE FEATURES MAP
SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

O:/iowa/supp groundwater ri/fig 1-2.cdr

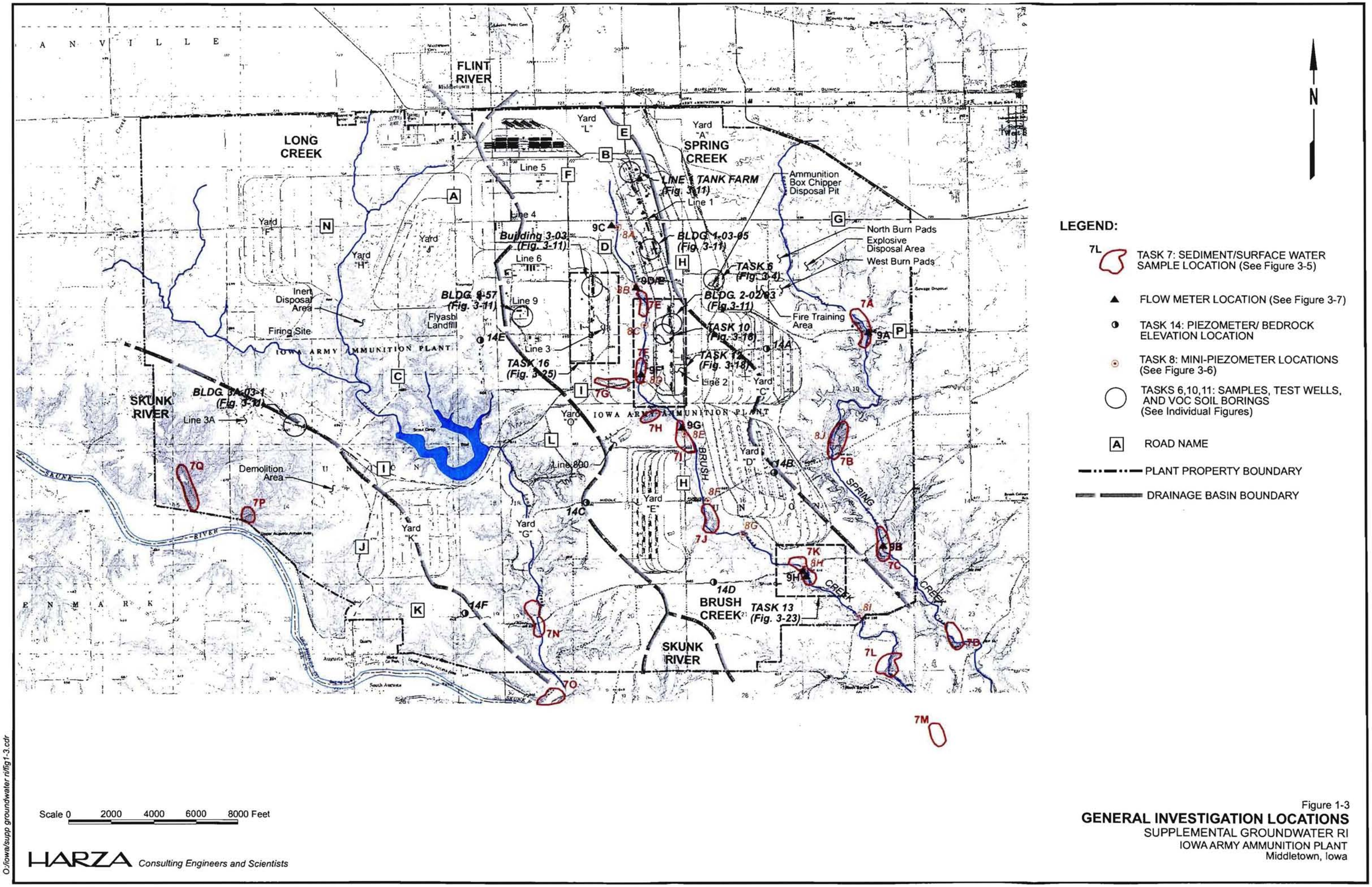

Figure 1-3
GENERAL INVESTIGATION LOCATIONS
SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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2.0 INVESTIGATION METHODS

This section outlines field and laboratory methods used in this investigation with reference to the approved Sampling and Analysis Plan (SAP), (Harza, 1997a). The work was conducted in accordance with the approved SAP, except as noted.

2.1 Drilling and Monitoring Well Construction

Prior to drilling, boring locations were staked and utility clearances obtained from Mason & Hanger personnel. Soil drilling was performed using 4¼ or 6¼ inch inner diameter hollow stem augers, depending on final well construction requirements. Continuous soil samples were collected using standard, 5-foot long Central Mine Equipment soil samplers sized to be compatible with the hollow stem auger (HSA) tools being used. All rock drilling utilized water rotary diamond coring methods with PQ wireline, continuous coring equipment. No mud drilling was required and water for rotary core drilling was municipal water obtained from the plant fire department. Where rock coring was required, the hollow stem augers served as the casing through which coring was completed.

The soil samples and rock core obtained from the borings were logged by the site geologist and draft boring logs were submitted to USACE as the work progressed. Final boring logs were prepared after the field work was completed and are provided in Appendix A. Rock cores were placed in wooden core boxes provided by USACE and were stored on-site. Color photographs were taken of each core box and placed in the project file. Each core box was photographed separately in both the dry and wet condition. After completion of the field work, at IAAAP's direction, two full core boxes were delivered to the local nature center and the remainder of the cores were discarded.

One soil sample for geotechnical testing was collected from the screen interval of each new monitoring well. Geotechnical samples were tested by the Missouri River Laboratory (MRL) for grain-size (sieve plus hydrometer, where appropriate). Test data are provided in Appendix B.

Borings to be abandoned (e.g. not completed as wells or piezometers) were grouted with high solids (30%) bentonite grout placed using a tremie pipe with the lower end of the tremie pipe located within 3 feet of the top of the seal. Pumping continued until grout flowed from the boring at the ground surface. Shallow (<15 feet) soil borings completed in Task 11 *(Soil and Groundwater Sampling for VOCs)* were backfilled with cuttings as agreed by USACE, IAAAP, and USEPA. Deeper borings completed in this task were grouted while temporary wells used in Task 6 *(Ammunition Box Chipper Disposal Area)* and Task 11 were abandoned in accordance with State of Iowa, Department of Health requirements by removing casing below the surface and backfilling with grout.

Well construction drawings are provided in Appendix C. Monitoring wells were constructed inside the hollow stem augers, which served as temporary casing. Wells were constructed using 2-inch inside diameter (ID), 10-foot, schedule 40 PVC V-wire screens with 0.010 inch slot size. Riser pipe sections consisted of 2-inch ID schedule 40 PVC. In Task 10 *(Aquifer Pumping Tests, Line 2)*, well 10A was constructed within Line 2 with 4-inch diameter riser pipe and screen. Wells 10A and 10B

were screened, according to plan, across a 40 foot section of the till aquifer. Other wells were provided with 10-foot long screens. Piezometers, where required, were installed inside rotary and/or core holes, or the hollow stem augers, as applicable, and were constructed with 1 inch diameter PVC riser pipe and 2-foot long, 1-inch diameter, manufactured porous tips. Well and piezometer materials were steam cleaned immediately before installation.

Filter pack consisted of a washed No. 40 silica sand and extend from the bottom of the screen to 2 feet above the screen. A gradation curve for the filter pack material is included in Appendix C. A 2-foot thick commercially manufactured sodium bentonite pellet seal was placed above the filter pack and allowed to hydrate for a minimum of 4 hours. The annular space above the seal then was grouted with high solids (30%) bentonite, mixed in accordance with manufacturer's instructions and placed by pumping through a side discharging tremie pipe. Grout consistency was measured using a mud scale in accordance with the manufacturer's specifications.

Monitoring wells were provided with lockable steel outer casings cemented in 3-ft by 3-ft concrete pads. The outer casings were four inches in diameter except for test well 10A installed in Task 10 *(Aquifer Pumping Tests, Line 2)*, which was six inches. Outer casings were painted orange, as designated by IAAAP. Like-keyed locks were provided and a set of the keys supplied to IAAAP. Three 2-inch diameter steel bumper posts were cemented in place around each well except for the piezometers in Task 14 *(Additional Bedrock Topography Data)*. Wells were provided with tag affixed to the outer casing and identifying the well number, depth, date of installation, USACE Omaha District and the adjusted top of casing elevation. Ground and top of casing elevations and state plane coordinates of the wells and piezometers were surveyed by American Surveying Consultants (ASC). Soil borings used for sampling were located by tape from known site features and coordinates and elevations estimated from existing site maps.

Wells were developed within one week after construction and no sooner than 48 hours after grouting. Piezometers with porous tips did not require development. Where possible, development consisted of mechanically surging and bailing for a minimum of 2 hours followed by continuous pumping using a Well Wizard bladder pump. Temperature, pH, specific conductivity and turbidity were measured after each well volume was removed and development continued until these parameters stabilized for four consecutive readings, as follows: pH (±0.2 units); Temperature (±10%); Specific conductivity (±10%); and Turbidity (±10%). Many of the wells recharged very slowly and could be bailed dry before multiple well volumes were removed. In these cases, pumping generally was not possible and removal of all standing water in the well and sand pack resulted in formation water entering the well for later sampling. However, field measurements by well volume in these wells are not available. Records of well development are provided in Appendix D. One-liter jars of water were collected at the completion of development in each well and photographed in color.

2.2 Sediment Sampling

Sediment samples were collected using hand augers, decontaminated between each use. Sample locations were located by tape from landmarks, such as bridges, and were staked and marked prior to

sampling. At each location, the sampler was augered to the first planned sample depth. The sampler then was withdrawn and the sample to be analyzed for VOCs, if any, transferred directly to pre-cleaned sample containers using stainless steel spoons. The VOC samples were collected with no headspace. After the sample for VOC analysis was collected, the remaining sample from that depth interval was placed in a stainless steel bowl and homogenized using stainless steel tools, before transferring to sample containers for explosives, semi-volatiles, and metals analysis. Where deeper samples were required from the same location, the sampler then was decontaminated and reinserted in the hole, advanced to the next required interval, and the procedure repeated. The maximum planned sample depth was 6 feet or refusal, whichever was less. Actual sample depths and quantities are summarized in Section 3.7. In most cases, refusal was encountered below the 3 foot sample depth. All methods and equipment used was documented on Sample Collection Field Sheets (SCFSs) provided in Appendix E.

2.3 Groundwater Sampling

2.3.1 Monitoring Wells

Well purging and sample collection was performed a minimum of 2 weeks after installation and development. Pre-existing monitoring wells in the same areas were sampled concurrently.

For new wells, low-flow purging and sampling techniques were attempted in each well to obtain samples representative of aquifer-quality water, while minimizing purge water volumes. This was accomplished by pumping from the well sampling zone (e.g. the screen interval) at rates causing minimal drawdown, thus inducing laminar flow from the aquifer through the screen to the pump, without having to purge the entire water column. The goal of the low flow sampling, as stated in the work plan, was to maintain less than 0.3 ft of drawdown at pump rates not exceeding 500 ml/L. Due to small yields from the clayey till soils, recharge to most wells was insufficient for this method, resulting in excessive drawdown even at low pumping rates and in some cases evacuating the well. These wells were purged dry and sampled with bailers after sufficient recovery or were purged using the pump until 3 to 5 well volumes had been removed and field measurements had stabilized, and then sampled using the pump and bailers. Five wells were sampled after being purged dry (shown with an asterisk in Table 2-1 below) and nine wells were sampled after purging 3 to 5 well volumes. Sampling of pre-existing wells was completed using dedicated sampling pumps installed in the wells. Data generated during purging and sampling was recorded in the Field Logbooks and on Sample Collection Field Sheet (Appendix E).

Table 2-1. Field Measurements at Time of Groundwater Sampling

Well Number	Volume Purged (gallons)	pH (units)	Conductivity (umhos/cm)	Temperature	Turbidity (nephalometer units)
10A	64	6.99	600	54.5 °F	4.0
10B	18	NA(1)	566	60.0 °F	32
JAW70	15	7.33	416	11.7 °C	0.648
12A(2)	4	7.07	798	63.5 °F	>200
12B	8	6.57	404	64.7 °F	5.1

Table 2-1. Field Measurements at Time of Groundwater Sampling

Well Number	Volume Purged (gallons)	pH (units)	Conductivity (umhos/cm)	Temperature	Turbidity (nephalometer units)
12C(2)	9	NA	782	68.1 °F	>200
12D	19	6.57	734	64.4 °F	11.2
12E	8	NA(1)	504	67.3 °F	2.25
12G(2)	NA	NA(1)	662	79.6 °F	36
JAW71	7	7.45	558	13.3 °C	28
JAW72	9.5	7.38	490	11.2 °C	1.52
JAW73	9	7.49	563	13.1 °C	4.45
13B	13.5	7.48	335	72.3 °F	5.52
13D(2)	10	7.67	646	69.2 °F	194
13E	4	6.75	1122	77.3 °F	4
13F	NA	NA	NA	NA	NA
G-54	85	7.02	792	65.9 °F	0.47
G-55	NA	NA	NA	NA	NA
16A	38	7.26	599	67.7 °F	4.6
16B	10.5	6.72	396	57.1 °F	30
16C	11.5	7.21	280	67.4 °F	34
16D	11	7.12	298	60.2 °F	3.48
16E(2)	9.5	7.09	611	77.3 °F	101.2
JAW53	6	7.50	504	12.0 °C	2
JAW54	10.5	7.25	486	11.3 °C	1.5
JAW55	9.5	7.16	521	11.7 °C	2.78

(1) pH meter not working properly. (2) Well purged dry before sampling.

2.3.2 Direct Push/Temporary Monitoring Wells

Direct push groundwater samples for chemical analysis were collected in Task 11 *(Soil and Groundwater Sampling for VOCs)* and Task 6 *(Ammunition Box Chipper Disposal Area)*. Samples were retrieved during drilling of hollow stem auger soil borings. Unless otherwise dictated by subsurface conditions, direct push groundwater samples were collected from depths of 3 to 5 feet below the augers, during drilling of soil borings. Most samples were collected from the upper part of the saturated zone. In some cases, direct push (DP) groundwater samples were collected from 2 or more depths within a boring. After the upper sample was collected, as above, the boring was advanced to approximately 3 to 5 feet above the next sample depth and the sampling procedure repeated. DP groundwater samples were collected using a Hydropunch II sampling system with PVC screen materials. Samples were retrieved using bailers which were decontaminated prior to each use. The DP points were purged to reestablish representative conditions before sample collection.

In some cases, DP methods were not feasible due to the length of time required for sufficient water quantities to enter the sampler. As agreed with USACE and USEPA for these cases, temporary wells were installed in the boring and left until sufficient water was present for sampling. The temporary wells were constructed by installing a 2-inch diameter, 2-1/2-foot long PVC screen and riser pipe in the boring through the hollow stem augers, installing an approximately 5 foot long filter pack around the screen, and installing a 5 to 10 foot thick bentonite seal above the filter pack. The surface of each temporary well was protected from surface water runoff. The temporary wells were installed in

Tasks 6 and 11 and were removed after sampling and the borings grouted or backfilled, as appropriate.

2.4 Mini-Piezometers

"Mini-piezometers" were installed and measured in Task 8 *(Mini-Piezometer Testing, Brush Creek)*. Installation and measurement were in accordance with relevant procedures outlined by Lee and Cherry *("A Field Exercise on Groundwater Flow Using Seepage Meters and Mini-piezometers, Journal of Geological Education, 1978, v. 27)*. Specific locations and results are discussed in Section 3.8.

Materials for constructing the "mini-piezometers" were assembled prior to mobilization. Each "mini-piezometer" consisted of a small diameter polyethylene tube provided with a wrapped, perforated tip and installed into the creek bed through a small diameter steel pipe. The pipe was driven into the creek bed manually, the plastic tube inserted, and the pipe withdrawn, leaving the tube in place. A lag bolt on the bottom of the pipe was used to keep sediment from plugging the pipe and was left in place when the pipe was withdrawn. The depth of installation depended on site conditions, with the intent being to install the piezometers at least 3 feet below the creek bed.

The "mini-piezometers" were measured after completion of all installations. Measurements consisted of determining the difference in head between the water level in the "mini-piezometer" and the creek level. If water levels in the creek bed are higher than the surface water level, the stream is gaining. If water levels in the creek bed are lower than the surface water level, the stream is losing.

"Mini-piezometer" locations were sketched on field maps as they were installed. A description and measured sketch of each test area was recorded in the bound field notebook along with a description of the installation, depths, any problems encountered, and measurement results.

2.5 Stream Flow Metering

2.5.1 Flow Meters

Seven stream flow meters were installed in this investigation, five on Brush Creek and two on Spring Creek. Locations and results are discussed in Section 3.9. Originally, flume type flow meters attached to small sheetpile weirs had been proposed. However, blocking flow in the creek was not permitted due to the presence of migrating fish. Therefore, an alternative, non-intrusive technique was used involving installation of acoustic doppler flow meters on the bottom of the streams. The meters are manufactured by Unidata Australia and measure pressure (depth), temperature and average velocity. Using the depth and velocity readings, discharge can be computed at each meter. Figure 2-1 shows a typical installation. The meter operates by generating ultrasonic sound pulses at a fixed frequency. Sound pulses that are reflected from objects in the flow are received by the meter and the frequency of the reflected pulse is compared to the generated pulse. The shift in frequency is directly related to the velocity of the flow.

The sites chosen for the meters were selected to have the following characteristics:

- Uniform, non-turbulent flow
- Stable channel cross-section
- Velocities greater than about 0.1 ft/sec
- Flow depth greater than 1 inch
- Flow not excessively aerated
- Stable stream bed - the meter would not be buried by sediment deposits

The accuracy of this method of flow measurement depends on a number of factors, the most important being the assumed shape of the longitudinal velocity distribution. Because the velocity is measured only at one point in the section, the measured value must be extrapolated over the whole section to compute the discharge. For small sections, such as a culvert pipe, the measured velocity is a good estimation of the overall section velocity and the discharge can be readily computed by multiplying the measured velocity by the cross-sectional area (computed from the depth). For a natural stream section, especially those that are wide and shallow with significant depth variation, the average velocity varies considerably across the section. The assumption of the magnitude of this variation is the key to computing a reasonable section discharge. The accuracy of the flume method of discharge measurement is about ±2-5%. For the method using the acoustic doppler meter the accuracy is on the order of ±10-15%. This is considered acceptable for the intended purpose.

2.5.1.1 Spring Creek.

The meters installed along Spring Creek were generally located at or near road crossings for ease of access. Detailed locations of each meter are discussed below.

Meter 9A. This meter was installed where Plant Road P crosses the creek. The meter is located about 20 feet upstream of the upstream face of the bridge crossing the creek. The stream bed at this location is gravel and stones up to about 1 inch diameter with some larger stones up to 9 inch diameter. The meter was attached to a concrete pedestal specially made for this purpose. The pedestal was placed in a hole excavated in the stream bottom with the top of the pedestal flush with the stream invert. The meter itself was then mounted on the pedestal. The stream reach in this location is straight and the cross section is fairly uniform.

Meter 9B. This meter was installed where Plant Road K crosses the creek. The meter is located about 20 feet downstream of the downstream face of the bridge crossing the creek. The stream bed at this location is course sand with gravel and stones up to about 1 inch diameter. The meter was attached to a concrete pedestal, as described for Meter 9A. The stream reach in this location is straight and the cross section is fairly uniform.

2.5.1.2 Brush Creek.

As with the Spring Creek meters, the meters along Brush Creek were generally located at or near road crossings for ease of access. Detailed locations are described below.

Meter 9C. The intent at this location was to use an existing flume. The existing flow meter installed in the flume at this location was to have been rehabilitated and a recording depth gage installed. However, due to the construction of an outfall from a low dam as part of sediment remediation activities, the invert of the channel downstream of the flume was raised significantly which created a permanent backwater condition. This condition makes it impossible to get reliable depth readings. Therefore, no meter was installed at this location.

Meters 9D/E. Two meters were installed where Plant Road D crosses the creek. Two culverts convey creek flow under the road, a 5 ft diameter corrugated metal pipe (CMP) and a 122 ft diameter CMP . Much of the dry-weather flow from the creek is diverted into the 5 ft dia. west culvert (9D). However, during even small storm events, flow can pass through the 122 ft dia. east culvert (9E). The meters were installed approximately 2 pipe diameters in from the downstream end to avoid contraction effects from the free outfall at the ends of the pipes.

Meter 9F. One meter was installed where Plant Road I crosses the creek. Two CMP culverts cross under the road and there is a double barreled box culvert under an abandoned road just upstream. Due to the sediment depth in the culverts, the meter was installed directly in the stream bed approximately 40 ft upstream of the box culvert. The stream bottom at this location is mainly course sand overlying gravel. The meter was mounted on a concrete pedestal. Due to the stream sinuosity, the meter could not be placed in a straight section of the stream. However, the radius of the curve of the channel is fairly large and the flow is shallow. Therefore, secondary currents developed by the curvature of the channel should not appreciably effect the flow measurements.

Meter 9G. One flow meter was installed where Plant Road H crosses the creek. There are the remains of an old flow metering station in the center of a concrete slab just downstream of the bridge. The new meter was mounted adjacent to the old meter base on the concrete slab. A diversion wall was constructed in front of the old meter base to direct all of the flow to the new meter.

Meter 9H. This meter was installed just downstream of the Plant Road K bridge over the creek. The meter was installed in the center of the stream bed about 20 feet downstream from the bridge. The stream bed at this location is gravel and stones up to about 1 inch diameter with some larger stones up to 9 inch diameter. The meter was attached to a concrete pedestal. The stream reach in this location is straight and the cross section is fairly uniform.

2.5.2 Rain Gage

A rain gage was installed near the location of the existing (non-functioning) rain gage at the

treatment plant near Brush Creek on Plant Road H. The gage is a tipping bucket type with a resolution of 0.01 inches. The gage is connected to an electronic recording device which records the number of tips in a specified time interval. The time interval was set to 5 minutes and later increased to 10 minutes.

2.5.3 Data Reduction

Several methods of computing stream discharge were required due to the variable conditions at the meter sites.

Culverts. For the circular culverts on Brush Creek at Plant Road D, the measured velocity was assumed to be the average for the entire section. The discharge was then computed by calculating the area of the flow from the measured depth and then multiplying by the measured velocity

Natural Channels. For channels with a Anatural@ cross-section, the average velocity at the center of the channel is not the average over the whole width and, therefore, multiplying the velocity by the area does not yield the correct discharge. However, for wide (width/depth > 10) channels with a uniform depth the average velocity measured near the center is a good representation of the section velocity. In this case multiplying the area and the velocity will give a reasonable approximation of the discharge. This is the situation at Meter 9G where the bottom of the channel is level concrete and the sides are vertical.

At Meters 9A, 9B, 9H and 9F the channel depth varies significantly across the section and a different method of computing the discharge was used. For streams with a uniform bottom roughness the

$$V = V_{meas} \bullet \left(\frac{d}{d_{meas}} \right)^n$$

average velocity in any vertical section will be related to the measured velocity by the formula: where n is a parameter to be estimated, d is the flow depth at a particular location and d_{meas} is the measured depth. Thus, a velocity can be computed for several locations across the stream and a discharge calculated. It is assumed that the point of measurement is at the deepest part of the stream where the average velocity is the greatest.

The value of n is based on the roughness of the stream bed and can be estimated from velocity measurements at several points across the stream. For a very rough bed, n will be large and for a smooth stream, n will be small. For n=0, the channel flow velocity is the same everywhere (i.e. there is no friction). The value selected for each stream location is shown in Table 2-2.

Table 2-2. Assumed Values of "n", Stream Flow Meter Locations

Meter	*n*
9A	*0.90*
9B	*0.70*

Table 2-2. Assumed Values of "n", Stream Flow Meter Locations	
Meter	*n*
9F	*1.20*
9H	*0.90/0.60*

At meter 9H, there are two values of n because there are two distinct bottom types, one significantly rougher than the other.

2.5.4 Computer Modeling

A computer model was constructed of the drainage area upstream of the meters on each stream and used to estimate runoff volumes and provide independent verification of the flow measurements for rainfall events. Using the measured rainfall data, computer generated hydrographs for each meter location were compared to hydrographs prepared from the flow meter data.

Table 2-3 shows the sub-basin characteristics for the Brush and Spring Creek watersheds. Figure 2-1 shows the extent of each sub-basin. The Curve Number (CN) and the time of concentration (t_c) are parameters used in the TR-20 computer model to develop the runoff hydrographs. The CN shown is for "normal" soil moisture conditions, when there has been at least 0.25 inches of rain in the prior five days. For dry conditions, when less than 0.25 inches have fallen in the prior 5 days, a CN of 76 could change to 59. For "wet" conditions, the CN could be increase to 93. These changes have a significant impact on the rate and total amount of surface runoff generated by a particular event.

Table 2-3. Sub Basin Characteristics			
Sub Basin	*Area (mi^2)*	*CN*	*tc (hrs)*
B1	*1.84*	*80*	*2.2*
B2	*0.74*	*76*	*2.6*
B3	*1.87*	*76*	*2.1*
B4	*2.77*	*76*	*2.8*
S1	*6.30*	*78*	*3.4*
S2	*5.81*	*74*	*4.0*

The TR-20 computer model only computes surface runoff and does not account for groundwater flow. That portion of the rainfall that does not runoff is assumed to infiltrate into the soil and is lost to the streamflow calculation. This assumption is reasonable if the object of the analysis is to determine the peak runoff rate from a particular storm and not the complete recession curve. For small rainfall events, however, where the rate of rainfall does not exceed the assumed rate of infiltration, the model will not show any runoff - all of the rainfall will go directly to subsurface flow or will be intercepted by vegetation. The subsurface flow will either go into the groundwater or will flow to the creeks.

The model was used to assist in the analysis of the data, to provide a check on the computation of the discharges at each meter location, to avoid any gross errors in the calculation of the discharge from the velocity measurements. It is expected that for small rainfall events, where all or a majority of the

flow in the creeks is from subsurface flow, the model will not indicate any surface runoff. Because the computer model was being used as a data check for low flow events, no calibration was done. The runoff parameters were selected based on engineering judgement and experience with runoff models for similar watersheds.

2.6 Field Permeability Tests and Hydraulic Integrity Tests

Field permeability tests were conducted in new monitoring wells installed in Tasks 12 *(Additional Groundwater Data, Line 2)*, 13 *(Additional Groundwater Data, Downstream Reaches of Brush Creek)*, and 16 *(Additional Groundwater Data, Line 3)*. Tests used the falling and rising head slug method and were conducted in accordance with the approved work plan using decontaminated solid slugs to displace water in the well and transducers and data loggers to measure recovery of the water levels to pre-test conditions. Data then were downloaded from the data logger to a portable computer and reduced using commercial software to obtain estimates of hydraulic conductivity. Data printouts are provided in Appendix F and results are discussed where appropriate in Section 3.0.

Short-term slug test methods also were used to help evaluate the condition of 28 existing wells in Task 5 *(Hydraulic Integrity Review, Existing Monitoring Wells)*. Methods were the same as described above, except tests did not necessarily continue to pre-test water levels, since results were not intended for use in estimating hydraulic conductivity. Rather, the data collected were reviewed qualitatively to help assess whether the tested wells were responding normally or, alternatively, abnormally possibly suggesting construction or maintenance problems. Results of the hydraulic integrity testing are discussed in Section 3.5 and data printouts are included in Appendix G.

2.7 Equipment Decontamination

Decontamination of personnel, small equipment, and large equipment was conducted in accordance with the approved QAPP for field activities in Tasks 3 *(Basewide Groundwater Level Measurements)*, 6 *(Ammunition Box Chipper Disposal Area)*, 7 *(Sediment and Surface Water Sampling, Site Drainages)*, *10 (Aquifer Pumping Tests, Line 2)*, 11 *(Soil and Groundwater Sampling for VOCs)*, 12 *(Additional Groundwater Data, Line 2)*, and 16 *(Additional Groundwater Data, Line 3)*. Other tasks either did not require intrusive field activities or were not located within known contaminated areas. Decontamination fluids from the sampling and drilling equipment were collected for disposal as investigation derived waste (IDW), discussed in Section 2.8. Small equipment used for drilling, soil sampling, and water sampling, and those portions of instruments and equipment placed into borings or wells, such as water level meter probes and cables, were decontaminated before and between each use. Single-use sampling equipment such as disposable bailers was used where appropriate to minimize decontamination requirements. Drilling and heavy equipment was decontaminated before first use on the site, between borings, and before demobilizing from the site. Drill cuttings caked on this equipment were scraped off at the sampling sites and the drill rig, augers, drill bits, shovels and similar equipment were sprayed with detergent water by a high-pressure washer, then rinsed with potable water.

2.8 Investigation Derived Waste

IDW generated during this project included excess soil cuttings from borings and wells, groundwater from monitoring well development and sampling, decontamination water and solutions, and used personal protective equipment (PPE).

IDW generated during field activities was segregated as potentially contaminated or uncontaminated based on proximity of the field location to known contaminated areas. All potentially contaminated IDW was placed in new, DOT and EPA approved drums, which were left at the investigation site pending final determination. A total of 173 drums were used and a drum inventory maintained. The drums were sealed, labeled, and recorded so that their contents could be identified as to material and source. Soils and water IDW were segregated in separate drums. IDW generated during drilling of bedrock piezometers in Task 14 *(Additional Bedrock Topography Data)* did not require containerization as agreed by IAAAP, USEPA, and USEPA. These sites are not located near any known contaminant sources. IDW generated during other drilling tasks was containerized.

Final disposition of soil IDW was based on results of environmental sampling in the boring or borings contained in the drums and was approved by USACE. Disposal was based on the "Action-Level Criteria for Soil" and the "Removal Action Decision Flow Chart" developed for the soil removal and provided in the FSP. Disposal was as follows:

a) Contents of 21 drums determined to contain clean soil and 34 drums determined to contain clean water IDW were spread or discharged on the ground near the boring locations;

b) 8 drums containing contaminated soil IDW and 88 drums of soil for which available analytical data were insufficient to reach a determination were transported and disposed in the Trench 6 landfill; and

c) 22 drums containing potentially contaminated water IDW were transported to the sedimentation dam at the Trench 6 landfill for treatment and discharge.

The emptied drums were steam cleaned on site and taken off-site by a local drum recycling firm. Rinsate from the on-site pressure washing was directed into the sedimentation dam at the Trench 6 landfill for treatment and discharge. Used PPE was bagged and disposed as municipal trash.

2.9 Surveying

Surveying was performed by ASC. Surveying included state plane coordinates and elevations (ground and top of casing) of new wells and piezometers installed in the supplemental RI (Tasks 6, 8, 10, 12, 13, and 16) and existing wells and piezometers in Task 3. ASC's final report is provided in Appendix H and details the methods used and final data. GPS survey methods were used first to establish a network of control points around the IAAAP and to provide survey control for wells and piezometers. These points were tied into existing National Geodetic Survey (NGS) control stations and were marked with iron pits. GPS surveying utilized Trimble 4000SSI dual frequency geodetic

receivers with L1/L2 geodetic antennas. The Fast-Static GPS baseline measuring technique was used to survey the project control network first. Then the Real Time Kinematic (RTK) survey technique was used to survey the wells and piezometers, adopting the control points as base stations. Surveyed coordinates and elevations were used in preparation of maps and other figures in this report and also are incorporated in the monitoring well inventory provided in Appendix I.

2.10 Analytical Methods

Soil and direct push groundwater samples collected in Task 11 *(Soil and Groundwater Sampling for VOCs)* were analyzed for VOCs by ONSITE Environmental Laboratories, Inc. (ONSITE) of Fremont, California, using USEPA SW-846 Method 8260A. Other soil, sediment, and water samples were analyzed off-site by Applied Research and Development Laboratory (ARDL), of Mt. Vernon, Illinois. Analytical methods used by ARDL are listed in Table 2-4, below:

Table 2-4. Analytical Methods

Analyte/Group	*Method*
Explosives	*SW846 Method 8330*
Volatile Organic Compounds	*SW846 Method 8260A*
Semi-Volatile Organic Compounds	*SW846 Method 8270B*
Metals by ICP (1)	*SW846 Method 6010A*
Metals by AA (2)	*SW846 7000 Series*
Alkalinity	*SW846 3210.1*
Nitrate/Nitrite	*Method 353.1*
Phosphate	*Method 365.2*
Dissolved Oxygen	*Method 360.1*
Biological Oxygen Demand	*Method 405.1*
Chemical Oxygen Demand	*SW846 Method 5220C*
Total Organic Carbon	*Method 415.1*
Sulfate	*Method 375.4*
Sulfide	*Method 376.1*
Total Dissolved Solids	*Method 160.1*
Chloride	*Method 300*

(1) Inductively coupled plasma. Aluminum, antimony, barium, beryllium, cadmium, chromium, copper, silver, vanadium, nickel.
(2) Atomic Adsorption. Arsenic, lead, mercury, selenium, thallium.

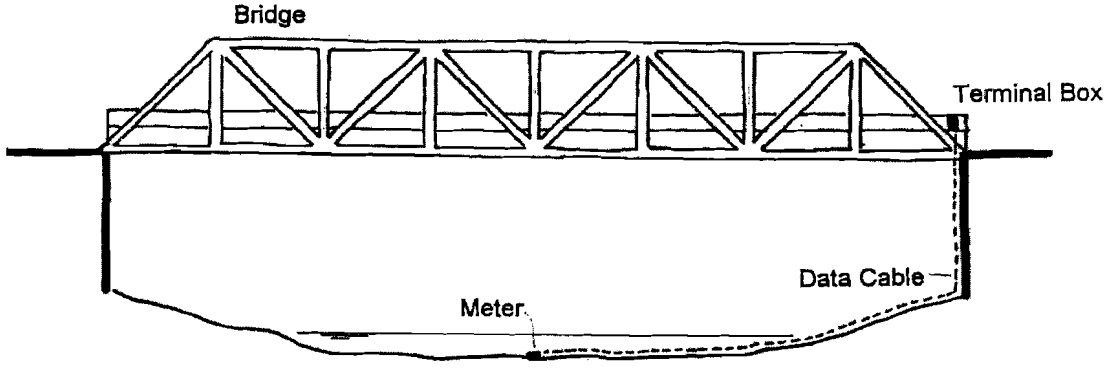
Results of the analyses are described in applicable portions of Section 3.0 and the nature and extent of contamination is discussed in Section 5.0. A summary tabulation of analytical results is provided in Appendix J, including data obtained in this supplemental RI, data taken from JAYCOR (1996), and data from Mason & Hanger monitoring, as used in this report. Laboratory reports are provided in Appendices K (for ONSITE) and L (for ARDL).

All the detected chemicals were subjected to data validation following the USEPA National Functional Guidelines for Inorganic/Organic Data Review. The analytical data were validated internally by the laboratories and case narratives as well as QC documentation provided. External

data validation was completed and a Quality Control Summary Report (QCSR) prepared summarizing results of the validation process. Analytical data provided from both laboratories was considered acceptable and useable with no major concerns. Other issues raised in the validation process are noted where applicable in this report.

FIGURES

O:/iowa/supp groundwater ri/fig2-1.cdr



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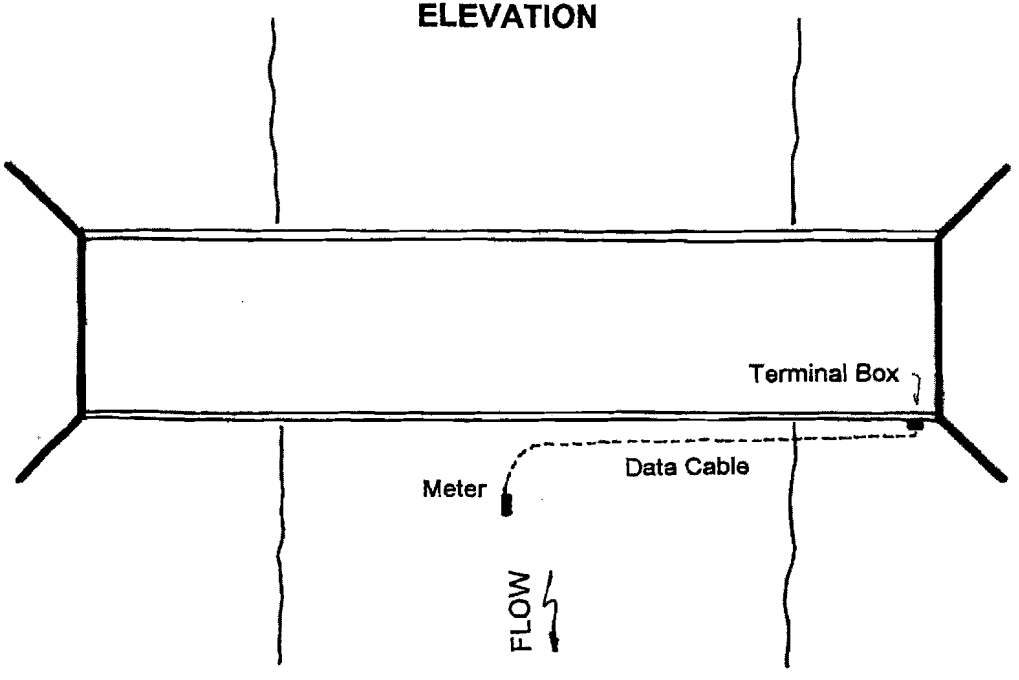

PLAN

NOT TO SCALE

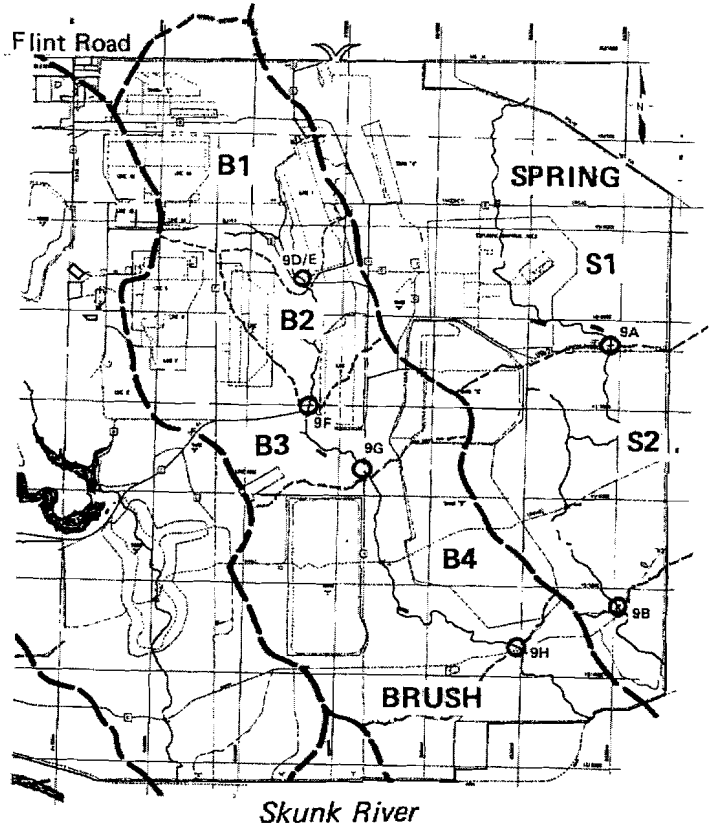

Figure 2-1

TYPICAL STREAM FLOW METER INSTALLATION AND DRAINAGE SUB-BASINS

SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

HARZA ENGINEERING COMPANY
WATER & ENVIRONMENT

3.0 STUDY AREA INVESTIGATION

This section summarizes findings of the sixteen tasks completed in the supplemental RI, including investigation locations and results. These findings, with data from previous investigations, are the basis for discussion of site physical characteristics in Section 4.0 and the nature and extent of contamination in Section 5.0. General investigation locations are shown on Figure 1-3.

3.1 Evaluation of Available NPDES Data

3.1.1 IAAAP Discharge System and Available Data

The purpose of this evaluation was to determine the extent to which the wastewater discharges permitted under NPDES may contribute to off-site migration of contaminants by the surface water pathway, in relation to possible groundwater contributions. The evaluation was based on data obtained from Mason & Hanger and the Iowa Department of Natural Resources, on stream flow monitoring in Task 9 *(Stream Flow Meters, Site Drainages)* and on surface water sampling in Task 7 *(Sediment and Surface Water Sampling, Site Drainages)*. Since the available NPDES data are limited to the period from 1986 to the present, the study reflects approximate current operating conditions in which some facilities were closed and others operated discontinuously. Discharge of contaminants to site streams is reported to have been more extensive in earlier periods of the facility's operation, a limitation on the present study.

NPDES Permit No. 29-00-9-00, requires IAAAP to monitor wastewater discharge at fourteen outfalls located throughout the plant. These discharge directly or via channels or surface drainages to Brush Creek, Long Creek, and a small unnamed tributary to the Skunk River near Line 3A. The regulated outfalls are listed in Table 3-1 and locations are shown on Figure 3-1.

Table 3-1. NPDES Outfalls

Outfall	Basin	Location	Description	Monitoring Parameters
11	Brush Creek	Line 1	Discharge from explosive loading operations.	Flow, pH, RDX+HMX, TNT, TSS
12		Line 1, Bldg. 1-70-1	Discharge from explosive loading operations.	Flow, pH, RDX+HMX, TNT, TSS, TOX.
13		Bldg. 500-216-1	Main sewage treatment plant outfall	Ag, BOD/COD, NH3-N, pH, TOX.
21		Line 2, Bldg. 2-70-1	Discharge from explosive loading operations.	Flow, pH, RDX+HMX, TNT, TSS
22		Line 2, Bldg. 2-70-2	Discharge from explosive loading operations.	Flow, pH, RDX+HMX, TNT, TSS
32		Line3, Bldg. 3-70-1	Discharge from explosive loading operations.	Flow, pH, RDX+HMX, TNT, TSS
33		Line3, Bldg. 3-70-2	Discharge from explosive loading operations.	Flow, pH, RDX+HMX, TNT, TSS
51		Line 5A, Bldg. 5A-140-3	Discharge from explosive loading operations.	Flow, pH, RDX+HMX, TNT, TSS
82		Line 800, Bldg. 800-70-1	Discharge from explosive loading operations.	Flow, pH, RDX+HMX, TNT, TSS, Pb
35	Long Creek	Line 3A, Bldg. 3A-70-2	Discharge from explosive loading operations.	Flow, pH, RDX+HMX, TNT, TSS
52		Line 5B, Bldg. 5B-140-3	Discharge from explosive loading operations.	Flow, pH, RDX+HMX, TNT, TSS
9		Bldg. 500-139	Treated effluent from main heating plant: coal pile runoff, boiler blowdown & flyash leachate.	Fe, pH, PO4, TSS
14	Skunk River	Line 3A, Bldg. 500-216-2	3A sewage treatment plant outfall	Ag, BOD/COD, pH, TSS
34		Line 3A, Bldg. 3A-70-1	Discharge from explosive loading operations.	Flow, pH, RDX+HMX, TNT, TSS

TSS = Total Suspended Solids. BOD = Biological Oxygen Demand. COD = Chemical Oxygen Demand. TOX = Total Halogenated Organics.

Outfall 9 discharges to a pond which, if allowed to overflow, would discharge to Long Creek. There has been no discharge from outfalls 35, 51, and 52 for more than seven years. According to IAAAP, only outfalls 22 and 35 currently are used for regular process water discharge. Process water at other facilities is recycled and discharged periodically.

Contaminant loading to site streams could be evaluated only for outfalls monitored for both explosives and flow. These are outfalls 12, 21, 22, 32, and 33. Discharge flow data were provided by Mason & Hanger for 1994, 1995, and 1996 and from the Iowa Department of Natural Resources back to June 1989. Approximate annualized monthly discharge flows were calculated by summing the reported flows for each 12 month period, and dividing by 12. Because many outfalls did not discharge continuously (i.e. zero flow reported for periods of days to months), the calculated average flows are lower than any given instantaneous discharge rate.

Explosives concentrations in the discharges were taken from the records provided by the Iowa Department of Natural Resources. IAAAP is required to monitor explosives concentrations (RDX+HMX and TNT) at outfalls 11, 12, 21, 22, 32, 33, 34, 35, 51, 52, and 82. These data, reported as average monthly concentrations, are available for the period January 1987 to March 1997. However, because flow data is available only to June 1989, average explosives loadings were calculated for the period June 1989 to March 1997, limited to those outfalls for which both flow and explosives concentration data were available.

During months with zero (0) average discharge values, loadings were calculated using monthly maximum discharge values. Average yearly flows were calculated using only the 30 day average discharge values. Average flow and maximum monthly discharges for each recorded year and explosives loadings are tabulated in Appendix M, indicating whether average or maximum flows were used to calculate loadings.

3.1.2 Wastewater Contribution to Stream Flow

Dry weather stream flow occurs when there is no surface water runoff contribution to the flow and provides a conservative scenario for assessing wastewater impacts on the streams. Wastewater contribution to dry weather stream flow was estimated for Brush Creek, since available data for other site streams was not sufficient for detailed evaluation. The average yearly discharge flows to Brush Creek for 1994, 1995, and 1996 and the average discharge for the three year period is shown in Table 3-2. below.

Table 3-2. Average Annual Wastewater Discharge [1]

Outfall	Discharge Flow							
	1996		1995		1994		Average	
	gpm	cfs	gpm	cfs	gpm	cfs	gpm	cfs
#11	0	0	0	0.0000	0.180	0.0004	0.045	0.0001
#12	0.359	0.0008	0.18	0.0004	0.404	0.0009	0.314	0.0007
#13	283.9	0.6326	329.9	0.7351	262.5	0.5850	292.1	0.6509
#21	0.135	0.0003	0.045	0.0001	0.180	0.0004	0.135	0.0003
#22	0.045	0.0001	0.045	0.0001	0.045	0.0001	0.045	0.0001
#32	0	0	0.898	0.0002	0.404	0.0009	0.180	0.0004
#33	0.180	0.0004	0.045	0.0001	0.090	0.0002	0.090	0.0002
#51	0	0	0	0	0	0	0	0
#82	0.268	0.0055	0	0	0	0	0.088	0.0018

1. Includes outfalls monitored for both flow and explosives.

Stream flows in Brush Creek were estimated from Task 9 *(Stream Flow Meters, Site Drainages)*, in which flows were monitored at the D, I, H, and K Road bridges (see Section 3.9). The flow measurements for May 24, 1997, were selected as representative of Spring season dry weather flow, since the preceding 5 days had been dry. These flows are summarized in Table 3-3. Only outfall 13 was actually discharging to the creek on that day.

Table 3-3. Typical Dry Weather Flows on Brush Creek [1]	
Location Along Creek	*Flow (cfs/gpm)*
D-Road (meter 9C)	0.11 / 49.4
I-Road (meter 9D)	0.19 / 85.3
H-Road (meter 9G)	0.86 / 386
K-Road (meter 9H)	2.65 / 1,189

[1] Based on flow measurements on May 24, 1997.

Wastewater outfalls to Brush Creek upstream of these flow metering locations were grouped together and summed to obtain a cumulative outfall flow, shown in Table 3-4, below.

Table 3-4. Average Wastewater Discharge				
Location	*Outfall*	*Average Outfall Flow, 1994-1996 (cfs)*		
		Discharge	*Combined*	*Cumulative*
D Road	#11	0.0001	0.0008	0.0008
	#12	0.0007		
	#51	0		
I Road	#21	0.0003	0.0010	0.0018
	#22	0.0001		
	#32	0.0004		
	#33	0.0002		
H Road	#82	0.0018	0.0018	0.0036
K Road	#13	0.6509	0.6509	0.6545

The estimated wastewater discharge contribution to stream flow from the various outfalls was calculated as the percentage of the cumulative average flows from outfalls discharging to Brush Creek compared to measured creek flows for each meter location. Results are shown in Table 3-5, below.

Table 3-5. Wastewater Discharge to Brush Creek			
Location	*Stream Flow (cfs)*	*Cumulative Wastewater Flow (cfs)*	*Wastewater Contribution to Stream Flow*
D Road	0.11	0.0008	0.72%
I Road	0.19	0.0018	0.94%
H Road	0.86	0.0036	0.42%
K Road	2.65	0.6545	24.70%

The average cumulative discharges from all outfalls upstream of H Road are less than 1 percent of the stream flow. In these reaches, during dry weather periods, groundwater and any unmonitored discharges must contribute the balance of stream flow. The major flow increment occurs where the treatment plant outfall (#13) enters the creek, just downstream of H Road, after which the cumulative outfall discharge is approximately 25 percent of the spring dry weather flow in Brush Creek.

3.1.3 Wastewater Contribution to Explosives Concentrations

Based on yearly average flows and explosives concentrations, mass loadings were calculated for each reach of Brush Creek corresponding to the storm water flow monitoring discussed Section 3.1.2. The tabulations and calculations are provided in Appendix M. The mass loadings were then used to estimate in-stream concentrations of explosives for the dry weather scenario using mass balance techniques, as follows:

$$C_{stream} = Q_{npdes} \times C_{npdes} / Q_{stream}; \text{ where}$$

'C' is concentration and Q is flow. Results are summarized in Table 3-6.

Table 3-6. Calculated In-Stream Flow Concentrations

Year	Calculated In-Stream Concentration (ug/l)			
	D-Road (Q_{stream}=0.11 cfs)	I-Road (Q_{stream}=0.19 cfs)	H-Road (Q_{stream}=0.86 cfs)	K-Road (Q_{stream}=2.65 cfs)
1997(Jan-March)	5.56	12.40	2.74	0.89
1996	2.02	3.42	0.75	0.24
1995	1.52	4.59	1.01	0.33
1994	17.20	26.16	5.78	1.88
1993	5.23	22.25	4.92	1.60
1992	2.87	5.76	1.27	0.41
1991	32.54	20.79	4.59	1.49
1990	1.85	6.64	1.47	0.48
1989 (June-Dec)	2.70	8.69	1.92	0.62
Average	7.94	12.30	2.72	0.88

The calculated average explosives concentrations were compared to results of surface water sampling performed in Task 7 *(Surface Water and Sediment Sampling, Site Drainages)*, as shown in Table 3-7, below. General sample locations were shown in Figure 1-3.

Table 3-7. Explosives Concentrations in Brush Creek

Location [1]	Sample Location	Actual Concentration (ug/l)	Calculated Concentration (ug/l)
D Road	7E	32.3	7.94
I Road	7F	10.2	12.30
	7H	4.6	
H Road	7I	5.3	2.72
	7J	6.8	
K Road	7K	2.67	0.88
	7L	7.9	
	7M	7.9	

[1] Samples are downstream of this location. Calculated concentrations are at this location.

Based on information provided by Mason & Hanger, there were no discharges on the days when the 1997 sampling covered in this report occurred, except at the wastewater treatment plant where explosives are not monitored. Discharges from some outfalls had occurred between 2 and 5 days before sampling at a few locations. Nonetheless, the sampling appears to reflect baseline conditions. Although generally in the same order of magnitude, sample concentrations are higher than calculated concentrations except at I Road, the balance possibly due to groundwater or other discharges not monitored for explosives. At K Road, in particular, the difference between sample and calculated concentrations is relatively large and could result from the significant flow from outfall #13, which is not monitored for explosives. It is important to note that flow and mass loadings were determined based on average flows, except for those months where the reported average flows were zero. Since many discharges are non-continuous, use of average flows tends to underestimate the flow and mass loading of contaminants from an actual discharge event. Use of maximum discharge flows tends to exaggerate the loading. These have opposing effects, but do not necessarily cancel each other.

3.2 Monitoring Well Inventory & Inspection

The updated monitoring well inventory generated in this task is provided in Appendix I, listing well number, location, survey data, and current status. A total of 335 possible wells or

piezometers were identified from initial records searches, including wells installed in this investigation. Subsequent efforts to locate and inspect these wells indicated 57 which either could not be located, and were known or presumed to have been abandoned, or were water supply wells, gas probes, or other facilities not suitable for groundwater monitoring. As a result, 278 wells or piezometers were identified as potentially available for measurement of groundwater levels. Locations of these wells are shown on Figure 3-2. Well inspection reports are included in Appendix I and identify a number of potential maintenance concerns such as missing caps and locks.

3.3 Basewide Groundwater Level Measurements

Groundwater levels were measured in 262 monitoring wells and piezometers during the week of May 19, 1997. Readings are included in the well inventory summary included in Appendix I. Readings were converted to elevations following surveying in Task 4 *(Survey Existing Monitoring Wells)*, and differentiated between shallow groundwater, deep groundwater, and bedrock wells for preparation of basewide potentiometric contour maps. Resultant maps and discussion of basewide groundwater flow is provided in Section 4.0.

3.4 Resurvey Monitoring Wells

In this task, ground and measurement point elevations and state plane coordinates were resurveyed or surveyed for approximately 288 existing and new wells and piezometers. Revised elevations and locations were entered in the monitoring well inventory for the site and were used as appropriate throughout this report. The surveyor's final report is provided in Appendix H and notes the following:

> *"The GPS survey was performed to FGCS accuracy standard Order C 2-1 as outlined in 'Geometric Geodetic Accuracy Standards and specifications for Using GPS Relative Positioning Techniques' Version 5.0 dated May 11, 1988, reprinted with corrections August 1, 1989. This accuracy standard allows for a base error (e) of 2.0 cm and a line-length dependent error of 20 ppm (i.e., 1:50,000) at 95% confidence level.*
>
> *The acutely achieved survey accuracy is about 1 cm horizontally, and 1 to 2 cm vertically."*

Figure 3-2 shows the location of the surveyed wells and piezometers. Coordinates are provided in Appendix H and in the well inventory in Appendix I.

3.5 Well Hydraulic Integrity Testing

Based on inspections in Task 2 *(Groundwater Monitoring Well Inventory)* and measurements in Task 3 *(Basewide Groundwater Level Measurements)*, twenty-eight existing wells were selected for hydraulic integrity testing. Short-term testing utilized falling head slug test methods as described in Section 2.0 to determine whether the well screens are in hydraulic communication with the surrounding aquifer. Permeability values were not calculated. To the extent feasible, the selection of wells to be tested was made as follows:

- No tests were performed in wells fitted with dedicated sampling pumps or dedicated samplers, which would have had to be removed and reinstalled. The presence of sampling pumps suggests that the wells are sampled at least

periodically and they should be reliable. The wells selected for testing represent just under 1/3 of the wells not equipped with pumps or bailers.

- Older wells were given preference, with the selected wells generally installed in the 1980s. Although the approved work plan requires that a small number of newer wells be tested for comparison, these are almost all equipped with sampling pumps. Therefore, slug tests in new wells installed in this investigation are used for comparison.

- Most tested wells are completed in the shallow groundwater zone, as were most existing wells at IAAAP. However, some wells screened in the lower till and bedrock are included.

- The tested wells are distributed across the property, to the extent possible, and among each of the Brush, Long and Spring Creek watersheds. Geographic distribution is somewhat uneven because of the unavailability of suitable wells in some cases. However, the wells to be tested do not represent all wells available for water level measurements, just those without pumps installed.

The selected wells are included with those shown on Figure 3-2. Evaluation of the data obtained from the short term slug tests and principal conclusions are provided in Table 3-8, below. The evaluation was based on comparing the test results to data obtained from successful slug tests performed in other newly installed wells, and on field observations during the testing. Several wells were switched in the field based on inspection and the results of both are shown. Data printouts from the testing are provided in Appendix G.

Table 3-8. Results of Hydraulic Integrity Testing, Existing Wells

Well	Drainage/Location	Water Level Response	Comments
FL-1	Long Creek/Flyash Landfill	Good	Well usable.
FL-3	Long Creek/Flyash Landfill	Good	Well usable.
FL-6	Long Creek/Flyash Landfill	Slow, steady	Well usable.
FL-9	Long Creek/Flyash Landfill	Good	Well usable.
NEP-C	Long Creek/Flyash Landfill	Not tested	Uncapped PVC, no surface casing, unsecured. Should abandon.
SEP-C	Long Creek/Flyash Landfill	Not tested	Uncapped PVC, no surface casing, unsecured. Should abandon.
SEP-W	Long Creek/Flyash Landfill	Not tested	Uncapped PVC, no surface casing, unsecured. Should abandon.
DM-1	Long-Brush Creek/Fuel Station	No response	Did not recover. Not usable. Should be abandoned.
DM-2	Long-Brush Creek/Fuel Station	Good	Well usable.
MW1-94	Long-Brush Creek/Fuel Station	Anomalous	Tests suggest well silted and not usable. Clean or abandon.
MW2-94	Long-Brush Creek/Fuel Station	Anomalous	Tests suggest well silted and not usable. Clean or abandon.
JAZ-629	Spring Creek/K-Road	Good	Well usable.
GZ-1	Brush Creek/Line 1	Very slow	Well usable.
GZ-2A	Brush Creek/Line 1	Extremely slow	Well usable. May recover slowly after disturbance.
JAW-38	Brush Creek/Line 1	Very slow	Well usable. May recover slowly after disturbance
JAW-41	Brush Creek/Line 1	Very slow	Well usable. May recover slowly after disturbance
G-17	Brush Creek/Line 800	Good	Well usable.
G-18	Brush Creek/Line 800	Good	Well usable.
G-42	Brush Creek/Line 800	Very slow, steady	Well usable.
G-43	Brush Creek/Line 800	Fast	Well usable.
G-47	Brush Creek/Line 800	Fast	Well usable.
JAW-78	Brush Creek/Line 800	Fast	Well usable.
JAW-79	Brush Creek/Line 800	Fast	Well usable.
R10PZ-1	Brush Creek/Line 9	Not tested	1-inch diameter piezometer. Not suitable for testing.
GZ3-1	Brush Creek/Line 1	Very good	Well usable.
MW2-92	Spring Creek/North Burn Pad	Not tested	Well obstructed. Should be abandoned.

Table 3-8. Results of Hydraulic Integrity Testing, Existing Wells			
Well	***Drainage/Location***	***Water Level Response***	***Comments***
G-8	*Long Creek/Firing Site*	*Very fast*	*Well usable*
G-15	*Brush Creek/SW of Line 2*	*Good*	*Well usable.*
G-54	*Brush Creek/Downstream*	*Good*	*Well usable.*
G-55	*Brush Creek/Downstream*	*Slow, steady*	*Well usable.*
GZ3-2	*Brush Creek*	*Not tested*	*Insufficient water to test (<1 ft). Probably usable.*

Based on these results, a few of the tested wells are not usable for water levels and should be abandoned. These include: MW2-92, NEP-C, SEP-C, SEP-W, and DM-1. MW1-94 and MW2-94 appear to be silted and should either be abandoned or reconditioned, if possible. Verification that additional wells are not usable would require that remaining wells be evaluated. However, the testing suggests that most existing wells at the site are usable and should be maintained for possible future use.

3.6 Ammunition Box Chipper Disposal Pit

This task had three components: reviewing historical aerial photographs to identify visual evidence of past disposal; determining shallow groundwater flow direction by obtaining potentiometric measurements in three existing monitoring wells; and collection of seven (7) direct push groundwater samples and three (3) existing monitoring well samples for laboratory analysis.

Aerial Photographs. The ammunition box chipper disposal area reportedly was active over a three-month period in the 1972 to 1975 time frame. The reported location of the disposal area is shown by JAYCOR in the south part of the general area, southwest of an oval shaped road and a rail loading facility. Historical aerial photographs for the years 1963, 1969, 1978, 1983, 1990, and 1994 were obtained and reviewed to determine if a more accurate location could be identified. Little or no evidence of past disposal is evident from examination of these photos. The 1978 photo is duplicated on Figure 3-3 and is the most relevant to this task, being the first photos taken after reported activity at this site. This photo indicates conditions apparently little changed from other years and specifically similar to the 1969 photo, the next earlier. The general area of concern appears to be grassed. Minor ground disturbance may be present in the general area of concern based on slight irregularities in the photo. However, this could be natural and no clear indication of the disposal pit is apparent. The general area is bounded on the south by a farm field, which probably represents an area where disposal activities would not have been undertaken. This field is essentially unchanged in all photo years, suggesting a south boundary for subsequent investigations.

Groundwater Levels. Groundwater levels were measured in existing monitoring wells JAW620, JAW621, and JAW622 on May 7, 1997. Levels were measured relative to the top of casing and surveyed well elevations taken from the Draft Final RI Report (JAYCOR 1992). Measurements are shown in Table 3-9, below.

Table 3-9. Groundwater Levels, Ammunition Box Chipper Disposal Area (Task 6)					
Well No.	***Ground Elevation***	***Stick-Up***	***TOC Elevation***	***GW Depth***	***GW Elevation***
JAW-620	*703.66*	*2.46'*	*706.12*	*-5.78'*	*700.34*
JAW-621	*699.42*	*2.46'*	*701.88*	*-5.38'*	*696.50*
JAW-622	*698.21*	*2.46'*	*700.67*	*-4.23'*	*696.44*

TOC = Top of Casing. GW = Groundwater.

The relative locations of these wells were field surveyed by tape and compass to obtain more accurate locations than available on existing maps. Generalized potentiometric contours were determined by arithmetic triangulation shown on Figure 3-3 , and indicated flow in the shallow groundwater zone to be almost due south across the area.

Groundwater Samples. Since aerial photos provided no conclusive evidence of the disposal site, seven (7) sample locations were selected in consultation with USEPA and USACE, based on groundwater flow, to span the suspect area from upgradient (north) to downgradient (south). Locations are shown as 6A through 6G on Figure 3-4 and provide a north-south line through the middle of the area. Locations 6D, 6E, and 6G provide an east-west line across the south (downgradient) boundary, along with JAW621 and JAW 622. Location 6C is an upgradient location and location 6F is to the west, downgradient from other areas of past site activity.

One direct push groundwater sample, six temporary well samples, and samples from the three existing wells were collected (total of 10) between June 16 and 18, 1997 and analyzed in the fixed laboratory for explosives and SVOCs. Soils encountered during drilling of 6A through 6G were black, silty clay topsoil (OL) one to two feet thick underlain by gray to black and brown mottled, silty and sandy clay tills with some gravel (CL). A clayey sand zone was encountered between depths of 7.5 and 11 feet in boring 6G, but was described as becoming increasingly clayey with depth. Groundwater was encountered in all borings between depths of about 4.5 and 10 feet. Although hydropunch sampling was attempted in each boring, this method was successful only in boring 6C. In all other borings, temporary PVC wells were installed and groundwater samples collected after sufficient water had entered the well. RDX at 2.8 ug/L was detected in existing monitoring well JAW620 and 1,3-dinitrobenzene at 4 ug/L was detected at location 6G. Bis(2-ethylhexyl)phthalate was detected in the three existing wells at concentrations of 76.7 ug/L, 70.8 ug/L, and 26.4 ug/L in JAW620, 621, and 622, respectively. This SVOC was not detected in any of the direct push or temporary well samples, suggesting that they could be associated with installation of the existing wells. However, this cannot be verified. Sample results are illustrated and discussed in Section 5.0, Nature and Extent of Contamination.

3.7 Sediment and Surface Water Sampling

A tabulation of analytical results for sediment and surface water samples collected in this task are provided in Appendix J and laboratory reports are provided in Appendix K, including detection limits. Sample locations are shown on Figure 3-5. Sample depths ranged from 1 to about 4.5 feet and samples were analyzed in the fixed laboratory variably for VOCs, SVOCs, explosives, and TAL metals. Specific sample depths and analytical parameters are summarized in Table 3-10.

Table 3-10. Sediment Sample Locations, Depths, and Analytical Parameters

Sample Location & Number	*Sample Depths (ft)*	*Analytical Parameters*			
		VOC	*SVOC*	*Expl.*	*Metals*
7A-1	*0-1*	✔	✔	✔	✔
7B-1	*0-1*	✔	✔	✔	✔
	3-4			✔	✔
7C-1	*0-1*	✔	✔	✔	✔
	3-4			✔	✔
7D-1	*0-1*	✔	✔	✔	✔
7E-1	*0-1*	✔	✔	✔	✔

51

Table 3-10. Sediment Sample Locations, Depths, and Analytical Parameters					
Sample Location & Number	Sample Depths (ft)	Analytical Parameters			
		VOC	SVOC	Expl.	Metals
	3-4			✔	✔
7E-2	0-1			✔	✔
7F-1	0-1	✔	✔	✔	✔
7F-2	0-1			✔	✔
7G-1	0-1	✔	✔	✔	✔
7G-2	0-1			✔	✔
7H-1	0-1	✔	✔	✔	✔
	3-4			✔	✔
7H-2	0-1			✔	✔
7I-1	0-1	✔	✔	✔	✔
	1-2			✔	✔
7I-2	0-1			✔	✔
7J-1	0-1	✔	✔	✔	✔
	2.75-3.25			✔	✔
7J-2	0-1			✔	✔
7K-1	0-1	✔	✔	✔	✔
	1.5-2.5			✔	✔
7K-2	0-1			✔	✔
7L-1	0-1	✔	✔	✔	✔
7L-2	0-1			✔	✔
	2.7-3.3			✔	✔
7M-1	0-1	✔	✔	✔	✔
	3-4			✔	✔
	4.5-5.5			✔	✔
7M-2	0-1			✔	✔
7N-1	0-1	✔	✔	✔	✔
7O-1	0-1	✔	✔	✔	✔
	3-4			✔	✔
	4.5			✔	✔
7P1	0-1	✔	✔	✔	✔
7Q1	0-1	✔	✔	✔	✔

Results are summarized in the following sections by watershed and are discussed further in Section 5.0, Nature and Extent of Contamination.

3.7.1 Spring Creek Watershed

A total of six sediment samples and four surface water samples were analyzed from four sampling areas in the Spring Creek Drainage. Sample locations are numbered 7A through 7D on Figure 3-5 .

3.7.1.1 Sampling Area 7A.

Area 7A is located in the upstream reaches of Spring Creek just east of Yard C. One sediment sample and one surface water sample were collected. Sediment thicknesses were insufficient for deeper sediment samples. Results of organic analyses are summarized in Table 3-11.

Table 3-11. Organics Detected in Sediment and Surface Water Sampling Area 7A		
Sampling Location	Sediment	Surface Water
Location 7A1 (1 ft)	VOCS: Methylene chloride (18.8 ug/kg)(B)	VOCs: Methylene chloride (10.1 ug/L)(B).
	SVOCs: Butylbenzylphthalate (293 ug/kg)(J)	SVOCs: None
	Explosives: None	Explosives: None

J = Estimated value below the quantitation limit. B = Detected in blank as well as sample.

Methylene chloride also was detected in the blank and is considered a laboratory contaminant. Results of selected metals analyses are summarized in Table 3-12, focusing on the eight RCRA metals. A full tabulation of results is included in Appendix J.

Table 3-12. RCRA Metals Detected in Sediment & Surface Water, Area 7A, Spring Creek

Parameter	*Sediment (1' depth) (mg/kg)*	*Surface Water (mg/L)*
Arsenic	*5.6*	*0.0013*
Barium	*189*	*0.16*
Cadmium	*ND*	*ND*
Chromium	*6.5*	*ND*
Lead	*14.9*	*ND*
Mercury	*ND*	*ND*
Selenium	*0.42*	*ND*
Silver	*0.92*	*ND*

3.7.1.2 Sampling Area 7B.

Area 7B is located on Spring Creek east of Yard D. Two sediment samples from one location and one surface water sample were collected. Results of organic analyses are summarized in Table 3-13, below.

Table 3-13. Organics Detected in Sediment and Surface Water Sampling Area 7B

Sampling Location	*Sediment*	*Surface Water*
Location 7B1 (1 ft)	*VOCS: Methylene chloride (8.7 ug/kg)(B)*	*VOCs: Methylene chloride (12.1 ug/L)(B).*
	SVOCs/Explosives: None	*SVOCs: None*
Location 7B1 (3 ft)	*VOCS/SVOCs: NA*	*Explosives: RDX (0.72 ug/L)(J)*
	Explosives: None	

J = Estimated value below the quantitation limit. B = Detected in blank as well as sample. NA = not analyzed.

The only organics detected were methylene chloride, also found in the blank, and a trace concentration of the explosive RDX in the surface water sample. Results of RCRA metals analysis are summarized in Table 3-14.

Table 3-14. RCRA Metals Detected in Sediment & Surface Water, Area 7B, Spring Creek

Parameter	*Sediment (mg/kg)*		*Surface Water (mg/L)*
	B1 (1')	*B1 (3')*	
Arsenic	*1.4*	*1.8*	*0.0017*
Barium	*68.2*	*113*	*0.14*
Cadmium	*ND*	*ND*	*ND*
Chromium	*2.1*	*4.5*	*ND*
Lead	*4.4*	*6.4*	*ND*
Mercury	*ND*	*ND*	*ND*
Selenium	*ND*	*0.12*	*ND*
Silver	*ND*	*ND*	*ND*

ND = Not Detected.

3.7.1.3 Sampling Area 7C.

Area 7C is located on Spring Creek near the southeast IAAAP property boundary. Two sediment samples from one location and one surface water sample were collected. Results of organic analyses are summarized in Table 3-15.

Table 3-15. Organics Detected in Sediment and Surface Water Sampling Area 7C		
Sampling Location	***Sediment***	***Surface Water***
Location 7C1 (1 ft)	*VOCS: Methylene chloride (6.5 ug/kg)(B)*	*VOCs: Methylene chloride (8.3 ug/L)(B).*
	SVOCs/Explosives: None	*SVOCs: None*
Location 7C1 (3 ft)	*VOCS/SVOCS: NA*	*Explosives: RDX (0.51 ug/L)(J)*
	Explosives: None	

J = Estimated value below the quantitation limit. B = Detected in blank as well as sample. NA = not analyzed.

The only organics detected were methylene chloride, also found in the blank, and a trace concentration of the explosive RDX in the surface water sample. Results of RCRA metals analysis are summarized in Table 3-16.

Table 3-16. RCRA Metals Detected in Sediment & Surface Water, Area 7C, Spring Creek			
Parameter	***Sediment (mg/kg)***		***Surface Water (mg/L)***
	C1 (1')	***C1 (3')***	
Arsenic	*4.7*	*5*	*0.0017*
Barium	*109*	*58.2*	*0.14*
Cadmium	*ND*	*ND*	*ND*
Chromium	*2.9*	*5.7*	*ND*
Lead	*6.3*	*5.4*	*ND*
Mercury	*ND*	*ND*	*ND*
Selenium	*0.093*	*0.11*	*ND*
Silver	*ND*	*ND*	*ND*

ND = Not Detected.

3.7.1.4 Sampling Area 7D.

Area 7D is about one mile southeast of the IAAAP property boundary on the Spring Creek Drainage. One sediment sample from a depth of 1 ft at one location and one surface water sample were collected. Methylene chloride at 7.6 ug/kg was detected in the sediment sample, but also in the blank and is considered a laboratory contaminant. No other VOCs, and no SVOCs or explosives were detected in the sediment sample. No VOCs, SVOCs, or explosives were detected in the surface water sample at this site. RCRA Metals detections are summarized in Table 3-17.

Table 3-17. RCRA Metals Detected in Sediment & Surface Water, Area 7D, Spring Creek		
Parameter	***Sediment (1' depth) (mg/kg)***	***Surface Water (mg/L)***
Arsenic	*1.4*	*0.0016*
Barium	*124*	*0.12*
Cadmium	*ND*	*ND*
Chromium	*5.8*	*ND*
Lead	*8.9*	*ND*
Mercury	*ND*	*ND*
Selenium	*ND*	*0.0012*
Silver	*0.87*	*ND*

ND = Not Detected.

3.7.2 Brush Creek Watershed

A total of 26 sediment samples and 9 surface water samples were collected from among nine locations along the Brush Creek Drainage. Sampling locations are designated on Figure 3-5 as 7E through 7K within the IAAAP boundaries and 7L and 7M downstream from the IAAAP boundaries.

3.7.2.1 Sampling Area 7E.

Three sediment samples from two locations and one surface water sample were collected from area 7E, located in the upstream reaches of Brush Creek near the north boundary of Line 1. Results of organic analysis are summarized in Table 3-18, below.

Table 3-18. Organics Detected in Sediment and Surface Water Sampling Area 7E

Sampling Location	*Sediment*	*Surface Water*
Location 7E1 (1 ft)	*VOCS: Methylene chloride (7.9 ug/kg)(B)*	*VOCs: Methylene chloride (4.5 ug/L)(B).*
	SVOCs/Explosives: None	*SVOCs: None*
Location 7E1 (3 ft)	*VOCS/SVOCs: NA*	*Explosives: RDX (9.3 ug/L); HMX (23 ug/L)*
	Explosives: None	
Location 7E2 (1 ft)	*VOCS/SVOCs: NA*	
	Explosives: RDX (470 ug/kg)(J)	

J = Estimated value below the quantitation limit. B = Detected in blank as well as sample. NA = not analyzed.

Other than methylene chloride, also found in the blank, the only organics detected were RDX in the sediment sample from location 7E2 and of RDX and HMX in the surface water sample. Results of RCRA metals analysis are summarized in Table 3-19.

Table 3-19. RCRA Metals Detected in Sediment & Surface Water, Area 7E, Brush Creek

Parameter	*Sediment (mg/kg)*			*Surface Water (mg/L)*
	E1 (1')	*E1 (3')*	*E2 (1')*	
Arsenic	*30.8*	*0.43*	*14.4*	*0.00088*
Barium	*128*	*24.2*	*144*	*0.12*
Cadmium	*ND*	*ND*	*ND*	*ND*
Chromium	*13.7*	*4.9*	*7.5*	*ND*
Lead	*18.1*	*4.4*	*14.7*	*0.0013*
Mercury	*ND*	*ND*	*ND*	*ND*
Selenium	*0.25*	*0.4*	*0.18*	*ND*
Silver	*1.2*	*ND*	*0.84*	*ND*

ND = Not Detected.

3.7.2.2 Sampling Area 7F.

Area F is on Brush Creek between Lines 2 and 3. Two sediment samples from 2 locations and one surface water sample were collected. Organics are summarized in Table 3-20.

Table 3-20. Organics Detected in Sediment and Surface Water Sampling Area 7F

Sampling Location	Sediment	Surface Water
Location 7F1 (1 ft)	VOCS: *Methylene chloride (8.3 ug/kg)(B)*	VOCs: *Methylene chloride (12.4 ug/L)(B).*
	SVOCs: *None*	SVOCs: *None*
	Explosives: *RDX (400 ug/kg)(J)*	Explosives: *RDX (5.2 ug/L); HMX (5 ug/L)*
Location 7F2 (1 ft)	VOCS/SVOCS: *NA*	
	Explosives: *RDX (310 ug/kg)(J)*	

J = Estimated value below the quantitation limit. B = Detected in blank as well as sample. NA = not analyzed.

RDX was detected at small concentrations in each sample and HMX in the water sample. Methylene chloride, also found in the blank, was the only VOC detected. RCRA metals analysis are summarized in Table 3-21.

Table 3-21. RCRA Metals Detected in Sediment & Surface Water, Area 7F, Brush Creek			
Parameter	Sediment (mg/kg)		Surface Water (mg/L)
	F1 (1')	F2 (1')	
Arsenic	11.4	9.5	0.00087
Barium	99.8	96.8	0.11
Cadmium	ND	ND	ND
Chromium	7.7	12.3	ND
Lead	17.2	13.6	0.0014
Mercury	ND	ND	ND
Selenium	0.18	0.13	ND
Silver	ND	1.8	ND

ND = Not Detected.

3.7.2.3 Sampling Area 7G.

Area G is located on a tributary to Brush Creek that drains Lines 7 and 9 and part of Line 3, entering Brush Creek from the west. Two sediment samples from two locations and one surface water sample were collected. Methylene chloride (8.7 ug/kg in the sediment sample from F1 and 11.6 ug/L in the water sample) was the only VOC, SVOC, or explosive chemical detected in these samples. Results of RCRA metals analysis are summarized in Table 3-22, below.

Table 3-22. RCRA Metals Detected in Sediment & Surface Water, Area 7G, Brush Creek			
Parameter	Sediment (mg/kg)		Surface Water (mg/L)
	G1 (1')	G2 (1')	
Arsenic	3.9	8.8	0.00092
Cadmium	ND	ND	ND
Chromium	6.7	7.5	ND
Lead	9.6	12.3	0.002
Mercury	ND	ND	ND
Selenium	0.16	0.18	ND
Silver	ND	ND	ND

ND = Not Detected.

3.7.2.4 Sampling Area 7H .

Area H is located on a tributary to Brush Creek that drains the west part of Line 800. Three sediment samples from two locations and one surface water sample were collected. Results of organic analysis are summarized in Table 3-23.

Table 3-23. Organics Detected in Sediment and Surface Water Sampling Area 7H		
Sampling Location	Sediment	Surface Water
Location 7H1 (1 ft)	VOCS: Methylene chloride (18.8 ug/kg)(B)	VOCs: Methylene chloride (11.7 ug/L)(B).
	SVOCs/Explosives: None	SVOCs: None
Location 7H1 (3 ft)	VOCS/SVOCs: NA	Explosives: RDX (3 ug/L); HMX (1.6 ug/L)
	Explosives: None	
Location 7H2 (1 ft)	VOCS/SVOCs: NA	
	Explosives: RDX (330 ug/kg)(J).	

J = Estimated value below the quantitation limit. B = Detected in blank as well as sample.

Methylene chloride was the only VOC or SVOC detected in the samples, and also in the blank and is considered a laboratory contaminant. Small concentrations of RDX were found in the sediment sample from H2 and in the surface water sample. No other explosive compounds were detected. Detections of RCRA metals are summarized in Table 3-24.

Table 3-24. RCRA Metals Detected in Sediment & Surface Water, Area 7H, Brush Creek				
Parameter	***Sediment (mg/kg)***			***Surface Water (mg/L)***
	H1 (1')	***H1 (3')***	***H2 (1')***	
Arsenic	*7.1*	*6.4*	*5.7*	*0.00093*
Barium	*182*	*45*	*99.9*	*0.12*
Cadmium	*1.3*	*ND*	*ND*	*ND*
Chromium	*10.7*	*6.4*	*12*	*ND*
Lead	*9.6*	*8*	*9.5*	*0.0017*
Mercury	*ND*	*ND*	*ND*	*ND*
Selenium	*0.14*	*0.47*	*0.26*	*0.00094*
Silver	*ND*	*ND*	*0.9*	*ND*

ND = Not Detected.

3.7.2.5 Sampling Area 7I.

Area I is just downstream of Line 2 and of the confluence of Brush Creek with a small stream draining the Line 800 area. It is upstream of the wastewater treatment plant discharge point. Three sediment samples from two locations and one surface water sample were collected. Results of organics analysis are summarized in Table 3-25.

Table 3-25. Organics Detected in Sediment and Surface Water Sampling Area 7I		
Sampling Location	***Sediment***	***Surface Water***
Location 7I1 (1 ft)	*VOCS: Methylene chloride (7.2 ug/kg)(B)*	*VOCs: Methylene chloride (10.4 ug/L)(B)*
	SVOCs: Phenanthrene (64.3 ug/kg)(J) Anthracene (64.9 ug/kg)(J) Pyrene (139 ug/kg)(J) Benzo(a)anthracene (47.8 ug/kg)(J) Chrysene (57.2 ug/kg)(J) Benzo(a)pyrene (64.6 ug/kg)(J).	*SVOCs: None*
		Explosives: RDX (3.4 ug/L HMX (1.9 ug/L)
	Explosives: RDX (9,900 ug/kg); HMX (1,900 ug/kg); 2,4,6-Trinitrotoluene (7,300 ug/kg); 2,4-Dinitrotoluene (800 ug/kg)(J); 4-Amino-2,6-Dinitrotoluene (2,000 ug/kg); 2-Amino-4,6-Dinitrotoluene (7,000 ug/kg).	
Location 7I1 (3 ft)	*VOCS/SVOCs: NA*	
	Explosives: None	
Location 7I2 (1 ft)	*VOCS/SVOCs: NA*	
	Explosives: RDX (460 ug/kg)(J).	

J = Estimated value below the quantitation limit. B = Detected in blank as well as sample. NA = Not analyzed.

Detections of organic chemicals included PNAs and explosives in the shallow sample from 7I, and trace concentrations of explosives in other samples. RCRA Metals detections are summarized in Table 3-26.

Table 3-26. RCRA Metals Detected in Sediment & Surface Water, Area 7I, Brush Creek				
Parameter	***Sediment (mg/kg)***			***Surface Water (mg/L)***
	I1 (1')	***I1 (3')***	***I2 (1')***	
Arsenic	*4.3*	*3.9*	*2.1*	*0.0013*
Barium	*567*	*169*	*84.4*	*0.15*
Cadmium	*ND*	*ND*	*ND*	*ND*
Chromium	*41.5*	*17.7*	*10.7*	*ND*
Lead	*8.9*	*22.7*	*5.3*	*0.003*
Mercury	*ND*	*ND*	*ND*	*ND*
Selenium	*0.19*	*0.26*	*ND*	*0.0011*
Silver	*6.8*	*0.82*	*0.78*	*ND*

ND = Not Detected.

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3.7.2.6 Sampling Area 7J.

Area J is located about one mile downstream from Line 2 on Brush Creek between Yards "D" and "E". Three sediment samples from two locations and one surface water sample were collected. Organic results are summarized in Table 3-27.

Table 3-27. Organics Detected in Sediment & Surface Water Sampling Area 7J

Sampling Location	Sediment	Surface Water
Location 7J1 (1 ft)	VOCS: Methylene chloride (16.7 ug/kg)(B)	VOCs: Methylene chloride (11.3 ug/L)(B)
	SVOCs: None	SVOCs: None
	Explosives: RDX (470 ug/kg) (J) 2,4,6-Trinitrotoluene (760 ug/kg) (J) 4-Amino-2,6-Dinitrotoluene (660 ug/kg) (J)	Explosives: RDX (5.3 ug/L) HMX (1.6 ug/L)
Location 7J1 (3 ft)	VOCS/SVOCs: NA	
	Explosives: None	
Location 7J2 (1 ft)	VOCS/SVOCs: NA	
	Explosives: RDX (460 ug/kg)(J).	

J = Estimated value below the quantitation limit. B = Detected in blank as well as sample. NA = Not analyzed.

Small concentrations of several explosive chemicals were detected in the shallow sample from both sampling sites and were the only organic detections other than methylene chloride. Results of RCRA metals analysis are summarized in Table 3-28.

Table 3-28. RCRA Metals Detected in Sediment & Surface Water, Area 7J, Brush Creek

Parameter	Sediment (mg/kg)			Surface Water (mg/L)
	J1 (1')	J1 (3')	J2 (1')	
Arsenic	5.2	3.6	13.8	0.00079
Barium	130	62.4	123	0.11
Cadmium	ND	ND	ND	ND
Chromium	12.7	11.4	20.8	ND
Lead	10.9	9.7	19.8	ND
Mercury	ND	ND	ND	ND
Selenium	0.16	0.53	0.3	0.0012
Silver	0.64	ND	4.2	ND

ND = Not Detected.

3.7.2.7 Sampling Area 7K.

Area K is located near the junction of Brush Creek and Plant Road "K", in the area of wells installed in Task 13 *(Additional Groundwater Data, Downstream Reach of Brush Creek)*. Three sediment samples from two locations and one surface water sample were collected. Organic results are summarized in Table 3-29.

Table 3-29. Organics Detected in Sediment & Surface Water Sampling Area 7K

Sampling Location	Sediment	Surface Water
Location 7K1 (1 ft)	VOCS: Methylene chloride (13.3 ug/kg)(B) Toluene (2.8 ug/kg)(J)	VOCs: Methylene chloride (8.8 ug/L)(B)
	SVOCs: None	SVOCs: None
	Explosives: None	Explosives: RDX (1.7 ug/L) HMX (0.97 ug/L)(J)
Location 7K1 (3 ft)	VOCS/SVOCs: NA	
	Explosives: None	
Location 7K2 (1 ft)	VOCS/SVOCs: NA	
	Explosives: None	

J = Estimated value below the quantitation limit. B = Detected in blank as well as sample. NA = Not analyzed.

Other than methylene chloride, also detected in the blank, detections were limited to trace levels of toluene in one sediment sample and of RDX and HMX in the surface water. Results of RCRA metals analysis are summarized in Table 3-30.

Table 3-30. RCRA Metals Detected in Sediment & Surface Water, Area 7K, Brush Creek

Parameter	Sediment (mg/kg)			Surface Water (mg/L)
	K1 (1')	K1 (3')	K2 (1')	
Arsenic	1.9	4.2	5.4	0.0012
Barium	67.1	39.8	109	0.11
Cadmium	ND	ND	ND	ND
Chromium	5.8	7.2	9.2	ND
Lead	8.2	7.7	10.3	ND
Mercury	ND	ND	ND	ND
Selenium	0.084	0.25	0.11	0.0014
Silver	ND	ND	0.77	ND

ND = Not Detected.

3.7.2.8 Sampling Area 7L.

Area 7L is located approximately ½ mile downstream from the IAAAP property boundary just above the confluence with an unnamed tributary entering from the west. Three sediment samples from two locations and one surface water sample were collected. Organic detections are summarized in Table 3-31.

Table 3-31. Organics Detected in Sediment & Surface Water Sampling Area 7L

Sampling Location	Sediment	Surface Water
Location 7L1 (1 ft)	VOCS: Methylene Chloride (6 ug/kg)(JB) Toluene (3.1 ug/kg)(J)	VOCs: None
	SVOCs: 4-Methylphenol (62.1 ug/kg)(J)	SVOCs: None
	Explosives: None	Explosives: RDX (6.2 ug/L) HMX (1.7 ug/L)
Location 7L2 (1 ft)	VOCS/SVOCs: NA	
	Explosives: None	
Location 7L2 (2.7 ft)	VOCS/SVOCs: NA	
	Explosives: None	

J = Estimated value below the quantitation limit. B = Detected in blank as well as sample.

Other than methylene chloride, detections included trace concentrations of the VOC toluene and the SVOC 4-methylphenol in the shallow sediment sample from location L1and the explosives RDX and HMX in the surface water sample. No explosives were detected in the other sediment samples. Results of RCRA metals analysis are summarized in Table 3-32.

Table 3-32. RCRA Metals Detected in Sediment & Surface Water, Area 7L, Brush Creek

Parameter	Sediment (mg/kg)			Surface Water (mg/L)
	L1 (1')	L1 (2.7')	L2 (1')	
Arsenic	6.7	3	3.6	0.0012
Barium	71.2	41	93.6	0.11
Cadmium	ND	ND	ND	ND
Chromium	5.7	6.2	10.7	ND
Lead	3.3	4.2	8.4	ND
Mercury	ND	ND	ND	ND
Selenium	ND	ND	0.16	0.00093
Silver	0.65	ND	0.75	ND

ND = Not Detected.

3.7.2.9 Sampling Area 7M.

Area 7M is located about one mile south of the IAAAP property boundary on the Brush Creek Drainage. Four sediment samples and one surface water sample were collected. Results of organic analysis are summarized in Table 3-33.

Table 3-33. Organics Detected in Sediment & Surface Water Sampling, Area 7M , Brush Creek

Sampling Location	Sediment	Surface Water
Location 7M1 (1 ft)	VOCS: Methylene Chloride (9.5 ug/kg)(B) Toluene (2.8 ug/kg)(J)	VOCs/SVOCs: None
	SVOCs/Explosives: None	Explosives: RDX (6.2 ug/L) HMX (1.7 ug/L)
Location 7M1 (3 ft)	VOCS/SVOCs: NA	
	Explosives: None	
Location 7M1 (4.5 ft)	VOCS/SVOCs: NA	
	Explosives: None	
Location 7M2 (1 ft)	VOCS/SVOCs: NA	
	Explosives: None	

J = Estimated value below the quantitation limit. B = Detected in blank as well as sample.

Other than methylene chloride, found also in the blank, a trace concentration of toluene was found in one sediment sample and small concentrations of explosive chemicals RDX and HMX in the water sample. Results of RCRA metals analysis are summarized in Table 3-34.

Table 3-34. RCRA Metals Detected in Sediment & Surface Water, Area 7M, Brush Creek

Parameter	Sediment (mg/kg)				Surface Water (mg/L)
	M1 (1')	M1 (3')	M1 (4.5')	M2 (1')	
Arsenic	4.1	5.6	7.3	7.9	0.0012
Barium	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND
Chromium	7.7	6	14	4.9	ND
Lead	4.2	5.8	5.1	5.5	ND
Mercury	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	0.00091
Silver	ND	ND	0.69	ND	ND

ND = Not Detected.

3.7.3 Long Creek Drainage

3.7.3.1 Sampling Area 7N.

Location 7N is on Long Creek near the IAAAP boundary. One sediment and one surface water sample were collected. Methylene chloride at 14 ug/kg in the sediment sample and 9.7 ug/L in the water sample was the only VOC, SVOC, or explosive chemical detected in these samples. Methylene chloride also was detected in the blank and is considered a laboratory contaminant. Results of RCRA metals analysis are summarized in Table 3-35, below.

Table 3-35. RCRA Metals Detected in Sediment & Surface Water, Area 7N, Long Creek

Parameter	Sediment (mg/kg)	Surface Water (mg/L)
	N1 (1')	
Arsenic	4.2	0.00079
Barium	78.6	0.073
Cadmium	ND	ND
Chromium	6.7	ND
Lead	8.5	0.001
Mercury	ND	ND

Table 3-35. RCRA Metals Detected in Sediment & Surface Water, Area 7N, Long Creek		
Parameter	*Sediment (mg/kg)*	*Surface Water (mg/L)*
	N1 (1')	
Selenium	*0.25*	*0.0009*
Silver	*ND*	*ND*

ND = Not Detected.

3.7.3.2 Sampling Area 7O.

Area 7O is located about 1/4 mile south of the IAAAP property boundary on the Long Creek Drainage. Three sediment samples from one location and one surface water sample were collected. Methylene chloride, at 5.9 ug/kg, was detected in the sediment sample and was the only VOC, SVOC, or explosive chemical detected in either sample from this location. Results of RCRA metals analysis are summarized in Table 3-36.

Table 3-36. RCRA Metals Detected in Sediment & Surface Water, Area 7O, Long Creek				
Parameter	*Sediment (mg/kg)*			*Surface Water (mg/L)*
	O1 (1')	*O1 (3')*	*O1 (4.5')*	
Arsenic	*5*	*2.9*	*3.7*	*0.0011*
Barium	*60.2*	*28.6*	*34*	*0.094*
Cadmium	*ND*	*ND*	*ND*	*ND*
Chromium	*9.2*	*5.8*	*7*	*ND*
Lead	*8.2*	*5.5*	*4.7*	*ND*
Mercury	*ND*	*ND*	*ND*	*ND*
Selenium	*0.088*	*ND*	*ND*	*0.0012*
Silver	*ND*	*0.61*	*ND*	*ND*

ND = Not Detected.

3.7.4 Unnamed Southwest Drainages

3.7.4.1 Sampling Area 7P.

Sampling Area 7P is at the downstream end of a small creek draining part of Line 3A. One sediment sample and one surface water sample were collected. Methylene chloride, at 6.1 ug/kg in the sediment sample and 3.1 ug/L in the water sample, was the only VOC, SVOC, or explosive chemical detected in either sample from this location. Results of RCRA metals analysis are summarized in Table 3-37.

Table 3-37. RCRA Metals Detected in Sediment & Surface Water, Area 7P, Unnamed Creeks		
Parameter	*Sediment (mg/kg)*	*Surface Water (mg/L)*
	P1 (1')	
Arsenic	*23.1*	*0.00067*
Barium	*345*	*0.059*
Cadmium	*0.81*	*ND*
Chromium	*10.3*	*ND*
Lead	*32.6*	*ND*
Mercury	*ND*	*ND*
Selenium	*ND*	*ND*
Silver	*1.2*	*ND*

ND = Not Detected.

3.7.4.2 Sampling Area 7Q.

Location Q is at the downstream end of another unnamed creek in the southwest corner of the facility and just west of location P. One sediment sample and one surface water sample were collected. Methylene chloride was the only VOC or SVOC detected in these samples and also in

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the blank. No explosives were detected in the sediment sample, but trace levels of RDX and HMX were detected in the surface water sample, as summarized in Table 3-38.

Table 3-38. Organics Detected in Sediment & Surface Water Sampling Area 7Q

Sampling Location	Sediment	Surface Water
Location 7Q1 (1 ft)	VOCS: Methylene Chloride (12.7 ug/kg)(B).	VOCs: Methylene chloride (7.9 ug/L)(B)
	SVOCs: None	SVOCs: None
	Explosives: None	Explosives: RDX (7.8 ug/L) HMX (1.6 ug/L)

J = Estimated value below the quantitation limit. B = Detected in blank as well as sample.

Results of RCRA metals analysis are summarized in Table 3-39.

Table 3-39. RCRA Metals Detected in Sediment & Surface Water, Area 7Q, Unnamed Creeks

Parameter	Sediment (mg/kg)	Surface Water (mg/L)
	Q1 (1')	
Arsenic	5.4	ND
Barium	39.3	0.067
Cadmium	ND	ND
Chromium	3.3	ND
Lead	10.2	ND
Mercury	ND	ND
Selenium	0.12	ND
Silver	ND	ND

ND = Not Detected.

3.8 Mini-Pezometer Testing, Brush Creek

In this task, a total of 58 mini-piezometers were installed at nine locations on Brush Creek and two on Spring Creek. An attempt was made to install a series on Long Creek. However, bedrock was shallow and these could not be installed. The objective was to determine whether the creeks were gaining or losing streams with respect to groundwater at the locations tested, by determining whether hydraulic heads in the sediments beneath the creek beds were higher (gaining) or lower (losing) than the surface water level. The test locations span the length of Brush Creek within the IAAAP boundaries and the central and downstream reaches of Spring and Long Creeks, respectively. Locations and sketches of each site are shown on Figure 3-6. The mini-piezometers were removed after measurement. One of the piezometers was underwater and could not be read and 13 were plugged. However, redundancy had been planned for and readings from other piezometers are summarized in Table 3-40.

Table 3-40. Mini-Piezometer Locations and Head Measurements

Location	Drainage	Mini-Piezometer Number & Reading					
8A	Brush Creek	#1	+1.25"	#2	+3"	#3	Plugged
		#4	+0.25"	#5	+0.25"	#6	+2"
8B		#1	+2.75"	#2	+4.75"	#3	+2"
		#4	+5.25"	#5	+2.25"	#6	+6"
8C		#1	+5.5"	#2	+3.25"	#3	+6.5"
		#4	+4"	#5	Plugged	#6	Plugged
8D		#1	+0.5"	#2	+3"	#3	+1.5"
		#4	+5"	#5	Plugged	#6	Plugged
8E		#1	Plugged	#2	+3"	Only four installed	
		#3	Plugged	#4	Plugged		
8F		#1	+13"	#2	+9"	#3	+5"
		#4	+9"	#5	+3"	#6	+11"
8G		#1	+3"	#2	+3"	#3	+2"
		#4	+2"	#5	+2"	#6	Plugged
8H		#1	+4"	#2	Plugged	#3	+1"
		#4	Plugged	#5	+1"	#6	+1"

Table 3-40. Mini-Piezometer Locations and Head Measurements

Location	Drainage	Mini-Piezometer Number & Reading					
8I		#1	Under water	#2	+4"	#3	+3"
		#4	Plugged	#5	Plugged	#6	Plugged
7B	Spring Creek	#1	+0.5"	#2	+1"	#3	+0.5"
7C		#1	0.0	#2	0.0	#3	0.0
7N	Long Creek	Bedrock too shallow for mini-piezometers (<1'). Nearby springs suggest gaining stream.					

Water levels measured in the mini-piezometers represents the hydraulic head beneath the streambeds at the time of measurement and were found to be higher than the stream surface water (e.g. "+") at all locations except 7C on Spring Creek, where the measured levels were equal. The magnitude of the individual head differences along Brush Creek ranged from as little as 0.25 inches to as much as 13 inches, with most being 3 inches or less. Average head differences between the various locations on Brush Creek ranged from +1.35 inches at 8A to +8.3 inches at 8F. Differences at 7B on Spring Creek were less, averaging 0.67 inches. Measurements are variable and there does not appear to be a pattern from upstream to downstream. Resultant upward vertical hydraulic gradients range from about 0.019 ft/ft to 0.134 ft/ft, into the streams effecting the local streambed area.

Based on these results, the creeks are indicated to be gaining at all locations at the time of the investigation. This observation is supported by potentiometric data obtained from monitoring wells, which show the shallow potentiometric surface sloping toward the creek from Line 2 (see Sections 3.12), Line 3 (see Section 3.16), and downstream reaches of Brush Creek (see Section 3.13). Therefore, contaminants present in groundwater adjacent to the streams may migrate to the streams and the stream sediments, but contaminants present in the stream or in the sediments are not likely to migrate to groundwater, except in the immediate vicinity of the streams during high water periods. These conditions are suggested to persist within the IAAAP boundaries, based on the available data. South of the IAAAP boundary, within the Skunk River valley, and to the east, within the Mississippi River physiographic valley, these conditions are likely to change with the tributary streams probably losing to groundwater in different locations and at different times.

3.9 Stream Flow Meters

Seven recording stream flow meters and one rain gage were installed in this task and monitored between May and August 1997. Meter locations are shown on Figure 3-7. The meters were visited on four occasions (May 24, June 9, June 24 and August 18), to download data, replace batteries and check the general condition of each installation. During these visits, a number of malfunctions in the automated equipment were noted and corrected, where possible, as summarized in Table 3-41.

Table 3-41. Availability of Weekly Rain Gage and Stream Flow Meter Data

Meter	May					June				July				August				
	3	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16	23	30
Rain gage	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
Meter 9D	■	■	■	■	■	■	2	2	■	■	■	■	■	■	■	■	■	
Meter 9E	■	■	■	■	■	■	▮	2	■	■	■	■	■	■	■	■	■	
Meter 9F	1	▮	■	■	▮	2	2	2	3	3	3	3	3	3	3	3	3	
Meter 9G	■	■	■	■	▮	2	2	2	■	■	■	■	■	■	■	■	■	
Meter 9H	■	■	■	■	▮	3	3	3	3	3	3	3	3	3	3	3	3	
Meter 9A	■	■	■	■	2	2	2	2	■	■	■	■	■	■	■	■	■	
Meter 9B	■	■	■	■	▮	3	3	3	3	3	3	3	3	3	3	3	3	

Notes: ■ = Data available. ▮ = Partial data available. 1. Meter not initialized properly. 2. Batteries not fully charged. 3. Meter damaged.

The data cables on Meters 9F, H and B were damaged by animals sufficiently to cause a permanent loss of signal. Individual meters also experienced short-term outages ranging in duration from 1 to 24 hours and usually caused by floating debris hanging up on the meter during low flows. However, based on review of all data collected, the outages noted are not judged to have significant impact on overall analyses completed in this task.

3.9.1 Rainfall Data

Rainfall data was collected for the period April 24 to August 18, 1997. Table 3-42 summarizes rainfall events exceeding 0.20 inches during this period.

Table 3-42. Significant Rainfall Events

No.	Starting Date and Time	Duration	Total Depth	Maximum Rate (in/hour)	Overall Rate (in/hour)
1	May 7 - 8:50 pm	55 min	0.21 in	0.3	0.2
2	May 25 - 10:00 pm	1 hr 50 min	0.86 in	1.0	0.4
3	June 7 - 6:40 pm	40 min	0.41 in	1.2	0.6

There were no significant rainfall events through July and the first half of August.

3.9.2 Flow Data

This section characterizes low flow and rainfall events delineated from the collected data. Figure 3-7 shows graphs of the flow data collected at each meter for the period April 20 to August 24. The heavy lines represent water depth and the lighter lines represent flow velocity. Gaps in the data are explained in Table 3-41. For comparison, Figure 3-8 plots the NPDES flows at the treatment plant (outfall #13) for the same period.

Low Flow Events. Figure 3-9 (A and B) shows plots of water depth, velocity and temperature at Meter 9G for a typical Spring, low flow event (April 25 to May 5). During, and at least 4 days prior to the start of this period, only trace amounts of rain fell. Therefore, it can be assumed that the flow in the stream at this time was the result of the contribution from groundwater and wastewater discharges only. The flow velocity in the stream is roughly constant at about 1.2 ft/sec., but is gradually decreasing. The water depth also is constant at about 0.25 ft. Water temperature follows a diurnal pattern between 48°F and 64°F.

A comparison of the flows at one point in time for all of the meters on Brush Creek is shown in Table 3-43, expressed as the ratio of drainage area upstream from each meter to flow at that location.

Table 3-43. Low Stream Flow vs. Drainage Area

Meter	Measured Flow (cfs)	Flow Ratio	Drainage Area Ratio
9D/E	0.11	0.06	0.25
9F	0.19	0.10	0.36
9G	0.86	0.46	0.62
9H	2.65/1.85[1]	1.00	1.00

(1) Second value is without the contribution from the treatment plant.

The "Flow Ratio" is the measured flow at each meter divided by the total cumulative flow measured at Meter 9H. The "Drainage Area Ratio" is the drainage area of the tributary upstream of each individual meter divided by the total drainage area upstream of Meter 9H. If

groundwater contributions to the stream are uniform, the ratios should be about equal. This is not the case, possibly due to variations in groundwater contributions along the stream. Variations in groundwater contributions could result from increasing hydraulic gradients as the creek becomes more deeply incised in the glacial drift upland (e.g. groundwater inflow would be expected to increase from north to south along the streams as the gradient steepens).

Figure 3-10 shows plots, for both streams, of the stream bottom, local ground surface, and a hypothetical uniform water table about 10 feet below the ground surface. From the well data collected it has been observed that the shallow groundwater table in the drift throughout the site is fairly uniform and parallels the ground surface at shallow depths. Because the streams become more deeply incised as they precede downstream, the groundwater flow at the lower meters will be proportionally greater than at the upstream meters. If the ratio of the flows to the ratio of the square of the "head" is compared at each meter location, the ratios would be expected to be closer, as shown in Table 3-44, below.

Table 3-44. Low Stream Flow vs. Head Ratio

Meter	*Computed Flow (cfs)*	*Flow Ratio*	*Head (ft)*	*Ratio of Head Squared*
9D/E	*0.11*	*0.06*	*13*	*0.09*
9F	*0.19*	*0.10*	*22*	*0.16*
9G	*0.86*	*0.46*	*25*	*0.34*
9H	*1.85*	*1.00*	*43*	*1.00*

cfs = cubic feet per second.

This indicates that the effect of the deeper stream depth at the downstream reaches is pronounced. Figure 3-9 (B) shows a low flow period at the same meter for a 10 day period during July. The depth of flow at the meter is below the level at which the meter can compute a flow velocity. Because the flow depth is less than the height of the meter body, the meter also is exposed to direct sunlight during a portion of the day, resulting in a temperature spikes on the plot. The flow data plots indicate that the upstream meters reflected very little, if any, flow during this period, while the downstream meters reflected measurable flow. Therefore, a subsurface flow contribution remained.

Rainfall Events. Figure 3-9 (C and D) show plots of water depth, velocity and temperature at Meter 9G for a low intensity, Spring rainfall runoff event taken as the ten days from May 5 to May 15. Total rainfall for this event is about 0.68 inches over a period of about 24 hours, starting at the beginning of May 7. The most intense event within this period was 0.21 inches of rain in about 1 hour, as shown in Table 3-42. The peak runoff value at this location is about 10 cfs. In the period leading up to this event, little more than trace amounts of rain fell. Therefore, ground conditions would be classified as dry. A computer simulation of the same event using CN's for dry conditions and the rainfall measured by the gage, shows a peak runoff value of 0 cfs. As noted previously, for small, low intensity events such as this one, the computer model will show very little, if any, runoff.

A comparison of the measured base flow and peak runoff rates for this event and the computer results are shown in Table 3-45. A dash indicates that data was not available from that meter for this date.

Table 3-45. Runoff Flow Comparison, May 7			
Meter	*Measured Base Flow (cfs)*	*Measured Peak Flow (cfs)*	*Computed Peak Runoff (cfs)*
9A	*1.25*	*9.2*	*0*
9B	*1.27*	*11.0*	*0*
9D/E	*0.1*	*3.4*	*0*
9F[1]			
9G	*0.9*	*9.8*	*0*
9H	*3.0*[2]	*11.8*[3]	*0*

[1] Meter out; [2] Includes 0.8 cfs from NPDES discharges; [3] Includes 1.1 cfs from NPDES discharges

For this event, the depth and intensity of the rainfall did not produce any direct surface runoff to the creeks. All of the flow increase from the base flow was the result of subsurface flow contributions.

Figure 3-9(D) shows plots depth, velocity and temperature for a larger, more intense event on May 25, 1997. A comparison of the measured base flow and peak runoff rates at each meter location for this event and the computer results are shown in Table 3-46, below.

Table 3-46. Runoff Flow Comparison, May 25			
Meter	*Measured Base Flow cfs)*	*Measured Peak Flow (cfs)*	*Computed Peak Runoff cfs)*
9A	*0.7*	*-*	*11*
9B	*-*	*-*	*19*
9D/E	*0.1*	*3.1*	*5*
9F	*0.2*	*11.8*	*9*
9G	*0.7*	*11.3*	*10*
9H	*2.0*[1]	*17.3*[2]	*13*

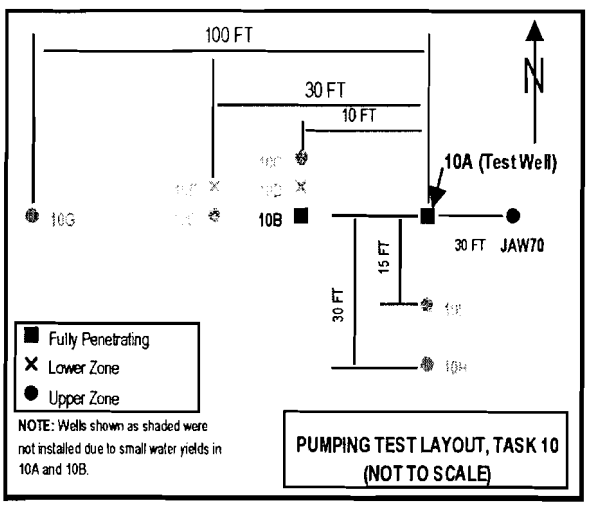
[1]Includes 0.8 cfs from the NPDES discharge. [2] Includes 1.6 cfs from the NPDES discharge.

The values indicate that a reasonable comparison exists between the computer generated values and the measured values, subtracting the base flow and the NPDES discharges.

3.10 Groundwater Pumping Test, Line 2.

Data collected in this task also pertain to geologic, hydrogeologic, and groundwater quality conditions at Line 2, discussed in Section 3.12.

The general location of the planned pumping test facility in Task 10 is shown on Figure 1-3. The planned layout is shown schematically below and included a pumping well (10A), eight new observation wells (10B through 10G), and an existing well JAW70. The pumping well and initial observation well (10A and 10B) were installed to depths of 50 feet on May 5 and May 1, 1997, respectively. During drilling of the test well 10A and the first observation well 10B, soils encountered consisted of generally stiff, silty clay till from the surface to the drilled depth of 50 feet. Gradation curves for two samples from these borings (see Table 3-55), one from a depth of 10 feet in 10A and the second from a depth of 49.5 feet in 10B, have indicated sandy clay with 60% to 70%



passing the #200 sieve. In well 10A, a 0.5 foot thick seam of loose, wet, clayey sand was encountered at a depth of 8.5 feet and scattered, wet silty zones in the clay were identified between 35 and 36 feet. In 10B, 10 feet north, a soft moist clay till zone was found between 6.5 and 9 feet and a 0.5 foot thick, wet sandy clay seam at 13 feet. These were the only potential water yielding zones identifiable from visual observation of the continuous soil samples.

Based on these findings, and as agreed with USACE and USEPA, additional observation wells were not completed. Instead, observations of groundwater levels were made during development of 10A and 10B to assess the practicality of further testing. Well data for 10A and 10B are summarized in Table 3-47. Boring logs and well construction drawings are provided in Appendices A and C, respectively.

Table 3-47. Monitoring Well Data, Task 10, Line 2 Pumping Test

No.	Coordinates		Elevation		Drilled Depth (ft)	Screen Depth (ft)		Aquifer Zone
	North	East	Ground	TOC		Top	Bottom	
10A	298818.8	2271164.5	681.65	683.75	50.4	10.0	50.4	Upper + Lower Till
10B	298806.5	2271151.0	681.55	683.94	50.0	10.0	50.0	Upper + Lower Till

TOC = Top of Casing.

Wells 10A and 10B were both constructed so that the full soil sequence from 10 to 50 feet in depth was screened. During development of well 10A, a 4-inch diameter well, approximately 140 gallons of water were removed at an average rate of 0.875 gpm. The water level in the well fell steadily during the pumping, and was measured at about 44 feet below ground surface at the end of development and was being pumped dry. Water levels in 10B, ten feet north, and JAW-70, an existing well 30 feet west, were monitored during development of well 10A. No water level response was observed in these wells. During development of well 10B, a 2-inch diameter well, approximately 110 gallons of water were removed at a rate of about 0.3 gpm. During the pumping, the water level in the well fell steadily and the well was pumped dry. Static levels in these wells, measured after development, were within about 2 feet of the ground surface.

Based upon the geologic conditions encountered in these two wells and the response of the wells to development pumping, the conclusion was reached that planned pumping tests were not feasible due to small yields and, with the concurrence of USACE and USEPA, no further tests were performed. The ultimate objective of this task was to assess the practicality of pump and treat remedial options in the clayey till soils common at IAAAP. Based upon the observed small yields and lack of response to pumping in nearby observation wells, traditional pump and treat technologies using wells does not appear economically practical. Wells pumping at very slow rates may be used to remediate groundwater contamination in highly localized areas. However, to address larger areas or to intercept contaminated groundwater migrating within the clay tills, it is likely that significant numbers of closely wells, each operating at small pumping rates, would be required. Interceptor trenches or similar technologies would appear to be more cost-effective.

3.11 Soil and Groundwater Sampling for VOCs

Results of VOC soil and groundwater sampling in this task are summarized in the following sections, organized by the six investigation areas (i.e. Areas A through F). Sampling locations are shown on Figure 3-11 and results of sampling are illustrated on Figures 3-12 through 3-17. Individual locations are identified by area A through F followed by boring number within each area (i.e. "A1" is boring 1 in Area A; "A2" is boring 2 in Area A, etc.).

3.11.1 Area A - Building 1-03-05

Previous soil gas sampling by others indicated VOC contamination at 3 to 7 foot depths on the west and north sides of this building and in discontinuous areas to the east. Soil gas concentrations, where detected, ranged up to 18,037 ppb total VOC (tvoc) at point 152 on the north side of the building. Three sample locations had been planned in this area: Location A at the northwest corner of the building; B on the north side; and C east of the building. At each location, three soil samples and one groundwater sample were planned. However, the presence of underground utilities and difficult drill rig access precluded use of the drill rig at locations A and B, which were sampled using hand augers without groundwater sampling.

Sample locations are shown on Figure 3-11(A) and results are illustrated on Figure 3-12. Six soil samples and one groundwater sample were analyzed from three borings. Soils encountered during hand augering and drilling consisted of soft to medium stiff, generally moist, dark gray to black, underlain by yellowish gray to yellowish orange silty clay till (CL). Groundwater was encountered during drilling only in boring 11A3, at an approximate depth of 5 feet. Results of analysis are summarized in Table 3-48.

Table 3-48. Results of VOC Analysis, Area A - Building 1-03-05

Boring No.	Sample Type	Sample Depth (ft)	VOC Parameters Detected (concentration)
A1	Soil	0	1,1,2-Trichlorofluoroethane (0.25 mg/kg)(B)
		4	None
A2	Soil	0	1,1,2-Trichlorofluoroethane (0.15 mg/kg)(B)
		4	1,1,2-Trichlorofluoroethane (0.063 mg/kg)
A3	Soil	0	1,1,2-Trichlorofluoroethane (0.43 mg/kg)
		4	None
	Groundwater		Toluene (3 ug/L)(B)

B = Detected in blank.

Small concentrations of Freon (1,1,2-Trichlorotrifluoroethane) in four of the six soil samples were also found in the blank and are considered cross-contamination due to high concentrations of Freon encountered previously at Building 9-57 (Area F). No other VOC detections in soil were reported in Area A. In the groundwater sample from location A3, 3 ug/L toluene was the only detection. Toluene also was found in the blank for this sample and is considered laboratory contamination. Based on these results, VOC contamination at Building 1-03-05 did not appear to represent a significant concern, and no follow-on sampling was recommended.

3.11.2. Area B - Line 1 Tank Farm

Soil gas sampling at the Line 1 Tank Farm indicated VOC contamination southwest of the southwesternmost tanks. Total VOCs in soil gas were reported between 407 and 4,031 ppb at depths of 5 feet. Two rounds of sampling were completed at locations shown on Figure 3-11(B). Results are illustrated on Figure 3-13. In the initial round, nine (9) soil samples and one (1) groundwater sample were collected from borings B1 through B4. B1 through B3 were hand auger borings and B4 was completed with the drill rig. Soils encountered were soft to stiff, generally moist, mottled clay (CL) and silt/clay (CL/ML) mixtures. Groundwater was encountered at depths of 5 to 6.5 feet. Positive PID headspace readings were noted in soils from boring B4, at depths of 5 to 8 feet, and odors were noted in this boring and at 2.5 feet in B2. Analytical results are summarized in Table 3-49.

Table 3-49. Results of VOC Analysis, Area B - Line 1 Tank Farm

Boring No.	Sample Type	Sample Depth (ft)	VOC Parameters Detected (concentration)
B1	Soil	0	1,1,2-Trichlorofluoroethane (0.96 mg/kg)
		4	Ethyl Benzene (0.87 mg/kg) 1,3,5-Trimethylbenzene (0.63 mg/kg) n-Butyl Benzene (1.4 mg/kg sec-Butyl Benzene (1.4 mg/kg) Isopropyl Benzene (0.69 mg/kg) 4-Isopropyl Toluene (0.63 mg/kg) Naphthalene (3.7 mg/kg) n-Propylbenzene (1.2 mg/kg)
B2	Soil	0	1,1,2-Trichlorofluoroethane (0.24 mg/kg)
		4	Ethyl Benzene (0.37 mg/kg) n-Butyl Benzene (1.3 mg/kg) sec-Butyl Benzene (1.9 mg/kg) Isopropyl Benzene (0.85 mg/kg) 4-Isopropyl Toluene (0.87 mg/kg) Naphthalene (8.9 mg/kg) n-Propylbenzene (1.5 mg/kg)
B3	Soil	0	1,1,2-Trichlorofluoroethane (0.43 mg/kg)
		4	None
B4	Soil	0	1,1,2-Trichlorofluoroethane (2.3 mg/kg)
		5	1,2,4-Trimethylbenzene (0.55 mg/kg) Ethyl Benzene (1.4 mg/kg) 1,3,5-Trimethylbenzene (4 mg/kg) n-Butyl Benzene (2.2 mg/kg) sec-Butyl Benzene (2 mg/kg) Isopropyl Benzene (1 mg/kg) 4-Isopropyl Toluene (0.95 mg/kg) Naphthalene (7 mg/kg) n-Propylbenzene (1.7 mg/kg)
		10	1,1,2-Trichlorofluoroethane (0.054 mg/kg)(B) 1,1-Dichloroethene (0.004 mg/kg)
	Groundwater	4	1,1,2-Trichlorofluoroethane (280 ug/L) 1,3,5-Trimethylbenzene (2 ug/L) n-Butyl Benzene (2 ug/L) sec-Butyl Benzene (12 ug/L) Isopropyl Benzene (3 ug/L) n-Propylbenzene (1 ug/L) 1,1-Dichloroethane (8 ug/L) 1,1-Dichloroethene (8 ug/L) cis-1,2-Dichloroethene (20 ug/L) Toluene (3 ug/L)(B)
B5	Soil	3	1,1,2-Trichlorofluoroethane (0.025 ug/kg)(B)
		8	Toluene (0.003 ug/kg)(B) 1,1,2-Trichlorofluoroethane (0.025 ug/kg)(B)
B6	Soil	3	1,1,2-Trichlorofluoroethane (0.059 ug/kg)(B) Toluene (0.003 ug/kg)(B)
		8	1,1,2-Trichlorofluoroethane (0.03 ug/kg)(B) Toluene (0.004 ug/kg)(B)
B7	Soil	3	None
		8	Toluene (0.004 ug/kg)(B)
B8	Soil	3	Toluene (0.003 ug/kg)(B)
		8	Toluene (0.004 ug/kg)(B)

B = Detected in blank.

In the initial sampling round, small concentrations of substituted benzene compounds were found at 4-6 ft depths in B1, B2, and B4, on the west side of the subject tanks, and in the groundwater sample from B4. These detections were not found in the shallower (0-1 ft) samples or in boring B3 on the northeast side of the tanks. The small concentrations of Freon in some samples is considered to represent cross-contamination from Area F, discussed earlier. Similar compounds were detected in the groundwater sample from location B4, as well as trace levels of 1,1-dichloroethane, 1,1-dichloroethene, and cis-1,2-dichloroethene. Concentrations in the groundwater sample typically are in the low part per billion range.

Based on the initial results, an additional eight soil samples were collected from four borings to explore the lateral extent of contamination. These locations, designated B5 through B8, were completed with a drill rig and soil samples were collected from depths of 3 and 8 feet. Results show trace concentrations of toluene, also detected in the blank, but generally indicated the VOC contamination is localized in the immediate vicinity of the tank.

3.11.3 Area C - Buildings 2-02 and 2-03

Previous soil gas sampling indicated VOCs up to 1,950 ppb near the east and south sides of Building 2-03, at depths from 10 to 27 feet, and VOCs up to 1,760 ppb at 5 foot depths on the southeast side of building 2-02. Two rounds of sampling were completed in this investigation. Sample locations are shown on Figure 3-11(C) and results are illustrated on Figure 3-14 and summarized in Table 3-50.

Table 3-50. Results of VOC Analysis, Area C - Buildings 2-02 and 2-03

Boring No.	Sample Type	Sample Depth (ft)	VOC Parameters Detected (concentration)
C1	Soil	0	1,1,2-Trichlorofluoroethane (0.013 mg/kg)
		10	Ethyl Benzene (0.004 mg/kg) Xylenes-total (0.054 mg/kg)
		25	1,1,2-Trichlorofluoroethane (0.66 mg/kg)
		33	1,1,2-Trichlorofluoroethane (0.12 mg/kg)
	Groundwater		1,1,2-Trichlorofluoroethane (60 ug/L) Xylenes-total (9 ug/L) Toluene (3.1 ug/L) (B)
			1,1,2-Trichlorofluoroethane (130 ug/L) Xylenes-total (2 ug/L)
C2	Soil	0	1,1,2-Trichlorofluoroethane (0.33 mg/kg)
		4	1,1,2-Trichlorofluoroethane (1.6 mg/kg) Methylene Chloride (0.016 mg/kg)(B) Chlorobenzene (0.008 mg/kg) 1,2-Dichlorobenzene (0.041 mg/kg) 1,4-Dichlorobenzene (0.007 mg/kg)
		10	1,1,2-Trichlorofluoroethane (0.073 mg/kg) Chlorobenzene (0.021 mg/kg)
	Groundwater		1,1,2-Trichlorofluoroethane (15 ug/L) Benzene (2 ug/L) Chlorobenzene (93 ug/L)
C3	Groundwater		None
C4	Groundwater		None
C6	Soil	5	None
	Groundwater		None

B = Detected in blank.

In the initial sampling round, seven soil samples and three groundwater samples were collected from two borings, designated C1 and C2. C1 was located at Building 2-03 and C2 at Building 2-02. Results identified small concentrations of ethyl benzene and xylenes in soils at Building 2-03 (boring C1) and of chlorobenzene, 1,2-dichlorobenzene, and 1,4-dichlorobenzene in soils at Building 2-02 (boring C2). As with other areas, small detections of Freon (1,1,2-trichlorofluoroethane) are attributed to cross-contamination resulting from prior sampling in Area F. The initial groundwater sampling indicated small concentrations of xylenes, below levels of concern, in C1, but 93 ug/L chlorobenzene in boring C2. Based on the detection in C2, three additional groundwater samples were collected from borings designated C3, C4, and C6 around Building 2-02 (Figure 3-14). No detections were found at these locations indicating that the chlorobenzene found in C2 is a localized concern. The source of contamination may be a former #1 fuel UST located south of building 2-03, which has been removed.

Soils encountered during drilling at this site were generally moist, soft to stiff; mottled brown to gray clay or silty, sandy clay (CL). Clayey silt (ML) was encountered from 4 to 10 feet in boring C3, from 8 to 13 feet in boring C4, and from 7 to 12.5 feet in boring C5. A 6 inch gravel seam also was encountered just beneath the surface in boring C4. Groundwater depths generally could not be determined during drilling and groundwater sampling in the deeper borings was accomplished using temporary wells. No VOC contamination was observed based on PID headspace measurements. However, a black tar-like substance was observed from 5 to 8 feet in boring C6 and was sampled. No VOCs were detected in that sample.

3.11.4 Area D - Building 3-03

Previous soil gas sampling indicated VOCs up to 1,462 ppb immediately adjacent to the north, east and south sides of this building. Most samples are from depths of 5 feet and show VOCs of 16 to 98 ppb. One point, 01 on the north side of the building, had the highest concentration at 5 feet, decreasing with depths of 9 and 15 feet. A total of three soil samples and one groundwater sample were collected. Sample locations are shown on Figure 3-11(D) and results are illustrated on Figure 3-15. Analytical results are summarized in Table 3-51.

Table 3-51. Results of VOC Analysis, Area D - Building 3-03

Boring No.	Sample Type	Sample Depth (ft)	VOC Parameters Detected (concentration)
D1	Soil	0	1,1,2-Trichlorofluoroethane (0.6 mg/kg)
		5	1,1,2-Trichlorofluoroethane (0.19 mg/kg) 1,2,4-Trimethylbenzene (0.03 mg/kg)
		13	None
	Groundwater	33	1,1,2-Trichlorofluoroethane (11 ug/L)

The only detection, other than Freon, was the 1,2,4-Trimethylbenzene in soil from the 5-6 foot depth. Freon may be present at this site, but may be residual cross-contamination due to earlier sampling at Building 9-57, as discussed in Section 3.11.6. Based on these results, no significant concern was indicated and no further sampling was recommended.

3.11.5 Area E - Building 3A-03-01

Previous soil gas sampling indicated VOCs at point 11 (6,486 ppb at 5 feet) south of the building and at point 8 (3 ppb at 5 feet). A total of five soil samples and one groundwater sample were collected from two borings in this area, designated E1 and E2. Sample locations are shown on Figure 3-11(E) and results are illustrated on Figure 3-16. Borings at this site penetrated 1.5 to 3.5 feet of crushed limestone fill underlain by gray to black, moist, soft to medium stiff clay (CL). A very thin wet zone was observed at a depth of about 8 feet in boring E1 and groundwater was measured at about 5 feet below ground surface in the Hydropunch sampler after drilling was complete. Detections are summarized in Table 3-52.

Table 3-52. Results of VOC Analysis, Area E - Building 3-03-01

Boring No.	Sample Type	Sample Depth (ft)	VOC Parameters Detected (concentration)
E1	Soil	0	1,1,2-Trichlorofluoroethane (1 mg/kg)
		5	1,1,2-Trichlorofluoroethane (0.18 mg/kg)
		10	1,1,2-Trichlorofluoroethane (0.31 mg/kg)
	Groundwater		None

Table 3-52. Results of VOC Analysis, Area E - Building 3-03-01			
Boring No.	*Sample Type*	*Sample Depth (ft)*	*VOC Parameters Detected (concentration)*
E2	*Soil*	*0*	*1,1,2-Trichlorofluoroethane (0.47 mg/kg)*
		4	*1,1,2-Trichlorofluoroethane (3.6 mg/kg)* *1,2,4-Trimethylbenzene (0.028 mg/kg)* *n-Butyl benzene (0.15 mg/kg)* *sec-Butyl benzene (0.013 mg/kg)* *4-Isopropyl toluene (0.021 mg/kg)* *n-Propylbenzene (0.008 mg/kg)*

Other than Freon, the only detections were at the 4-5 foot depths in boring E2, where small concentrations of 1,2,4-trimethylbenzene, n-butylbenzene, sec-butyl benzene, 4-isopropyl toluene, and n-propylbenzene were reported. Freon may be present at this site, but may be residual cross-contamination due to earlier sampling at Building 9-57, discussed in Section 3.11.6. Groundwater apparently is not impacted. Therefore, no additional investigations were recommended at this location.

3.11.6 Area F - Building 9-57

Previous soil gas sampling indicated VOCs mostly to the east of this building but also south and west of its northwest corner. Soil gas detections generally were from 5 to 7 foot depths, but also were reported up to 78 feet. Two rounds of samples were collected. In the initial round, a total of 39 soil and 4 groundwater samples were collected from eight borings (F1 through F8). Based on these results, an additional 11 soil and 5 groundwater samples were collected from six borings (F9 through F14) to further explore the lateral extent of contamination. Sample locations are shown on Figure 3-11(F). Results are illustrated on Figure 3-17.

Soils encountered in borings at this site consisted primarily of yellowish brown to olive clay and silty, sandy clay (CL, CL/ML). Clayey silt and silt (ML) zones were encountered at various depths in borings F1, F3, and F5. In boring F3, sandy gravel (GP) was penetrated from 3.6 to 4.5 feet and silty sand (SP) from 14.5 to 18 feet, with clayey silt (ML) above and below. Sand zones also were encountered 32 to 33 feet and 38 to the bottom at 40 feet with clayey silt between. Groundwater, where identifiable, was reported generally at depths between 6 and 10 feet. In boring F1, elevated PID headspace measurements (3.5 to 4.5 ppm) were recorded from 13 to about 25 feet and possible product was observed in some soils and cuttings. Similarly, in boring F2, positive PID readings were measured on the outside of the soil cores intermittently between depths of 12 and 35 feet. A clear liquid with a 'sweet' odor was observed draining from the sampler. PID readings were negative on fresh core samples and may result from this liquid draining down the outside of the core and/or sampler. The liquid evaporated almost immediately and is suspected to be Freon. Again, in boring F7, PID readings up to 58 ppm were measured on soil surfaces from 32 to 35 feet and positive PID readings were recorded variably between 13 and 16 feet in borings F11 and F12. Results of analysis are summarized in Table 3-53.

Table 3-53. Results of VOC Analysis, Area F - Building 9-57						
Boring No.	*Sample Type*	*Sample Depth (ft)*	*VOC Parameters Detected (concentration)*			
			1,1,2-TCA	*Methylene Chloride*	*Toluene*	*1,1,1-TCA*
F1	*Soil*	*0*	*0.42 mg/kg*			
		5	*15 mg/kg*			
		13	*9,000 mg/kg*			
		23	*280 mg/kg*	*8 mg/kg (B)*		
		33	*3.2 mg/kg*			
	Groundwater	*6*	*220,000 ug/L*			

Table 3-53. Results of VOC Analysis, Area F - Building 9-57

Boring No.	Sample Type	Sample Depth (ft)	VOC Parameters Detected (concentration)			
			1,1,2-TCA	Methylene Chloride	Toluene	1,1,1-TCA
F2	Soil	0	0.16 mg/kg			
		5	9 mg/kg			
		13	4,000 mg/kg			
		23	1.7 mg/kg			
		33	3.1 mg/kg			
F3	Soil	0	0.3 mg/kg			
		5	1.4 mg/kg			
		13	6.3 mg/kg			
		23	34 mg/kg			
		32	3,900 mg/kg	6.6 mg/kg (B)		
		36	26 mg/kg	2.7 mg/kg (B)		
F4	Soil	0	0.4 mg/kg			
		5	1 mg/kg			
		13	910 mg/kg			
		15	2,000 mg/kg			
		23	0.091 mg/kg (B)			
		33	0.79 mg/kg			
	Groundwater	6	36,000 ug/L		2,000 ug/L (B)	
F5	Soil	0	0.27 mg/kg			
		5	0.44 mg/kg			
		13	29 mg/kg			
		23	1.4 mg/kg			
		33	5.9 mg/kg			
	Groundwater	8	69,000 ug/L		2,000 ug/L (B)	
F6	Soil	0	0.73 mg/kg			
		4	0.11 mg/kg			
F7	Soil	0	1.5 mg/kg			
		5	0.99 mg/kg			
		13	110 mg/kg			
		20	620 mg/kg			
		33	27 mg/kg			
	Groundwater	4	270,000 ug/L		2,000 ug/L (B)	
F8	Soil	0	0.39 mg/kg			
		5	0.068 mg/kg			0.025 mg/kg
		13	4.9 mg/kg			
		23	0.15 mg/kg			
F9	Soil	3	0.017 mg/kg		0.014 mg/kg (B)	
		13	4.5 mg/kg		0.4 mg/kg (B)	
	Groundwater	5	11,000 ug/L			
F10	Soil	3			0.007 mg/kg (B)	
		13	1.0 mg/kg (E)			
	Groundwater	5	2,500 ug/L		33 ug/L (B)	
F11	Soil	15	6,200 mg/kg		1.7 mg/kg (B)	
F12	Soil	3	0.11 mg/kg		0.004 mg/kg (B)	
		13	78 mg/kg		0.01 mg/kg (B)	
	Groundwater	6	2,300 ug/L		75 ug/L (B)	
F13	Soil	3			0.004 mg/kg (B)	
		13	0.48 mg/kg			
	Groundwater	7	1,500 ug/L		70 ug/L (B)	
F14	Soil	3	0.037 mg/kg		0.004 mg/kg (B)	
		13	0.37 mg/kg		0.008 mg/kg (B)	
	Groundwater	7	5,600 ug/L		2,000 ug/L (B)	

B = Detected in blank.

Analytical results from the first round of sampling identified 1,1,2-Trichlorofluoroethane (Freon) in all soil and groundwater samples. Concentrations ranged up to 9,000 mg/kg in soil and 270,000 ug/L in groundwater, with highest concentrations in borings F1, F2, F3, and F4, just east of Building 9-57. In the second round of samples, Freon also was detected in most samples, but generally at lower concentrations: up to 6,200 mg/kg in soil but only 11,000 ug/L in

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groundwater. These locations were east of the building but at greater distances to help delineate the lateral extent of contamination. Vertically, the extent of Freon contamination is between the approximate 23 to 33 foot sampling depths, or less. Freon concentrations at those depths declined to less than 10 mg/kg in soil, except for 26 mg/kg at a depth of 36 feet in F3. It is noted that sampling in Area F was completed before the other sites. Therefore, low levels of Freon noted in some samples from other sites are considered to represent residual cross-contamination from building 9-57. This has been noted as appropriate in earlier sections. In addition, methylene chloride and toluene were detected in some samples, but also in the blank and are considered laboratory contaminants. A small concentration of 1,1,1-Trichloroethane (0.025 mg/kg) was detected in the 5-foot soil sample at F8, but not in any other sample.

3.12 Additional Groundwater Data, Line 2

Seven new monitoring wells and one piezometer were installed at Line 2 in addition to wells 10A and 10B installed in Task 10 *(Aquifer Pumping Tests, Line 2)*. Well locations are shown on Figure 3-18 and well data are summarized in Table 3-54, below. Boring logs and well construction drawings are in Appendix A and C, respectively.

Table 3-54. Monitoring Well Data, Task 12, Line 2

Number	Coordinates		Elevation		Drilled Depth (ft)	Screen Depth (ft)		Aquifer Zone
	North	East	Ground	TOC		Top	Bottom	
12A	298784.8	2270801.4	679.14	681.25	20.5	10.5	20.5	Upper Till
12B	297915.9	2270847.4	689.23	691.44	20.5	10.5	20.5	Upper Till
12C	297922.1	2270834.6	689.18	691.66	50.2	40.2	50.2	Lower Till
12D	297912.5	2270838.1	689.28	691.26	120.0	110.0	120.0	Bedrock
12E	297294.4	2271125.7	688.53	690.37	20.0	10.0	20.0	Upper Till
12F*	298192.9	2271212.0	688.26	690.54	50.4	40.4	50.4	Lower Till
12G	298035.1	2270441.2	687.97	690.00	20.3	10.3	20.3	Upper Till
12H	298714.4	2269728.1	688.13	689.60	30.0	28.0(1)	30.0(1)	Upper Till

(1) 12H installed as a piezometer with 1-inch diameter PVC riser and porous tip. * 12F dry after installation. No slug test or sampling performed.
TOC = Top of Casing

3.12.1 Geology

Subsurface conditions encountered in Line 2 are illustrated on generalized hydrogeologic cross-sections A, B, and C on Figures 3-19, 3-20, and 3-21. In general, borings encountered dense silty clay/clayey silt till soils (CL/ML in the Unified Soil Classification System) throughout the unconsolidated sequence. The clayey soils contain sporadic sand seams, which appear discontinuous and generally are less than one foot thick. These are rare, but are found throughout the till thickness. Silt (ML) is reported in pre-existing borings JAW70 and JAW75 and more extensive sand and silt seams in JAW74. These may represent variations in field classification, or could suggest that granular soils are present in the upper portions of the till sequence in the east part of Line 2. Gradation curves were obtained for five samples from the new wells and also from wells 10A and 10B in Task 10 *(Groundwater Pumping Test, Line 2)*. Results are shown in Table 3-55 and indicated sandy clay soils generally with 60% to 70% passing the #200 sieve.

Table 3-55. Results of Gradation Testing, Line 2

Well No.	Depth (ft)	Classification	% Gravel	% Sand	% Silt	% Clay
12C	45-46.5	Sandy Clay	4.8	37.9	32.8	24.5
12D	15-16.5	Sandy Clay w/Gravel	18.3	20.7	34.3	26.7
12E	17-18	Sandy Clay	11.2	26.1	36.8	25.9
12F	45.5-46	Sandy Clay	1.9	39.9	34.8	23.4
12G	12.3-12.5	Sandy Clay w/Gravel	17.2	26.6	33.0	23.2

Table 3-55. Results of Gradation Testing, Line 2						
Well No.	*Depth (ft)*	*Classification*	*% Gravel*	*% Sand*	*% Silt*	*% Clay*
10A	*10-10.5*	*Sandy Clay*	*11.2*	*29.4*	*39.5*	*19.9*
10B	*49.5-50*	*Sandy Clay*	*8.8*	*21.3*	*42.3*	*27.6*

Data for wells 10A and 10B, installed in Task 10 *(Pumping Tests, Line 2)* are included above as relevant to Line 2. Limestone bedrock was encountered at a depth of about 110 feet in deep boring 12D.

3.12.2 Hydrogeology

During drilling in Line 2, identifiable groundwater occurrences were sparse due to the predominance of low-permeability, clayey tills beneath the site. Groundwater encountered during drilling generally was limited to the sporadic sand or silty sand seams scattered through the vertical soil sequence. However, all wells contained groundwater after well completion and development.

Potentiometric elevations and contours in Line 2 are shown on Figure 3-22 and ranged between elevation 646.73 in deep well 12D and 684.35 shallow well 12B (intermediate depth well 12F was reported dry at the time of measurement). Groundwater elevations measured in shallow wells were generally between elevations 680 to 685 in the shallow wells, within 8 to 10 feet of the ground surface. Groundwater flow in the upper till sequence is indicated to be generally westward, discharging to Brush Creek. Piezometer 12H, installed west of the creek, also shows water levels above the creek, indicating that the creek is recharged by groundwater from both sides. The shallow potentiometric surface closely parallels the ground surface, as can be seen particularly on Cross-Section C-C' (Figure 3-21). Because surface topography at Line 2 is undulating, there is relatively more variation in the groundwater elevations than at some other study areas and potentiometric contours become difficult to develop. Lateral hydraulic gradients estimated between various monitoring wells in the shallow till ranged between about 0.01ft/ft and 0.004 ft/ft. A lateral gradient of about 0.018 ft/ft is estimated between wells 10A/10B and Brush Creek, as depicted in Cross-Section B-B' (figure 3-20). As elsewhere at the plant, downward vertical hydraulic gradients exist within the tills. An overall downward gradient of approximately 0.374 ft/ft was estimated between shallow well 12B and deep bedrock well 12D. Wells 10A and 10B were screened across both the shallow and intermediate tills and groundwater levels deeper than the shallow wells could be expected. However, water levels in these wells were within about 10 feet of the surface, equivalent to the shallow wells. This suggests that the majority of the piezometric head (and inflow) to these wells is derived from the upper part of the screen interval.

Results of field permeability tests in Line 2 wells are summarized in Table 3-56, below.

Table 3-56 Results of Field Permeability Tests, Task 12, Line 2	
Well Number	*Estimated Hydraulic Conductivity*
12A	*5.36 x 10^{-4} cm/sec (1.520 ft/day)*
12B	*6.31 x 10^{-4} cm/sec (1.788 ft/day)*
12C	*1.39 x 10^{-5} cm/sec (0.0395 ft/day)*
12D	*1.00 x 10^{-6} cm/sec (0.00285 ft/day)*
12G	*2.29 x 10^{-5} cm/sec (0.065 ft/day)*

Estimated permeability values for shallow wells 12A and 12B averaged about 1.65 ft/day, appropriate for silty soils, while shallow wells 12C and 12G averaged 0.053 ft/day, appropriate for clayey tills. Well 12C also could be bailed dry during developing. The low permeability of 0.00285 ft/day in 12D, the bedrock well, suggests that the bedrock at this location is relatively unfractured and is tight.

Using a lateral hydraulic gradient of 0.0059 ft/ft scaled from contours on Figure 3-22 (representing an approximate gradient from well JAW70 west toward Brush Creek), and the average hydraulic conductivity from slug tests in the drift (0.853 ft/day), average horizontal groundwater flow velocities in the shallow till were estimated using Darcy's Law in the form: V = KI/n; where "V" is flow velocity, "I" is gradient; and "n" is effective porosity (assumed at 30% from published values). The resultant average flow velocity is 0.027 ft/day (about 10 ft/year). Further rough approximations were made of groundwater flux toward Brush Creek in the shallow till using Darcy's Law in the form Q = KIA, where Q is flow if ft^3/day; 'A' is the area of the cross-section across which flow occurs, and 'KI' are as defined above. For the purposes of this rough evaluation, a unit cross-sectional flow area paralleling the creek of 100 feet long by 20 feet deep was used, resulting in average estimated unit flows of about 16.2 ft^3/day (1.9×10^{-4} cfs) for each 100 foot reach of Brush Creek. Since Brush Creek parallels Line 2 for a distance of approximately 4,000 ft (40 unit cross-sectional flow areas at 100 feet long each), total flow to the creek in the shallow tills from the Line 2 area are suggested to be in the order of 648 ft^3/day (about 0.0075 cfs or 3.4 gpm). Although these results should be viewed with great caution due to the variables and uncertainties implicit in the assumptions made, they suggest the small rates of flow in the drift unit.

3.12.3 Groundwater Sampling Results

Groundwater samples were collected from eight new monitoring wells (10A and B and 12 A, B, C, D, E, and G) and four existing wells (JAW-70, 71, 72, and 73). Results of organic analysis are summarized in Table 3-57. Results are illustrated and discussed in Section 5.0, Nature and Extent of Contamination incorporating analytical data obtained from Mason & Hanger and JAYCOR.

Table 3-57. Organic Chemicals Detected in Groundwater, Line 2 (Task 12)

Well No.	Volatile Organics (ug/L)	Semi-Volatile Organics (ug/L)	Explosives (ug/L)
12A	Methylene Chloride (7.2 B)	Butylbenzylphthalate (2.7 J)	RDX (1,200) 1,3-Dinitrobenzene (0.46 J)
12B	None	Butylbenzylphthalate (0.78 J) Bis(2-ethylhexyl)phthalate (3.4J)	RDX (4.9) HMX (1.2 J)
12C	Methylene Chloride (4.6 JB)	None	1,3-Dinitrobenzene (0.46 J) 4-Nitrotoluene (1.6)
12D	Toluene (5.2)	Butylbenzylphthalate (2.2 J) Bis(2-ethylhexyl)phthalate (4.2J)	None
12E	Methylene Chloride (21.7 B)	Bis(2-ethylhexyl)phthalate (6.8J)	1,3-Dinitrobenzene (0.95 J)
12G	Methylene Chloride (5.5 B)	None	None
JAW70	Methylene Chloride (3.3)	Bis(2-ethylhexyl)phthalate (5J)	RDX (1,200) HMX (130) 4-Amino-2,6-dinitrotoluene (23) 2-Amino-4,6-dinitrotoluene (21)
JAW71	Methylene Chloride (4.3)	Bis(2-ethylhexyl)phthalate (4.3J)	RDX (9.3) HMX (2.6) 1,3-Dinitrobenzene (2.4)

Table 3-57. Organic Chemicals Detected in Groundwater, Line 2 (Task 12)

Well No.	Volatile Organics (ug/L)	Semi-Volatile Organics (ug/L)	Explosives (ug/L)
JAW72	Methylene Chloride (5.2) Trichloroethene (7.7)	Bis(2-ethylhexyl)phthalate (6.7J)	RDX (1,600) HMX (140) 4-Amino-2,6-dinitrotoluene (19) 2-Amino-4,6-dinitrotoluene (30)
JAW73	Methylene Chloride 4.4	Bis(2-ethylhexyl)phthalate (7.7J)	RDX (190) HMX (4.7)
10A	None	None	RDX (1200) HMX (220) 2,4-Dinitrotoluene (7.8 J) 4-Amino-2,6-Dinitrotoluene (14) 2-Amino-2,6-Dinitrotoluene (20)
10B	Methylene Chloride (10.4 B)	None	RDX (250) HMX (82) 4-Amino-2,6-Dinitrotoluene (5.9) 2-Amino-2,6-Dinitrotoluene (8.1)

J = Estimated concentration below the reporting limit. B = Found in the blank and the sample

Results of RCRA metals analyses (dissolved) are summarized in Table 3-58. A full tabulation of results is included in Appendix J.

Table 3-58. Selected Metals Analysis (mg/L), Task 12, Line 2

Parameter	12A	12B	12C	12D	12E	12G	JAW70	JAW71	JAW72	JAW73	10A	10B
Arsenic	ND	ND	0.016	0.001	ND	ND	ND	ND	ND	ND	ND	ND
Barium	0.14	0.13	0.44	ND	0.064	0.11	0.082	0.067	0.071	0.063	0.11	0.015
Cadmium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	0.00088	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND = Not Detected

3.13 Additional Groundwater Data, Downstream Reach of Brush Creek

Four new monitoring wells (13B, E, D, and F) were installed at three locations in this task to evaluate the downstream reaches of Brush Creek as potential migration pathways for contaminants and to evaluate interactions between groundwater and surface water in the creek. Well locations are shown on Figure 3-23. Well 13B is a single well west of the creek, screened in bedrock. Wells 13E and 13D are a well pair east of the creek, screened in the upper and lower till. Well 13F, also east of the creek and east of 13E/D, is a single well screened in the till. Well information is summarized in Table 3-59. Boring logs and well construction sketches are provided in Appendices A and C, respectively.

Table 3-59. Monitoring Well Data, Task 13, Downstream Reach Brush Creek

Number	Coordinates		Elevation		Drilled Depth (ft)	Screen Depth		Aquifer Zone
	North	East	Ground	TOC		Top	Bottom	
13A	Not drilled due to subsurface conditions encountered							
13B	287765.7	2277255.5	627.67	629.59	45.4	33.6	43.6	Bedrock
13C	Not drilled due to subsurface conditions encountered							
13D	228128.0	2278281.7	652.84	654.59	85.0	74.8	84.8	Lower Till
13E	228119.5	2278285.2	652.56	654.21	34.5	33.5	34.5	Upper Till
13F	288227.2	2278612.3	658.65	660.44	55.0	45.0	55.0	Lower Till

TOC = Top of Casing

The new wells supplement an existing well pair (wells G54 and G55), located in the bottom of the creek valley and screened in the bedrock and shallow till, respectively. The shallow well of this existing pair, G55, is screened at an elevation about 6 feet lower, but roughly equivalent to 13F, and just above 13B. Initially, additional new monitoring wells 13A and 13C were planned

west of the creek. However, the first well boring west of the creek, 13B, encountered bedrock at a depth of about 8 feet and, with the concurrence of USACE and USEPA, further drilling west of the creek was concluded to be unnecessary to achieve task objectives and these two wells were not drilled.

3.13.1 Geology

A generalized hydrogeologic cross-section across the creek is shown on Figure 3-24. The geology of this area, as illustrated on the cross-section, is characterized by unconsolidated glacial deposits overlying limestone bedrock. East of Brush Creek, the till sequence extends to more than 85 feet, the depth of the longest well boring, 13D. Bedrock was not encountered in borings east of the creek. Well G54 encountered bedrock at a depth of about 45 feet beneath the creek bed. West of the creek, the bedrock surface rises steeply and bedrock is only 8 feet deep in 13B. Shallow bedrock also was encountered in piezometer boring 14D about 3,000 feet further west from 13B. Soil materials encountered in these borings consisted of silty to sandy clay immediately underlying the surface to depths of about 8 feet underlain by interbedded silt, clayey silt, and silty clay with occasional sand seams and beds. These interbedded units extended to the bottom of the deepest boring drilled, 13D, at 85 feet. The soil types encountered in these borings appears more granular than further north in Line 2 and 3. Three gradation tests were obtained on samples from these wells. Results are shown in Table 3-60 and indicated clayey sand, sandy clay, and clay soils with 30% to 85% passing the #200 sieve.

Table 3-60. Results of Gradation Testing, Downstream Reach of Brush Creek

Well No.	Depth (ft)	Classification	% Gravel	% Sand	% Silt	% Clay
13D	78.5-79	Clayey Sand	5.1	61.7	25.3	7.9
13E	26-26.5	Sandy Clay	1.2	45.1	37.6	16.1
13F	52-52.5	Clay	0.1	14.8	57.3	27.8

3.13.2 Hydrogeology

Potentiometric levels measured in the wells in this task ranged from elevation 602.16 in G55, located on the river bank, to 624.16 in 13E east of the creek (Figure 3-24). Potentiometric levels from all wells are slightly above the estimated level of Brush Creek, indicating that groundwater is recharging the creek from both the west and east sides. Based on measurements in the 13D/13E well pair, screened at two depth zones, a downward vertical hydraulic gradient of approximately 0.17 ft/ft is indicated. Therefore, determination of horizontal gradients must be based upon measurements from wells screened in roughly equivalent elevation intervals. Potentiometric measurements in bedrock well 13B are consistent with measurements from other wells showing flow first to the overlying drift/alluvium and then toward the creek. Therefore, bedrock aquifer appears hydraulically connected to the unconsolidated aquifer and to the creek.

Hydraulic conductivity values estimated from field permeability (slug) tests in these wells are summarized in Table 3-61.

Table 3-61. Results of Field Permeability Tests, Task 13, Brush Creek

Well Number	Estimated Hydraulic Conductivity
13B	1.23 x 10-2 cm/sec (34.88 ft/day)
13D	1.42 x 10-6 cm/sec (0.0040 ft/day)
13E	Test data could not be analyzed
13F	Recovery too rapid for data analysis

The value of about 35 ft/day in well 13B indicates the shallow bedrock at that location is relatively permeable. During development by bailing and pumping, this well also recharged relatively quickly, yielding about 70 gallons in slightly less than 3 hours. The much lower value of 0.004 ft/day in 13D reflects the clayey till in which the well is screened and is consistent with development data (the well could be bailed dry manually). Test data from 13E could not be reliably interpreted and appears to be a bad data set. 13E also could be bailed dry during development. Well 13F recovered too rapidly for valid analysis of the slug test data, normally suggesting high permeabilities. However, this well also could be bailed dry during development, suggesting slow recharge. Therefore, this result is questionable and should not be used.

3.13.3 Groundwater Sampling

Groundwater samples collected in this task were analyzed for explosives, metals (total and dissolved), and water quality parameters. Results of analysis are tabulated in Appendix J. Results are illustrated and discussed further in Section 5.0, Nature and Extent of Contamination.

Explosive concentrations detected in the Task 13 samples are shown in cross-section on Figure 3-24, including nearby surface water and sediment sampling at (Location K) in Task 7 *(Sediment and Surface Water Sampling, Site Drainages).* No explosives were detected in groundwater from 13E or 13F, screened in the upper or intermediate drift east of Brush Creek. This confirms the absence of local surface contamination sources and reflects the observation that these wells are upgradient from the creek (i.e. contaminants would not migrate from the creek to these shallow wells). Low concentrations of explosives were detected in deeper wells 13D and G54 and in 13B in the upper bedrock west of the creek. 4-Nitrotoluene was detected in 13B at an estimated concentration of 0.56 ug/L and 1.6 ug/L nitrobenzene were detected in 13D. 2-Nitrotoluene was detected at 2.8 ug/L in pre-existing well G54, the deeper of the 2-well pair adjacent to the creek. In G55, the shallower of the pair, RDX was detected at 2.2 ug/L and 1,3-dinitrobenzene was detected at an estimated concentration of 0.43 ug/L. No other explosives were detected.

It is possible that the creek is the local source of this contamination. However, the creek is being recharged by the groundwater and the trace concentrations detected in the deeper wells could reflect contamination from more remote sources upgradient from the Task 13 study area. If so, the lateral extent of the contamination could be significant, but the concentrations are low. Sediment samples from location K contained no detectable explosives, although the surface water sample contained 2.67 ug/L total explosives, similar to the 2.63 ug/L detected in the adjacent shallow well G55. These results show that the sediment is not a significant continuing source of contamination, but that the surface water itself is acting as a migration pathway, at least for small concentrations of contaminants. Also, these results suggest that well G55 is monitoring surface water conditions related to the creek, more than the groundwater itself.

Results of dissolved metals analysis are summarized in Table 3-62, focusing on the metals for which groundwater PRGs were published for the site. Complete results are summarized in Appendix J.

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Table 3-62. Selected Dissolved Metals Detected in Groundwater, Task 13, Brush Creek						
Parameter (mg/L)	13B	13D	13E	13F	G54	G55
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	0.0036	0.00053	0.0012	0.00062	0.00068
Barium	0.08	0.67	0.06	0.35	0.12	0.04
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium	ND	ND	ND	ND	ND	ND
Lead	ND	ND	ND	ND	ND	ND
Manganese	0.31	0.098	0.27	0.14	0.0092	1.3
Mercury	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	0.032	ND	ND

ND = Not Detected

Results of analysis for water quality parameters are summarized in Table 3-63, below.

Table 3-63. Results of Groundwater Quality Parameter Analysis, Task 13, Brush Creek					
Parameter	13B	13E	13F	G54	G55
Alkalinity (mg/L)	297	587	453	373	508
Chloride (mg/L)	1.1	4.5	3.4	5.6	8.4
Nitrate-Nitrite (mg/L)	ND	ND	ND	ND	ND
pH (units)	7.8	7.4	7.1	7.4	6.7
Total Dissolved Solids (mg/L)	284	1300	520	385	1710
Total Suspended Solids (mg/L)	5.4	7.1	180	1.9	12.8
Sulfate (mg/L)	6.1	186	45.8	22.3	401
Sulfide (total) (mg/L)	ND	ND	ND	ND	ND
Total Organic Carbon (mg/L)	1	1.3	4.6	ND	ND

3.14 Additional Bedrock Topography Data

The purpose of this task was to obtain additional data on the elevation of the bedrock surface beneath the IAAAP and to evaluate the new and existing data to identify impacts of the bedrock surface on groundwater flow, migration pathways, and possible remedial actions.

Six (6) piezometers were installed in the upper bedrock in this task. The piezometers are designated 14A through 14F on Figure 1-3 and were located in areas where no bedrock data were available from previous drilling. The borings for the piezometers ranged from 43.6 to 108.5 feet deep and bedrock was encountered at depths between 21.6 feet in 14F and 88.5 feet in 14E. Piezometer data are summarized in Table 3-64. Boring logs and construction sketches are provided in Appendices A and C, respectively.

Table 3-64. Piezometer Data, Task 14, Bedrock Topography								
Number	Coordinates		Elevation		Drilled Depth (ft)	Screen Depth		Aquifer Zone
	North	East	Ground	TOC		Top	Bottom	
14A	298163.3	2275920.3	691.57	693.83	67.5	65.3	67.5	Bedrock
14B	292254.9	2276161.8	678.28	680.84	98.0	95.8	98.0	Bedrock
14C	290752.7	2267497.7	6834.35	686.24	77.1	75.1	77.1	Bedrock
14D	287166.9	2273457.5	676.81	679.05	43.6	41.4	43.6	Bedrock
14E	298555.6	2262676.4	689.81	691.28	108.5	106.6	108.8	Bedrock
14F	285498.9	2260874.1	675.16	677.20	43.5	40.4	42.4	Bedrock

TOC = Top of Casing

Three monitoring well borings installed in other tasks (12D, 13B, and 16A), also encountered bedrock. In addition, available boring logs from previous field programs were reviewed and top

of bedrock data from these borings also were used. In all, sixty-eight (68) subsurface data points on the bedrock elevation are available for the evaluation, as listed in Table 3-65, below.

Table 3-65. Top of Bedrock Elevations in Site Borings

Well	Drainage	Location	Boring Depth (ft)	Ground Elevation (ft MSL)	Depth to Bedrock (ft)	Bedrock Elevation (ft MSL)
12-D	Brush	Line 2	120.00	689.28	110	579.28
13-B	Brush	Road K	85.00	627.67	7.5	620.17
14-A	Spring	General	67.50	691.57	47.5	644.07
14-B	Brush/Spring	General	98.00	678.28	77.2	601.08
14-C	Long/Brush	General	77.10	684.35	56.0	628.35
14-D	Brush	General	43.60	676.81	22.5	654.31
14-E	Long	General	108.50	689.81	88.5	601.31
14-F	Skunk/Long	General	43.50	675.16	21.6	653.56
16-A	Brush	Line 3	110.00	694.35	109.5	584.85
DA-1	Skunk	Demolition Area	21.00	673.53	7.90	665.63
DA-2	Skunk	Demolition Area	25.00	678.29	11.80	666.49
EDA-2	Spring	Demolition Area	27.00	671.62	32.60	639.02
G-10	Skunk	Demolition Area	24.00	681.92	15.00	666.92
G-11	Skunk	Demolition Area	37.00	691.64	25.00	666.64
G-13	Skunk	Perimeter/SW	30.00	646.74	18.50	628.24
G-24	Brush	Perimeter/SE	17.00	600.11	6.00	594.11
G-30	Spring	West Burn Pad	17.00	652.01	4.40	647.61
G-40	Brush	Line 800	83.00	682.28	58.00	624.28
G-42	Brush	Line 800	77.00	683.14	49.00	634.14
G-44	Brush	Line 800	80.00	679.70	50.00	629.70
G-46	Brush	Line 800	68.00	678.42	41.00	637.42
G-50	Brush	Brush Creek	82.00		63.00	
G-52	Brush	Brush Creek	39.00	634.72	21.00	613.72
G-54	Brush	Brush Creek/K Road	65.00	611.64	45.00	566.64
JAW-1	Skunk	Demolition Area	20.00	674.45	10.00	664.45
JAW-2	Skunk	Demolition Area	27.00	682.75	18.00	664.75
JAW-4	Spring	Explosive Disposal Area	23.50	657.95	8.00	649.95
JAW-12	Spring	North Burn Pad	23.00	674.13	23.00	651.13
JAW-13	Spring	North Burn Pad	18.50	667.18	15.00	652.18
JAW-14	Spring	North Burn Pad	30.00	671.27	19.00	652.27
JAW-16	Long	Line 3A	58.00	710.98	53.50	657.48
JAW-18	Long	Line 3A	51.20	709.24	47.50	661.74
JAW-21	Long	Line 3A	58.2	711.88	56.0	655.88
JAW-23	Spring	West Burn Pad	10.50	654.19	6.00	648.19
JAW-24	Spring	West Burn Pad	11.00	640.61	8.00	632.61
JAW-27	Long	Inert Disposal Area	116.00	684.22	108.50	575.72
JAW-33	Long	Firing Site	34.00	682.22	30.50	651.72
JAW-35	Long	Firing Site	21.00	640.04	12.00	628.04
JAW-58	Spring	Fire Training Pit	34.00	685.93	31.00	654.93
JAW-59	Spring	Fire Training Pit	33.00	682.53	25.00	657.53
JAW-60	Spring	Fire Training Pit	34.00	681.46	25.80	655.66
JAW-76	Brush	South Boundary	78.50	600.00	5.50	595.33
JAW-78	Brush	Line 800	66.00	674.78	50.00	624.78
JAW-80	Spring	Fire Training Pit	26.00	672.69	17.00	655.69
JAW601	Brush	Line 1	68.50	678.72	54.50	624.22
JAW602	Brush	Line 1	98.00	711.21	87.50	623.71
JAW603	Brush	Line 1	98.00	714.79	80.50	634.29
JAW609	Brush/Long		112.50	720.06	93.00	627.06
JAW614	Spring	Explosive Disposal Area	37.00	673.49	22.50	650.99
JAW618			58.00	690.55	44.30	646.25
JAW619	Long	Firing Site	55.00	682.42	33.00	649.42
JAW627	Spring	North Burn Pad	39.50	680.62	30.00	650.62
PW-1			456.00	712	105.00	607.00
PW-2			91.00	699	85.00	614.00
PW-3			497.00	717	115.00	602.00
PW-4			1 198.50	726	137.00	589.00
T-6	Long	Inert Disposal Area	129.00	711.21	76.00	635.21

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Table 3-65. Top of Bedrock Elevations in Site Borings						
Well	Drainage	Location	Boring Depth (ft)	Ground Elevation (ft MSL)	Depth to Bedrock (ft)	Bedrock Elevation (ft MSL)
T-7	Long	Inert Disposal Area	130.00		85.00	
T-8	Long	Inert Disposal Area	128.00		95.00	
T-9	Long	Inert Disposal Area	137.00	703.67	117.00	586.67
T-12	Long	Flyash Landfill	121.00	723.06	97.00	626.06
T-15	Long	Flyash Landfill	107.00	717.61	87.10	630.50
T-18	Long	Flyash Landfill	115.00	715.57	88.00	627.57
T-21	Long	Flyash Landfill	121.00	714.71	99.00	615.71
T-24	Long	Flyash Landfill	125.00	713.69	102.50	611.19
T-27	Long	Flyash Landfill	140.00	713.52	116.00	597.52
T-30	Long	Flyash Landfill	149.00	713.91	125.50	588.41
T-33	Long	Flyash Landfill	139.00	713.64	119.00	594.64
T-36	Long	Flyash Landfill	160.00	712.52	136.50	576.02

Surface reconnaissance mapping also was performed to locate bedrock exposures. These data are basewide in nature, and discussion is provided in Section 4.1, including elevation contours on the top of bedrock surface.

3.15 Evaluation of Vertical Hydraulic Gradients

The direction and magnitude of vertical hydraulic gradients was evaluated by determining the ratio between measured piezometric depths and screen midpoint depths from paired wells. Data from Task 2 *(Groundwater Monitoring Well Inventory)* were reviewed to identify well pairs usable for this purpose in different parts of the plant. In all, 21 well pairs (or triplets) were determined to be useable for this purpose and were evaluated. These utilized both pre-existing and new wells and included wells installed in the upper and lower till zones and the bedrock. In general, a relatively large number of paired wells exists across the northern half of the IAAAP, including a series of closely spaced triple wells in Line 9 (T10 through T33). There are fewer well pairs available in the south, although the availability of data is generally sufficient for the objectives of the evaluation.

Results of this evaluation are summarized in Table 3-66, below. As defined for this evaluation, positive ("+") values represent downward hydraulic gradients.

Table 3-66. Vertical Hydraulic Gradients Estimated from Paired Wells			
Location	From Well:	To Well:	Vertical Gradient ft/ft)
Line 9	T10 (Upper till)	T11 (Lower till)	+0.881
Line 9	T11 (Till)	T12 (Bedrock)	+0.224
Line 9	T13 (Upper till)	T14 (Lower till)	+0.566
Line 9	T14 (Till)	T15 (Bedrock)	+0.676
Line 9	T16 (Upper till)	T17 (Lower till)	+0.401
Line 9	T17 (Till)	T18 (Bedrock)	+0.373
Line 9	T19 (Upper till)	T20 (Lower till)	+0.249
Line 9	T20 (Till)	T21 (Bedrock)	+0.361
Line 9	T22 (Upper till)	T23 (Lower till)	+0.311
Line 9	T23 (Till)	T24 (Bedrock)	+0.299
Line 9	T25 (Upper till)	T26 (Lower till)	+0.318
Line 9	T26 (Till)	T27 (Bedrock)	+0.471
Line 9	T28 (Upper till)	T29 (Lower till)	+1.006
Line 9	T29 (Till)	T30 (Bedrock)	+0.046
Line 9	T31 (Upper till)	T32 (Lower till)	+0.400
Line 9	T32 (Till)	T33 (Bedrock)	+0.245
Brush Creek	G53 (Till)	G52 (Bedrock)	-0.346
Brush Creek	G55 (Till)	G54 (Bedrock)	-0.054
Line 2	12B (Upper till)	12C (Lower till)	+0.422

Table 3-66. Vertical Hydraulic Gradients Estimated from Paired Wells

Location	*From Well:*	*To Well:*	*Vertical Gradient ft/ft)*
Line 2	*12C (Upper till)*	*12D (Bedrock)*	*+0.356*
Line 2	*13E (Till)*	*13D (Bedrock)*	*+0.176*
Line 800, East side	*G45 (Till)*	*G44 (Bedrock)*	*+0.298*
Line 800, West side	*G41 (Till)*	*G40 (Bedrock)*	*+0.378*
Firing Site	*JAW34 (Till)*	*JAW619 (Bedrock)*	*+0.606*
Line 5A	*JAW606 (Till)*	*JAW609 (Bedrock)*	*+0.543*
Firing Site	*JAW34 (Till)*	*JAW33 (Bedrock)*	*-0.34*
Firing Site	*JAW33 (Upper Bedrock)*	*JAW619 (Deeper edrock)*	*+1.158*
Firing Site	*JAW32 (Till)*	*JAW618 (Bedrock)*	*+0.810*
Line 3A	*JAW17 (Till)*	*JAW18 (Bedrock)*	*+0.072*
Fuel Station	*DM1 (Upper till)*	*DM2 (Lower till)*	*-0.058*

Note: "+" values indicate downward hydraulic gradient.

In almost all cases, vertical hydraulic gradients are indicated to be positive (e.g. downward) through the glacial tills and between the till and the bedrock. This indicates recharge of the till aquifer by infiltration of precipitation and downward movement of groundwater through the aquifer, ultimately recharging the bedrock. The magnitude of the downward vertical gradient varies widely, as would be expected given the geologic and topographic variability of the IAAAP. Values typically ranged from less than 0.1 ft/ft to as much as 1.46 ft/ft.

Negative (e.g. upward) vertical gradients were found for well pairs G52/53 and G54/55, located along Brush Creek. The upward gradient in these wells is due to their close proximity to the creek and reflects groundwater flow from the aquifer to the Creek. This finding supports mini-piezometer and other data collected in this program, which show the creek to be gaining. The small negative (upward) gradient between well DM1 in the upper till and DM2 in the lower till cannot be so readily explained and may reflect well conditions, which are not well known.

An upward gradient of 0.34 ft/ft also was identified between JAW34 and JAW33, at the Firing Site in the southwest part of the plant. These wells are screened in the till and upper bedrock zones, respectively. However, a downward gradient is indicated between JAW33 and JAW619, screened slightly deeper in the bedrock. There are insufficient wells in this area to determine whether the upward gradient between JAW 34 and 33 is a general condition in this part of the site. If so, it would result from proximity to the Skunk River valley and the shallow bedrock in this area and would reflect complex flow patterns at the boundary of the till aquifer. This condition may be present across the south perimeter of the site, nearest to the Skunk River, but has little impact on overall groundwater flow, since the data indicate recharge to the Skunk River in any event.

Wells G24 and JAW76, near Brush Creek at the south boundary of the IAAAP also represented an unusual condition in which the shallow well, G24, was screened in the bedrock while the deeper well, JAW76, was screened in till. The gradient was identified as downward and would infer that the bedrock was recharging till. However, these wells are not in close enough proximity to be considered "paired" and appear affected by variable bedrock surface and proximity to both Brush Creek and the Skunk River valley.

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3.16 Additional Groundwater Data, Line 3

Five new monitoring wells were installed at Line 3 in this task. Locations are shown on Figure 3-25 and well data are summarized in Table 3-6. Boring logs and well construction sketches are provided in Appendices A and C, respectively.

Table 3-67. Monitoring Well Data, Task 16, Line 3

Number	Coordinates		Elevation		Drilled Depth (ft)	Screen Depth		Aquifer Zone
	North	East	Ground	TOC		Top	Bottom	
16A	299600.9	2267990.9	694.35	696.30	110.0	99.4	109.4	Bedrock
16B	300701.1	2268410.4	699.15	701.10	25.2	15.1	25.1	Upper Till
16C	300002.3	2268670.8	695.66	697.69	25.6	15.6	25.6	Upper Till
16D	298983.3	2268246.0	695.77	697.66	25.1	15.0	25.0	Upper Till
16E	298986.4	2268235.6	695.69	697.55	55.0	45.0	55.0	Lower Till

TOC = Top of Casing

3.16.1 Geology

Monitoring wells installed in Line 3 are shown on Figure 3-25 and subsurface conditions are illustrated by generalized hydrogeologic cross-sections A and B on Figures 3-26 and 3-27. In general, soils encountered in Line 3 consist of silty clay and clayey silt similar to Line 2. However, boring logs suggest a somewhat greater proportion of silt and sand. A generalized sequence includes silty clay from the surface to depths of 10 or 15 feet, underlain by an intermediate unit of interbedded silt, silty clay, and clay/silt admixtures with sand seams. This unit extends to depths of between 25 and 55 feet, thickening to the south. Soils underlying the intermediate unit consist of silty clay till with sparse, thin sand seams extending to bedrock. Limestone bedrock was encountered at a depth of 109.5 feet in 16A. Four gradation tests were obtained on samples from the new wells. Results are shown in Table 3-68 and indicated clayey sand and sandy clay with 35% to 60% passing the #200 sieve.

Table 3-68. Results of Gradation Testing, Downstream Reach of Brush Creek

Well No.	Depth (ft)	Classification	% Gravel	% Sand	% Silt	% Clay
13A	108.5-109	Clayey Sand w/Gravel	32.5	32.8	22.2	12.5
13B	22-22.5	Sandy Clay	2.4	43.7	30.5	23.4
13C	23.5-24	Sandy Clay	1.3	48.3	30.6	19.8
13D	17-17.2	Sandy Clay	5.8	33.4	38.4	22.4
13E	52-52.5	Sandy Clay	2.7	33.8	35.6	27.9

Note: Test reports provided in Appendix B.

3.16.2 Hydrogeology

During drilling, groundwater was encountered intermittently in the form of moist, soft zones in the intermediate and upper clayey till sequences and sporadic, thin saturated sand seams. However, no water bearing units of significant thickness were encountered in the predominantly clayey and silty soils.

Potentiometric elevations and contours in Line 3 are shown on Figure 3-28. Potentiometric levels ranged from elevation 678.88 in deep well 16A to 698.47 in shallow well JAW57. Potentiometric levels measured in shallow (e.g. <25 feet deep) wells were between 3.7 and 5 feet of the ground surface. Groundwater flow in this upper zone is southeasterly, obliquely downstream toward Brush Creek, as illustrated by generalized contours on Figure 3-28. However, lateral hydraulic gradients are small, between 0.0038 ft/ft and 0.0075 ft/ft. The flow toward Brush Creek indicates that groundwater recharges the creek at Line 3. As elsewhere, downward vertical hydraulic gradients exist of approximately 0.26 ft/ft between paired wells

16D and 16E, and 0.05 ft/ft between 16E and well 16A, screened in the lower till just above bedrock. Thus, the potentiometric contours on Figure 3-29 should be used with caution, since measured levels are effected by screen depth. Hydraulic conductivity values estimated from field permeability tests at Line 3 are summarized in Table 3-69.

Table 3-69. Field Permeability Test Results, Line 3 (Task 16)

Well Number	*Estimated Hydraulic Conductivity*
16A	*Recovery too rapid for analysis.*
16B	*6.46 x 10-7 cm/sec (0.00183 ft/day)*
16C	*2.42 x 10-5 cm/sec (0.0685 ft/day)*
16D	*2.42 x 10-2 cm/sec (68.57 ft/day)*
16E	*1.33 x 10-6 cm/sec (0.0038 ft/day)*

Due to rapid recovery, test data for well 16A could not be evaluated. This probably reflects both a 2 - 3 foot sand seam in the screened interval, but more likely the limestone bedrock immediately below. Data from wells 16B, 16C, and 16E, screened in silty clay tills average 0.03 ft/day, consistent with the low permeability soils. All of these wells could be manually bailed dry during development and these values appear to be representative of the tills underlying Line 3. The value of 68.57 ft/day from well 16D appears anomalously high for these soils and is inconsistent with well development, during which the well could be bailed dry. This test result is questionable and was not used.

Based on average lateral hydraulic gradients scaled from the potentiometric contours (taken as 0.0057 ft/ft), and average values of hydraulic conductivity from the slug tests in the shallow monitoring wells (taken as 0.025 ft/day), average horizontal groundwater flow velocities were estimated using Darcy's Law in the form: v = ki/n; where "v" is flow velocity, "I" is gradient, and "n" is effective porosity (assumed at 30% from published values). Average flow velocities thus are indicated to be in the order of 4.75×10^{-5} ft/day (about 0.02 ft/year), suggesting further that groundwater movement at this site is very slow.

3.16.3 Groundwater Sampling

Groundwater samples collected in Line 3 included five (5) new monitoring wells (16A, B, C, D, and E) and three (3) existing wells (JAW-53, 54, and 55). Results of analyses are summarized below and are illustrated and discussed further in Section 5.0, Nature and Extent of Contamination. Full tabulations are provided in Appendix J. Detections of VOCs, SVOCs, and explosives are summarized in Table 3-70.

Table 3-70. Organic Chemicals Detected in Groundwater, Line 3 (Task 16)

Well No.	*Volatile Organics (ug/L)*	*Semi-Volatile Organics (ug/L)*	*Explosives (ug/L)*
16A	*Methylene Chloride (6.7 B)*	*Butylbenzylphthalate (3.3 J)* *Bis(2-ethylhexyl)phthalate (10.9)*	*Nitrotoluene (2.9)* *Nitrobenzene (4)* *Tetryl (2.1)*
16B	*None*	*None*	*None*
16C	*None*	*None*	*None*
16D	*None*	*None*	*None*
16E	*Methylene Chloride (0.58 JB)*	*None*	*None*
JAW53	*Methylene Chloride (7.4)*	*Bis(2-ethylhexyl)phthalate (5.2J)*	*None*
JAW54	*Methylene Chloride (8.1)* *Chloroform (1.9)*	*None*	*RDX (1,500)* *HMX (210)* *2,4-Dinitrotoluene (10)* *4-Amino-2,6-dinitrotoluene (26 J)* *2-Amino-4,6-dinitrotoluene (87)*

Table 3-70. Organic Chemicals Detected in Groundwater, Line 3 (Task 16)			
Well No.	***Volatile Organics (ug/L)***	***Semi-Volatile Organics (ug/L)***	***Explosives (ug/L)***
JAW55	*Methylene Chloride (0.41 J)*	*Bis(2-ethylhexyl)phthalate (6.4J)*	*RDX (0.87 J)* *HMX (3.9)*

J = Estimated concentration below the reporting limit. B = Found in the blank and the sample

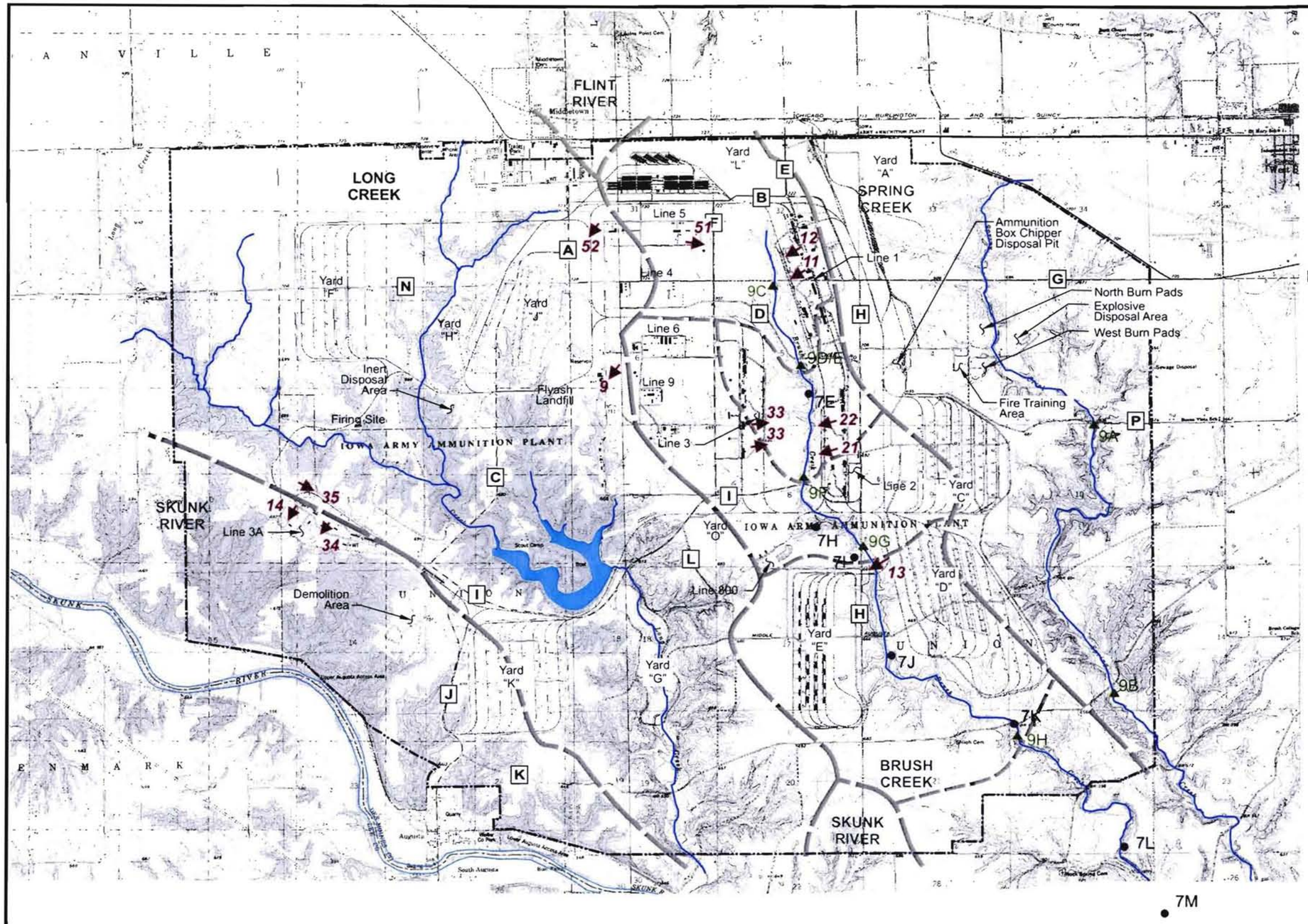
Analytical results are plotted on the cross-sections on Figures 3-26 and 3-27. Explosives were detected in samples from 16A, JAW54, and JAW55. RDX was present in JAW54 at 1,500 ug/L with several other compounds detected.

RCRA metals analyses (dissolved) are summarized in Table 3-71 and tabulated in Appendix J.

Table 3-71. Selected Metals Detected in Groundwater (mg/L), Task 12, Line 2								
Parameter	***16A***	***16B***	***16C***	***16D***	***16E***	***JAW53***	***JAW54***	***JAW55***
Arsenic	*ND*	*0.00059*	*ND*	*ND*	*ND*	*0.00055*	*ND*	*0.00065*
Barium	*0.36*	*0.12*	*0.14*	*0.087*	*0.26*	*0.1*	*0.091*	*0.1*
Cadmium	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
Chromium	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
Lead	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
Mercury	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
Selenium	*ND*	*0.0013*	*ND*	*0.00062*	*ND*	*ND*	*0.0011*	*ND*
Silver	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*

ND = Not Detected

FIGURES



LEGEND:

- A — ROAD NAME
- PLANT PROPERTY BOUNDARY
- DRAINAGE BASIN BOUNDARY
- APPROXIMATE DRAINAGE SUB-BASIN BOUNDARY
- 13 → APPROXIMATE NPDES OUTFALL LOCATION
- 9G ▲ FLOW MONITORING LOCATION
- 7H ● BRUSH CREEK SURFACE WATER SAMPLING LOCATION

Scale 0 2000 4000 6000 8000 Feet

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Figure 3-1
LOCATION OF NPDES DISCHARGE OUTFALLS
SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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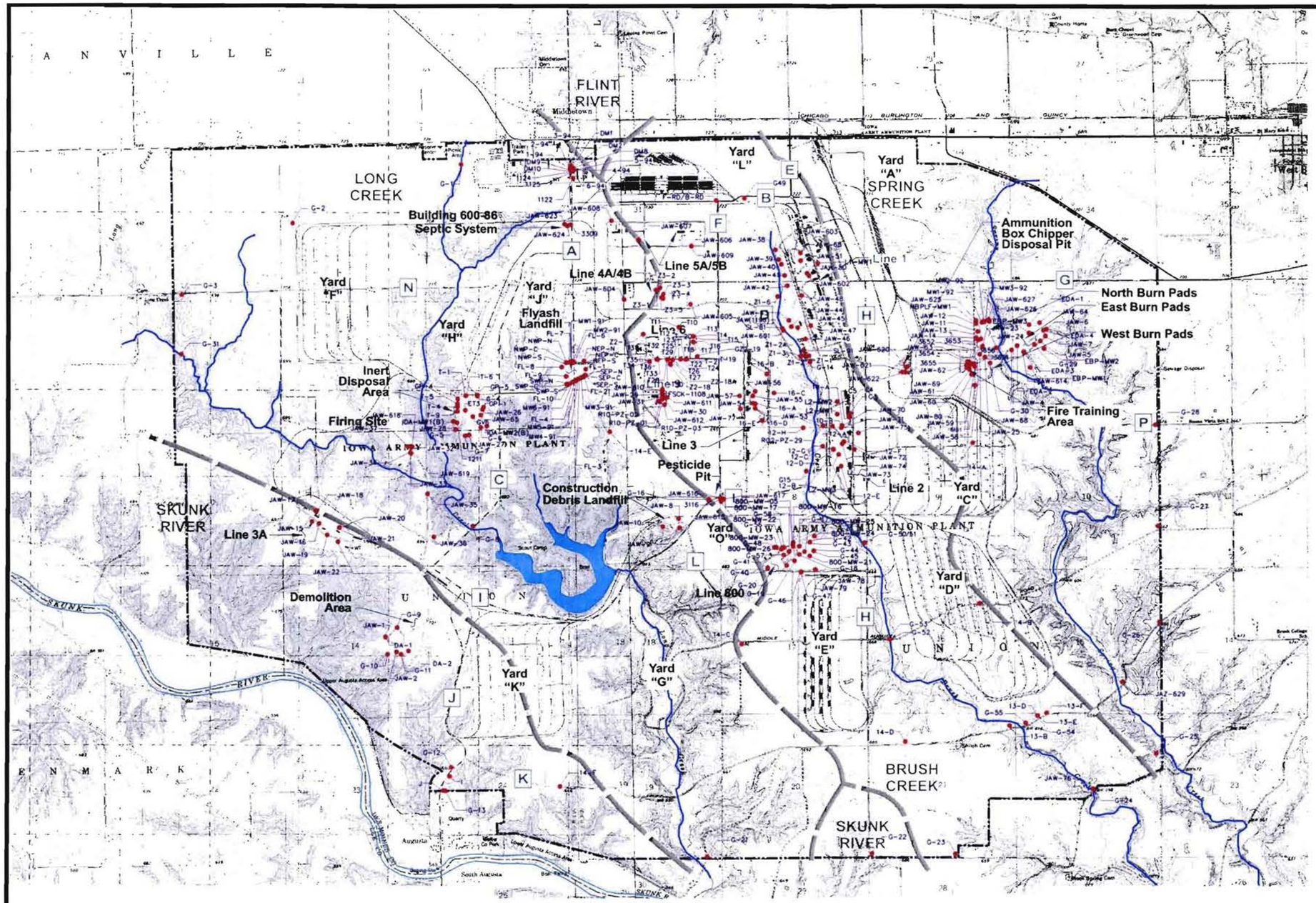

N

LEGEND:

- Monitoring Well / Piezometer
- Road Name
- Plant Property Boundary
- Drainage Basin Boundary

Scale 0 2000 4000 6000 8000 Feet

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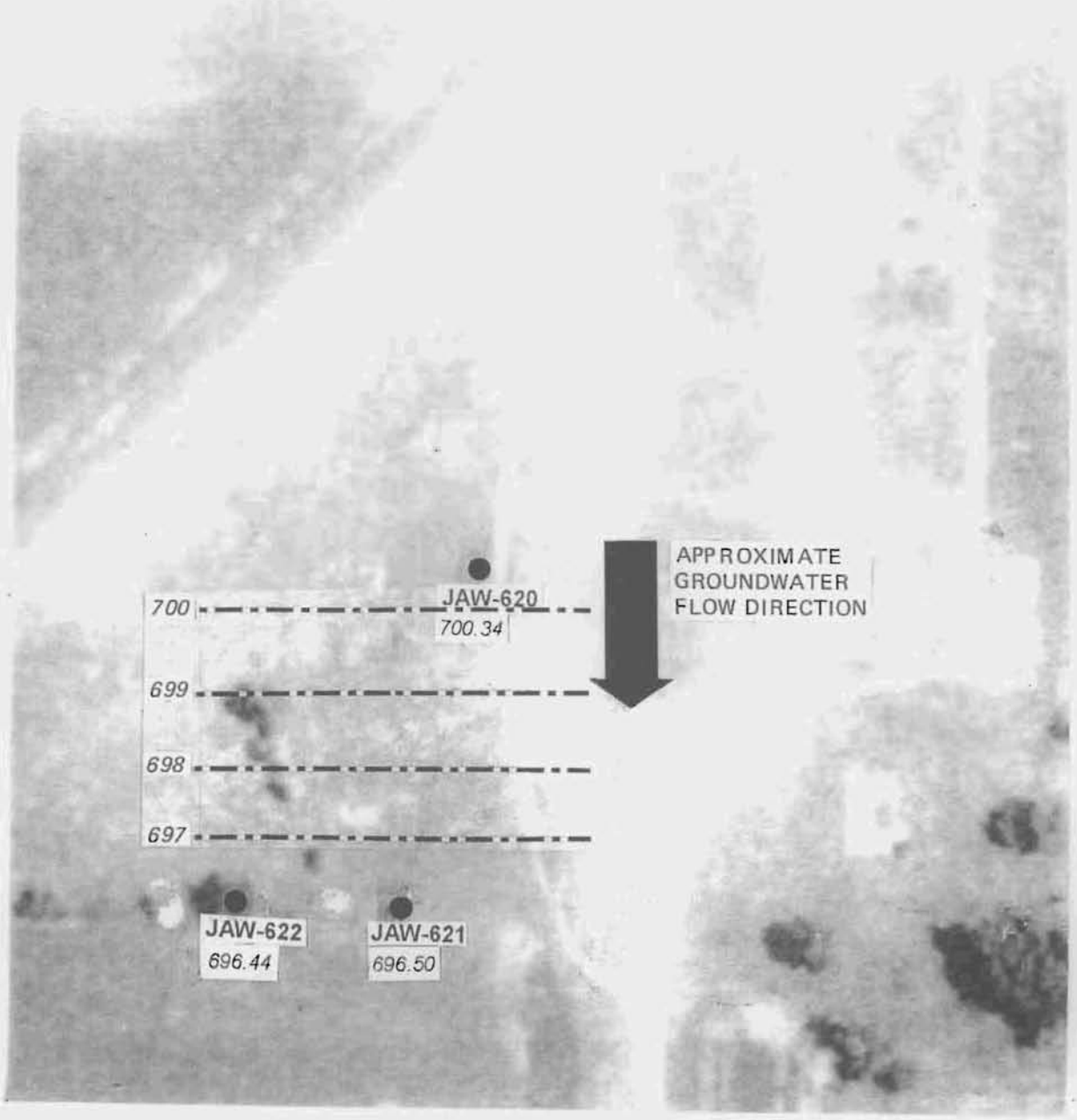
Figure 3-2
BASELINE MONITORING WELLS LOCATION MAP
SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

O:/iowa/supp groundwater rifig3-2.cdr



LEGEND:

- Hydropunch /Temporary Well Location
- Existing Monitoring Well
- 700.34 — Measured Groundwater Elevations (May 8, 1997)
- Approximate Potentiometric Contour

SOURCE: USDA Aerial Photograph 1978

Scale 0 — 120 Feet
Approximate Scale

Figure 3-3

AERIAL PHOTO AND GROUNDWATER FLOW, AMMUNITION BOX CHIPPER DISPOSAL AREA (TASK 6)

SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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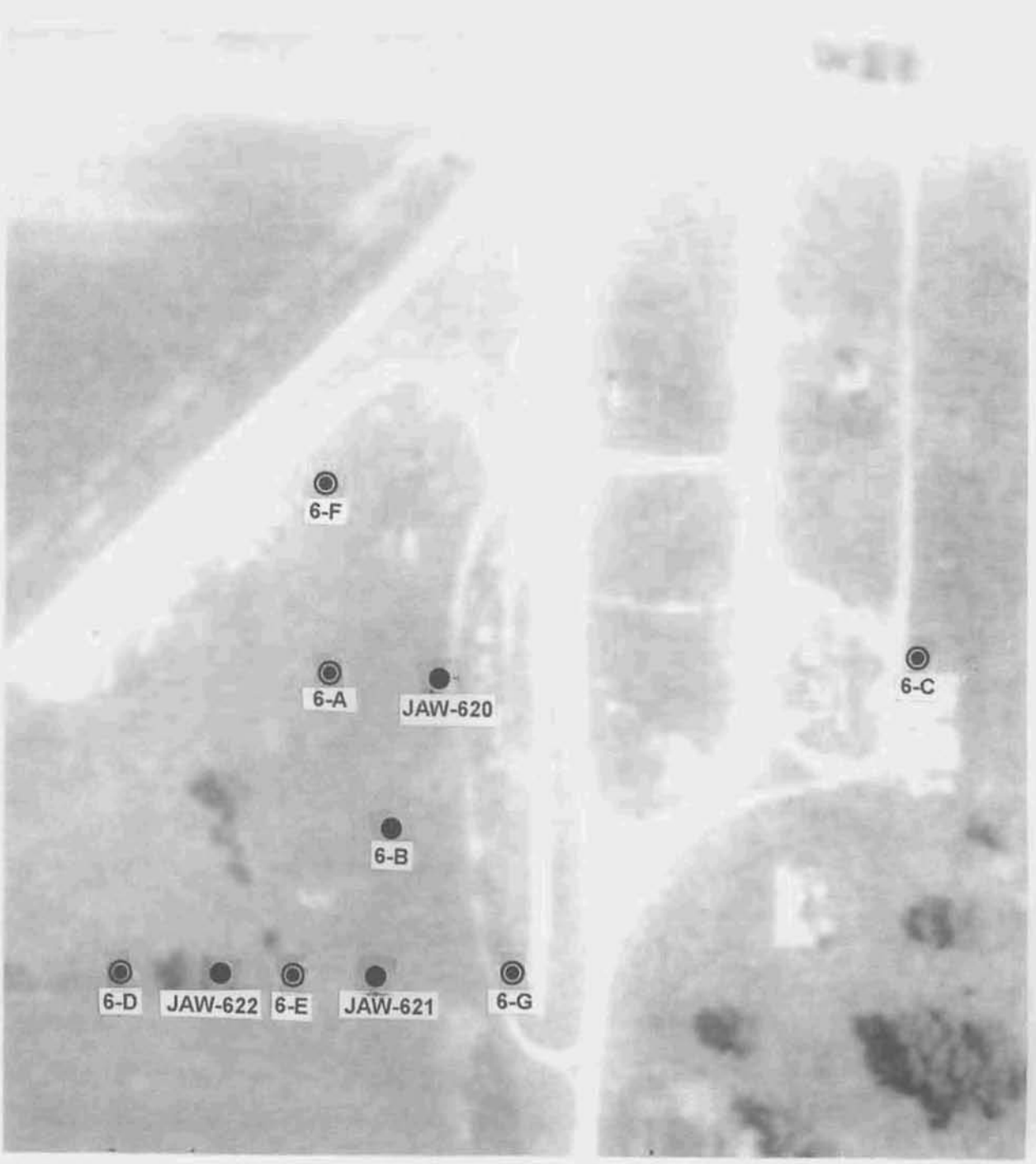

LEGEND:

- Hydropunch /Temporary Well Location
- Existing Well Location

Scale 0 120 Feet
Approximate Scale

SOURCE: USDA Aerial Photograph 1978

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Figure 3-4
SAMPLE LOCATION MAP
AMMUNITION BOX CHIPPER
DISPOSAL AREA (TASK 6)
SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

G:\5644\fig-11p.cdr

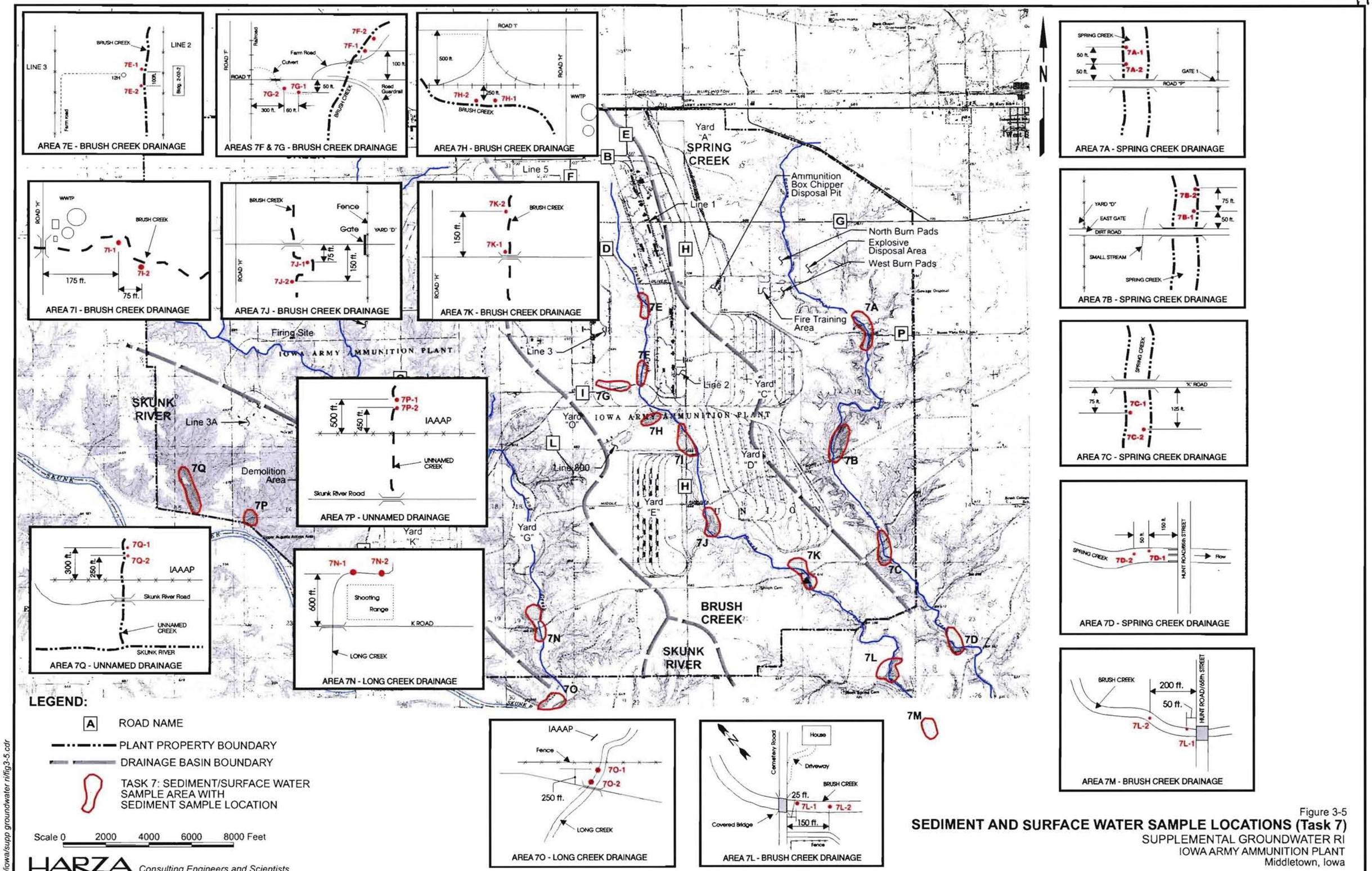
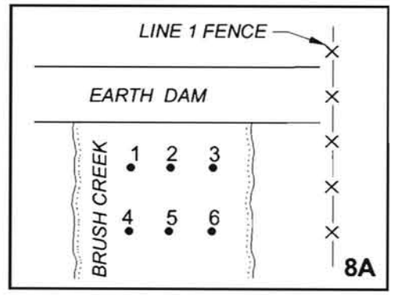


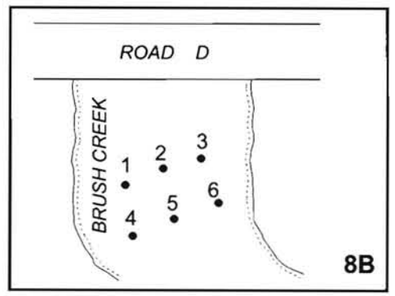
Figure 3-5

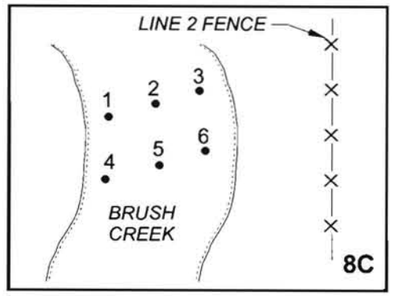
SEDIMENT AND SURFACE WATER SAMPLE LOCATIONS (Task 7)

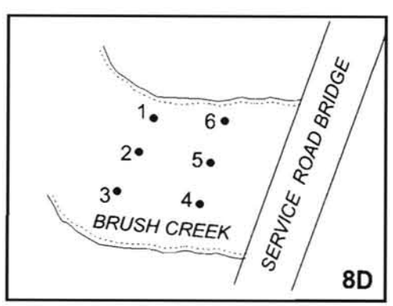
SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

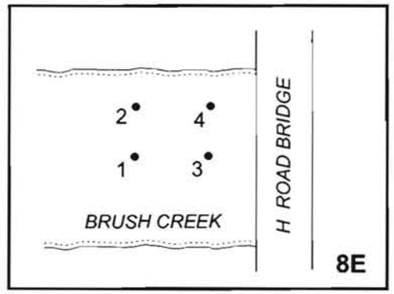
O:/iowa/supp groundwater ri/fig3-5.cdr

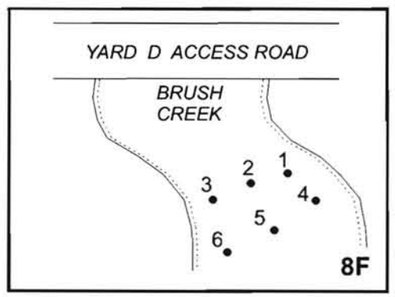


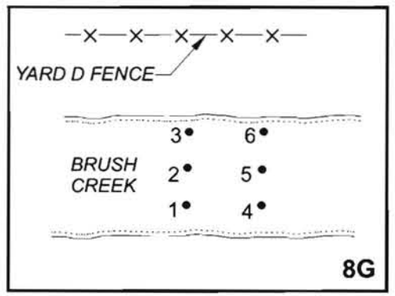


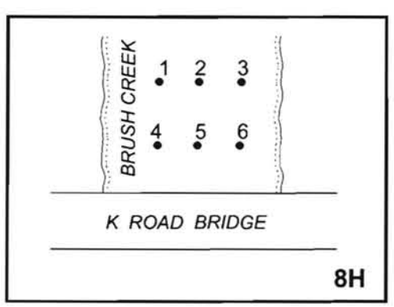




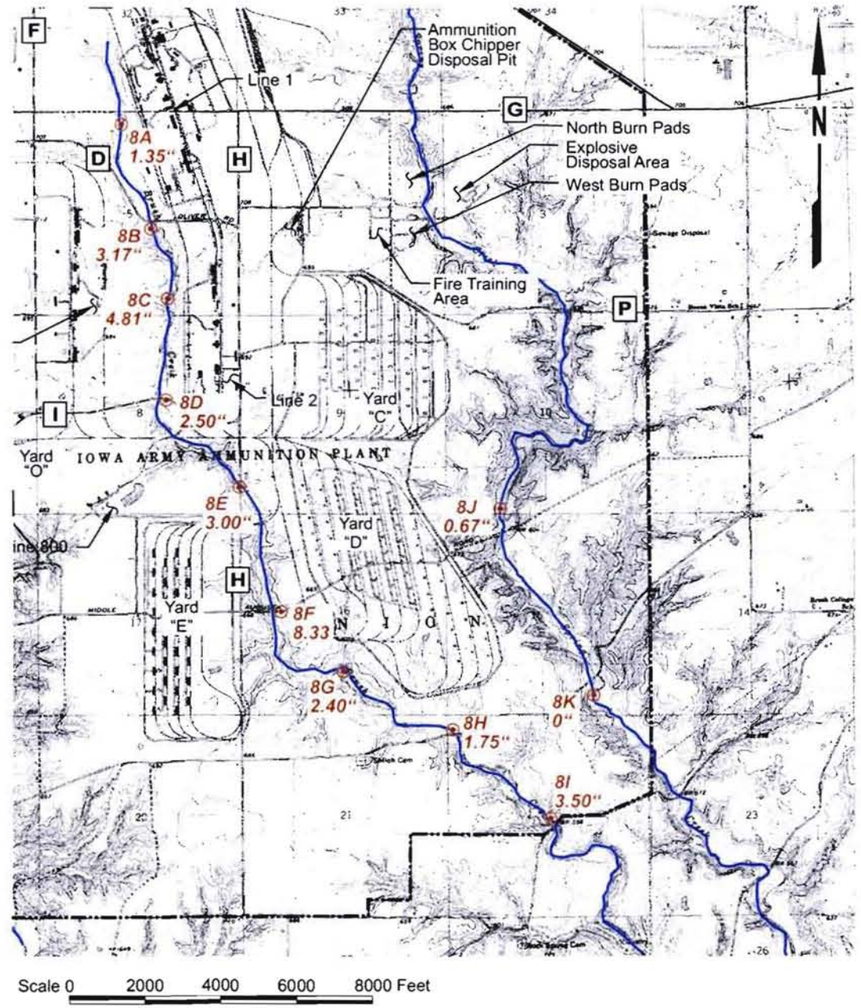


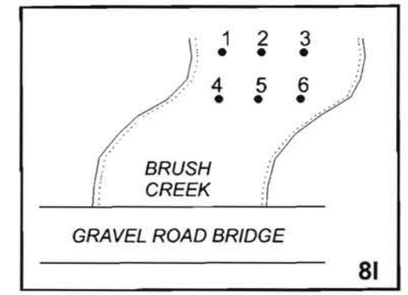


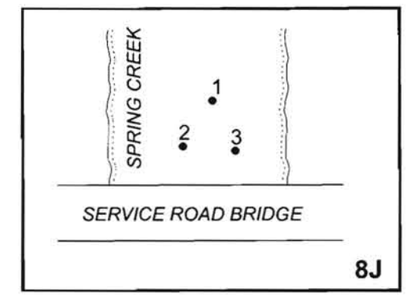


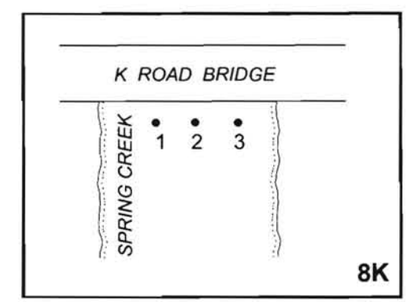


NOTE: Readings are the average of all readable piezometers at each location.









LEGEND:

- Piezometer Location
- 3.50" Mini-Piezometer Reading
- P Road Name
- Plant Property Boundary

Figure 3-6

MINI-PIEZOMETER LOCATIONS AND READINGS (TASK 8)

SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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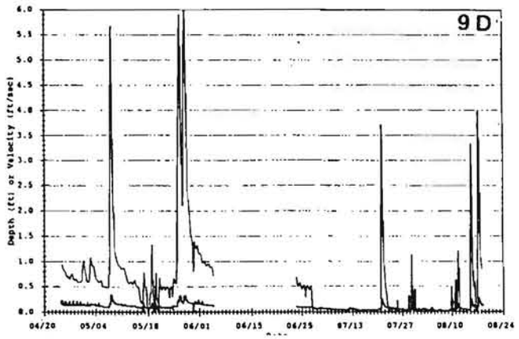

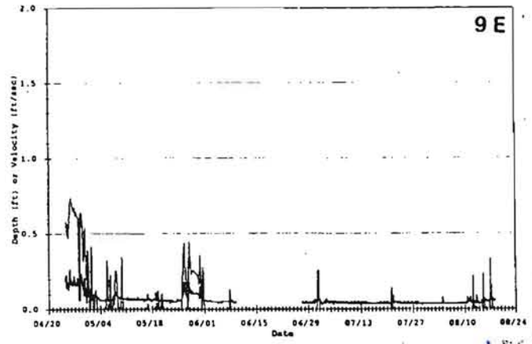

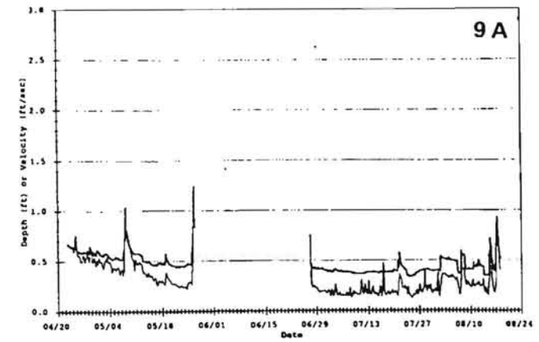

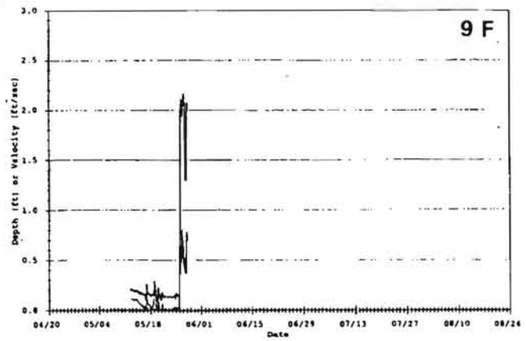

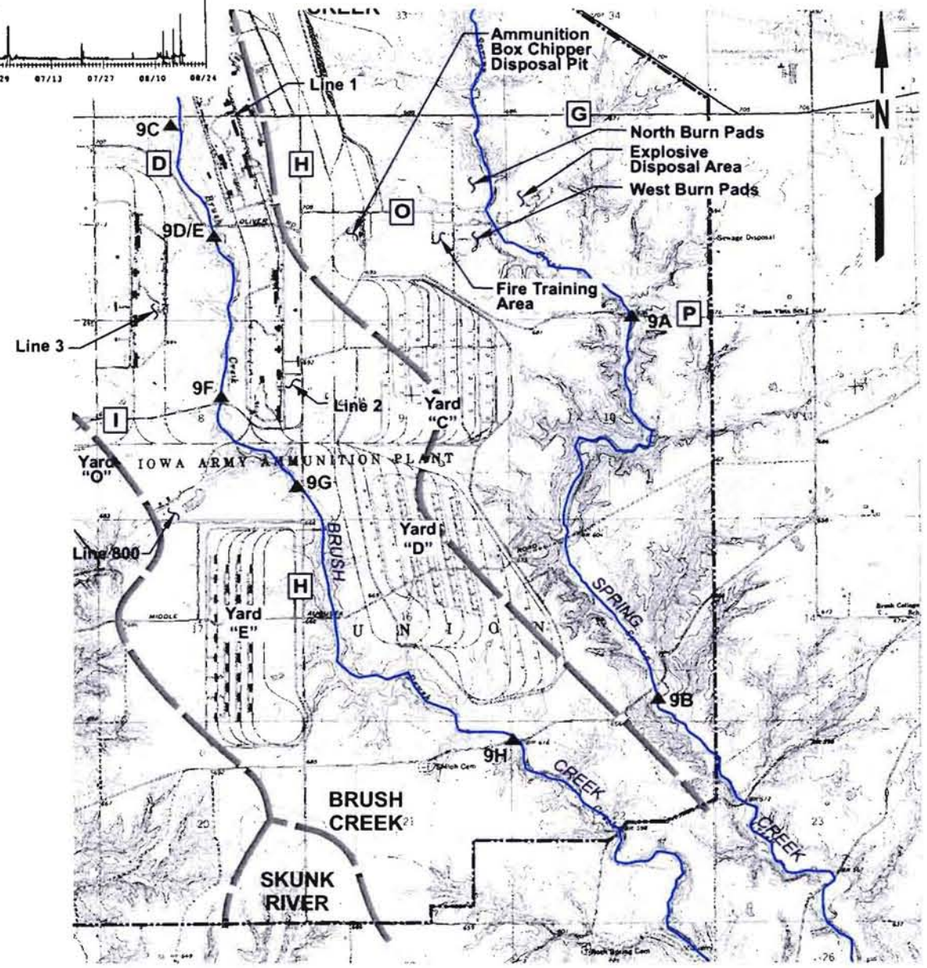

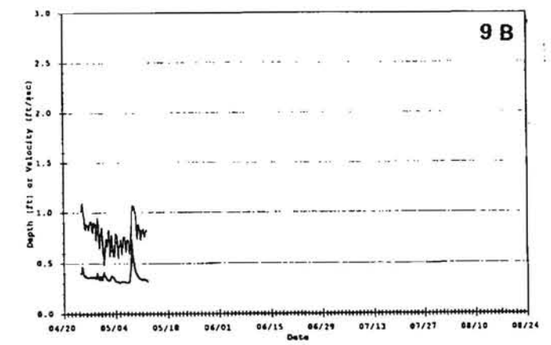

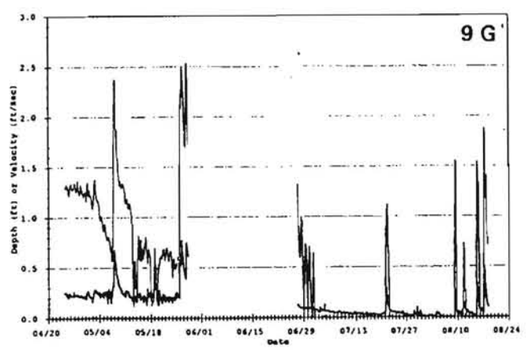

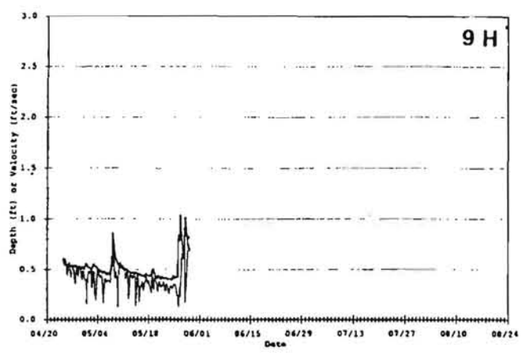

LEGEND:

- 9B ▲ METER LOCATION
- PLANT PROPERTY BOUNDARY
- DRAINAGE BOUNDARY
- A ROAD NAME

Figure 3-7
STREAM FLOW METER LOCATIONS AND FLOW DATA
SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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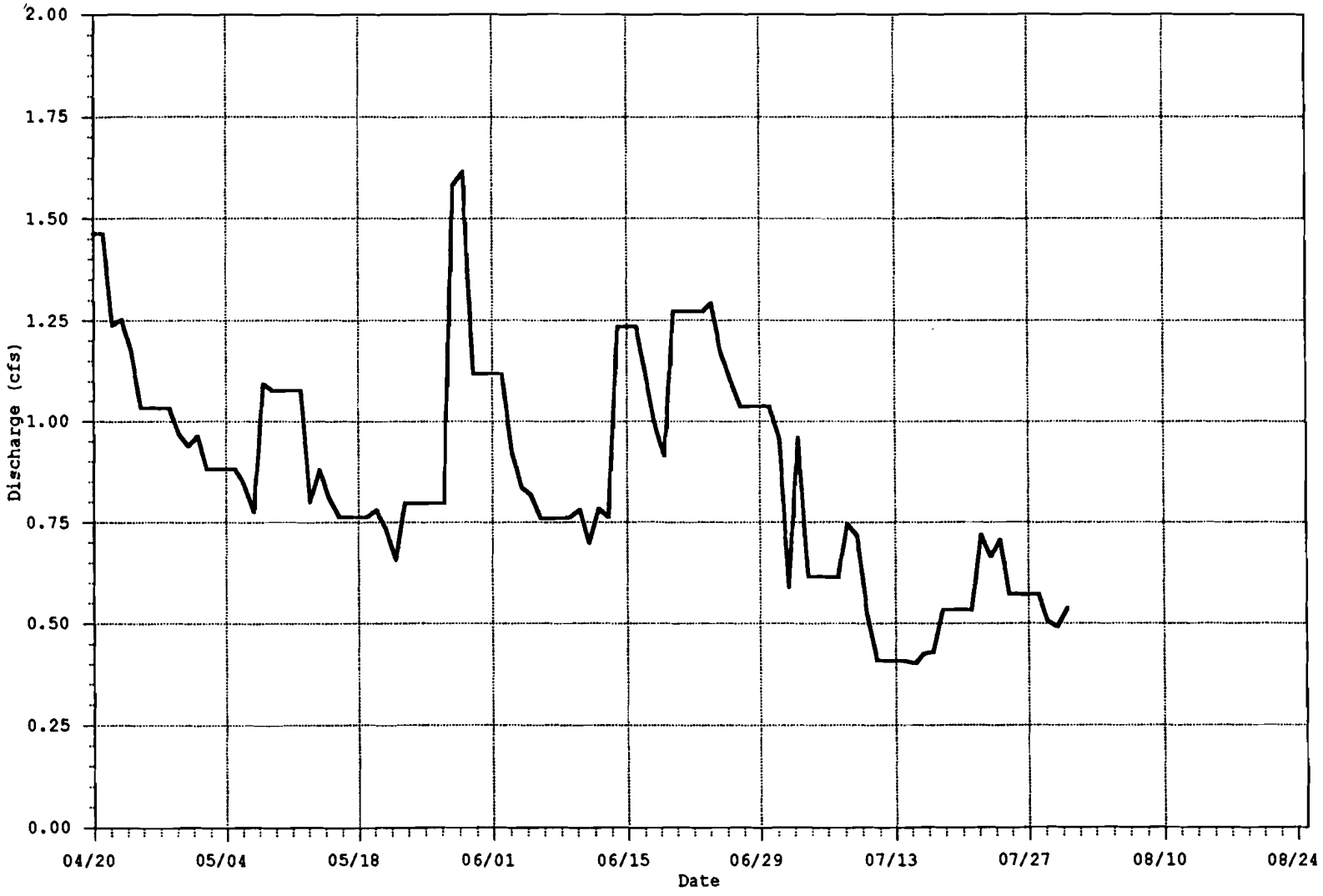

Figure 3-8

NPDES FLOWS AT THE WASTEWATER TREATMENT PLANT

SUPPLEMENTAL GROUNDWATER RI

IOWA ARMY AMMUNITION PLANT

Middletown, Iowa

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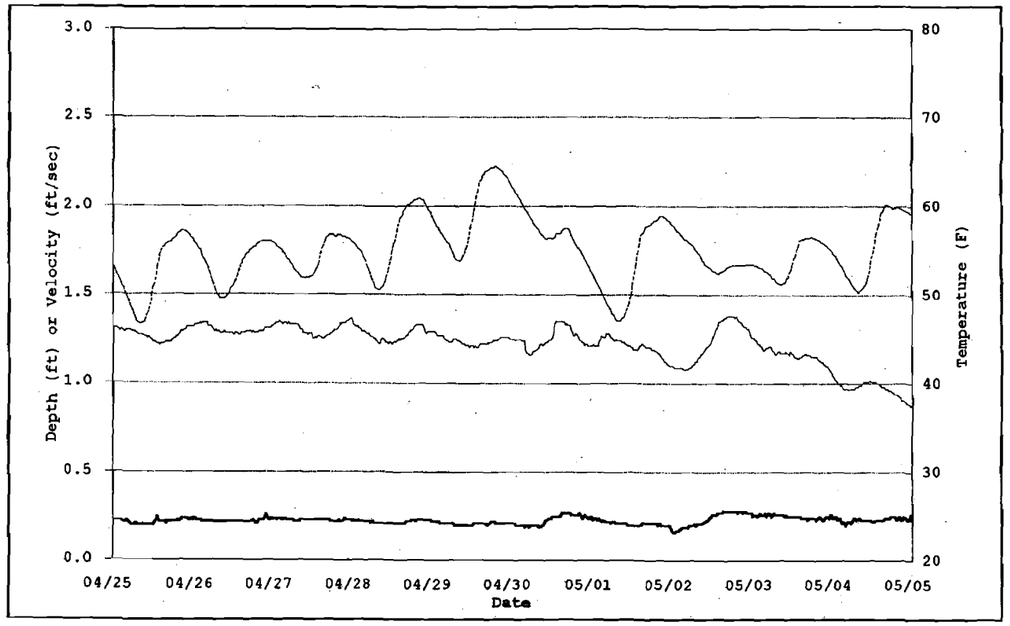
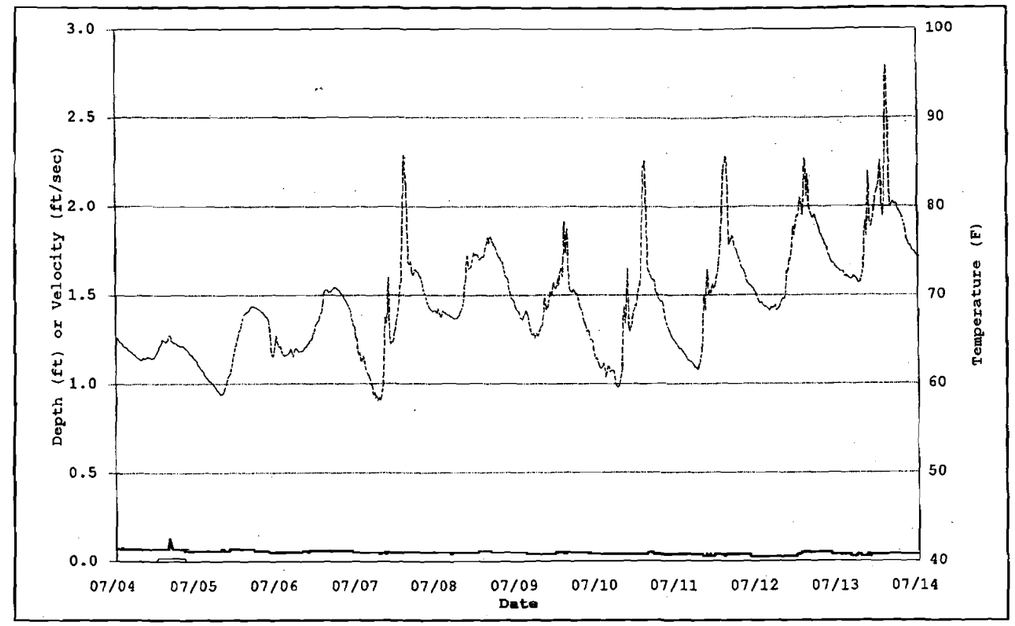
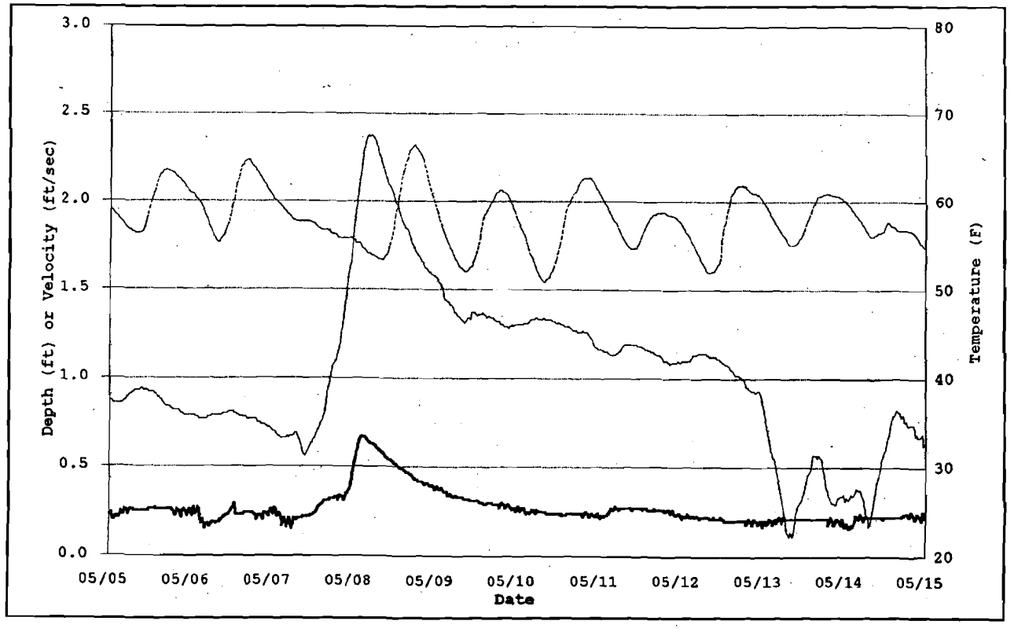


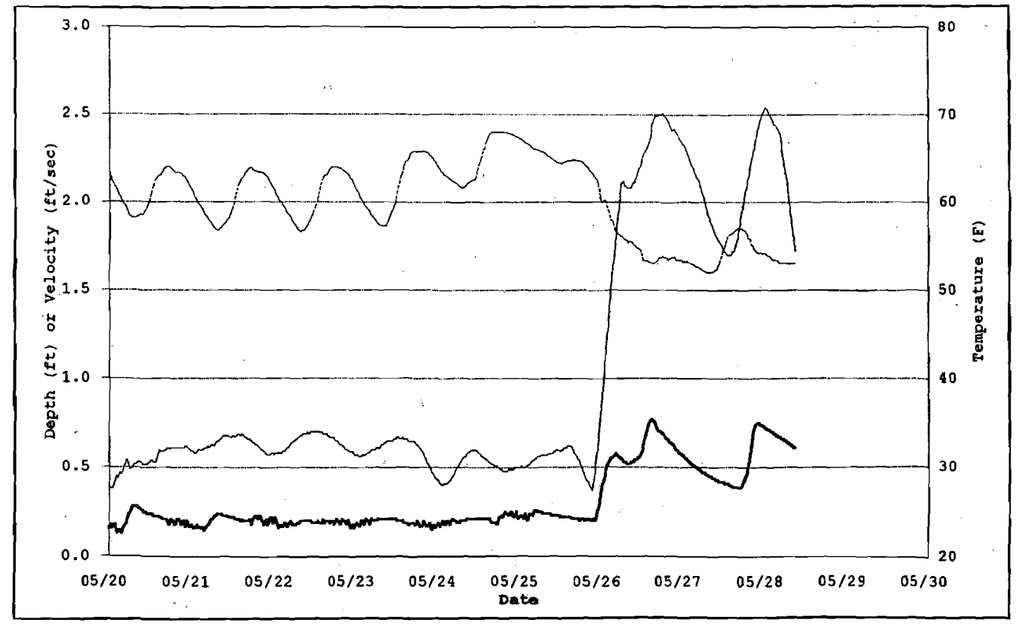
A. MAY LOW FLOW



B. JULY LOW FLOW



C. RAINFALL EVENT - MAY 5 TO MAY 15



D. RAINFALL EVENT - MAY 20 TO MAY 30

LEGEND:

- Temperature
- Flow Depth
- Flow Velocity

Figure 3-9

STREAM FLOW METER 9G

LOW FLOW AND RAINFALL EVENT DATA

SUPPLEMENTAL GROUNDWATER RI

IOWA ARMY AMMUNITION PLANT

Middletown, Iowa

HARZA *Consulting Engineers and Scientists*

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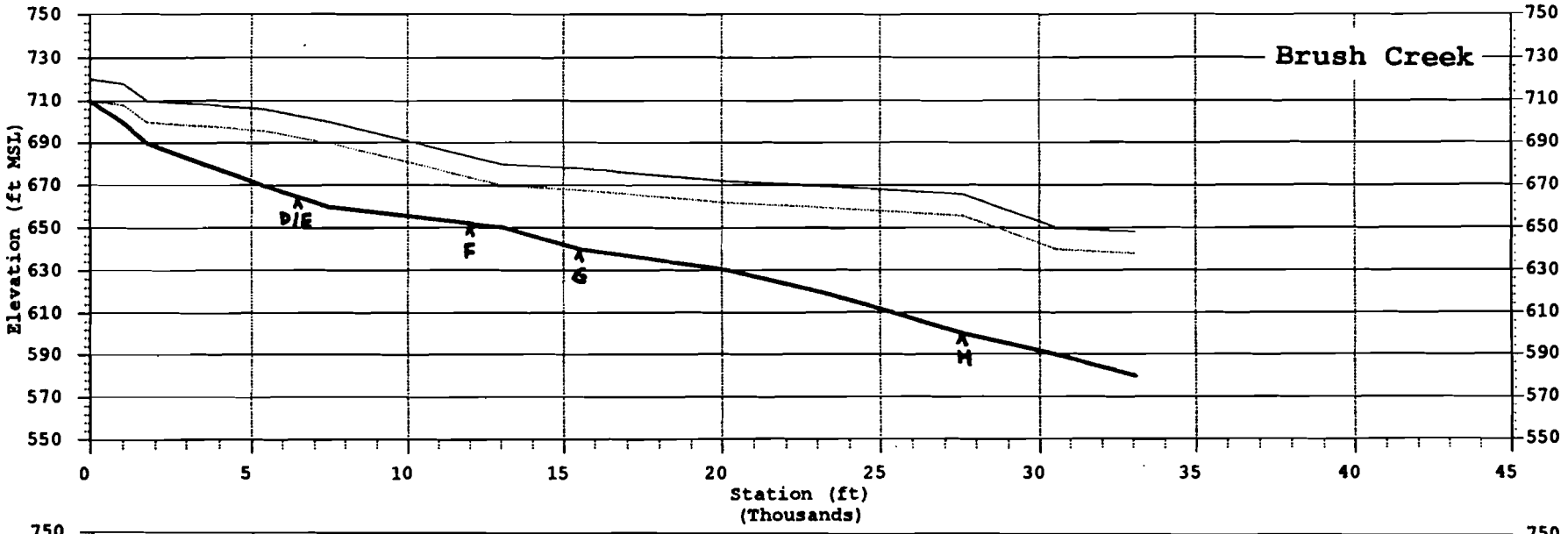

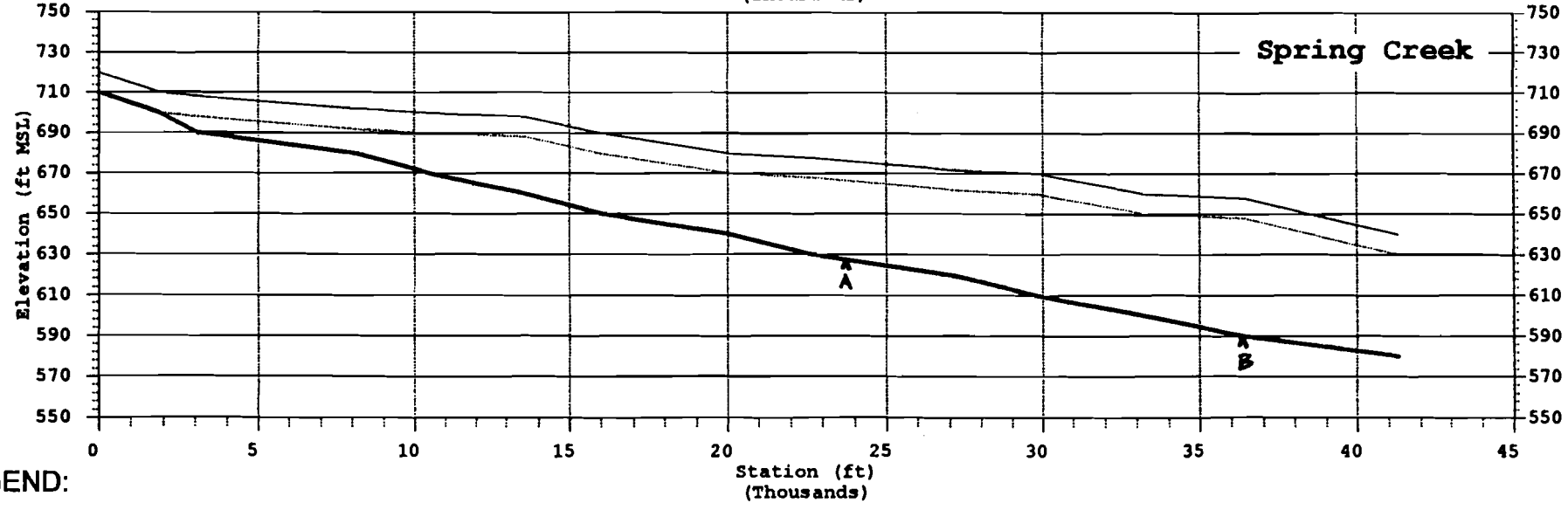

LEGEND:

- Local Plateau Ground Surface
- Hypothetical Groundwater Table
- Stream Bottom

Figure 3-10

BRUSH CREEK STREAM PROFILE

SUPPLEMENTAL GROUNDWATER RI

IOWA ARMY AMMUNITION PLANT

Middletown, Iowa

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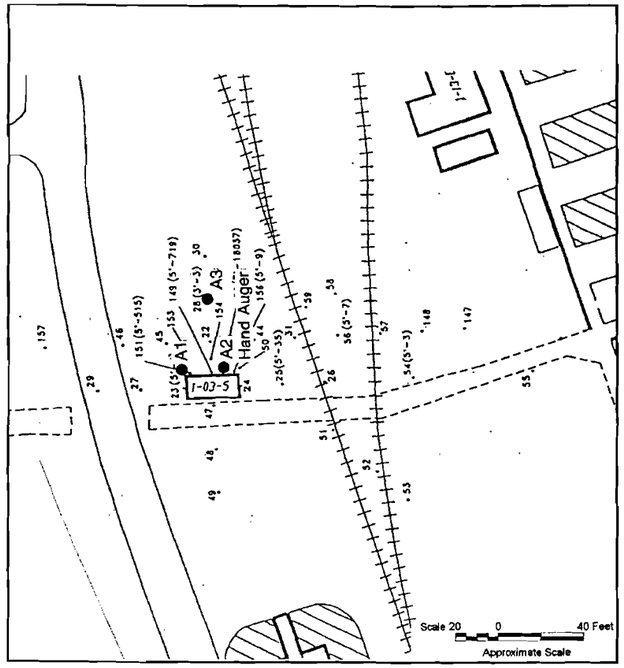
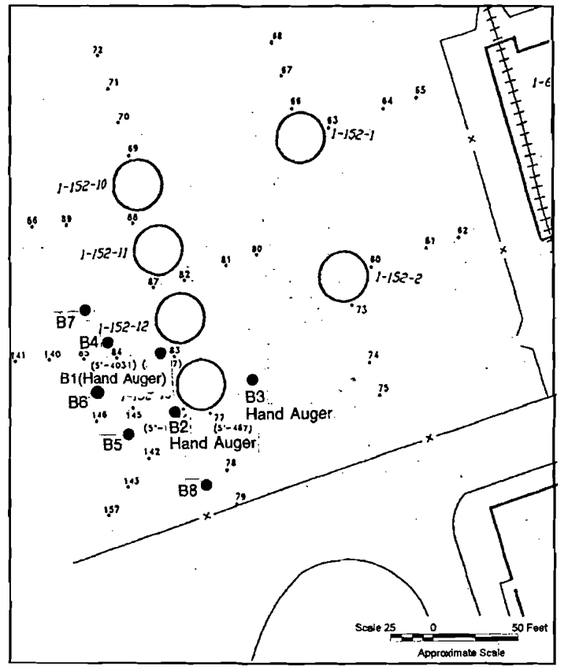
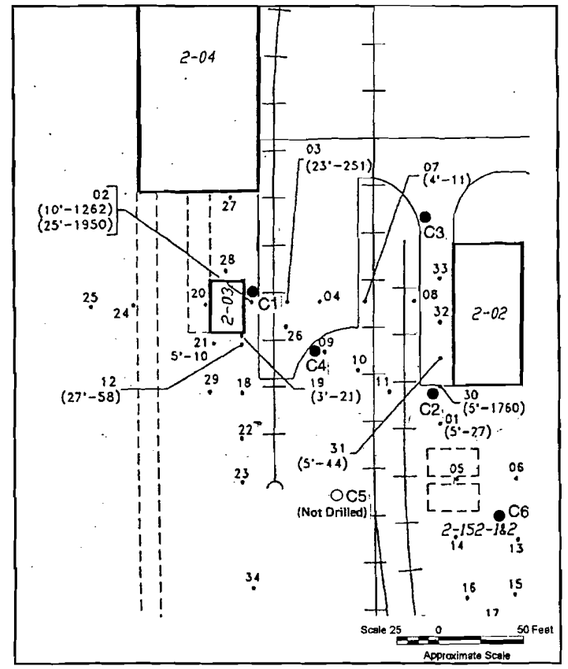


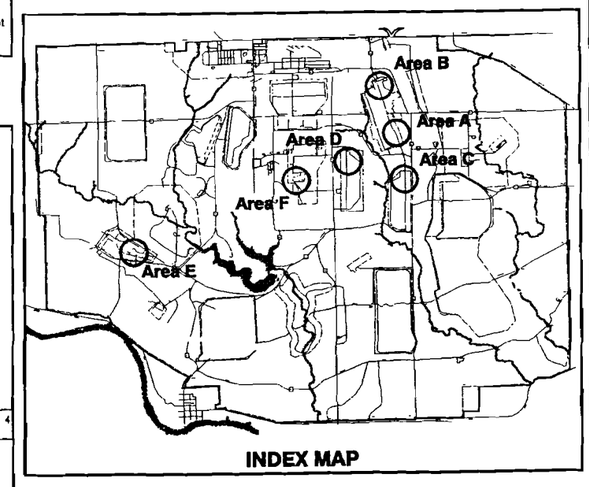
BUILDING 1-03-05 (Area A)



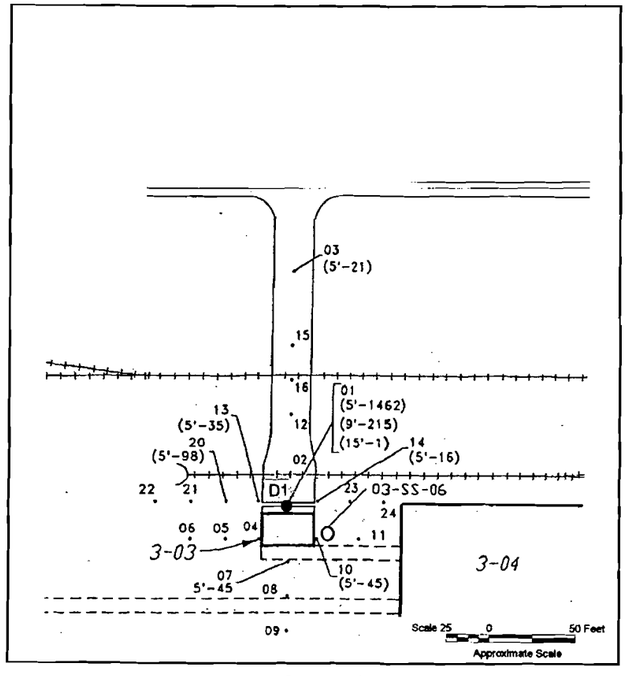
LINE 1 TANK FARM (Area B)



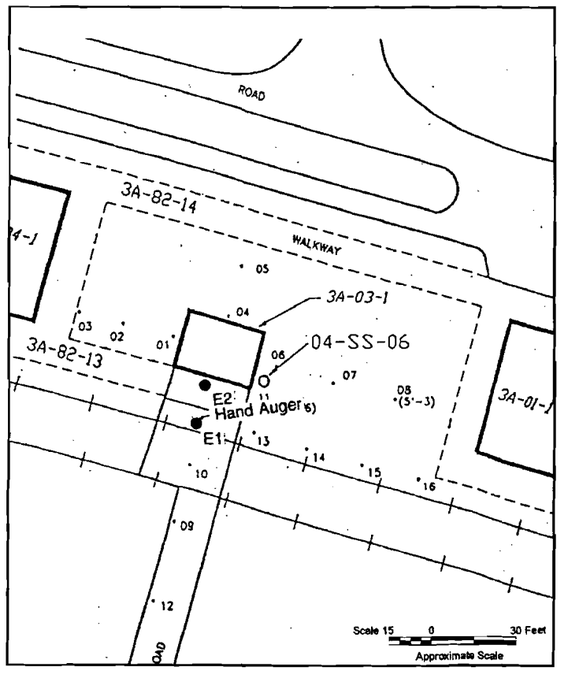
BUILDING 2-02 AND 2-03 (Area C)



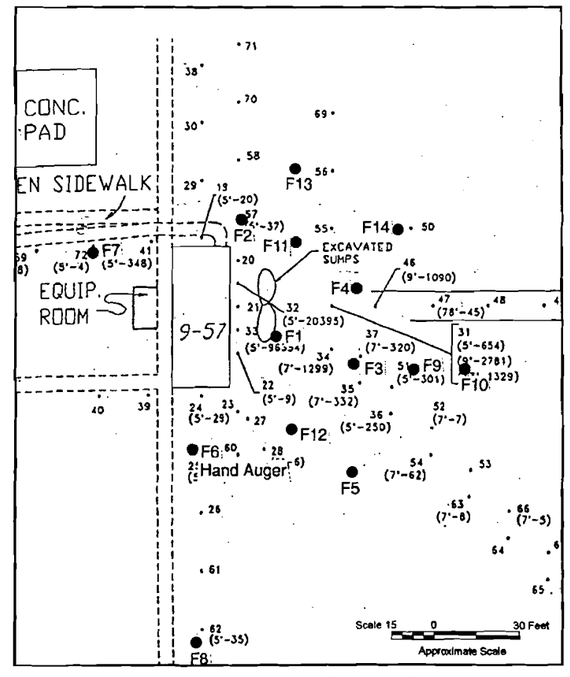
INDEX MAP



BUILDING 3-03 (Area D)



BUILDING 3A-03-01 (Area E)



BUILDING 9-57 (Area F)

LEGEND:

- • Previous Soil Gas Point, showing Depth and TVOC: (ppb)
- ● VOC Boring

Figure 3-11

VOC SAMPLE LOCATION MAPS (Task 11)

SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

HARZA *Consulting Engineers and Scientists*

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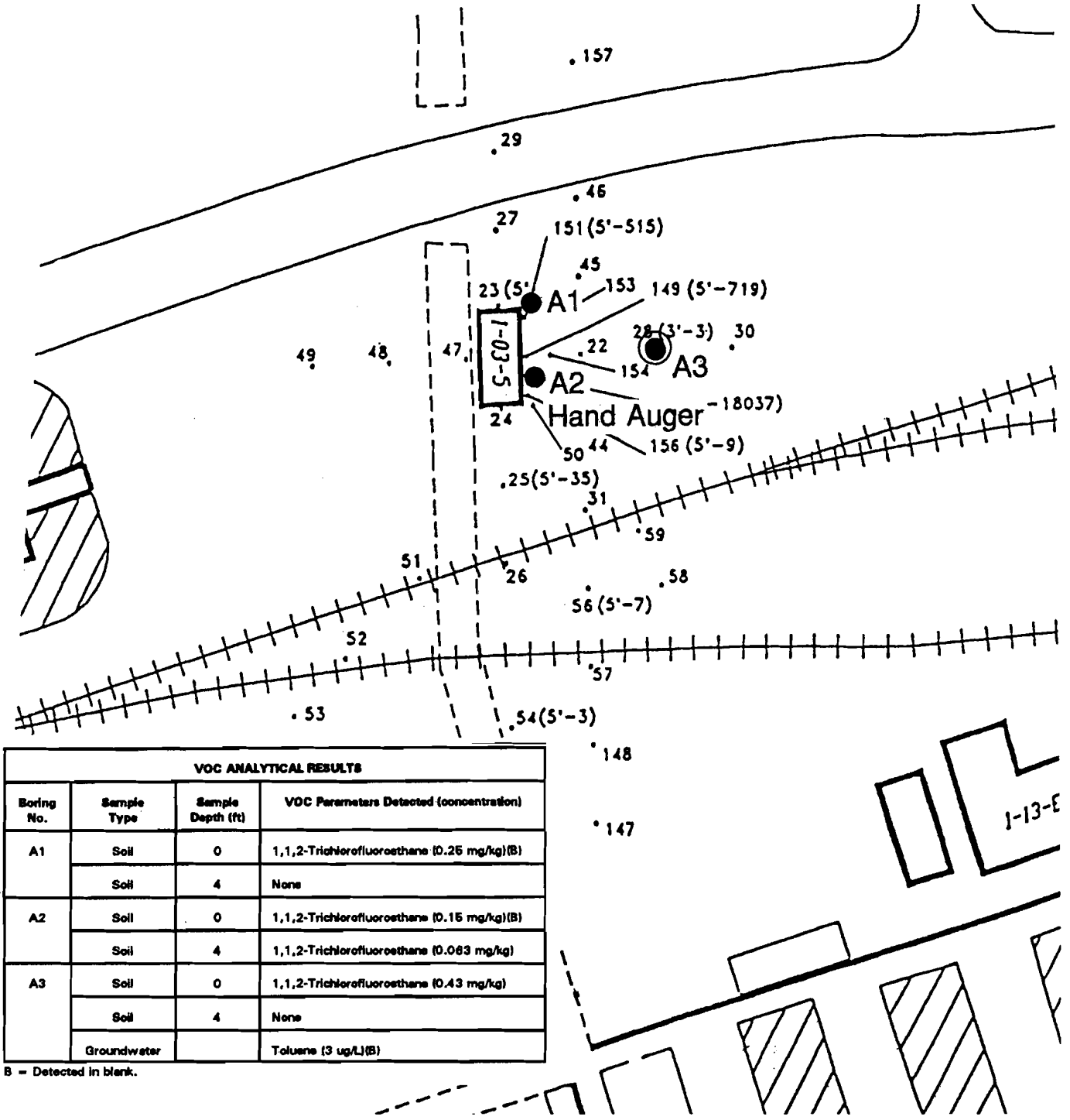

VOC ANALYTICAL RESULTS			
Boring No.	Sample Type	Sample Depth (ft)	VOC Parameters Detected (concentration)
A1	Soil	0	1,1,2-Trichlorofluoroethane (0.25 mg/kg)(B)
	Soil	4	None
A2	Soil	0	1,1,2-Trichlorofluoroethane (0.15 mg/kg)(B)
	Soil	4	1,1,2-Trichlorofluoroethane (0.063 mg/kg)
A3	Soil	0	1,1,2-Trichlorofluoroethane (0.43 mg/kg)
	Soil	4	None
	Groundwater		Toluene (3 ug/L)(B)

B = Detected in blank.

LEGEND:

- • Previous Soil Gas Point, showing Depth and TVOC: (ppb)
- ● VOC Boring
- ◉ VOC Boring with Groundwater Sample

Scale 20 0 40 Feet

Approximate Scale

Figure 3-12

VOC ANALYTICAL RESULTS
A. BUILDING 1-03-05 (Task 11)

SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

HARZA *Consulting Engineers and Scientists*

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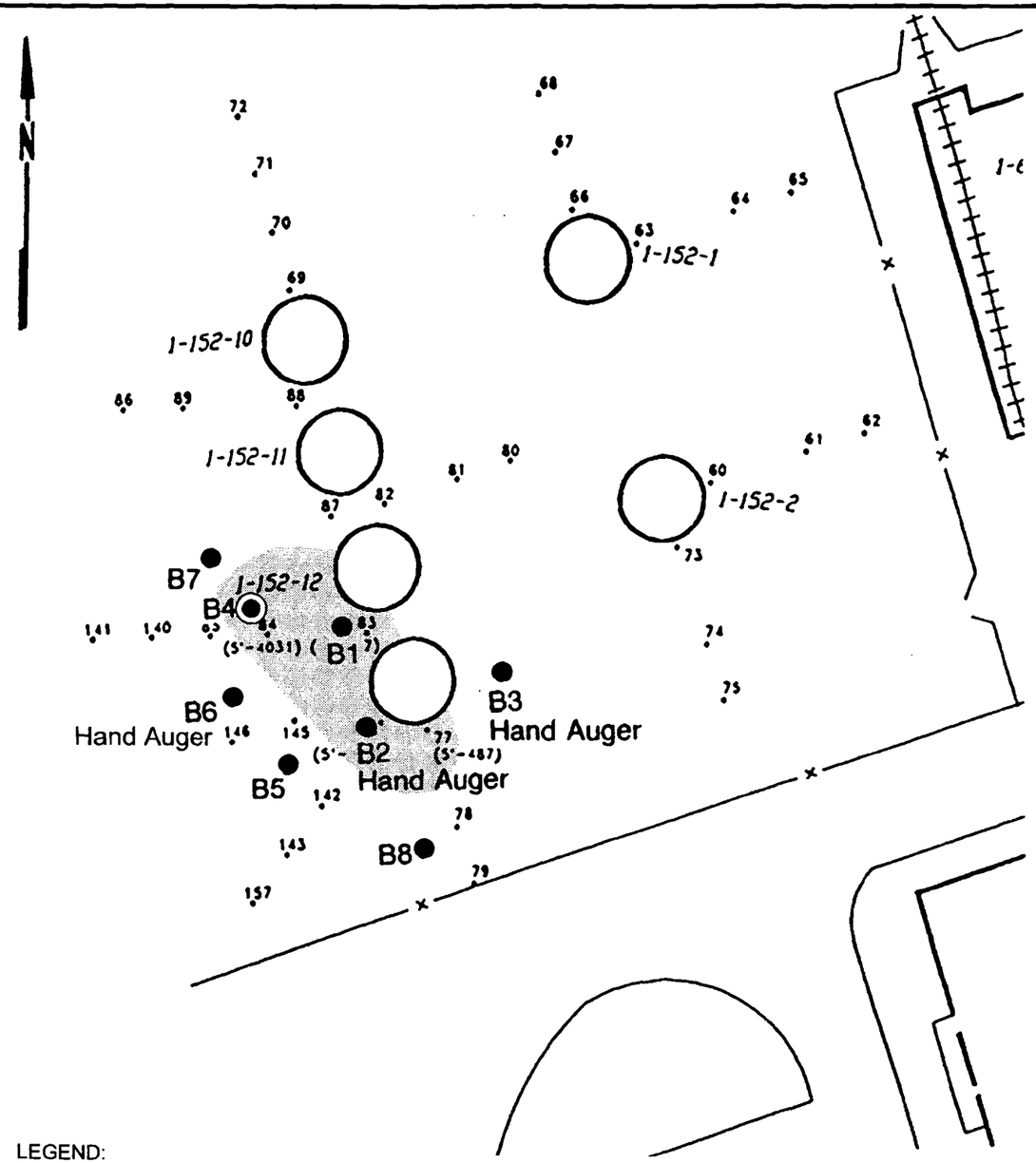

VOC ANALYTICAL RESULTS			
Boring No.	Sample Type	Sample Depth (ft)	VOC Parameters Detected (concentration)
B1	Soil	0	1,1,2-Trichlorofluoroethane (0.96 mg/kg)
	Soil	4	Ethyl Benzene (0.87 mg/kg), 1,3,5-Trimethylbenzene (0.63 mg/kg), n-Butyl Benzene (1.4 mg/kg), sec-Butyl Benzene (1.4 mg/kg), Isopropyl Benzene (0.69 mg/kg), 4-Isopropyl Toluene (0.63 mg/kg), Naphthalene (3.7 mg/kg), n-Propylbenzene (1.2 mg/kg)
B2	Soil	0	1,1,2-Trichlorofluoroethane (0.24 mg/kg)
	Soil	4	Ethyl Benzene (0.3[illegible] g/kg), n-Butyl Benzene (1[illegible] g/kg), sec-Butyl Benzene [illegible] mg/kg), Isopropyl Benzene (0.85 mg/kg), 4-Isopropyl Toluene (0.87 mg/kg), Naphthalene (8.9 mg/kg), n-Propylbenzene (1.5 mg/kg)
B3	Soil	0	1,1,2-Trichlorofluoroethane (0.43 mg/kg)
	Soil	4	None
B4	Soil	0	1,1,2-Trichlorofluoroethane (2.3 mg/kg)
	Soil	5	1,2,4-Trimethylbenzene (0.55 mg/kg), Ethyl Benzene (1.4 mg/kg), 1,3,5-Trimethylbenzene (4 mg/kg), n-Butyl Benzene (2.2 mg/kg), sec-Butyl Benzene (2 mg/kg), Isopropyl Benzene (1 mg/kg), 4-Isopropyl Toluene (0.95 mg/kg), Naphthalene (7 mg/kg), n-Propylbenzene (1.7 mg/kg)
	Soil	10	1,1,2-Trichlorofluoroethane (0.064 mg/kg)(B), 1,1-Dichloroethane (0.004 mg/kg)
B5	Soil	3	1,1,2-Trichlorofluoroethane (0.025 ug/kg)(B)
	Soil	8	Toluene (0.003 ug/kg)(B), 1,1,2-Trichlorofluoroethane (0.025 ug/kg)(B)
B6	Soil	3	1,1,2-Trichlorofluoroethane (0.059 ug/kg)(B), Toluene (0.003 ug/kg)(B)
	Soil	8	1,1,2-Trichlorofluoroethane (0.03 ug/kg)(B), Toluene (0.004 ug/kg)(B)
B7	Soil	3	None
	Soil	8	Toluene (0.004 ug/kg)(B)
B8	Soil	3	Toluene (0.003 ug/kg)(B)
	Soil	8	Toluene (0.004 ug/kg)(B)
B4	Groundwater	4	1,1,2-Trichlorofluoroethane (280 ug/L), 1,3,5-Trimethylbenzene (2 ug/L), n-Butyl Benzene (2 ug/L), sec-Butyl Benzene (12 ug/L), Isopropyl Benzene (3 ug/L), n-Propylbenzene (1 ug/L), 1,1-Dichloroethane (8 ug/L) 1,1-Dichloroethane (8 ug/L), cis-1,2-Dichloroethane (20 ug/L), Toluene (3 ug/L)(B)

NOTE:

Generalized extent of contamination based on concentrations in soil excluding "B" flagged data. "B" flag indicates chemical found in blank and sample.

LEGEND:

- Previous Soil Gas Point, showing Depth and TVOC: (ppb)
- VOC Boring
- VOC Boring with Groundwater Sample
- Generalized Lateral Extent of VOC Contamination in Soil

SCALE 25 0 50 100 Feet

Figure 3-13
VOC ANALYTICAL RESULTS
B. LINE 1 TANK FARM (Task 11)
SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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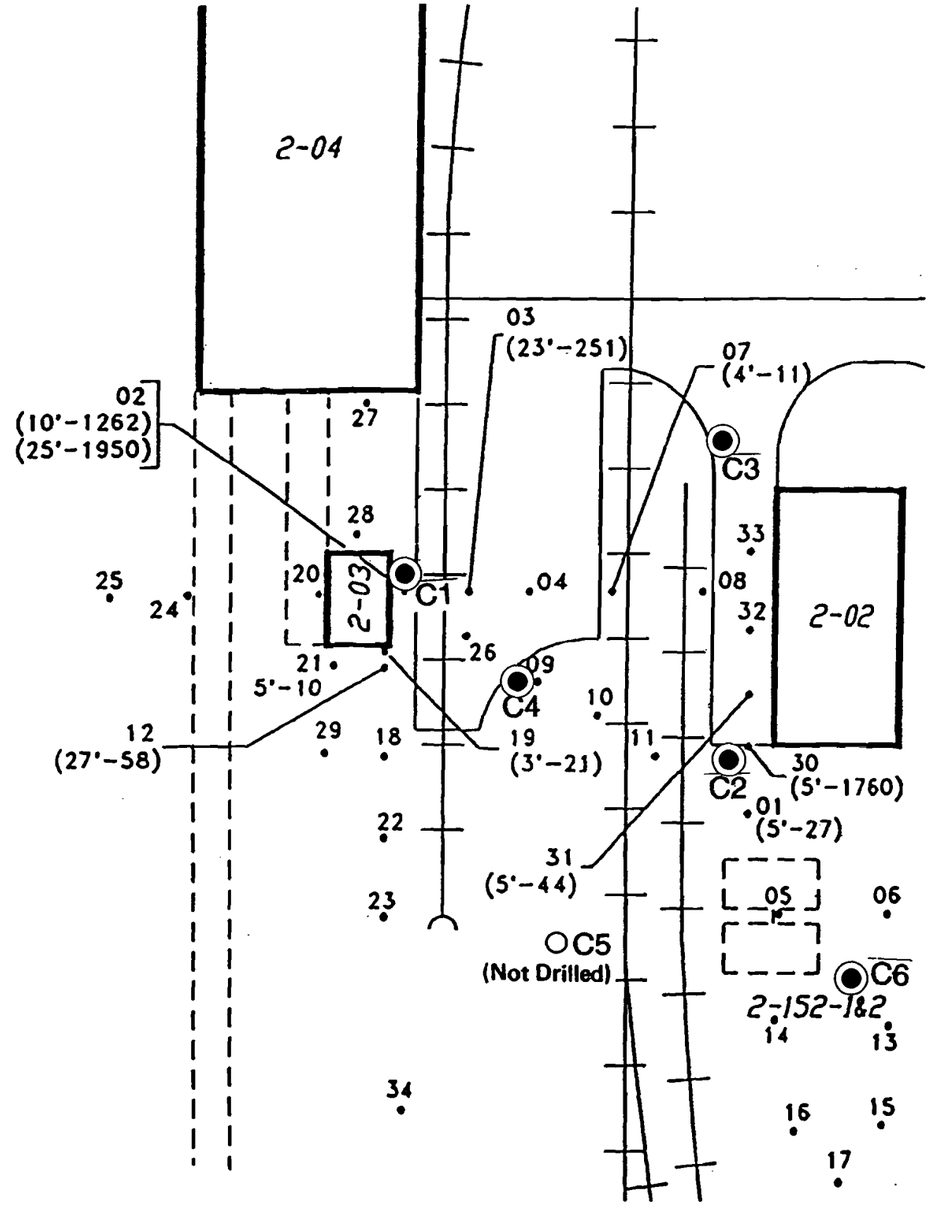

VOC ANALYTICAL RESULTS			
Boring No.	Sample Type	Sample Depth (ft)	VOC Parameters Detected (concentration)
C1	Soil	0	1,1,2-Trichlorofluoroethane (0.013 mg/kg)
	Soil	10	Ethyl Benzene (0.004 mg/kg), Xylenes-total (0.054 mg/kg)
	Soil	25	1,1,2-Trichlorofluoroethane (0.66 mg/kg)
	Soil	33	1,1,2-Trichlorofluoroethane (0.12 mg/kg)
	Groundwater		1,1,2-Trichlorofluoroethane (60 ug/L), Xylenes-total (9 ug/L), Toluene (3.1 ug/L)(B)
	Groundwater		1,1,2-Trichlorofluoroethane (130 ug/L), Xylenes-total (2 ug/L)
C2	Soil	0	1,1,2-Trichlorofluoroethane (0.33 mg/kg)
	Soil	4	1,1,2-Trichlorofluoroethane (1.6 mg/kg), Methylene Chloride (0.016 mg/kg)(B), Chlorobenzene (0.008 mg/kg), 1,2-Dichlorobenzene (0.041 mg/kg), 1,4-Dichlorobenzene (0.007 mg/kg)
	Soil	10	1,1,2-Trichlorofluoroethane (0.073 mg/kg), Chlorobenzene (0.021 mg/kg)
	Groundwater		1,1,2-Trichlorofluoroethane (15 ug/L), Benzene (2 ug/L), Chlorobenzene (93 ug/L)
C3	Groundwater		None
C4	Groundwater		None
C6	Soil	5	None
	Groundwater		None

B = Detected in blank.

LEGEND:

- Previous Soil Gas Point, showing Depth and TVOC: (ppb)
- VOC Boring
- VOC Boring with Groundwater Sample
- Generalized Lateral Extent of VOC Contamination in Soil

Scale 25 0 50 Feet
Approximate Scale

Figure 3-14
VOC ANALYTICAL RESULTS
C. BUILDINGS 2-02 AND 2-03 (TASK 11)
SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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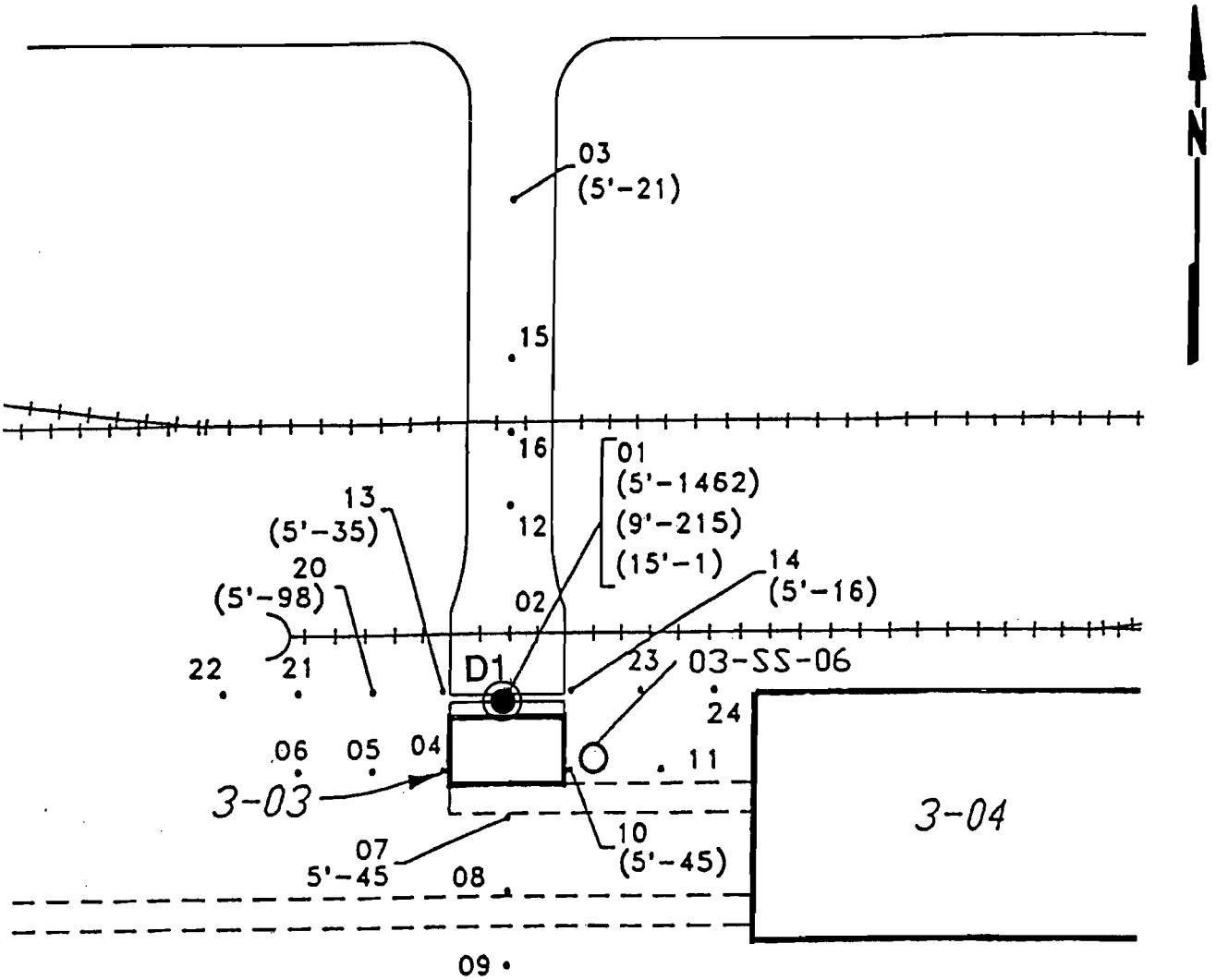

VOC ANALYTICAL RESULTS			
Boring No.	Sample Type	Sample Depth (ft)	VOC Parameters Detected (concentration)
D1	Soil	0	1,1,2-Trichlorofluoroethane (0.6 mg/kg)
	Soil	5	1,1,2-Trichlorofluoroethane (0.19 mg/kg), 1,2,4-Trimethylbenzene (0.03 mg/kg)
	Soil	13	None
	Groundwater	33	1,1,2-Trichlorofluoroethane (11 ug/L)

LEGEND:

- • Previous Soil Gas Point, showing Depth and TVOC: (ppb)
- ● VOC Boring
- ◉ VOC Boring with Groundwater Sample

Scale 25 0 50 Feet
Approximate Scale

Figure 3-15
VOC ANALYTICAL RESULTS
D. BUILDING 3-03 (Task 11)
SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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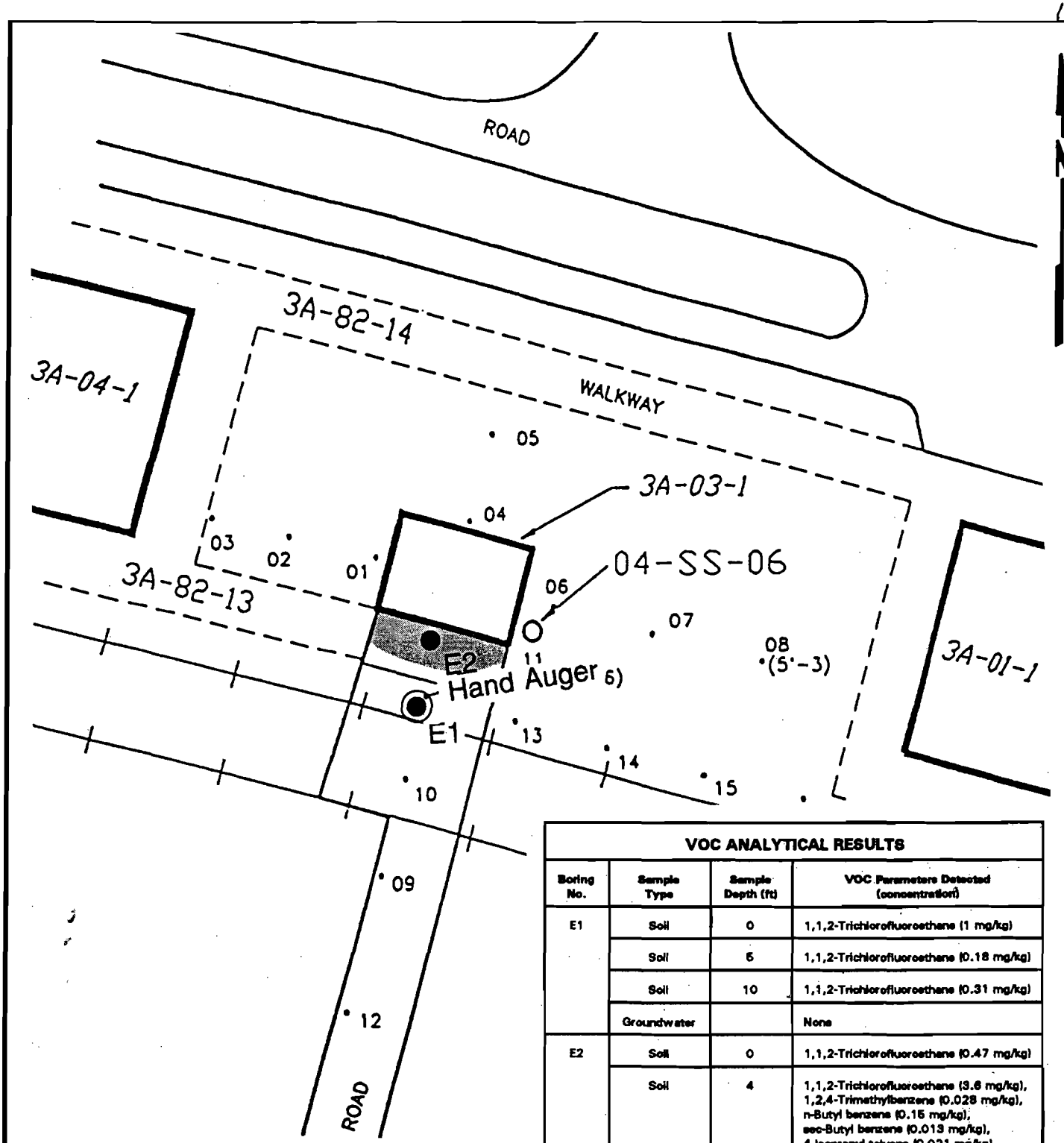

VOC ANALYTICAL RESULTS			
Boring No.	Sample Type	Sample Depth (ft)	VOC Parameters Detected (concentration)
E1	Soil	0	1,1,2-Trichlorofluoroethane (1 mg/kg)
	Soil	5	1,1,2-Trichlorofluoroethane (0.18 mg/kg)
	Soil	10	1,1,2-Trichlorofluoroethane (0.31 mg/kg)
	Groundwater		None
E2	Soil	0	1,1,2-Trichlorofluoroethane (0.47 mg/kg)
	Soil	4	1,1,2-Trichlorofluoroethane (3.6 mg/kg), 1,2,4-Trimethylbenzene (0.028 mg/kg), n-Butyl benzene (0.15 mg/kg), sec-Butyl benzene (0.013 mg/kg), 4-Isopropyl toluene (0.021 mg/kg), n-Propylbenzene (0.008 mg/kg)

LEGEND:

- • Previous Soil Gas Point, showing Depth and TVOC: (ppb)
- ● VOC Boring
- ◉ VOC Boring with Groundwater Sample
- Generalized Extent of Groundwater Contamination

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Figure 3-16
VOC ANALYTICAL RESULTS
E. BUILDING 3A-03-01 (Task 11)
SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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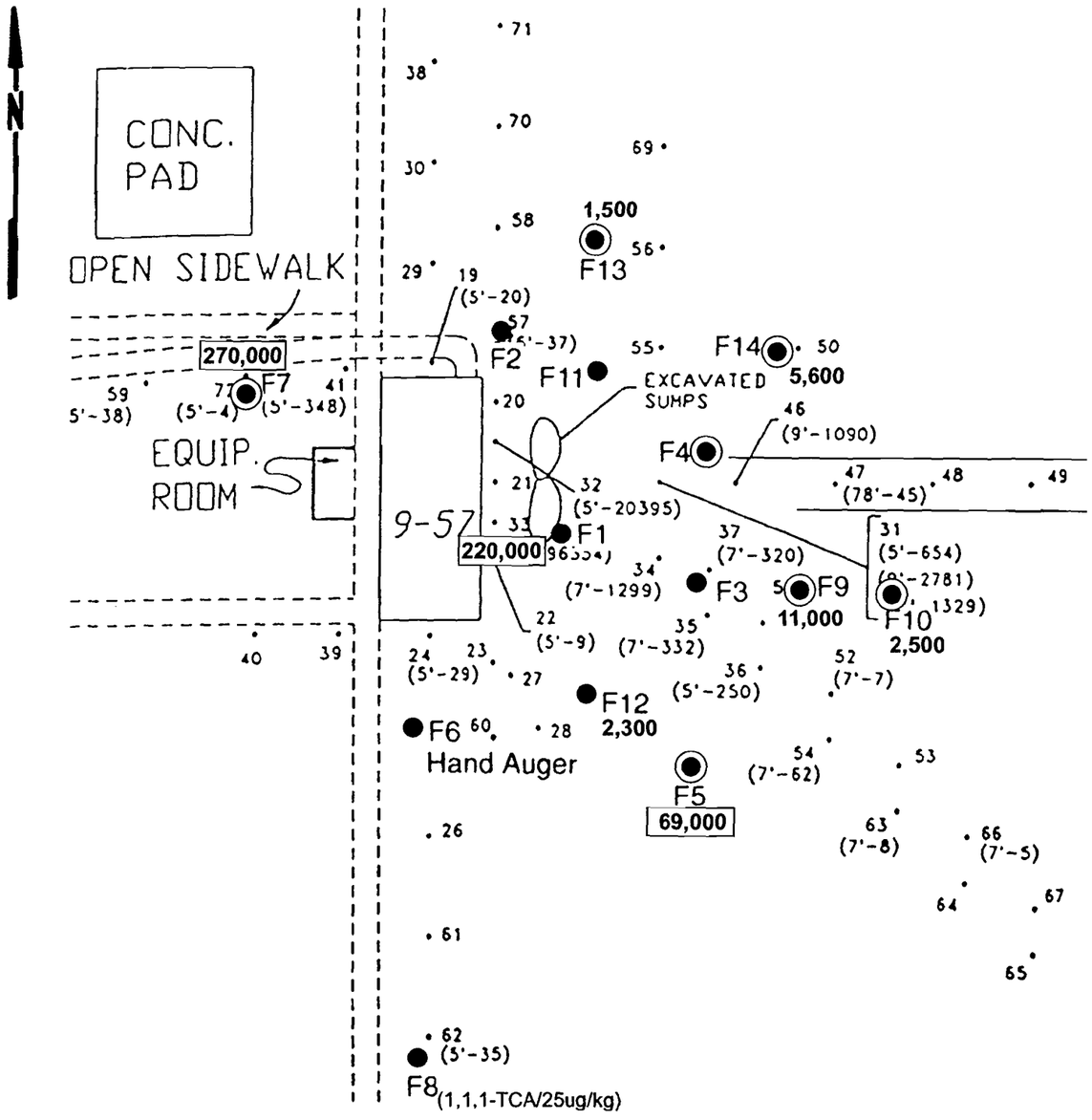

LEGEND:

- Previous Soil Gas Point, showing Depth and TVOC: (ppb)
- VOC Boring
- VOC Boring with Groundwater Sample
- **1,500** Freon Concentration in Groundwater (ug/L)
- **69,000** Freon Concentration >PRG (59,000 ug/L) in Groundwater

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VOC ANALYTICAL RESULTS

Boring No.	Sample Type	Sample Depth (ft)	VOC Parameters Detected (concentration)
F1	Soil	0	1,1,2-Trichlorofluoroethane (0.42 mg/kg)
	Soil	5	1,1,2-Trichlorofluoroethane (15 mg/kg)
	Soil	13	1,1,2-Trichlorofluoroethane (9,000 mg/kg)
	Soil	23	1,1,2-Trichlorofluoroethane (280 mg/kg), Methylene chloride (8 mg/kg)(B)
	Soil	33	1,1,2-Trichlorofluoroethane (3.2 mg/kg)
F2	Soil	0	1,1,2-Trichlorofluoroethane (0.18 mg/kg)
	Soil	5	1,1,2-Trichlorofluoroethane (9 mg/kg)
	Soil	13	1,1,2-Trichlorofluoroethane (4,000 mg/kg)
	Soil	23	1,1,2-Trichlorofluoroethane (1.7 mg/kg)
	Soil	33	1,1,2-Trichlorofluoroethane (3.1 mg/kg)
F3	Soil	0	1,1,2-Trichlorofluoroethane (0.3 mg/kg)
	Soil	5	1,1,2-Trichlorofluoroethane (1.4 mg/kg)
	Soil	13	1,1,2-Trichlorofluoroethane (6.3 mg/kg)
	Soil	23	1,1,2-Trichlorofluoroethane (34 mg/kg)
	Soil	32	1,1,2-Trichlorofluoroethane (3,900 mg/kg), Methylene chloride (6.6 mg/kg)(B)
	Soil	36	1,1,2-Trichlorofluoroethane (26 mg/kg), Methylene chloride (2.7 mg/kg)(B)
F4	Soil	0	1,1,2-Trichlorofluoroethane (0.4 mg/kg)
	Soil	5	1,1,2-Trichlorofluoroethane (1 mg/kg)
	Soil	13	1,1,2-Trichlorofluoroethane (910 mg/kg)
	Soil	15	1,1,2-Trichlorofluoroethane (2,000 mg/kg)
	Soil	23	1,1,2-Trichlorofluoroethane (0.091 mg/kg)(B)
	Soil	33	1,1,2-Trichlorofluoroethane (0.79 mg/kg)
F5	Soil	0	1,1,2-Trichlorofluoroethane (0.27 mg/kg)
	Soil	5	1,1,2-Trichlorofluoroethane (0.44 mg/kg)
	Soil	13	1,1,2-Trichlorofluoroethane (29 mg/kg)
	Soil	23	1,1,2-Trichlorofluoroethane (1.4 mg/kg)
	Soil	33	1,1,2-Trichlorofluoroethane (5.9 mg/kg)
F6	Soil	0	1,1,2-Trichlorofluoroethane (0.73 mg/kg)
	Soil	4	1,1,2-Trichlorofluoroethane (0.11 mg/kg)
F7	Soil	0	1,1,2-Trichlorofluoroethane (1.5 mg/kg)
	Soil	5	1,1,2-Trichlorofluoroethane (0.99 mg/kg)
	Soil	13	1,1,2-Trichlorofluoroethane (110 mg/kg)
	Soil	20	1,1,2-Trichlorofluoroethane (620 mg/kg)
	Soil	33	1,1,2-Trichlorofluoroethane (27 mg/kg)

VOC ANALYTICAL RESULTS

Boring No.	Sample Type	Sample Depth (ft)	VOC Parameters Detected (concentration)
F8	Soil	0	1,1,2-Trichlorofluoroethane (0.39 mg/kg)
	Soil	5	1,1,2-Trichlorofluoroethane (0.068 mg/kg), 1,1,1-Trichloroethane (0.025 mg/kg)
	Soil	13	1,1,2-Trichlorofluoroethane (4.9 mg/kg)
	Soil	23	1,1,2-Trichlorofluoroethane (0.15 mg/kg)
F9	Soil	3	1,1,2-Trichlorofluoroethane (0.017 mg/kg), Toluene (0.014 mg/kg)(B)
	Soil	13	1,1,2-Trichlorofluoroethane (4.5 mg/kg), Toluene (0.4 mg/kg)(B)
F10	Soil	3	Toluene (0.007 mg/kg)(B)
	Soil	13	1,1,2-Trichlorofluoroethane (1.0 mg/kg)(E)
F11	Soil	15	1,1,2-Trichlorofluoroethane (6,200 mg/kg), Toluene (1.7 mg/kg)(B)
F12	Soil	3	1,1,2-Trichlorofluoroethane (0.11 mg/kg), Toluene (0.004 mg/kg)(B)
	Soil	13	1,1,2-Trichlorofluoroethane (78 mg/kg), Toluene (0.01 mg/kg)(B)
F13	Soil	3	Toluene (0.004 mg/kg)(B)
	Soil	13	1,1,2-Trichlorofluoroethane (0.48 mg/kg)
F14	Soil	3	1,1,2-Trichlorofluoroethane (0.037 mg/kg), Toluene (0.004 mg/kg)(B)
	Soil	13	1,1,2-Trichlorofluoroethane (0.37 mg/kg), Toluene (0.008 mg/kg)(B)
F1	Groundwater	6	1,1,2-Trichlorofluoroethane (220,000 ug/L)
F4	Groundwater	6	1,1,2-Trichlorofluoroethane (36,000 ug/L), Toluene (2,000 ug/L)(B)
F5	Groundwater	8	1,1,2-Trichlorofluoroethane (69,000 ug/L), Toluene (2,000 ug/L)(B)
F7	Groundwater	4	1,1,2-Trichlorofluoroethane (270,000 ug/L), Toluene (2,000 ug/L)(B)
F9	Groundwater	5	1,1,2-Trichlorofluoroethane (11,000 ug/L)
F10	Groundwater	5	1,1,2-Trichlorofluoroethane (2,500 ug/L), Toluene (33ug/L)(B)
F12	Groundwater	6	1,1,2-Trichlorofluoroethane (2,300 ug/L), Toluene (75 ug/L)(B)
F13	Groundwater	7	1,1,2-Trichlorofluoroethane (1,500 ug/L), Toluene (70 ug/L)(B)
F14	Groundwater	7	1,1,2-Trichlorofluoroethane (5,600 ug/L), Toluene (2,000 ug/L)(B)

B = Detected in blank.

Scale 15 0 30 Feet
Approximate Scale

Figure 3-17
VOC ANALYTICAL RESULTS
F. BUILDING 9-57 (Task 11)
SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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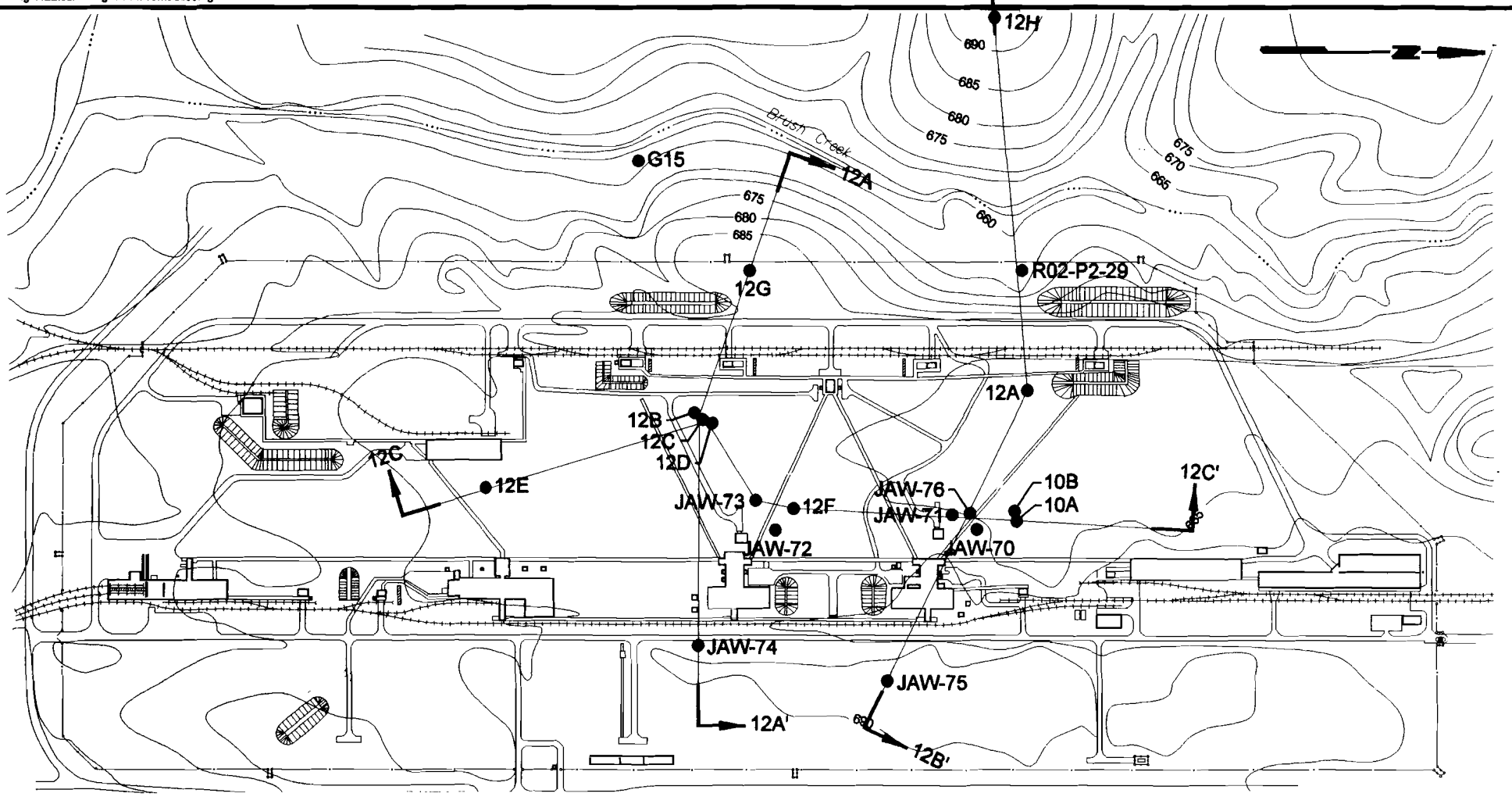

LEGEND:

- Road
- Walkway
- Fence
- Building Number
- Berm (Explosion Protection)
- Topographic Contour
  Contour Interval = 5 Feet
- Intermittent Stream
- Monitoring Well / Piezometer
- Cross Section Locations

Scale 0 250 500 Feet

Figure 3-18

WELL LOCATION MAP, LINE 2 (TASK 12

SUPPLEMENTAL GROUNDWATER RI

IOWA ARMY AMMUNITION PLANT

Middletown, Iowa

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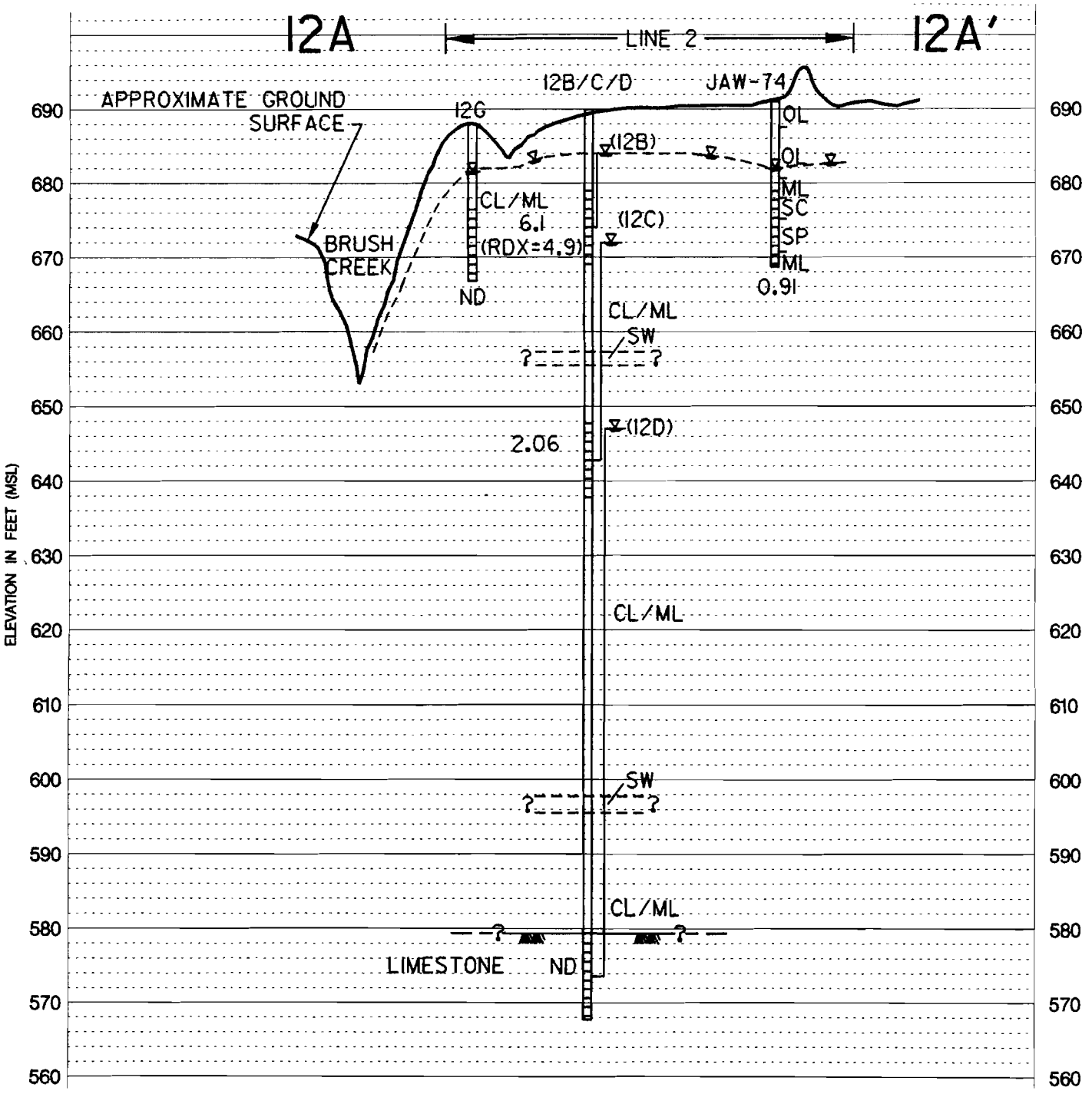

LEGEND:

CL, ML, SP, SC OL, OH, CH	United Soil Classification Soil Abbreviations
▽	Static Water Level Elevation Measured 5-19-97 through 5-21-97
9.0	Total Explosives (ug/L)
(__=__)	>PRGs (ug/L)
ND	Not Detected

NOTE: See Figure 3-18 for Cross Section Location

Horizontal Scale 0 — 2000 Feet

Vertical Scale 0 — 20 Feet

Figure 3-19

GENERALIZED HYDROGEOLOGIC CROSS SECTION 12A-12A', LINE 2 (Task 12)

SUPPLEMENTAL GROUNDWATER RI

IOWA ARMY AMMUNITION PLANT

Middletown, Iowa

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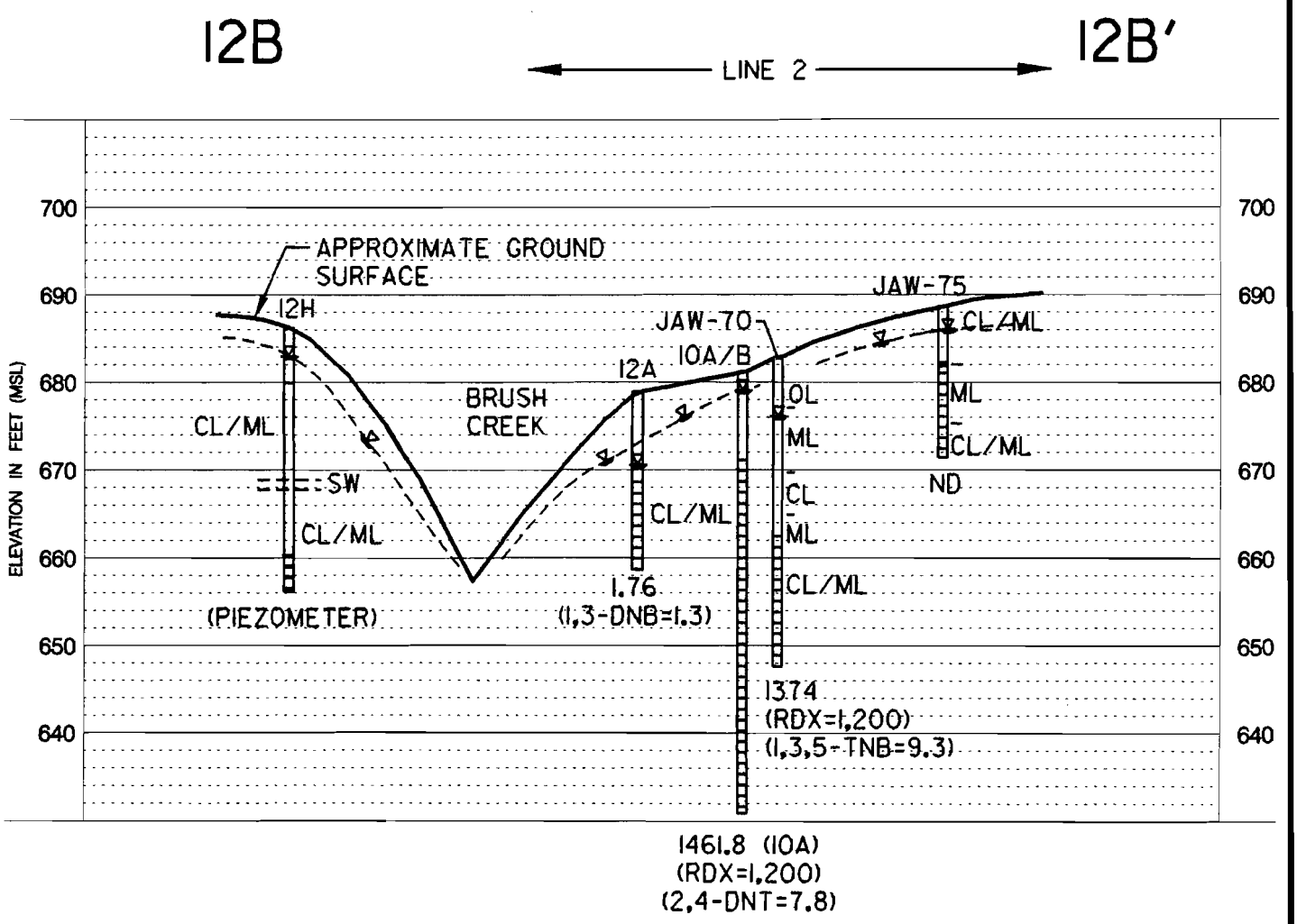

LEGEND:

CL, ML, SP, SC OL, OH, CH	United Soil Classification Soil Abbreviations
▽	Static Water Level Elevation Measured 5-19-97 through 5-21-97
9.0	Total Explosives (ug/L)
(__=__)	>PRGs (ug/L)
ND	Not Detected

NOTE: See Figure 3-18 for Cross Section Location

Horizontal Scale 0 — 2000 Feet

Vertical Scale 0 — 20 Feet

Figure 3-20

GENERALIZED HYDROGEOLOGIC CROSS SECTION 12B-12B', LINE 2 (Task 12)

SUPPLEMENTAL GROUNDWATER RI

IOWA ARMY AMMUNITION PLANT

Middletown, Iowa

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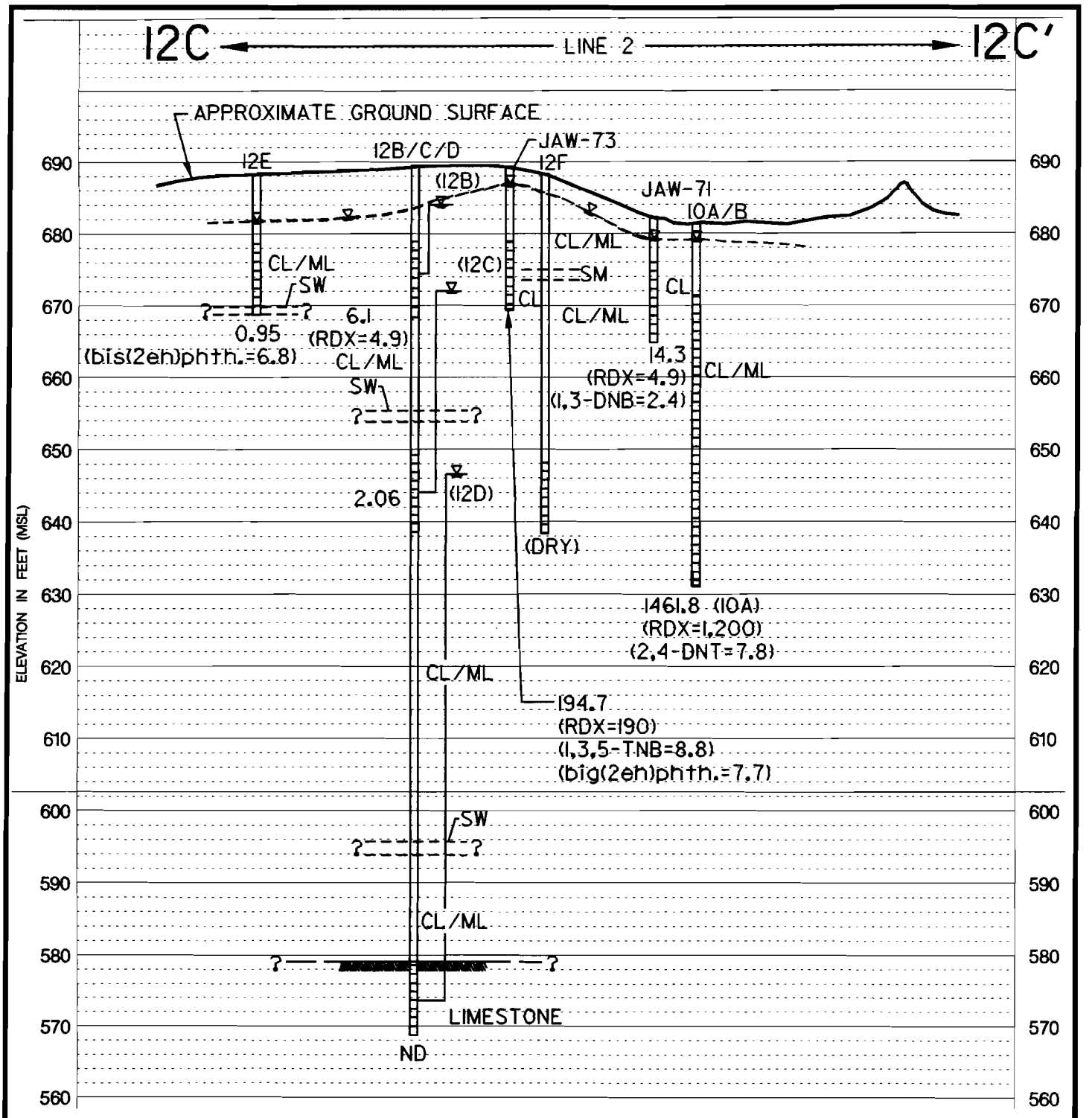

LEGEND:

CL, ML, SP, SC OL, OH, CH	United Soil Classification Soil Abbreviations
▽	Static Water Level Elevation Measured 5-19-97 through 5-21-97
9.0	Total Explosives (ug/L)
(__=__)	>PRGs (ug/L)
ND	Not Detected

NOTE: See Figure 3-18 for Cross Section Location

Horizontal Scale 0 — 2000 Feet

Vertical Scale 0 — 20 Feet

Figure 3-21

GENERALIZED HYDROGEOLOGIC CROSS SECTION 12C-12C', LINE 2 (Task 12)

SUPPLEMENTAL GROUNDWATER RI

IOWA ARMY AMMUNITION PLANT

Middletown, Iowa

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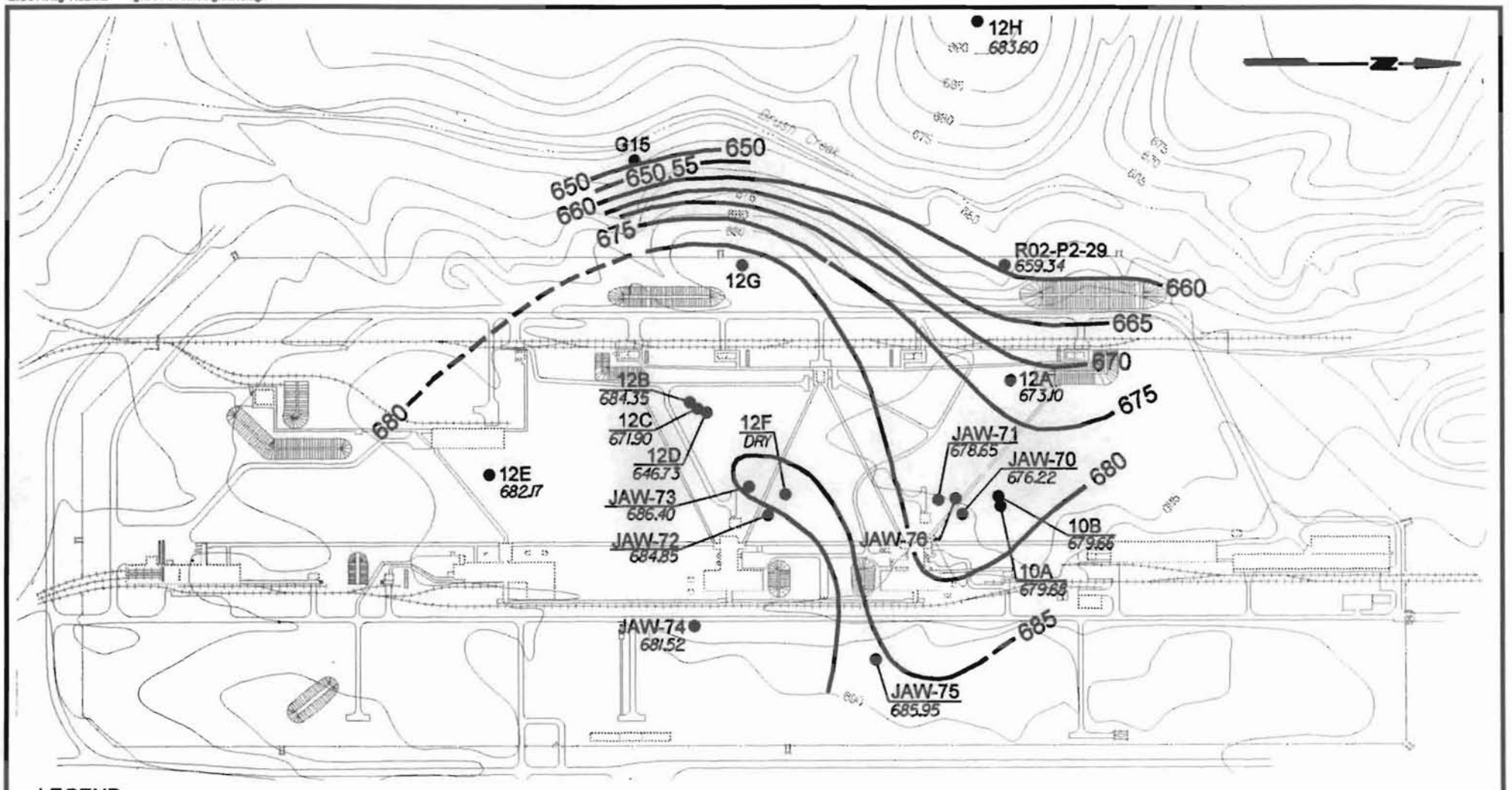

LEGEND:

- Road
- Walkway
- Fence
- Building Number
- Berm (Explosion Protection)
- Topographic Contour Contour Interval = 5 Feet
- Intermittent Stream
- Monitoring Well / Piezometer
- 694.30 Groundwater Elevations
- 680 Generalized Potentiometric Contour (Shallow Till)

Scale 0 250 500 Feet

Figure 3-22

GENERALIZED POTENTIOMETRIC CONTOURS, LINE 2 (Task 12)

SUPPLEMENTAL GROUNDWATER RI

IOWA ARMY AMMUNITION PLANT

Middletown, Iowa

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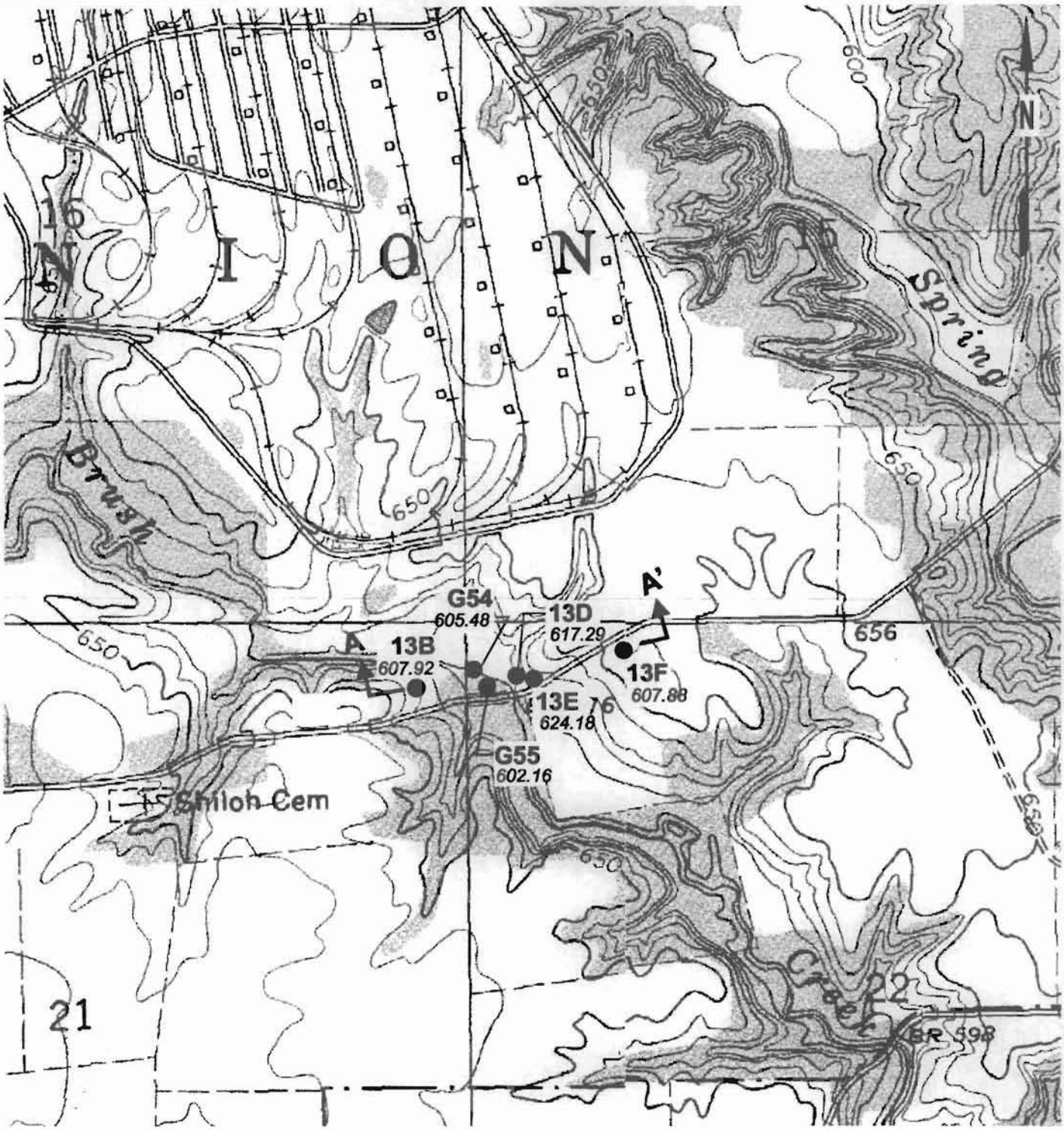

LEGEND:

● Monitoring Well

Cross Section Location

607.92 Measured Groundwater Elevation

Scale 0 500 1000 Feet

Figure 3-23

WELL LOCATION MAP AND GROUNDWATER ELEVATIONS, BRUSH CREEK (TASK 13)

SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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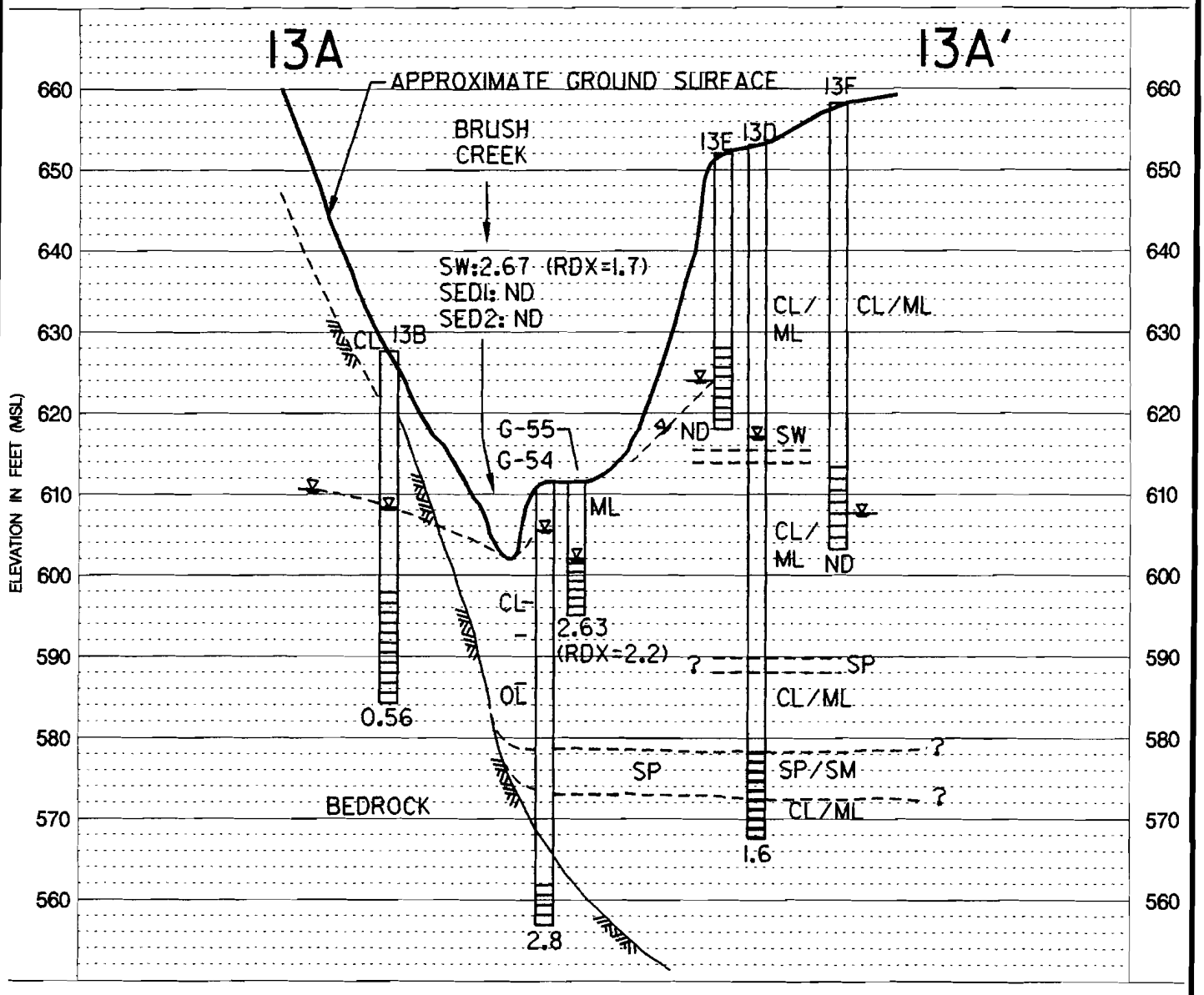

LEGEND:

CL, ML, SP, SC OL, OH, CH	United Soil Classification Soil Abbreviations
▽	Static Water Level Elevation Measured 5-19-97 through 5-21-97
9.0	Total Explosives (ug/L)
(__= __)	>PRGs (ug/L)
ND	Not Detected
SW/SED	Total Explosives in Surface Water/ Sediment, Location 7K

Horizontal Scale 0 — 2000 Feet

Vertical Scale 0 — 20 Feet

NOTE: See Figure 3-23 for Cross Section Location

Figure 3-24

GENERALIZED HYDROGEOLOGIC CROSS SECTION 13A-13A', BRUSH CREEK (Task 13)

SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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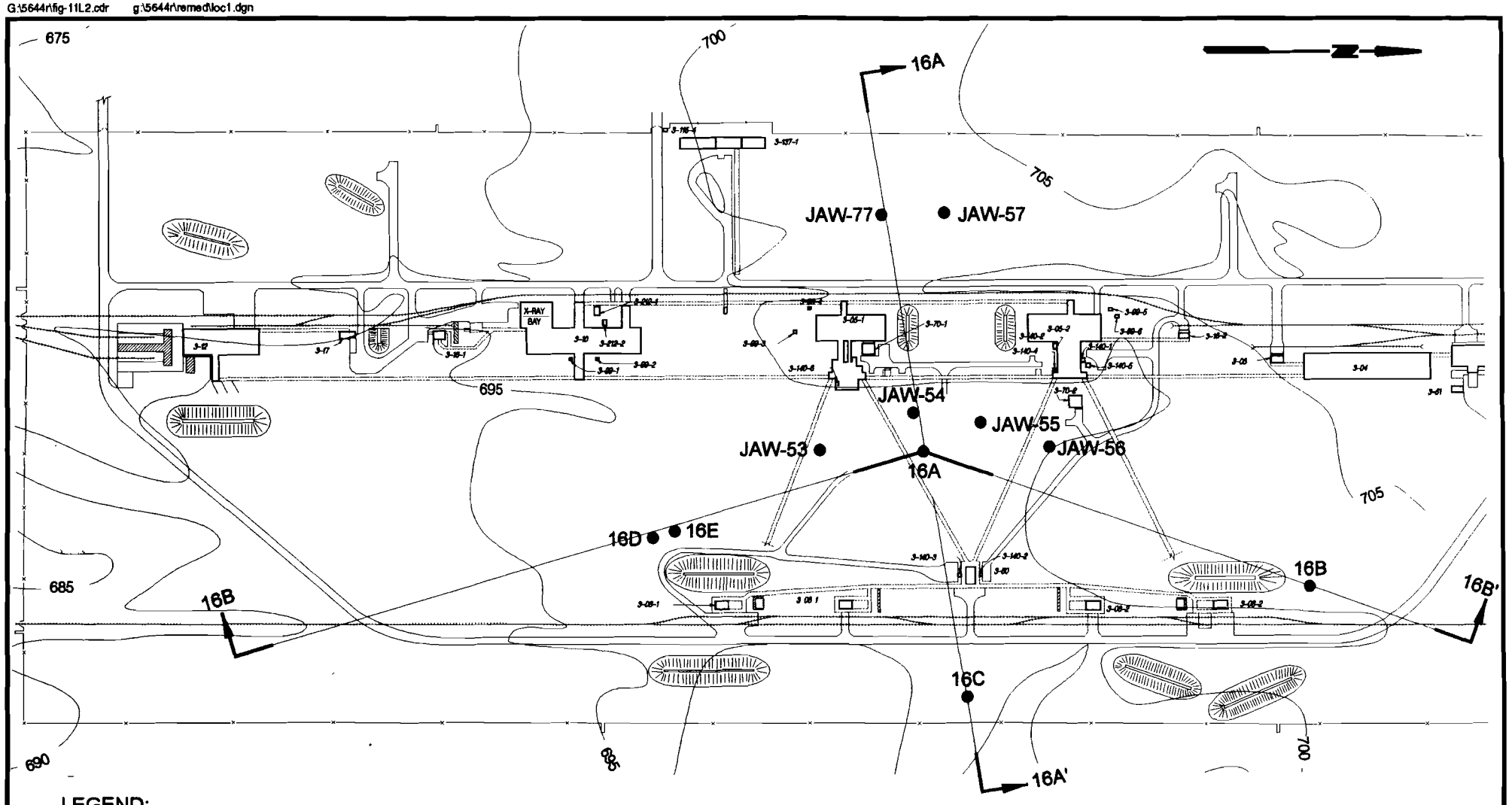

LEGEND:

- Road
- Walkway
- Fence
- Building Number
- Berm (Explosion Protection)
- Topographic Contour Contour Interval = 5 Feet
- Intermittent Stream
- Monitoring Well / Piezometer
- Cross Section Locations

Scale 0 250 500 Feet

Figure 3-25

WELL LOCATION MAP, LINE 3 (TASK 16)

SUPPLEMENTAL GROUNDWATER RI

IOWA ARMY AMMUNITION PLANT

Middletown, Iowa

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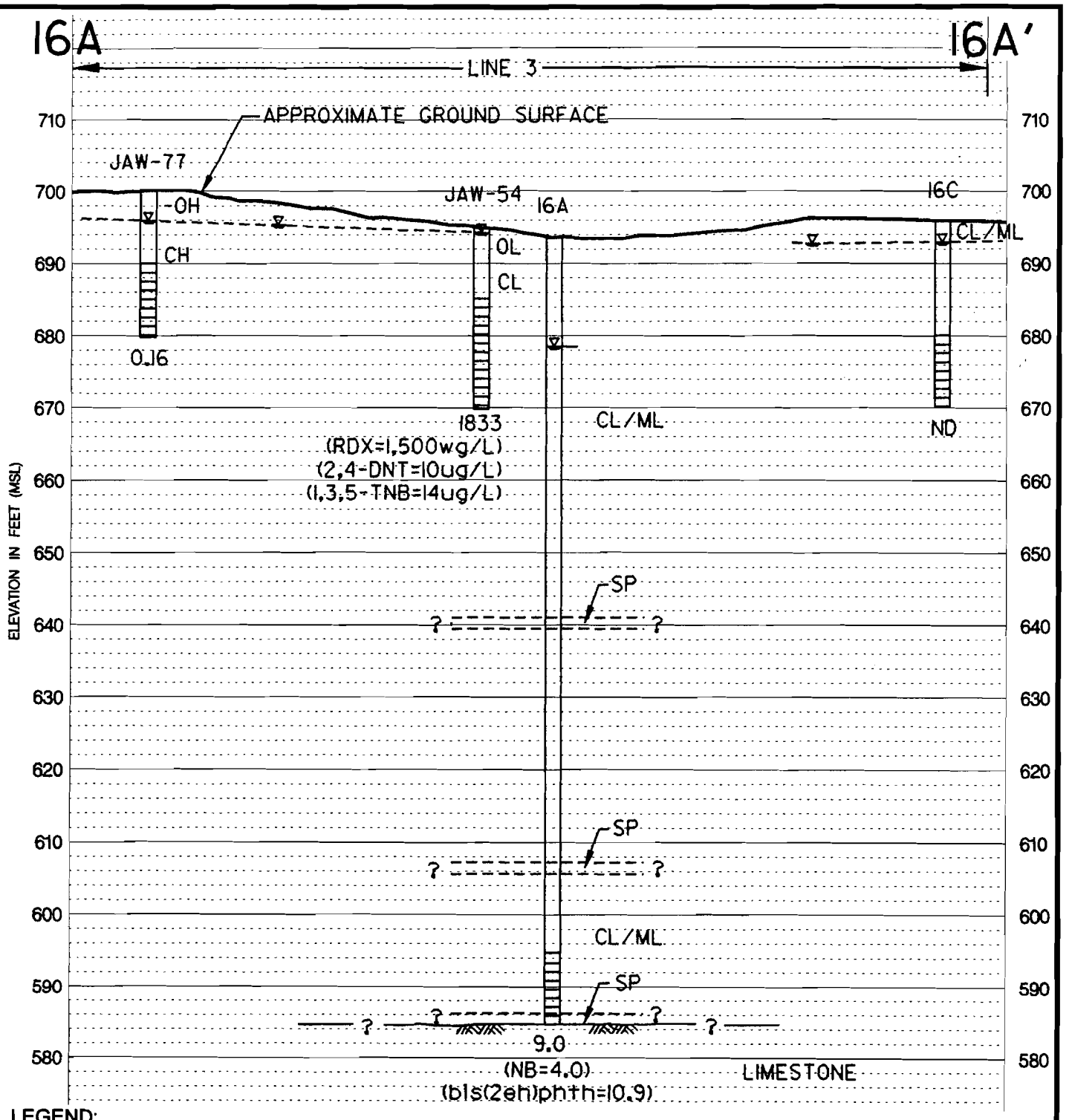

LEGEND:

CL, ML, SP, SC	United Soil Classification
OL, OH, CH	Soil Abbreviations
▽	Static Water Level Elevation Measured 5-19-97 through 5-21-97
9.0	Total Explosives (ug/L)
(__=__)	>PRGs (ug/L)
ND	Not Detected

Horizontal Scale 0 — 2000 Feet

Vertical Scale 0 — 20 Feet

NOTE: See Figure 3-25 for Cross Section Location

Figure 3-26

GENERALIZED HYDROGEOLOGIC CROSS SECTION 16A-16A', LINE 3 (Task 16)

SUPPLEMENTAL GROUNDWATER RI

IOWA ARMY AMMUNITION PLANT

Middletown, Iowa

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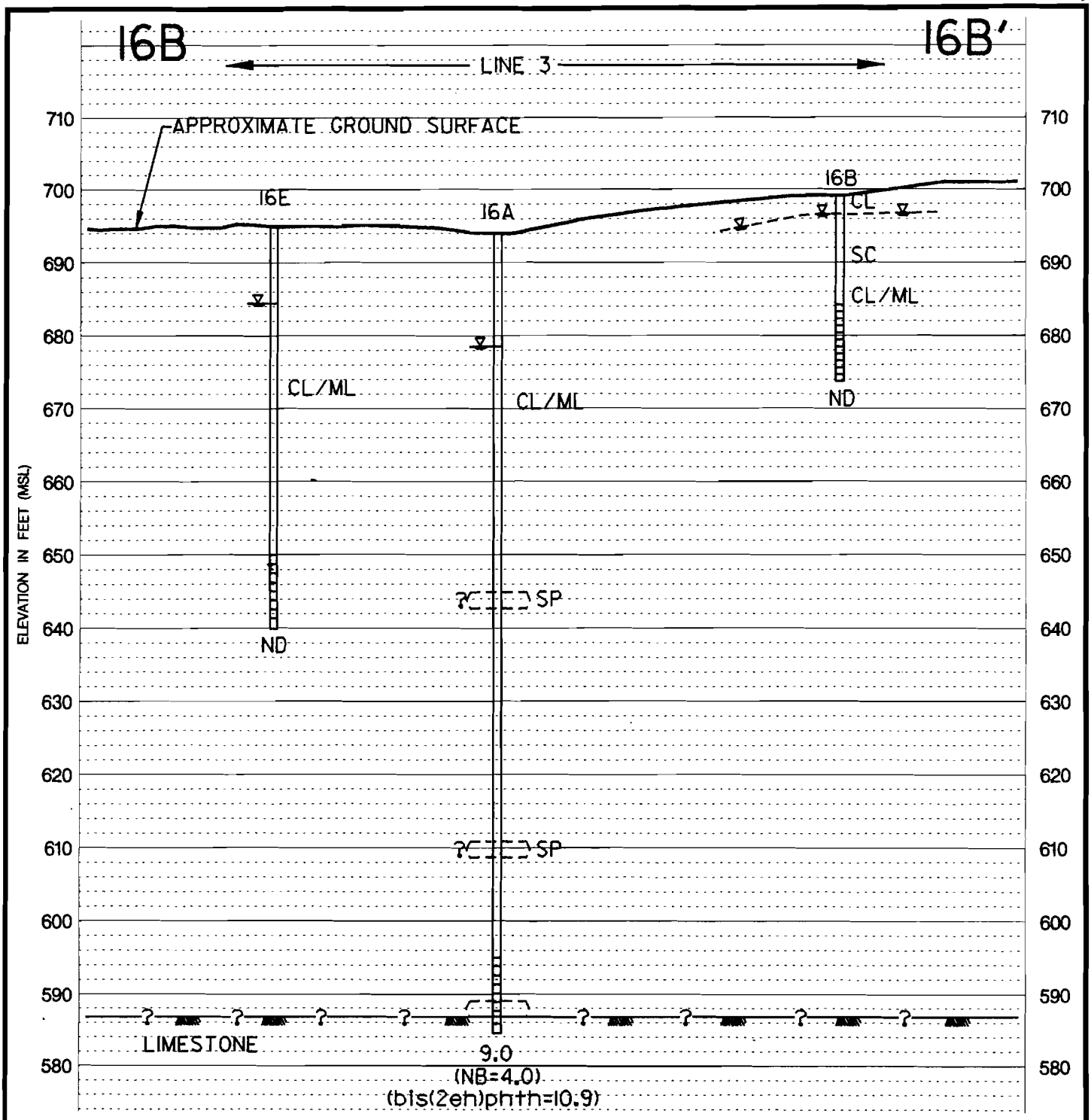

LEGEND:

CL, ML, SP, SC OL, OH, CH	United Soil Classification Soil Abbreviations
▽	Static Water Level Elevation Measured 5-19-97 through 5-21-97
9.0	Total Explosives (ug/L)
(__= __)	>PRGs (ug/L)
ND	Not Detected

Horizontal Scale 0 — 2000 Feet

Vertical Scale 0 — 20 Feet

NOTE: See Figure 3-25 for Cross Section Location

Figure 3-27

GENERALIZED HYDROGEOLOGIC CROSS SECTION 16B-16B', LINE 3 (Task 16)

SUPPLEMENTAL GROUNDWATER RI

IOWA ARMY AMMUNITION PLANT

Middletown, Iowa

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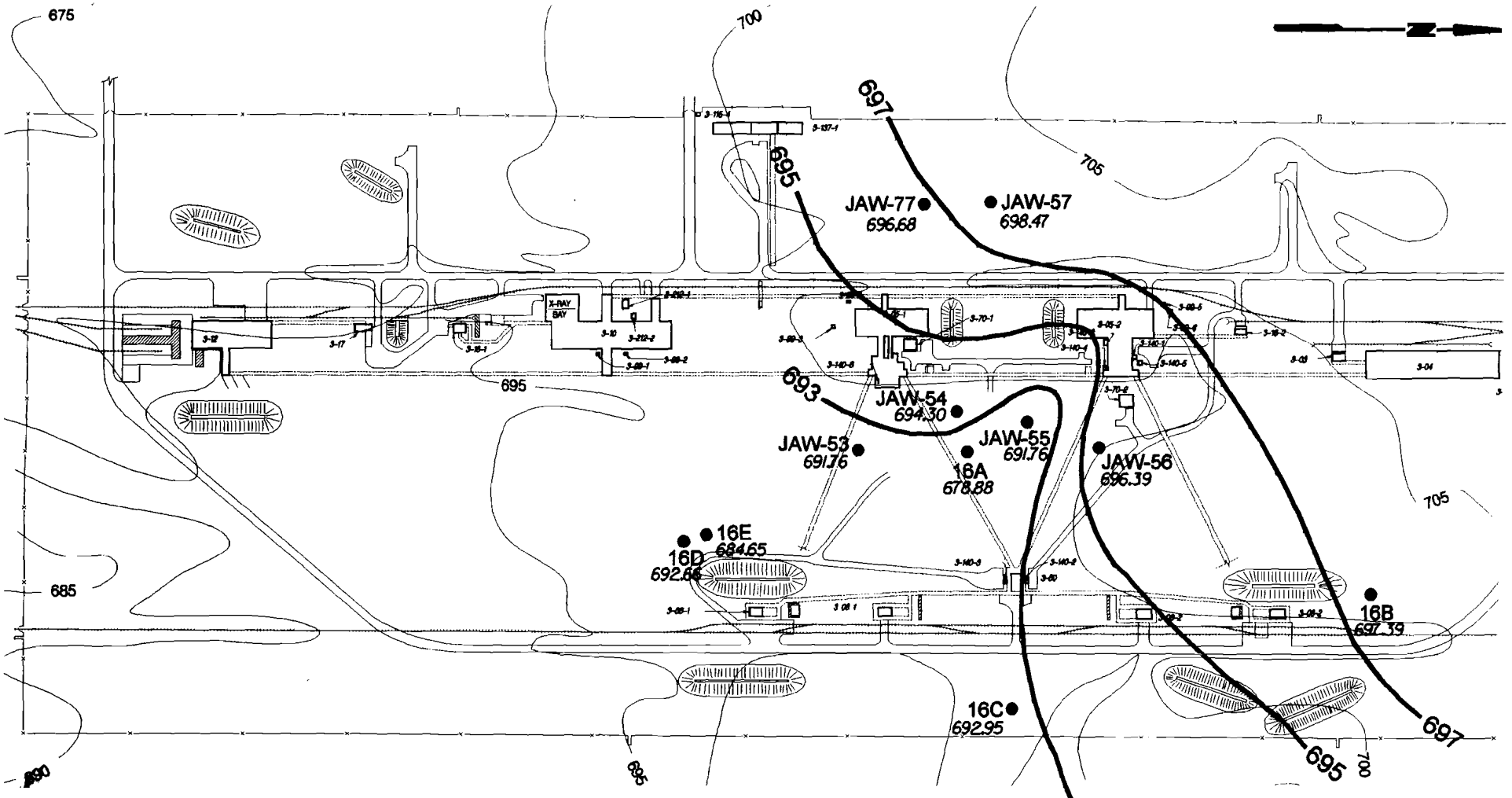

LEGEND:

- Road
- Walkway
- Fence
- Building Number
- Berm (Explosion Protection)
- Topographic Contour Contour Interval = 5 Feet
- Intermittent Stream
- Monitoring Well / Piezometer
- 694.30 Groundwater Elevations
- 680 Generalized Potentiometric Contour (Shallow Till)

Scale 0 250 500 Feet

Figure 3-28

GENERALIZED POTENTIOMETRIC CONTOURS, LINE 3 (Task 16)

SUPPLEMENTAL GROUNDWATER RI

IOWA ARMY AMMUNITION PLANT

Middletown, Iowa

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4.0 PHYSICAL CHARACTERISTICS OF THE STUDY AREA

This section outlines the overall geologic, hydrogeologic, and surface water characteristics of the IAAAP based on results of specific tasks discussed in Section 3.0 and additional information reported by JAYCOR (1996). Detailed geologic and groundwater information available in specific site areas is referenced to those sources.

4.1 Geology

The IAAAP is located in the Dissected Till Plain section of the Central Lowland Province of the Southern Iowa Drift Plain Region. The site is underlain by a sequence of unconsolidated deposits of Pleistocene age, including surficial loess and thick glacial tills, underlain by sedimentary bedrock units.

The loess deposits at the IAAAP are fine-grained, poorly sorted materials deposited by wind action in the Wisconsin period. They overlie the glacial drift intermittently at thicknesses up to a reported 26 feet, averaging 6 to 8 feet.

The glacial tills at the IAAAP are part of the Kellersville Till Member (Illinoisan Age) of the Glasford Formation of southeastern Iowa. The Kellersville Till is subdivided into a subglacial or basal till and a superglacial facies. The basal till facies is composed of firm, dense, over-consolidated till of rather uniform texture and is distinguished by its rich illite and dolomite content. The superglacial facies is composed of a wide variety of sediments and is highly variable in texture and density. The sediments in the superglacial facies include reworded till, sorted fluvial and lacustrine sediments, and peat beds. The tills extend to depths in excess of 100 feet in portions of the north half of the IAAAP, but are absent locally in deeper stream valleys in the south and generally thinner in the northwest.

The bedrock underlying IAAAP consists of a sequence of limestones interbedded with varying thicknesses of shales and sandstones, ranging in age from Cambrian to Mississippian. The uppermost bedrock unit beneath the site is associated with the Mississippian Osage Series of southeastern Iowa, composed predominantly of cherty carbonate rocks (limestones) interstratified with minor amounts of shale. The Osage series is divided into three members: the Warsaw Formation, Keokuk Limestone, and Burlington Limestone. The Warsaw Formation consists primarily of blue-gray calcareous shales, fragmental, fossiliferous, dolomitic limestone, and calcarenites.

The depth to bedrock varies widely across the IAAAP. Depths in excess of 100 feet are reported locally in the northern half of the Site, while the bedrock is exposed along the edges of the Skunk River Valley in the southwest and near the Mathes Lake dam. In core borings completed for this study, the bedrock is described as generally gray, hard to weathered, locally fossiliferous and vuggy limestone varying between closely fractured and massive. Shale sequences are reported from previous borings completed by others. The upper part of the bedrock, where cored, typically is more

highly fractured than at greater depths and is somewhat weathered, providing a more permeable zone relative to the overlying clay tills or the likely less fractured deeper bedrock zones. However, transmissivity of the upper bedrock is suggested to be highly variable locally.

Available top of bedrock elevation data were used to develop elevation contours on the top of bedrock surface across the plant, shown on Figure 4-1. These data were complemented by information on bedrock surface exposures obtained during geologic reconnaissance mapping, also shown on Figure 4-1. The exposure areas shown represent areas where bedrock is continuously exposed, or is intermittently exposed suggesting that bedrock is very shallow in the general area.

Based on the available data, bedrock beneath the IAAAP occurs between approximate elevations 565 and 670. Bedrock is exposed along portions of the Skunk River valley bluff and within the lower reaches of Long and Brush Creeks, as well as locally elsewhere. The bedrock surface can be characterized as generally flat between approximate elevations 625 and 650, dissected by a buried valley feature bisecting the plant from the west central area to the east and southeast. Thus, bedrock is at or above elevation 650 beneath the southwest and south portions of the site and the northeast corner, but is generally below elevation 600 within the buried valley. From northwest to southeast, the valley trends beneath Line 9, most of Line 3, the south half of Line 2, and Yard D just east of and parallel to the present surface trace of Brush Creek. Just off-site to the south, the bedrock surface is expected to drop rapidly toward the Skunk River Valley. Figures 4-2 and 4-3 show the configuration of the bedrock surface along two generalized profiles across the IAAAP.

4.2 Hydrogeology

4.2.1 Hydrogeologic Units

The IAAAP is underlain by four principal hydrogeologic units: the glacial drift and bedrock units of Mississippian, Devonian, and Cambro-Ordovician age. Drilling and sampling completed during this, and previous site investigations, are limited to the glacial drift and the upper portion of the Mississippian bedrock.

The uppermost hydrogeologic unit consists of Pleistocene age unconsolidated deposits including surficial loess overlying glacial till. Thin fluvial deposits underlie active stream beds, but are generally less than 3 feet thick and of no significance hydrogeologically. The glacial deposits occupy the upland till terrace and are predominantly clayey and silty glacial tills. They range up to more than 100 feet thick locally, but are absent or very thin in portions of the southwest and south part of the site.

Bedrock encountered at IAAAP consists predominantly of limestone and shaley limestone with shale interbeds. Site data suggest that the drift and upper bedrock aquifer are in hydraulic communication, thus comprising a single hydraulic system. The bedrock is exposed at the surface sporadically in the southwest part of the plant, around Mathes Lake, and locally along the Skunk River valley bluff south of the plant. As noted, it is found in depths of more than 50 to 100 feet elsewhere at IAAAP.

4.2.2 Groundwater Occurrence

Field data generated by this and previous site investigations indicate that the glacial drift contains little free groundwater and acts as an aquitard, slowing precipitation recharge of the underlying bedrock. Groundwater occurrence in the drift is highly variable, both laterally and vertically. Field observations during development and sampling of wells demonstrate that many wells can be pumped dry or are drawn down significantly even under very small pumping rates. Based on observations during drilling, most identifiable groundwater recharge to the wells and borings derives from silt and sand seams within the clayey till. These seams, when present, range up to 1 or 2 feet thick, but generally are much thinner. When encountered within the drift, they are sporadic in occurrence, occur at variable depths, and appear discontinuous and not interconnected. Review of boring logs suggests the sparse frequency of silt and sand, water-bearing seams within the predominantly clayey drift is similar across the IAAAP. However, some variation is noted, with somewhat more frequent occurrences of silty soils and/or sand seams locally. For example, this appears to be the case in the upper drift in parts of Line 3 (see Section 3.16), east of Brush Creek in the downstream reaches (see Section 3.13), and locally elsewhere, such as some of the sites in the general Explosive Disposal Area at the headwaters of Spring Creek. Nonetheless, high clay content is typical of the vast majority of the drift soils. Although some existing wells reportedly encountered sand just above the bedrock surface, most did not and no extensive basal sand or gravel unit appears to be present at the site.

Although, as noted, the quantity of free groundwater in the drift is very limited due to the clayey soils and the paucity of significant water-bearing strata, hydraulically the drift is saturated below shallow depths and appears to be hydraulic communication with the bedrock (e.g. there is a hydraulic head continuum from the shallow water table to the upper bedrock). This is demonstrated by the observation that all wells deeper than about 10 or 15 feet eventually recharge and are found to contain water, even where no identifiable groundwater was encountered during drilling.

In the limestone bedrock, groundwater occurs primarily within open bedding planes and/or joints and groundwater occurrence and flow is controlled by the presence, properties, and orientation of these features. It is common in the upper midwest for much of the groundwater in these bedrock units to be found in the more fractured and weathered upper sequence, just under the drift. Limited cores obtained in this investigation indicate that fracturing and weathering is variable in the upper bedrock units and, thus, groundwater yields from these units vary widely. This is supported by results of several slug tests in wells which show hydraulic conductivity in the upper bedrock varying from low at 1×10^{-6} cm/sec (0.0029 ft/day) to moderately high at 1.2×10^{-2} cm/sec (34.9 ft/day). Because porosity in this type of bedrock depends almost entirely on open fractures and bedding planes, groundwater occurrence and permeability can vary widely over very short distances both horizontally and vertically and is unpredictable.

4.2.3 Groundwater Flow

Groundwater elevations measured in drift wells at the site are plotted on Figure 4-4. The groundwater table in the drift generally occurs within 10 feet of the ground surface, and often less.

Piezometric data from well pairs and clusters show that a significant downward vertical gradient exists within the drift, and between the drift and the bedrock, throughout the IAAAP except in the immediate vicinity of major streambeds. Thus: a) piezometric levels measured in wells increase in depth with increasing depth of screen; b) true water table conditions can be measured only in wells screened across the water table; and c) the horizontal component of gradient can be determined only from wells screened at equivalent elevations. Most monitoring wells at IAAAP are screened at shallow depths (less than 20 or 30 feet) and generally reflect the shallow drift - either true or almost true water table conditions. These data show that shallow groundwater flow closely parallels the ground surface. Thus, as a general rule, surface topography defines and illustrates shallow groundwater flow as it does surface water runoff. Resulting flow patterns are locally complex, due to variable topography, and are difficult to illustrate meaningfully with potentiometric contours, which accordingly were not prepared for the base as a whole (potentiometric data for individual plant facilities are provided in Sections 3.0 and 5.0). However, based on topography, supported by review of groundwater elevations, flow within the base is from topographic highs, including most of the Line and Yard areas, toward surface drainages, particularly the larger streams such as Spring, Brush, and Long Creeks and the Skunk River. This supports results of mini-piezometer measurements, discussed in Section 3.8, which demonstrate that the streams are gaining within the IAAAP property.

Piezometric data collected in Line 2, particularly wells 10A and 10B, are of further significance in understanding the drift flow regime. These wells are screened over a 40 foot depth range, between 10 and 50 feet below ground surface. Almost all other wells, either shallow or deep, are provided with only 10 foot screens. Normally, the effective depth of a screened interval can be approximated by the midpoint depth of the screen; 30 feet for wells 10A and 10B and about 15 feet for other shallow wells at Line 2. Because of the vertical gradients within the drift, deeper piezometric levels would be expected in 10A and 10B compared to the shallower wells. However, the measured levels are equivalent, reflecting conditions in the shallow drift zone, despite the longer and deeper screen. This suggests the majority of the groundwater inflow to wells 10A and 10B, and of the piezometric head measured by these wells, is derived from the shallow zone rather than the deeper. This further suggests that most of the active groundwater flow in the drift occurs within the upper 20 to 25 feet.

The glacial drift is recharged directly by infiltration of precipitation. Because of its small permeability, particularly vertically, as discussed later in this section, the rate of recharge is small with most precipitation lost by evapotranspiration and surface runoff. Discharge from the drift is primarily by lateral flow to site streams, clearly indicated by the shallow water table into which the streams are incised, and by mini-piezometer testing in this investigation, which show the streams to be gaining throughout their length. Some lateral groundwater flow in the deep portions of the drift bypasses the streams, where they are not deeply incised. However, ultimately the groundwater will discharge to surface water at larger rivers such as the Skunk River. The drift aquifer also discharges downward to the bedrock aquifer. However, this component of recharge is expected to be very small compared to lateral flow, probably by several orders of magnitude. This is due to higher permeabilities in the horizontal plane caused by primary structure of the clayey deposits and because sporadic silt and sand seams through which most flow occurs are oriented horizontally.

Sitewide, available groundwater levels suggest that overall flow direction in the bedrock is to the south and east, toward the Skunk and Mississippi Rivers. However, as illustrated by generalized potentiometric contours on Figure 4-4, flow patterns are effected by surface topography when viewed at the scale of the IAAAP. Therefore, although flow in the bedrock is generally south and east, patterns in specific plant areas vary widely.

The bedrock aquifer is recharged primarily by subsurface inflow from upgradient (north and west) and secondarily by downward infiltration from the drift. Because the bedrock is exposed in downstream reaches of some of the streams, the bedrock aquifer is recharged directly by precipitation in local areas. This is not expected to significantly effect groundwater flow or contaminant migration, if any, in the bedrock at the site. The bedrock generally does not appear to discharge to the surface or to surface waters on-site, except in the vicinity of the Mathes Lake dam spillway on Long Creek. However, such discharge is expected in major regional drainages, including the Skunk and Mississippi Rivers.

Available data on hydraulic properties of the drift soils indicate low permeabilities throughout the plant and consequent small recharges to wells. Results of field tests obtained during the supplemental RI and also reported by JAYCOR (1996) are summarized in Table 4-1.

Table 4-1 Summary of Field Permeability Tests

Well	*Location*	*Unit (Screen Depth in feet)*	*Estimated Hydraulic Conductivity*	
			cm/sec	*ft/day*
12A	*Line 2*	*Drift (10.5-20.5)*	5.36×10^{-4}	*1.520*
12B	*Line 2*	*Drift (10.5-20.5)*	6.31×10^{-4}	*1.788*
12C	*Line 2*	*Drift (40.2-50.2)*	1.39×10^{-5}	*0.0395*
12D	*Line 2*	*Bedrock (110-120)*	1.00×10^{-6}	*0.00285*
12G	*Line 2*	*Drift (10.3-20.3)*	2.29×10^{-5}	*0.065*
13B	*Brush Creek, Downstream*	*Bedrock (33.6-43.6)*	1.23×10^{-2}	*34.88*
13D	*Brush Creek, Downstream*	*Drift (74.8-84.8)*	1.42×10^{-6}	*0.0040*
16B	*Line 3*	*Drift (15.1-25.1)*	6.46×10^{-7}	*0.00183*
16C	*Line 3*	*Drift (15.6-25.6)*	2.42×10^{-5}	*0.0685*
*16D **	*Line 3*	*Drift (15-25)*	2.42×10^{-2}	*68.57*
16E	*Line 3*	*Drift (45-55)*	1.33×10^{-6}	*0.0038*
*G3 ***	*Northwest Boundary*	*Drift (20.5-30.5)*	6.71×10^{-5}	*0.19*
*G7 ***	*Inert Disposal Area*	*Drift (32-42)*	9.95×10^{-5}	*0.28*
*G10 ***	*Demolition Area*	*Bedrock (14-24)*	2.78×10^{-5}	*0.079*
*G12 ***	*Southwest Boundary*	*Drift (9.5-19.5)*	2.55×10^{-4}	*0.72*
*G14 ***	*Line 1/Brush Creek*	*Drift (26-36)*	8.56×10^{-4}	*2.42*
*G17 ***	*Line 800*	*Drift (9-19)*	1.62×10^{-4}	*0.46*
*G18 ***	*Line 800*	*Drift (9-19)*	1.08×10^{-4}	*0.30*
*G20 ***	*Line 800*	*Drift (9.5-19.5)*	1.50×10^{-3}	*4.25*
			4.63×10^{-4}	*1.31*
*G21 ***	*South Boundary*	*Drift (7-17)*	1.39×10^{-3}	*3.92*
*G24 ***	*Southeast Perimeter*	*Bedrock (6-16)*	5.21×10^{-4}	*1.47*

Table 4-1 Summary of Field Permeability Tests

Well	Location	Unit (Screen Depth in feet)	Estimated Hydraulic Conductivity	
			cm/sec	ft/day
G29 **	Explosive Disposal Area	Drift (8-18)	6.60×10^{-5}	0.19
G41 **	Line 800	Drift (9.8-19.8)	1.16×10^{-4}	0.33
G45 **	Line 800	Drift (30-40)	6.94×10^{-4}	1.96
G46 **	Line 800	Bedrock (58-68)	1.16×10^{-4}	0.33

* Test data anomalous. ** Reported by JAYCOR, 1996.

Based on these data, permeability values in the screened intervals of drift wells ranged from 1.39×10^{-3} (3.92 ft/day) to 6.46×10^{-7} cm/sec (0.0018 ft/day). Since many wells are screened to span at least limited sandy or silty zones, these values tend to overstate the permeability of the drift sequence as a whole. Nonetheless, the values are generally consistent with silty/clayey type soils found at the site. They also are demonstrated by slow recharge rates to monitoring wells observed during site investigations, many of which could be bailed or pumped dry at slow discharge rates. Based on the available data, there is no clear pattern of permeability distribution either laterally across the site or with depth. However, most of the available test data are derived from the shallow drift zone, less than about 25 feet deep. This shallow zone would be expected to be somewhat more weathered and less consolidated than deeper drift sections and, therefore, to be more permeable. As illustration, of the 7 test results exceeding 5×10^{-4} cm/sec in the drift, 4 are from this shallow zone and the remaining 2 only slightly deeper.

JAYCOR (1996) reported results of laboratory permeabilities for till samples ranging from 2.4×10^{-7} to 9.6×10^{-9} cm/sec, two or more orders of magnitude lower than the field tests. Laboratory tests are typically considered to represent vertical hydraulic conductivity whereas field tests in screened monitoring wells represent principally horizontal permeability. The difference in these values in part reflects basic differences in test procedures. However, horizontal permeability in clayey till soils typically is significantly greater than vertical permeability because of natural alignment of platy soil particles and the horizontal orientation of sand seams caused by depositional environment. In any event, the very low permeabilities indicated by the laboratory tests confirms that downward infiltration through the tills will be extremely slow.

Limited hydraulic conductivity data is available for bedrock wells at the site and indicate a wide range of values from moderately high at 1.23×10^{-2} cm/sec (34.9 ft/day) to low at 1.0×10^{-6} (0.0029 ft/day). This is due to the variable occurrence of open fractures and/or bedding planes and can be expected to persist throughout the site. This will affect local groundwater flow to the extent that the rate and direction of flow will be controlled by the presence, properties, orientation, and degree of interconnection of open fractures and bedding planes. Fractures at the IAAAP typically are near-vertical and appear generally to occur in two primary sets, roughly north-south and east-west. Bedding planes are near-horizontal. In three dimensions, these features intersect and provide the overall permeability and porosity of the rock mass, controlled by the number, properties and frequency of their occurrence. In general, the uppermost bedrock units, either beneath the ground surface or beneath the drift, would be expected to be more closely fractured and, thus, have the

higher permeabilities. In these areas, intersecting fractures could be sufficiently close so that groundwater flow would resemble flow in porous media, controlled by overall rock mass permeability and the direction and magnitude of hydraulic gradient. In bedrock masses not characterized by such closely spaced fracture systems, as might be expected at greater depths but also in shallower zones, local groundwater flow can be constrained to a single fracture or group of fractures. In these circumstances, which are expected to exist in parts of the IAAAP, groundwater flow and any contaminant transport would depend on the properties of the individual fracture or fracture group; flow direction would be influenced by the orientation of the fracture(s) rather than solely by the direction of gradient, and flow rate would be controlled by the width and properties of the individual feature rather than the properties of the rock mass as a whole. For these reasons, although regional groundwater flow in the bedrock is predictable and toward the Mississippi River valley and other major drainages, local flow in the bedrock can be highly variable.

4.3 Surface Water

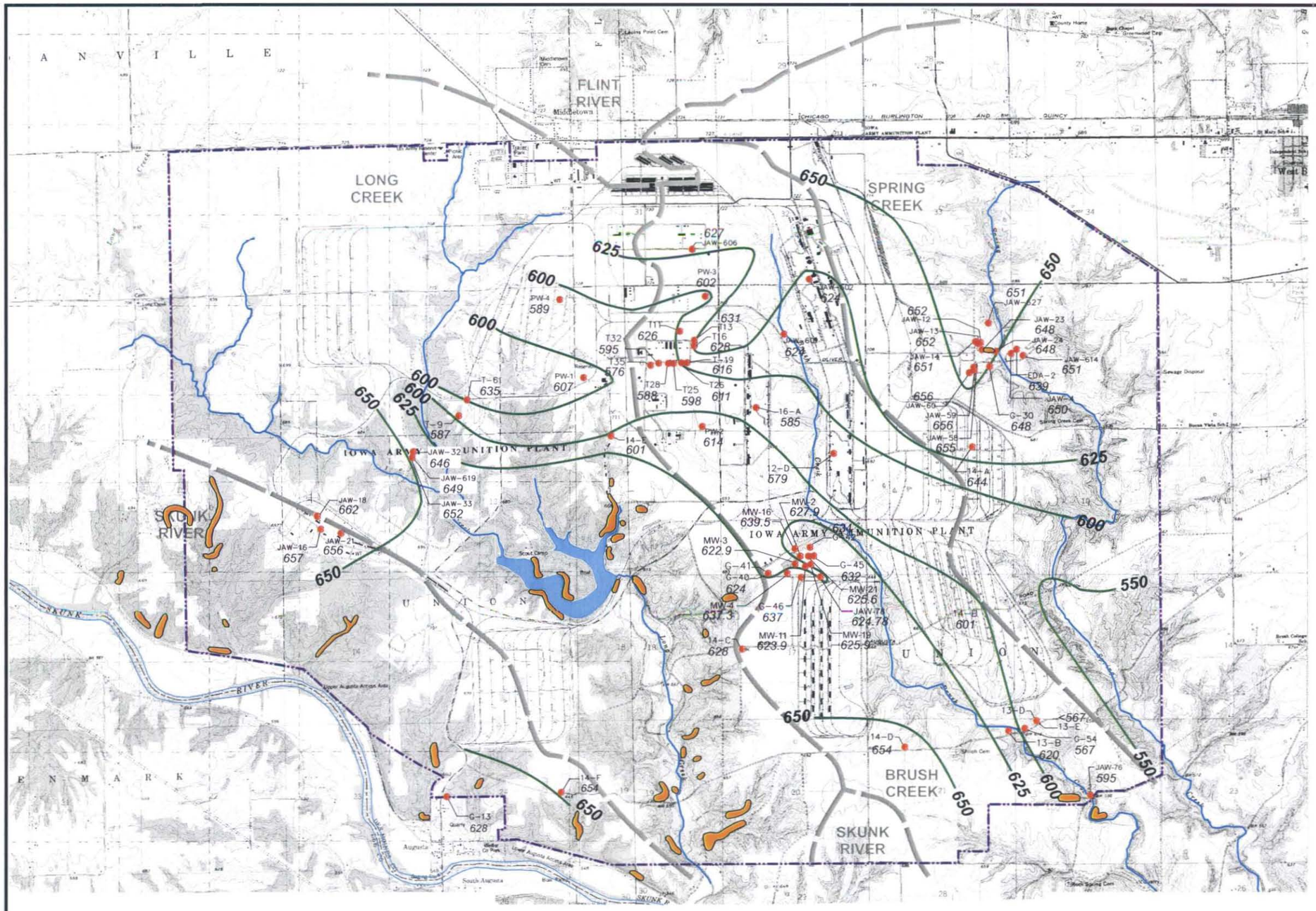
The IAAAP is drained by five water courses shown previously on Figure 1-3 and other maps. Little Flint Creek drains a small area in the north of the site. The rest of the base is drained by the Skunk River, Long Creek, Brush Creek and Spring Creek. Long Creek is a tributary of the Skunk River, which flows to the Mississippi River. Brush and Spring Creeks are tributaries of the Mississippi River.

Stream flow within the IAAAP comprises three principal elements: surface runoff; groundwater inflow; and discharges under NPDES. Runoff occurs only during rain events, while NPDES discharges are monitored and can be evaluated. During a typical low flow event (taken as May 24, 1997, which included four preceding days with insignificant rainfall), flows in Brush Creek ranged from 0.11 cfs at the upstream end adjacent to Line 1 to 2.65 cfs (including 0.8 cfs wastewater discharge), at K Road on the downstream end. Measured flows in Spring Creek during this event were 1.25 cfs at the upstream end east of Yard C (flow was not measured at the downstream end of Spring Creek due to equipment failure). These flows, less the known wastewater discharges, represent groundwater contributions to the creek.

During a significant wet weather event (May 25, 1997, which included 0.86 inches of precipitation in 110 minutes), peak flows in Brush Creek ranged from 3.1 cfs at the upstream end to 17.3 cfs (including 1.6 cfs of wastewater discharge) at the downstream end. Peak flows in Spring Creek were not measured during this event due to equipment failure, but computer simulations predicted a peak flow of 11 cfs at the upstream end and 19 cfs at the downstream end.

Based on these evaluations, groundwater contributions to the streams, primarily Brush Creek, appear to increase significantly from upstream to downstream across IAAAP. This may be due to hydraulic heads adjacent to the creek increasing as the creek becomes more deeply incised and results in good correlation between groundwater contributions to the creek during low flow conditions and groundwater head.

FIGURES



N

LEGEND:

- PLANT PROPERTY BOUNDARY
- 14-A BEDROCK-PENETRATING MONITORING WELL/PIEZOMETER
- 644 BEDROCK ELEVATION
- GENERALIZED BEDROCK EXPOSURE AREA
- GENERALIZED TOP OF ROCK ELEVATION CONTOUR
- DRAINAGE BASIN BOUNDARY

NOTE:
This map incorporates data collected after 1997.

Scale 0 2000 4000 6000 8000 Feet

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Figure 4-1
BASEWIDE TOP OF BEDROCK CONTOURS
SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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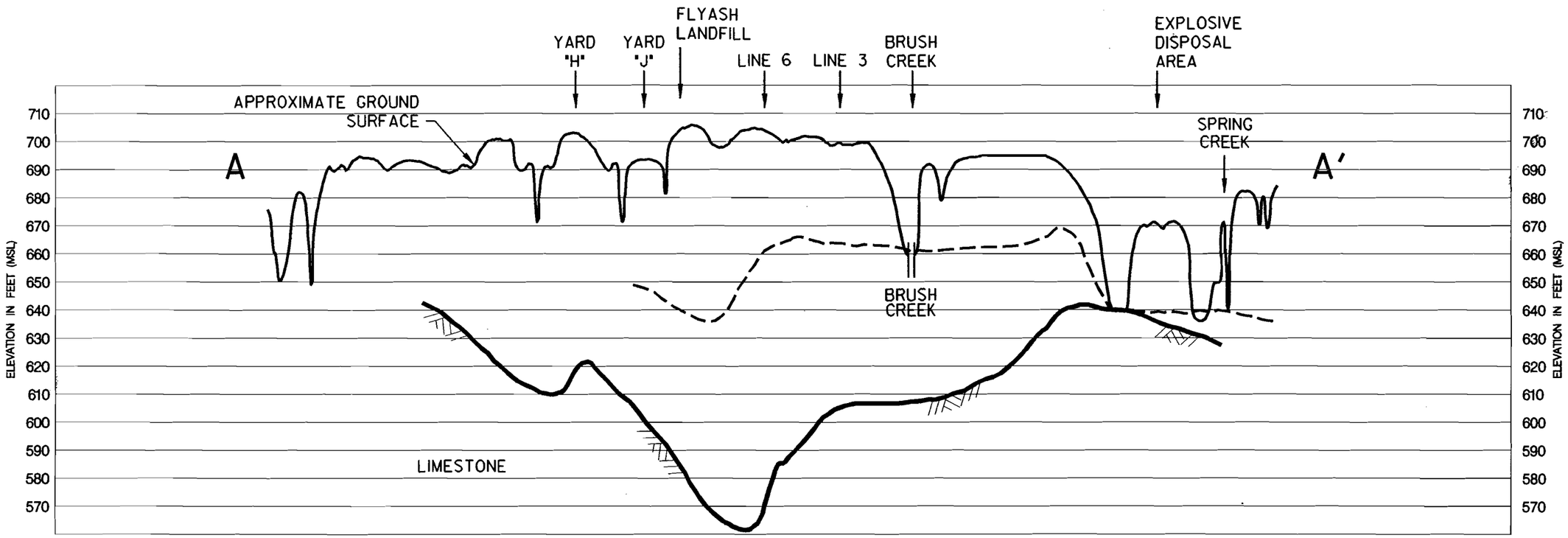

LEGEND:

Piezometric Surface Bedrock Aquifer

Generalized Top of Bedrock

Horizontal Scale 0 — 4000 Feet

Vertical Scale 0 — 40 Feet

NOTES:

1. Shallow drift potentiometric levels within 10 feet of ground surface.
2. See Figure 4-4 for section location.

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Figure 4-2

GENERALIZED BASEWIDE HYDROGEOLOGIC CROSS SECTION A-A'

SUPPLEMENTAL GROUNDWATER RI

IOWA ARMY AMMUNITION PLANT

Middletown, Iowa

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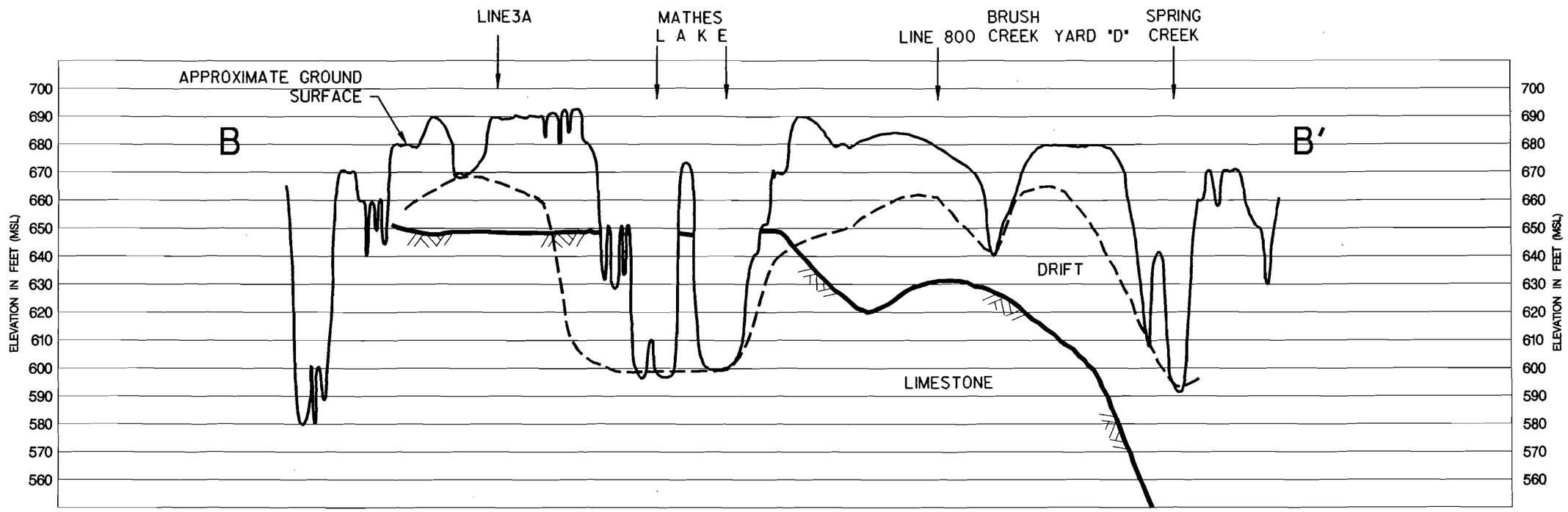

LEGEND:

Generalized Piezometric Surface Bedrock Aquifer

Generalized Top of Bedrock

Horizontal Scale 0 — 4000 Feet

Vertical Scale 0 — 40 Feet

NOTES:

1. Shallow drift potentiometric levels within 10 feet of ground surface.
2. See Figure 4-4 for section location.

Figure 4-3

GENERALIZED BASEWIDE HYDROGEOLOGIC CROSS SECTION B-B'

SUPPLEMENTAL GROUNDWATER RI

IOWA ARMY AMMUNITION PLANT

Middletown, Iowa

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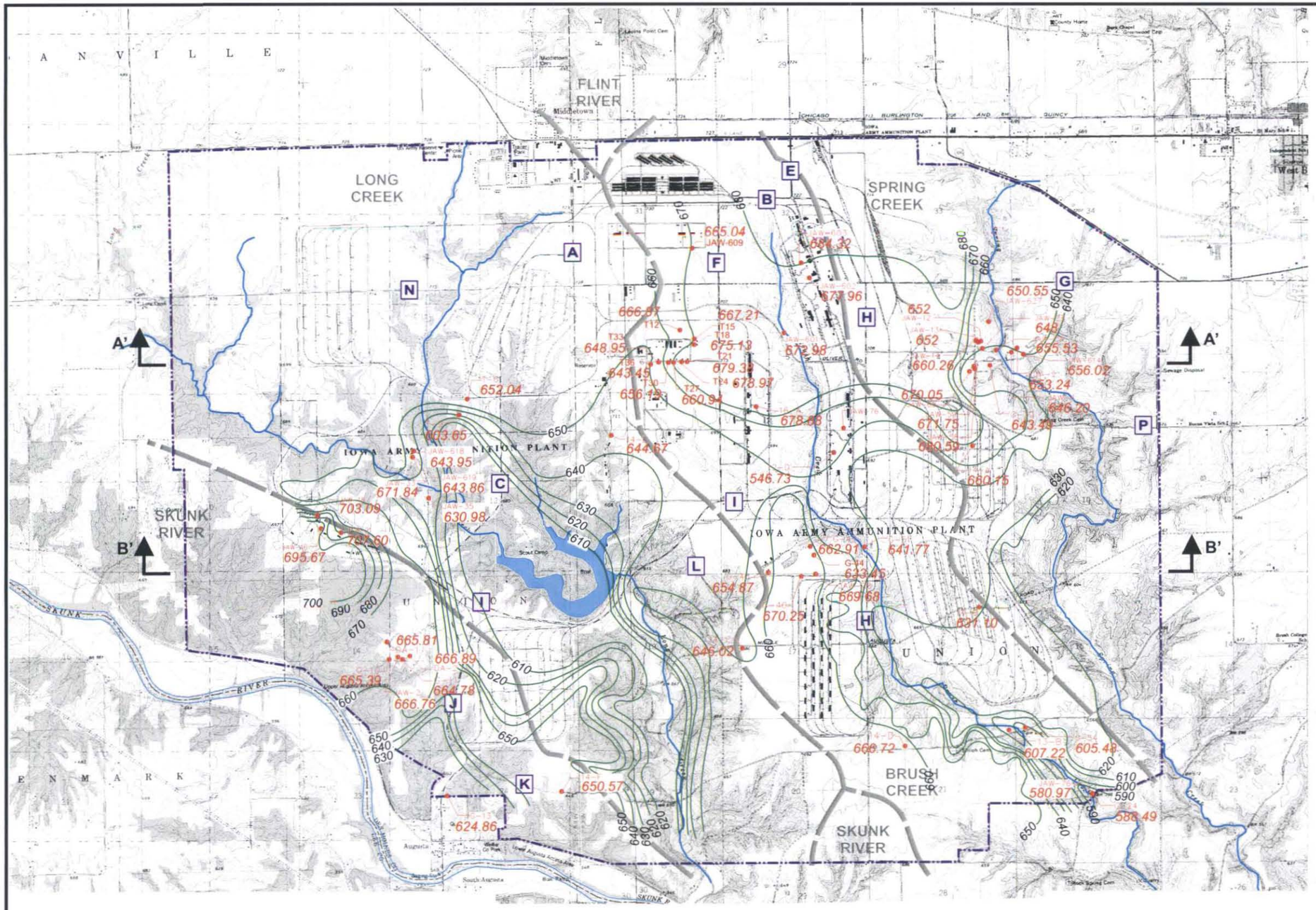

N

LEGEND:

- PLANT PROPERTY BOUNDARY
- BEDROCK-PENETRATING MONITORING WELL/PIEZOMETER
- 660.15 BEDROCK ELEVATION
- A ROAD NAME
- POTENTIOMETRIC CONTOUR
- BASIN BOUNDARY

NOTES:

1. See Figure 4-2 for A-A' Cross Section
2. See Figure 4-3 for B-B' Cross Section

Scale 0 2000 4000 6000 8000 Feet

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Figure 4-4

BASEWIDE POTENTIOMETRIC CONTOUR MAP, UPPER BEDROCK

SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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5.0 NATURE AND EXTENT OF CONTAMINATION

5.1 General

This section discusses the nature and extent of groundwater contamination at IAAAP. Surface water, sediment, and soil are discussed to the extent that analytical results were obtained in Task 7 *(Surface Water and Sediment Sampling, Site Drainages)* and Task 11 *(Soil and Groundwater Sampling for VOCs)* of this supplemental RI. The discussion of groundwater is based primarily on analytical data obtained in this supplemental RI and presented in Section 3.0 and on monitoring data provided by Mason & Hanger for the Second Cycle, FY1997 sampling, the most recent available. Additional data are taken from the Revised Draft Final Remedial Investigation/Risk Assessment Report (JAYCOR 1996), primarily for wells not sampled in this investigation or by Mason & Hanger. A summary tabulation of analytical data from these sources is provided in Appendix J. Laboratory reports for samples analyzed in this supplemental RI are provided in Appendices K and L.

The discussion is organized by major watershed; Spring Creek, Brush Creek, Long Creek, and the Skunk River. Within each watershed, the nature and extent of contamination are summarized with respect to individual plant facilities and for the watershed as a whole. The location of plant facilities and watershed boundaries are included on Figure 5-1. Other figures are referenced in the text as needed to illustrate the nature and extent of contamination in the individual watersheds.

5.2 Preliminary Remedial Goals for Groundwater

Proposed Preliminary Remedial Goals (PRGs) were identified to help delineate the nature and extent of contamination. PRGs are USEPA Maximum Contaminant Levels (MCLs) or lifetime Health Advisory Levels (HALs), where available (USEPA, 1996c). Where not available, USEPA (1996b) Region IX PRGs for tap water generally were used. No lifetime HALs were available from USEPA for the 2,4-dinitrotoluene or 2,6-dinitrotoluene. However, published USEPA HALs equivalent to the 10^{-4} cancer risk and Region IX PRGs for non-carcinogenic health effects were both available. The published HALs equivalent to the 10^{-4} cancer risk were significantly lower than the Region IX PRGs for these chemicals and, therefore, were selected as the more conservative. For some inorganic nutrients, such as calcium and iron, Recommended Daily Allowance (RDA) values were also used. Proposed PRGs are summarized in Table 5-1 and an annotated summary is provided in Appendix M.

Table 5-1. Proposed Preliminary Remedial Goals for Groundwater

Chemical	*Proposed PRG (ug/L)*	*Source*	*Chemical*	*Propose PRG (ug/L)*	*Source*
Metals			***VOCs***		
Aluminum	*37,000*	*PRG[b]*	*Acetone*	*610*	*PRG[b]*
Antimony	*3*	*HAL*	*Benzene*	*5*	*MCL*
Arsenic	*50*	*MCL*	*sec-Butylbenzene*	*61*	*PRG[b]*
Barium	*2,000*	*MCL*	*Carbon disulfide*	*21*	*PRG[b]*
Beryllium	*4*	*MCL*	*Carbon tetrachloride*	*5*	*MCL*

Table 5-1. Proposed Preliminary Remedial Goals for Groundwater

Chemical	Proposed PRG (ug/L)	Source	Chemical	Propose PRG (ug/L)	Source
Cadmium	5	MCL	Chlorobenzene	100	MCL
Calcium	600,000	RDA	Chloroform	100	MCL
Chromium (total)	100	MCL	1,2-Dichlorobenzene	600	MCL
Copper (at tap)	1,300	MCL*	1,5-Dichlorobenzene	75	HAL
Iron	6,000	RDA	1,1-Dichloroethane (1,1-DCA)	790	PRG[b]
Lead (at tap)	15	MCL*	1,1,2-Dichloroethane (1,2-DCA)	5	MCL
Magnesium	150,000	RDA	1,1-Dichloroethene (1,1-DCE)	7	MCL
Manganese	1,700	PRG[b]	1,2-Dichloroethane (1,2-DCA)	5	MCL
Mercury	2	HAL	cis-1,2-Dichloroethene (cis-1,2-DCE)	70	MCL
Nickel	100	HAL	Ethylbenzene	700	MCL
Potassium	2,925,000	RDA	Methylene chloride	5	MCL
Selenium	50	MCL	Methyl ethyl ketone	1,900	PRG[b]
Silver	100	HAL	Methyl isobutyl ketone	160	PRG[b]
Thallium	0.5	HAL	Tetrachloroethylene	5	MCL
Vanadium	260	PRG[b]	Toluene	1,000	MCL
Zinc	2,000	HAL	Trichloroethene (TCE)	5	MCL
SVOCs			1,1,1-Trichloroethane (1,1,1-TCA)	200	MCL
Fluorene	240	PRG[b]	1,1,2-Trichlorotrifluoroethane (Freon)	59,000	PRG[b]
2-Methylphenol	1,800	PRG[b]	1,2,4-Trimethylbenzene	3	PRG[b]
Naphthalene	20	HAL	1,3,5-Trimethylbenzene	2.4	PRG[b]
Bis(2-ethylhexyl)phthalate	6	MCL	Vinyl chloride	2	MCL
Diethylphthalate	5,000	HAL	Xylenes (total)	10,000	MCL
Phenol/Carbolic acid	4,000	HAL			
Explosives					
1,3,5-Trinitrobenzene (1,3,5-TNB)	1.8	PRG[b]	Nitrobenzene (NB)	3.5	PRG[b]
1,3-Dinitrobenzene (1,3-DNB)	1	HAL	Nitrotoluene (NT)	370	PRG[b]
2,4-Dinitrotoluene (2,4-DNT)	5	(a)	2-Nitrotoluene (2-NT)	370	PRG[b]
2,6-Dinitrotoluene (2,6-DNT)	5	(a)	3-Nitrotoluene (3-NT)	370	PRG[b]
2,4,6-Trinitrotoluene (2,4,6-TNT)	2	HAL	4-Nitrotoluene (4-NT)	370	PRG[b]
4-Amino-2,6-dinitrotoluene	NA	NA	Hexahydro-1,3,5-trinitro-1,3,5-triazine RDX)	2	HAL
2-Amino-4,6-dinitrotoluene	NA	NA	Tetryl	NA	NA
Octahydro-1,3,5,7-tetrazocine (HMX)	400	HAL			

NA = Not available. * = Treatment Technology.
(a) 10^{-4} cancer risk. (b) USEPA Region IX PRG (1996)

5.3 Spring Creek Watershed

5.3.1 Groundwater

The Spring Creek watershed drains the east portion of the IAAAP, extending to the east boundary. Industrial facilities associated with groundwater contamination in this drainage are the East Burn Pads, North Burn Pad, West Burn Pad, Fire Training Pit, and Ammunition Box Chipper Disposal Area. These are located in general proximity to each other in the north-central part of the watershed,

near the headwaters of the creek. Various arms of Spring Creek are present just east of the East Burn Pads, between the East Burn Pads and the North and West Burn Pads, between the burn pads and the Fire Training Pit, and to the south of these facilities. The Ammunition Box Chipper Disposal Area is located in a flat area approximately 2 mile further west. Principal contaminants associated with these facilities are explosive chemicals, except the Fire Training Pit, where VOCs are the principal contaminants. The location of the facilities and groundwater concentrations exceeding PRGs are illustrated on Figure 5-1. Although contaminants in groundwater in these areas appear associated with the individual sources and are not interconnected, together they represent a general area of groundwater contamination because of their proximity to each other. The nature and extent of contamination in the individual areas are described in the following paragraphs.

East Burn Pads. The East Burn Pads is the easternmost of the facilities listed above, located between Spring Creek to the west and a tributary to the east. Chemicals exceeding PRGs are listed in Table 5-2, below.

Table 5-2. Chemicals Exceeding PRGs, East Burn Pads

Well	*Chemical*	*Screening Criterion (ug/L)*	*Concentration (ug/L)*	*Source*
EDA2	*RDX*	*2 (HAL)*	*77*	*2*
EDA4	*RDX*	*2 (HAL)*	*19*	*2*
G29	*RDX*	*2 (HAL)*	*5.5*	*2*
JAW614	*RDX*	*2 (HAL)*	*3.4*	*2*
JAW6	*TCE*	*5 (MCL)*	*8*	*2*
	Methylene Chloride	*5 (MCL)*	*15*	*2*
JAW4	*Bis(2-ethylhexyl)phthalate*	*6 (MCL)*	*16*	*2*
JAW64	*Bis(2-ethylhexyl)phthalate*	*6 (MCL)*	*80*	*2*

Source: (1) = Harza 1997; (2) = Mason & Hanger, 2nd Cycle, 1997; (3) = JAYCOR, 1996.

RDX was reported below the PRG in all other wells at the site, except EDA1, ranging from 0.21 ug/L to 0.87 ug/L. Other explosives detected below screening levels were: HMX at 0.17 ug/L in JAW6 and 76 ug/L in EDA4 and 2,4,6-TNT at 1.0 ug/L in EDA3. Bis(2-ethylhexyl)phthalate was detected in all other wells below the MCL. Methylene chloride and bis(2-ethylhexyl)phthalate are common laboratory contaminants, but were not flagged as such in the data and, therefore, are included.

The apparent lateral extent of contamination at this site is illustrated on Figure 5-2. EDA4 is located at the northeast end of the facility, EDA2 and JAW614 at the southwest end, and G29 on the southeast side. JAW 6 is located at the east end of the facility. Laterally, the extent of contamination exceeding PRGs is delineated by EDA1 on the north, which was non-detect for explosives, and by JAW5 on the southwest and JAW64, JAW7, JAW35, and EDA3 on the south and east. Each of these wells had been reported as non-detect for explosives by JAYCOR (1996) in 1993, delimiting the extent of contamination toward Spring Creek at that time. However, 1997 data obtained by Mason & Hanger indicate the presence of explosives below PRGs in these wells. At the small concentrations found, this could result from differences in sampling or analytical procedures or could

reflect continued migration of contaminants. However, concentrations of explosives below PRGs extend beyond the available monitoring wells and may be reaching Spring Creek.

The wells at the EDA are relatively shallow, between about 19 and 37 feet deep. However, bedrock also is relatively shallow in the general area and, therefore, EDA2 and JAW614, as well as JAW35, are screened in bedrock. Therefore, explosives exceeding PRGs are present in both the shallow till and in the upper bedrock, particularly at the southwestern end. No deeper wells are available in this area.

North Burn Pads. The North Burn Pad is located just west of Spring Creek, northwest of the EDA and north of the West Burn Pad. Chemicals exceeding PRGs are listed in Table 5-3, below.

Table 5-3. Chemicals Exceeding PRGs, North Burn Pads

Well	*Chemical*	*Screening Criterion (ug/L)*	*Concentration (ug/L)*	*Source*
JAW625	*RDX*	*2 (HAL)*	*5.6*	*2*
JAW627	*RDX*	*2 (HAL)*	*9.4*	*2*

Source: (1) = Harza 1997; (2) = Mason & Hanger, 2nd Cycle, 1997; (3) = JAYCOR, 1996.

RDX also was detected below the PRGs in JAW11, JAW12, JAW13, JAW14 and JAW626. Other detections below the PRGs were: HMX at 0.2 ug/L in JAW14, 5.9 ug/L in JAW625 and JAW627, and 14 ug/L in JAW626; 1,3,5-TNB at 0.13 ug/L in JAW625 and 0.28 ug/L in JAW627; 2,4,6-TNT ranging from 0.15 to 0.42 ug/L in all wells except JAW12, which was dry, and JAW14, which was non-detect; 2,6-DNT at 0.66 ug/L in JAW626 and 0.60 ug/L in JAW627; and 2-NT at 0.46 ug/L in JAW627. No VOCs or SVOCs exceeded PRGs at this site.

The apparent lateral extent of contamination in the north part of this site is illustrated on Figures 5-3 (northern area) and 5-4 (southern area). Wells JAW11, JAW13, and JAW14 are south of the area shown on the map, but did not exceed PRGs. JAW625 and JAW627 are located in the north part of the area and the lateral extent of contamination exceeding the HAL appears limited. The site occupies a slight topographic rise west of Spring Creek and groundwater flow appears to be northeastward toward a small drainage flowing into Spring Creek. Because subsequent groundwater flow probably is to Spring Creek, contaminants may be reaching Spring Creek at small concentrations. Contamination below screening levels extends southward toward the West Burn Pad. Although no wells are available north of the site, the area is bounded by small drainages on the north and south, which likely control shallow groundwater flow and contaminant migration. It is noted that no explosives detections had been reported by JAYCOR (1996) in wells JAW11 or JAW13, suggesting either differences in analytical procedures or continued migration.

Vertically, both of the wells in which RDX exceeded PRGs are screened in the upper drift unit, which is comparatively thin in this area. JAW13, JAW14, and JAW626 are screened in the upper bedrock to depths between 17 and 28 feet. Therefore, although small concentrations of explosive chemicals are present in the upper bedrock, concentrations decrease with depth. No deeper wells are available in this area.

West Burn Pads. The West Burn Pads is located south of the North Burn Pad between the Fire Training area to the west and the EDA to the east, on the opposite side of Spring Creek. Chemicals exceeding PRGs are listed in Table 5-4, below.

Table 5-4. Chemicals Exceeding PRGs, West Burn Pads

Well	Chemical	Screening Criterion (ug/L)	Concentration (ug/L)	Source
JAW23	RDX	2 (HAL)	6,900	2
	HMX	400 (HAL)	720	2
	1,3,5-TNB	1.8 (EPA Region 9 PRG)	66	2
	2,4,6-TNT	2 (HAL)	15	2
	Lead	15 (Action Level at tap)	76	2
	Cadmium	5 (MCL)	67	2
	Barium	2,000 (MCL)	2,200	2
JAW24	RDX	2 (HAL)	4.3	2
	Cadmium	5 (MCL)	51	2
	Lead	15 (MCL)	54	2
JAW25	RDX	2 (HAL)	81	2
	1,3,5-TNB	1.8 (EPA Region 9 PRG)	2.1	2
	Cadmium	5 (MCL)	19	2
	Lead	15 (MCL)	20	2

Source: (1) = Harza 1997; (2) = Mason & Hanger, 2nd Cycle, 1997; (3) = JAYCOR, 1996.

Other explosive chemicals detected below the PRGs included HMX, 1.3-DNB, 2,6-DNT, and 2,4-DNT in JAW23 and JAW24, and 2,4,6-TNT in JAW25 and JAW24. RDX (0.22 ug/L) and 2,4,6-TNT (0.81 ug/L) also were reported below PRGs in G30 and HMX (33 ug/L), RDX (0.35 ug/L) and 2,4,6-TNT (0.45 ug/L) in JAW68. No VOCs or SVOCs exceeded PRGs at this site.

The generalized lateral extent of contamination at the West Burn Pad is illustrated on Figure 5-5. The wells in which PRGs were exceeded are in the east, northwest, and southwest parts of this site with the highest concentrations in JAW23 near the northwest corner. The site rests on a topographic rise west of Spring Creek bounded by small drainages on the north and south. Shallow groundwater flow appears to be to these drainages toward the northeast and southeast. The area of contamination exceeding PRGs is delineated to the north by lower concentrations in the nearby North Burn Pad (JAW12) and in G30 and G68, to the south, and also because shallow groundwater flow probably is controlled by the drainages. The small concentrations of RDX and 1,3,5-TNB in JAW24 may represent migration from the area of JAW23, along the tributary drainage, rather than migration directly east from the burn pad area. Since JAW24 is located immediately adjacent to Spring Creek, contaminants may be reaching the creek at small concentrations. Data from G30 and JAW68 indicate that small explosive concentrations below PRGs also may be reaching a tributary to Spring Creek to the south.

Available wells in the West Burn Pad are shallow (<20 feet). JAW23 and JAW24 are bedrock wells and JAW25 is a drift well. Therefore, contaminants above PRGs are present in both bedrock and the drift, although both at shallow depths (between 10 and 19 feet). To the south, G30 is a shallow

bedrock well and JAW68 is a shallow drift well. No deeper wells are available in this area.

Fire Training Area. The Fire Training Pit is located just southwest of the West Burn Pad and several hundred feet west of an intermittent tributary to Spring Creek. VOCs are the primary contaminant at this site with no explosives exceeding PRGs. Chemicals exceeding PRGs are listed in Table 5-5, below.

Table 5-5. Chemicals Exceeding PRGs, Fire Training Area

Well	Chemical	Screening Criterion (ug/L)	Concentration (ug/L)	Source
JAW58	1,1-DCE	7 (MCL)	790	2
	Tetrachloroethene	5 (MCL)	8.9	2
	1,1,1-TCA	200 (MCL)	1,800	2
	1,1,2-TCA	5 (MCL)	10	2
JAW59	1,1-DCE	7 (MCL)	140	2
	Tetrachloroethene	5 (MCL)	5.4	2
JAW60	Benzene	5 (MCL)	29	2
	1,1-DCE	7 (MCL)	440	2
	1,2-DCA	5 (MCL)	29	2
	1,1,1-DCA	200 (MCL)	230	2
	TCE	5 (MCL)	110	2
JAW61	1,1-DCE	7 (MCL)	21	2
	Tetrachloroethene	5 (MCL)	36	2
	TCE	5 (MCL)	16	2
JAW69	Acetone	610 (EPA Region 9 PRG)	57,000	2
	MEK	1,900 (EPA Region 9 PRG)	6,300	2
	1,1-DCA	790 (EPA Region 9 PRG)	3,400	2
	1,1-DCE	7 (MCL)	3,300	2
	cis-1,2-DCE	70 (HAL)	19,000	2
	Toluene	1,000 (MCL)	20,000	2
	1,1,1-TCA	200 (MCL)	5,500	2
JAW80	1,1-DCE	7 (MCL)	15	2

Source: (1) = Harza 1997; (2) = Mason & Hanger, 2nd Cycle, 1997; (3) = JAYCOR, 1996.

The approximate lateral extent of contamination at the Fire Training Area is illustrated on Figure 5-6. The highest concentrations and greatest number of VOCs exceeding PRGs were reported in JAW69, in the immediate pit area, extending laterally to the east and south. Shallow groundwater flow at this site also is indicated to be southeastward, toward a tributary of Spring Creek. The extent of contamination in this direction cannot be fully delineated and may extend to the stream. The lateral extent of contamination is delineated to the north and west by wells JAW62 and JAW63 in which no PRGs were exceeded. JAW80, in which 1,1-DCE was the only VOC exceeding PRGs, probably is near the south limit of contamination, although not fully delineating the plume.

Bedrock is relatively shallow at the Fire Training Pit and VOC contaminants are present in both drift and upper bedrock units. JAW58, JAW59, JAW60, and JAW80 are screened in bedrock to depths

between 25 and 31 feet. JAW61, JAW62, JAW63, JAW69, are screened in the drift to depths of 19 and 20 feet. No deeper wells are available at this site.

Ammunition Box Chipper Disposal Area. The Ammunition Box Chipper Disposal Area is located in a generally flat area west of the Fire Training Pit and was investigated in the supplemental RI by groundwater sampling in existing monitoring wells and using direct push and temporary well methods (see Section 3.6). Chemicals were found to slightly exceed PRGs in two of the four samples listed below in Table 5-6.

Table 5-6. Chemicals Exceeding PRGs, Ammunition Box Chipper Disposal Area

Well	*Chemical*	*Screening Criterion (ug/L)*	*Concentration (ug/L)*	*Source*
JAW620	*RDX*	*2 (HAL)*	*2.8*	*1*
	Bis(2-ethylhexyl)phthalate	*6 (MCL)*	*76.7*	*1*
H06G	*1,3-DNB*	*1 (HAL)*	*4.0*	*1*
JAW621	*Bis(2-ethylhexyl)phthalate*	*6 (MCL)*	*70.8*	*1*
JAW622	*Bis(2-ethylhexyl)phthalate*	*6 (MCL)*	*26.4*	*1*

Source: (1) = Harza 1997; (2) = Mason & Hanger, 2nd Cycle, 1997; (3) = JAYCOR, 1996.

Mason & Hanger data, representing a similar timeframe, indicate trace concentrations of RDX (0.15 to 0.42 ug/L) in each of the three existing wells, and of 2,4,6-TNT in JAW621 (0.35 ug/L) and JAW622 (0.23 ug/L). They report no explosives or bis(2-ethylhexyl)phthalate exceeding PRGs. Based on this, these occurrences may be attributable to differences in field or laboratory procedures or represent analytical variation at low concentrations near the detection limit.

Although no samples are available south of H06G, these detections appear localized laterally, based on the small concentrations and non-detects in sampling points immediately to the east, and to the west, and southwest (Figure 5-7). Shallow groundwater flow is indicated to be due south as discussed in Section 3.6. Vertically, all sample data are from the shallow drift unit (<20 feet deep) and no deeper sampling points are available at this site.

East Boundary. No chemicals exceeding PRGs were detected in wells G25, G26, G27, and G28, which are located along the east boundary of the IAAAP within the Spring Creek watershed. Trace concentrations of a few explosive chemicals were detected in these wells, below PRGs, including: HMX (0.17 ug/L) in G25; 1,3,5-TNB (0.12 ug/L), RDX (0.74 ug/L), and 1,3-DNB (0.21 ug/L) in G26; RDX (0.72 ug/L) in G27; and HMX (0.30 ug/L) in G28.

5.3.2 Surface Water and Sediment

Sampling locations 7A through 7D in Task 7 *(Sediment and Surface Water Sampling, Site Drainages)* are located on Spring Creek. Locations and results are illustrated on Figure 5- 8. No explosives were detected in surface water or sediment at location 7A, the furthest upstream, draining the northeast corner of the IAAAP including parts of the East Burn Pads. RDX was detected in surface water at 7B and 7C, reported at estimated concentrations of 0.72 and 0.51 ug/L, respectively. Although this suggests a possible continuing source of contamination, no explosives were detected

in the sediment samples at these locations, suggesting that sediments have not been impacted and do not represent a source of residual contamination. No explosives were detected in samples from 7D, located about 2 mile outside the IAAAP boundary downstream. Based on these results, one or more trace sources of contamination may be present impacting the intermediate reaches of Spring Creek, within the IAAAP boundaries. However, concentrations are small and no off-site impacts were identified. Additional details are provided in Section 3.7.

5.4 Brush Creek Watershed

5.4.1 Groundwater

The Brush Creek drainage contains the greatest number of facilities potentially or actually contributing to groundwater contamination at IAAAP. Constituents exceeding PRGs in groundwater are shown on Figure 5-1 from a basin-wide and plant wide perspective. Areas of contamination are associated with individual facilities and are scattered within the watershed. Sampling results indicate chemical constituents in groundwater exceeding PRGs in Line 1, Line 2, Line 3, Line 9, Line 800, downstream reaches of the creek at and near the south IAAAP boundary, and in one well in the north part of the area near Yard AL@. Principal contaminants are explosive chemicals with VOCs exceeding PRGs in local areas. Small concentrations of a few explosives are present along the downstream boundary of the IAAAP within the watershed. The nature and extent of contamination in individual site areas are discussed in the following paragraphs.

Line 1. Line 1 is just east of Brush Creek in the north part of the IAAAP. Chemicals found to exceed PRGs are listed in Table 5-7, below.

Table 5-7. Chemicals Exceeding PRGs, Line 1

Well	*Chemical*	*Screening Criterion (ug/L)*	*Concentration (ug/L)*	*Source*
JAW50	*RDX*	*2 (HAL)*	*36*	*2*
H11B4	*1,1-DCE*	*7 (MCL)*	*8*	*1*
	TCE	*5 (MCL)*	*6*	*1*

Source: (1) = Harza 1997; (2) = Mason & Hanger, 2nd Cycle, 1997; (3) = JAYCOR, 1996.

Explosives were detected in other wells to the south and south-southeast, but below PRGs. These include JAW43, JAW45, JAW47, JAW48, and JAW51. JAW 602, a deep (>85 feet) bedrock well paired with JAW50, was reported by JAYCOR to contain 2,6-DNT and nitrobenzene, below PRGs, in May 1995. No explosives were reported in later sampling by Mason & Hanger and the earlier detections may relate to well installation or development, rather than contamination. Data reported by JAYCOR (1996) also identified RDX at 3.41 ug/L, slightly above the PRG in well SL-81, southwest of Line 1 and west of Brush Creek. No further data are available near this well. The 1,1-DCE found in H11B4, slightly exceeding the PRG, was from a shallow, direct push groundwater sample at the Line 1 Tank Farm during Task 11 *(Soil and Groundwater Sampling for VOCs).*

The generalized lateral extent of apparent groundwater contamination at Line 1 is illustrated on Figure 5-9 Explosives contamination exceeding groundwater PRGs is limited to the local area

around well JAW50. However, explosives concentrations less than PRGs are indicated to be present in a relatively broad area south-southeast from JAW50, probably discharging to Brush Creek near JAW43 and JAW45. Contaminant migration does not appear to have occurred directly west from JAW50 toward Brush Creek, based on non-detects in wells JAW38, 39, 50, and 51, or south of JAW47, based on non-detects in JAW46 and other wells.

Vertically, explosives contamination appears limited to the upper portion of the drift sequence. JAW50 is a shallow (22 feet deep) well and SL81, west of Brush Creek, is 10.5 feet deep. Wells containing explosives below HALs include shallow (<20 feet) drift wells JAW43, JAW45, JAW47, and JAW51 and intermediate (44 feet deep) drift well JAW48. Bedrock is approximately 80 to 90 feet deep beneath Line 1. Assuming explosives are not detected in continued monitoring of JAW602, no explosives were detected in the available bedrock wells. Other bedrock wells include JAW601, paired with SL81 west of Brush Creek, and JAW603, paired with JAW51. VOC detections in the Line 1 Tank Farm were from a depth of only 4 feet and this appears limited vertically as well as laterally.

Line 2. Line 2 is just east of Brush Creek and just south of Line 1 in the north-central part of IAAAP. Chemicals found to exceed PRGs are listed in Table 5-8, below.

Table 5-8. Chemicals Exceeding PRGs, Line 2

Well	Chemical	Screening Criterion (ug/L)	Concentration (ug/L)	Source
H10A	RDX	2 (HAL)	1,200	1
	2,4-DNT	5 (10^{-4} Cancer Risk)	7.8 J	1
H10B	RDX	2 (HAL)	250	1
	Iron	6,000 (RDA)	16,800	1
H12A	1,3-DNB	1 (HAL)	1.3	1
H12B	RDX	2 (HAL)	4.9	1
H12E	Bis(2ethylhexyl)phthalate	6 (MCL)	6.8	1
JAW70	RDX	2 (HAL)	1,200	1
	1,3,5-TNB	1.8 (EPA Region 9 PRG)	9.3	2
JAW71	RDX	2 (HAL)	9.3	1
	1,3-DNB	1 (HAL)	2.4	1
JAW72	RDX	2 (HAL)	1,600	1
	1,3,5-TNB	1.8 (EPA Region 9 PRG)	13	2
	2-4,DNT	5 (10^{-4} Cancer Risk)	6.3	2
	TCE	5 (MCL)	8.6	1
	Bis(2ethylhexyl)phthalate	6 (MCL)	6.7	1
JAW73	RDX	2 (HAL)	190	1
	1,3,5-TNB	1.8 (EPA Region 9 PRG)	8.8	2
	Bis(2ethylhexyl)phthalate	6 (MCL)	7.7	1
G15	RDX	2 (HAL)	970	3

Source: (1) = Harza 1997; (2) = Mason & Hanger, 2nd Cycle, 1997; (3) = JAYCOR, 1996.

The RDX data reported for G15 by JAYCOR (1996) was from October 1992, southwest of Line 2

near Brush Creek. No later data are available from this area. Other explosive detections, at trace levels below HALs, were identified in some of the wells listed above, and in H12C, H12E, and JAW74. These contaminants variably included 1,3-DNB, RDX, and HMX, but also 2-amino-2,6-DNT, 4-amino-2,6-DNT, and 4-nitrotoluene. HMX at 230 ug/L also was reported by JAYCOR (1996) in G15.

The generalized lateral extent of explosive contamination is illustrated on Figure 5-10, based on interpretation of available analytical data and on groundwater flow patterns. Two areas are identified in which HALs are exceeded, a northern area extending west from wells H10A/B and a central area extending southwest from JAW72/73 to G15. Two areas are shown, rather than a single larger area, because an intervening well (H12F) was dry and potentiometric data show an intervening divide extending roughly east west across the site. Groundwater flow in the northern area is westward and in the southern area, is southward and then southwestward.

The northern area of contamination is indicated to be extend west to Brush Creek based on small concentrations of 1,3-DNB (1.3 ug/L), above the HAL, and RDX (0.46 ug/L), below the HAL, in H12A. Groundwater flow is directly from H10A/B to H12A and, therefore, contaminants may have reached and are assumed to be discharging to Brush Creek. However, in the relatively short distance between these wells RDX concentrations decrease from 1,200 ug/L to 0.46 ug/L and, if discharging to the creek, concentrations are expected to be very small. Available data are insufficient to delineate this area to the north. However, north is hydraulically upgradient limiting the likelihood of migration, and also upgradient from most likely source areas.

The central area of contamination is shown as extending southwest from JAW72 and it is assumed that the groundwater is discharging to Brush Creek in this area based on the result reported from G15. There are no data points between H12B and G15 and it is possible this area is not continuous. Explosive concentrations below the HALs occur south of the central area but the full extent of these occurrences cannot be fully delimited with available wells. Vertically, explosives contamination at Line 2 is limited to the shallow (<25 feet) drift zone. This is indicated by the three well cluster at H12B/C/D in which concentrations decrease between the shallow and intermediate wells and are non-detect in the deep bedrock well.

Line 3. Line 3 is located just west of Brush Creek in the north-central part of the watershed, opposite Line 2. Chemicals found to exceed PRGs are listed in Table 5-9, below.

Table 5-9. Chemicals Exceeding PRGs, Line 3

Well	Chemical	Screening Criterion (ug/L)	Concentration (ug/L)	Source
H16A	Nitrobenzene	3.5 (EPA Region 9 PRG)	4.0	1
	Bis(2-ethylhexyl)phthalate	6 (MCL)	10.9	1
JAW54	RDX	2 (HAL)	1,500	1
	2,4-DNT	10^{-4} Cancer Risk	10	1
	1,3,5-TNB	1.8 (EPA Region 9 PRG)	14	2
JAW55	Bis(2-ethylhexyl)phthalate	6 (MCL)	6.5	1

Source: (1) = Harza 1997; (2) = Mason & Hanger, 2nd Cycle, 1997; (3) = JAYCOR, 1996.

Other explosives detected in H16A (or its duplicate H16I), below the PRGs, were NT (2.9 ug/L), well below the PRG of 370 ug/L, RDX (estimated at 0.57 ug/L) below the HAL of 2 ug/L, and tetryl (1.3 ug/L) for which no PRGs are available. In JAW54, other explosives detected below PRGs were 2-amino-4,6-DNT (87 ug/L), 4-amino-2,6-DNT (26 ug/L), and HMX (220 ug/L). Mason & Hanger also reported detections below PRGs, including: HMX (190 ug/L), 1,3-DNB (0.16 ug/L), 2,4,6-TNT (1.2 ug/L), 2,4-DNT (4.8 ug/L), and 2,6-DNT (0.35 ug/L) in JAW54; RDX estimated at 1.5 ug/L and HMX at 3.9 ug/L in JAW55; and 2,4,6-TNT at 0.16 ug/L in JAW77. No explosives were detected in other wells sampled at Line 3.

Based on the available analytical data, the lateral extent of explosives contamination exceeding PRGs at Line 3 is limited to a small area near JAW55 and H16A (Figure 5-11). Groundwater flow at Line 3 is to the south-southeast, toward Brush Creek. However, the available data do not suggest that contaminant migration has occurred in this direction, based on non-detect results in nearby downgradient well JAW53, and others. Contaminants from Line 3 do not appear to have reached Brush Creek, several hundred yards east.

Vertically, significant explosives contamination is limited to the shallow (<25 feet) drift zone in which JAW55, JAW55, and most other wells are screened. However, H16A is a deep (110 feet) bedrock well. Based on the small concentrations of explosives detected in H16A, although slightly exceeding the PRG for NB, these deep detections may be a result of the well drilling and installation process and continued monitoring should determine whether explosives actually are present.

Line 800/Pink Water Lagoon. Line 800 and the former Pink Water Lagoon are located near the west side of the Brush Creek watershed in the central part of the IAAAP. The west extremity of the area extends into the Long Creek watershed. This has been the site of ongoing remedial activities, in which the lagoon has been replaced by a wetland area. Because of the ongoing activities, no sampling data for this area were obtained in this investigation or by Mason & Hanger. Therefore, this discussion is based on earlier data reported by JAYCOR (1996). Chemicals reported to exceed PRGs are listed in Table 5-10, below.

Table 5-10. Chemicals Exceeding PRGs, Line 800/Pink Water Lagoon

Chemical	Screening Criteria(ug/L)	Well (ug/L)							
		G17	G18	G19	G20	G41	G56	G57	G58
1,3,5-TNB	1.8 (PRG)[a]	—	190	63	2,600	—	—	—	—
1,3-DNB	1 (HAL)	—	110	110	72	—	—	—	1.05
2,4,6-TNT	2 (HAL)	—	2,200	2,000	470	—	—	—	—
2,4-DNT	5[b]	—	95	140	96	—	—	—	—
2,6-DNT	5[b]	—	75	96	—	—	—	—	—
RDX	2 (HAL)	4.58	8,600	8,400	13,000	12.5	45.6	470	1,500
Nitrobenzene	3.4 (PRG)[a]	—	—	—	170	—	—	—	—
HMX	400 (HAL)	—	1,100	980	1,700	—	—	—	—

Source: JAYCOR, 1996. (a) USEPA Region IX PRG. (b) 10E-6 Cancer Risk.

The highest concentrations of explosives and greatest number of chemicals exceeding PRGs are reported in wells G18, G19, and G20, located along the southeast side of the former Pink Water Lagoon, although significant concentrations of RDX and HMX also were detected in G58, north of the lagoon. HMX concentrations, below the HAL, were reported in wells G57 (10.6 ug/L) and G41 (2.56 ug/L).

The lateral extent of contamination at Line 800 can be only partially delineated from the available data and is illustrated on Figure 5-12. The area exceeding PRGs is relatively extensive, occupying the area around the former Pink Water Lagoon and elongated in the northeast-southwest direction. The southwesternmost well available, G41, is located at the edge of the Brush Creek water shed and slightly exceeded the HAL for RDX. The lateral extent of contamination in this direction cannot be fully delineated and may extend into the Long Creek watershed. To the northeast, the area of higher explosives concentrations may be delimited by wells G17 and G56, where only HMX below the HAL was detected. However, the small concentrations of HMX in these wells indicate the plume has not been fully delineated in this direction. Also, the northeast portion of this site abuts the headwaters of a small tributary to Brush Creek and the available wells may not fully span local groundwater flow and contaminant migration pathways. To the east and southeast, the extent of contamination is delineated by non-detect results from wells G42, G43, G45, G45, JAW78, and JAW 79. However, due south of the former lagoon, a trace concentration of RDX was detected in G47 at least suggesting that the plume has not been fully delimited in that direction. Northwest of the former lagoon, the extent of contamination is generally limited by non-detect results reported from well G48. However, available wells are sparse in that general area and the plume boundary cannot be identified with precision.

Vertically, contamination at this site has been detected in the upper and intermediate drift zone in which most wells are screened, generally to depths of 30 feet or less. Deeper bedrock wells are available to the southwest (G40) and to the east (G45, G46), paired with shallower drift wells, and did not contain explosives. However, none of these wells are located in the immediate area of the former Pink Water Lagoon, where the most significant contamination was detected. Further, the wells with the greatest contamination, G18, G19, and G20 are the shallowest wells at the site, about 20 feet deep. Therefore, the vertical extent of contamination cannot be fully determined from the available data.

Line 9. Line 9 is located in the west-central part of the Brush Creek watershed and west of Line 3. Groundwater sampling using direct push methods and temporary wells during Task 11 *(Soil and Groundwater Sampling for VOCs)* detected the presence of Freon (1,1,2-trichlorotrifluoroethane) in the area of Building 9-57 (Figure 5-13). No MCL or HAL is available for Freon, but the PRG of 59,000 ug/L was exceeded in three samples: Chemicals detected above available PRGs are listed in Table 5-11, below.

Table 5-11. Chemicals Exceeding PRGs, Line 9

Well	Chemical	Screening Criterion (ug/L)	Concentration ug/L)	Source
H11F1	Freon	59,000 (EPA Region 9 PRG)	229,000	1
H11F5	Freon	59,000 (EPA Region 9 PRG)	69,000	1
H11F7	Freon	59,000 (EPA Region 9 PRG)	220,000	1
JAW611	Methylene Chloride	5 (MCL)	8.5	2
JAW612	Methylene Chloride	5 (MCL)	6.9	2

Source: (1) = Harza 1997; (2) = Mason & Hanger, 2nd Cycle, 1997; (3) = JAYCOR, 1996.

Trace concentrations of 2,4,6-TNT, ranging from 0.23 to 0.90 ug/L and below the HAL, were reported by Mason & Hanger in wells JAW29, JAW30, and JAW31, and in JAW610, JAW611, and JAW612. 0.56 ug/L HMX was also reported in JAW31.

Laterally, the extent of Freon contamination exceeding the PRG is centered around sampling points F1, F5, and F7, particularly F1, just east of Building 9-57 and F7, west of the northwest corner of Building 9-57. These indicate significant contamination on both sides of the building, while F5, located south of F1, is only slightly over the PRG. Freon also was detected in other samples collected in this task, indicating that the lateral extent of contamination is not fully delineated, but only at much reduced concentrations and below the PRG. Vertically, groundwater samples collected in this task were from the shallow drift zone, less than 10 feet deep. Deeper soil samples collected at the site indicated the presence of Freon at greater depths and, therefore, deeper groundwater contamination is expected.

Downstream Reach of Brush Creek/South Boundary. This section discusses results of groundwater analysis obtained during Task 13 *(Additional Groundwater Data, Downstream Reaches of Brush Creek)* and sampling results from wells G22, G23, and G24, at the south IAAAP boundary. Well G22 actually is located within a small watershed area draining directly to the Skunk River, but is included in the Brush Creek watershed for discussion.

In Task 13, four wells were installed across Brush Creek at "K" Road supplemented by existing well pair G54/G55 (see Section 3.13). Results of analysis indicated the presence of RDX in well G55 at 2.2 ug/L slightly exceeding the HAL of 2 ug/L. Also, manganese at 3,700 ug/L exceeded the RDA of 1,700 ug/L in G55 and iron, at 20,700 ug/L exceeded the RDA of 6,000 ug/L. Other detections below PRGs in this area were 4-NT (estimated at 0.56 ug/L) in H13B, NB (at 1.6 ug/L) in H13D, 2-NT (at 2.8 ug/L) in G55, and 1,3-DNB (estimated at 0.43 ug/L) in G55.

Explosives contamination exceeding PRGs is limited to the RDX in G55. The lateral extent of contamination represented by concentrations below PRGs is delineated to the east by non-detects in wells H13F and H13E. To the east, however, the extent of contamination indicated by the trace concentration of 5-NT in H13B cannot be delineated. Vertically, the extent of contamination in the immediate vicinity of the creek is addressed by well pair G54/G55, and appears limited to the shallow zone. G55 is a shallow (<16 feet) well immediately adjacent to the creek and may reflect the local surface water regime affected by the creek. No contamination was found in its deeper paired

well, G54. East of the creek, the trace contamination found in H13D represents the deeper of a well pair with H13E. No contamination was found in the shallow well, indicating that in this local area, trace explosives are present at elevations roughly equivalent to the creek elevation (see Figure 3-25), but not in the shallower zone, confirmed by non-detect results from H13F completed in the upper drift further east. To the west of Brush Creek, H13B encountered shallow bedrock and trace concentrations of 4-NT. The vertical extent of contamination in this area cannot be delineated.

Wells G22, G23, and G24 are located at the south boundary of the IAAAP. RDX was detected by Mason & Hanger in G22 and G24, both west of Brush Creek, at levels slightly exceeding the HAL of 2 ug/L, 2.3 and 3.4 ug/L, respectively. RDX, below the HAL also was detected in G23 (0.76 ug/L), located between G22 and G25, and JAW76 (0.63 ug/L), paired with G24 while trace concentrations of HMX were detected in G22 (0.26 ug/L) and G24 (1.8 ug/L), below the PRGs. G22 is screened in the lower drift to a depth of 52 feet while G23 and G25 are shallow, less than 20 feet deep. G24 and JAW76 are screened in shallower and deeper bedrock zones, respectively. It is noted that 1992 sampling reported by JAYCOR (1996) did not indicate the presence of any chemicals exceeding PRGs in any of these wells. The detections reported by Mason & Hanger may reflect differences in sampling or analytical procedures or may represent general, low-level groundwater contamination in the downstream reaches of the Brush Creek watershed.

Yard "L". Yard "L" is located at the north edge of the IAAAP property and the Brush Creek watershed. Data reported by JAYCOR (1996) for well G49, just south of Yard "L", south of Road B, and northwest of Line 1, indicated the presence of RDX at 3.23 ug/L, slightly exceeding the HAL of 2 ug/L, and HMX, at 12.4 ug/L, well below the HAL of 400 ug/L, in July 1992. G49 is screened to a depth of 29.5 feet in the drift. No later data are available from this well and no other data are available delineating the possible source of contamination or lateral or vertical extent.

5.4.2 Surface Water And Sediment

Sample locations 7E through 7M are located on Brush Creek or tributaries (Figure 5-8). Locations 7E and 7F, the furthest upstream, are between, and drain parts of Line 2 and Line 3, and are downstream from Line 1. Concentrations of Total explosives, 32.3 and 10.2 ug/L, respectively, were detected in the surface water samples. No explosives were detected in one of the sediment sampling locations at 7E at either the 1 foot or 3 foot depths. However, total explosives between 310 and 470 ug/kg were detected from the 1 foot depth at the second 7E location and both locations at 7F. Based on these results, surface water in Brush Creek is being moderately impacted by Lines 1, 2, and/or 3. Residual explosives also are present in shallow sediments, at least sporadically, although deeper sediments do not appear effected. Impacts on surface water may be due to current plant discharges under NPDES permit. However, contributions may occur due to migration of contaminated groundwater, particularly from Line 2, and/or remobilization of contaminants in sediment.

Location 7G is on a small tributary to Brush Creek, entering from the west just south of Line 3, and drains Line 7, Line 9 and the south portion of Line 3. No explosives were detected in either surface water or sediment at this location. This tributary drainage does not appear to contribute to

contamination entering Brush Creek.

Location 7H is on a small tributary entering Brush Creek from the west and draining eastern parts of Line 800. Explosives totaling 4.6 ug/L were detected in the surface water sample and 330 ug/kg in one of two sediment sample locations. No explosives were detected at the other sediment location, either at the 1 or 3 foot depth. This tributary is indicated to contribute to contamination entering Brush Creek, probably from Line 800. However, contributions appear minor compared to other results, and sediment impacts may be sporadic.

Locations 7I and 7J are on Brush Creek downstream from Line 2. Small concentrations of explosives were detected in surface water at these locations, totaling 5.2 and 6.8 ug/L, respectively. However, significant explosives concentrations were detected in shallow (1 foot) sediment samples. Total explosives concentrations from two shallow sediment samples at 7I were 28,900 ug/kg and 460 ug/kg and at 7J were 1,890 and 4,490 ug/kg. Sediment samples from the 3 foot depth at both locations were non-detect for explosives. Based on these results, significant residual contamination is indicated to be present in sediments, at least locally, along this reach of Brush Creek. Impacts appear limited to the shallow zone and may be variable laterally. Surface water impacts, although present, appear minor compared to sediments and may reflect plant discharges, rather than remobilization of contaminants from the sediment.

Locations 7K, 7L, and 7M are on Brush Creek spanning the downstream portion of the IAAAP. 7L and 7M are outside the plant boundary and 7K is at the AK@ Road bridge. At each location, trace explosive concentrations were detected in surface water, ranging from 2.67 ug/L at 7K and 7.9 ug/L at the others. However, no explosives were detected in any of the sediment samples. Based on the absence of contaminants in sediment, small concentrations of explosives in the surface water are likely due to surface water flow from upstream rather than any local source and could be due either to plant discharges or sediment contamination further upstream.

5.5 Long Creek Watershed

5.5.1 Groundwater

Long Creek is the largest watershed at IAAAP, draining broad areas from the northwest to the south-central border. Industrial facilities within the Long Creek watershed include the Firing Site, Inert Disposal Area, Line 5B, Line 4B, and the Flyash Landfill. Mathes Dam is located on Long Creek in the middle reaches of the property, downstream from these facilities. The westernmost portion of Line 800 also extends to the boundary of the Long Creek Watershed, downstream from the dam, but available wells are in the Brush Creek watershed and are discussed primarily in Section 5.3.1. The northern part of Line 3A extends into the Long Creek Watershed, but available wells and known groundwater contamination are in the Skunk Creek watershed and are discussed in Section 5.5.1.

Based on monitoring well data used for this supplemental RI, the only PRG exceeded in groundwater within the Long Creek watershed was methylene chloride at 7.3 ug/L reported by Mason & Hanger

in well JAW605, located in Line 4B. The MCL for methylene chloride is 5 ug/L, although this is a common laboratory contaminant. RDX, at 0.16 ug/L, below the HAL of 2 ug/L was reported by Mason & Hanger in well G21, located adjacent to the creek at the south IAAAP boundary. This is a shallow (17 feet deep) well completed in the drift and may be effected more by surface water rather than groundwater migration. Line 800 well G41, located at the west edge of the Brush Creek watershed very near the boundary with the Long Creek watershed, slightly exceeded the HAL for RDX (2 ug/L) at 2.56 ug/L. Although associated with Brush Creek, groundwater migration from the west edge of Line 800 could extend toward Long Creek. Similarly, wells JAW17 and JAW21, in Line 3A, are at or near the boundary between the Skunk River and Long Creek watersheds, and exceeded the HAL for RDX at 10 and 19 ug/L, respectively. The estimated lateral extent of contamination associated with these, and other wells in Line 3A, extends into the Long Creek watershed. However, because of the steep topography and hydraulic gradients toward the Skunk River in this area, it is unlikely that contaminant migration would significantly impact the Long Creek Watershed.

5.5.2 Surface Water and Sediment

Sampling locations 7N and 7O are on the downstream reaches of Long Creek just upstream and downstream of the IAAAP boundary, respectively (Figure 5-8). No explosives were detected in either surface water or sediment samples from these locations. Additional details are provided in Section 3.7.

5.6 Skunk River Watershed

5.6.1 Groundwater

The Skunk River watershed, as referenced herein, refers to the extreme southwest part of the IAAAP adjacent to the river valley and incorporating a portion of the valley bluff. Industrial facilities within this area include Line 3A and the Demolition Area.

Line 3A. Line 3A is located in the southwest corner of the plant southwest of the Inert Disposal Area and northwest of the Demolition Area. It occupies an area above the Skunk River valley bluff and at the headwaters of two intermittent, unnamed tributaries to the Skunk River. Contaminants detected in groundwater at this site are explosive chemicals. Chemicals found to exceed PRGs are listed in Table 5-12, below.

Table 5-12. Chemicals Exceeding PRGs, Line 3A

Well	*Chemical*	*Screening Criterion (ug/L)*	*Concentration (ug/L)*	*Source*
JAW15	*RDX*	*2 (HAL)*	*36*	*2*
JAW17	*RDX*	*2 (HAL)*	*10*	*2*
JAW21	*RDX*	*2 (HAL)*	*19*	*2*
JAW22	*RDX*	*2 (HAL)*	*48*	*2*

Source: (1) = Harza 1997; (2) = Mason & Hanger, 2nd Cycle, 1997; (3) = JAYCOR, 1996.

Trace concentrations of HMX, from 0.23 to 7 ug/L, well below the HAL of 400 ug/L, also were

detected in JAW15, JAW17, JAW20, JAW21, and JAW22, while RDX at 0.67 ug/L was detected in JAW20. 1993 sampling reported by JAYCOR detected no explosives in JAW21 and JAW22. Trace concentrations of HMX, well below the HAL, had also been reported by JAYCOR (1996) in wells JAW16 and JAW19 (1.64 and 3.09 ug/L, respectively) in October 1992. However, no explosives were detected in these by Mason & Hanger in the second cycle 1997 sampling. No VOCs or SVOCs exceeding PRGs are reported in Line 3A.

The generalized lateral extent of explosives contamination in Line 3A is shown on Figure 5-14, based on interpretation of available data. Two areas exceeding the HAL for RDX are shown centered at wells JAW15/JAW17 toward the west and JAW21/JAW22 toward the east. These areas could be connected, but are interpreted as distinct based on non-detect results from JAW16 and JAW19. No monitoring wells are available outside the existing wells (i.e. to the west, east, south, or north). Therefore, the lateral extent of groundwater contamination cannot be fully delineated and relatively steep terrain makes placement of additional wells difficult in some areas. Based on the steep terrain just south of Line 3A, groundwater gradients are expected to be relatively steep to the south, toward the Skunk River, limiting contaminant movement to the north or west. However, this cannot be verified with the available data and it equally implies that migration to the south is likely and contaminants are likely reaching the IAAAP boundary.

Of the wells in which RDX exceeded the PRG, JAW15, JAW17, and JAW22 are shallow (<20 feet) drift wells and JAW21 is a deeper (58 feet) bedrock well. Shallow drift well JAW 17 is paired with bedrock well JAW18, in which no explosives were detected and JAW16, another bedrock well at the site, also was non-detect for explosives. Based on this, the vertical extent of contamination appears generally limited to the upper drift units. However, RDX exceeding the HAL in bedrock well JAW21, in the northeast part of the area, indicates that contaminants have reached bedrock at least locally.

Demolition Area. The Demolition Area is located just above the Skunk River valley bluff southeast of Line 3A. The area is drained by several unnamed, intermittent tributaries to the Skunk River. Chemicals found to exceed PRGs are listed in Table 5-13, below.

Table 5-13. Chemicals Exceeding PRGs, Demolition Area

Well	*Chemical*	*Screening Criterion (ug/L)*	*Concentration (ug/L)*	*Source*
DA1	*RDX*	*2 (HAL)*	*2.5*	*2*
DA2	*RDX*	*2 (HAL)*	*8.5*	*2*
G10	*RDX*	*2 (HAL)*	*6.2*	*2*
JAW1	*RDX*	*2 (HAL)*	*6.6*	*2*

Source: (1) = Harza 1997; (2) = Mason & Hanger, 2nd Cycle, 1997; (3) = JAYCOR, 1996.

Explosive concentrations below PRGs also were detected in wells G9 and JAW2.

The generalized lateral extent of explosives contamination at the Demolition Area is shown on Figure 5-15, based on interpretation of available data. Groundwater flow at this site appears to be to

the south in the south part of the area and west-northwest in the north part of the area, discharging to separate arms of a small Skunk River tributary creek. Wells in which RDX detections exceeded the HAL are located on the west (G10, JAW1) and east (DA2) sides of the facility nearest these streams. Therefore, the lateral extent of contamination cannot be fully delineated. Although the steep topography downgradient from these wells makes placement of additional wells difficult, contaminants are likely to have migrated toward the south and could reach the IAAAP boundary.

Bedrock is very shallow at the Demolition Area, generally less than 15 feet deep. Therefore, of the available wells in the area, DA1, DA2, and JAW1 are bedrock wells, although all less than 25 feet deep. The remaining wells are screened in the drift at even shallower depths. However, available data indicate that explosive contaminants in this area are present in both the drift and the bedrock. No deeper wells are available in the area.

5.6.2 Surface Water and Sediment

Locations 7P and 7Q are located on small unnamed tributaries to the Skunk River in the southwest corner of the IAAAP (Figure 5-8). The 7P tributary drains parts of the Demolition Area and no explosives were detected in either the surface water or the sediment sample from this location. The 7Q tributary drains parts of Line 3A. No explosives were detected in the sediment sample. However, 9.4 ug/L total explosives were detected in the surface water. The source of the surface water contamination is not known, but may be due to NPDES discharges from Line 3A, immediately up slope, or migration of groundwater from Line 3A. Additional details are provided in Section 3.7.

5.7 Offsite Areas

The presence of explosive chemicals in off-site residential water supply wells downgradient from IAAAP was reported by JAYCOR from the basewide RI. No off-site sampling of water wells was conducted during the supplemental RI and the following information is abstracted from JAYCOR (1996).

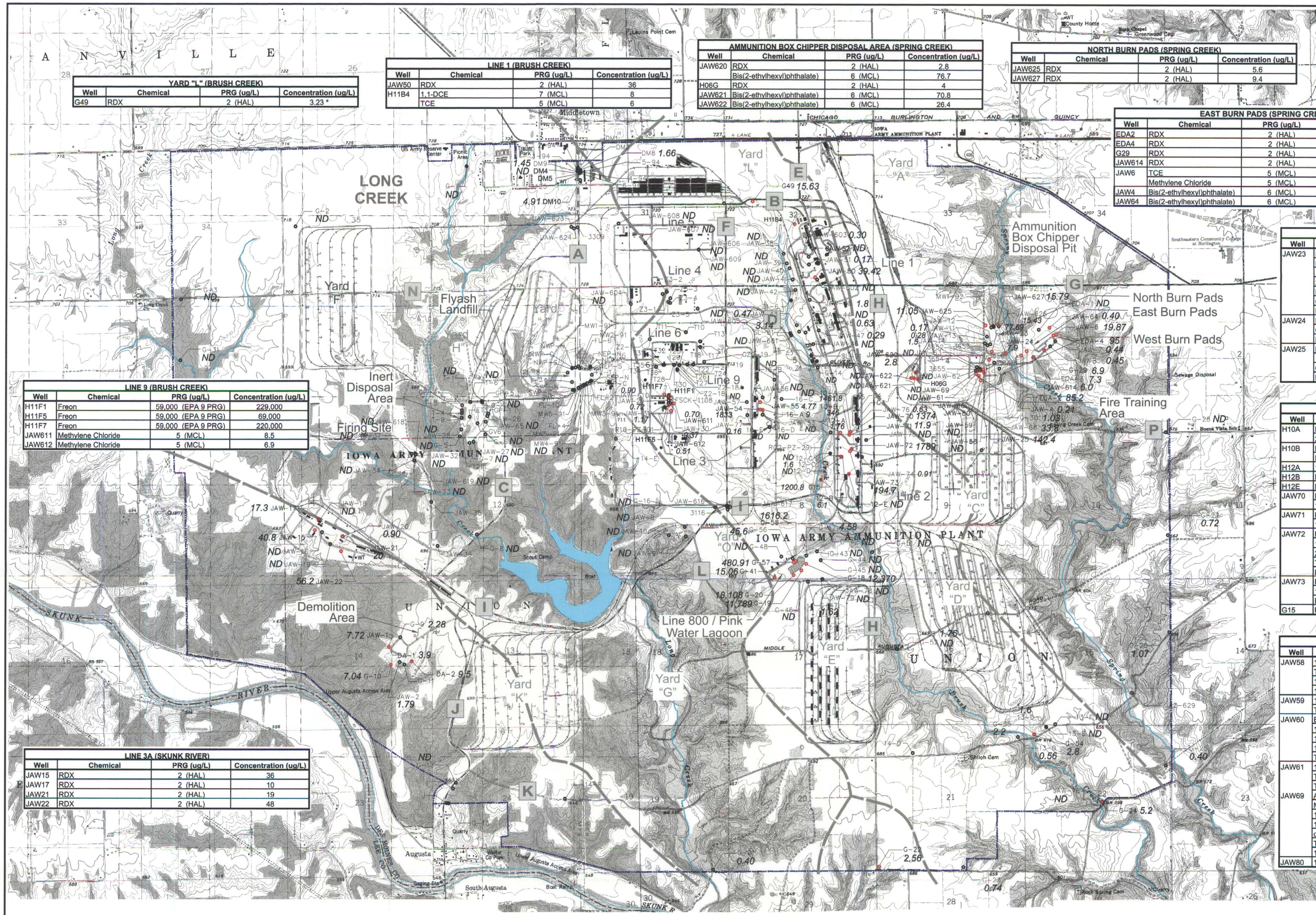
Groundwater samples were collected from six residential wells south/southeast of IAAAP on 21 September 1992. The wells were designated RBW-GW-25 through 30 by JAYCOR. RBW-GW-25 through 29 ranged in depth from 28 to 45 feet and RBW-GW-30 is 800 feet deep. RBW-GW-25 contained RDX at 15.5 μg/L and RBW-GW-26 contained RDX at 27.5 μg/L, both above the HAL. The wells were resampled on 15 March 1993 and the presence of RDX at similar levels in these wells was confirmed.

USAEC, assisted by the Rock Island District Office and the Omaha District U. S. Army Corps of Engineers, then conducted extensive off-post sampling and analysis of residential wells located in the watersheds leaving the IAAAP. Of the 54 residences sampled, three were found to contain RDX above the HAL of 2.0 μg/L. Two of these residences are located at the extreme southwest boundary of the IAAAP, near the town of Augusta, on a tributary of the Skunk River. One contained RDX at 2.08 μg/Land the other contained RDX at 3.31 μg/L. The third residence is located along the Brush Creek watershed adjacent to the first two homeowners whose wells tested positive for RDX. This

well contained RDX at 2.10 μg/L. Resampling at these three residences showed RDX contamination at similar levels.

As an interim action, the Army provided bottled water to the affected residences. The IAAAP, in coordination with the USAEC and Mason & Hanger, contracted directly with the Public Water Utility in the area to connect all residences in the area to the public water supply at the Army's expense. The affected area has been defined as the area south of the IAAAP, between Brush Creek at the IAAAP's southeastern boundary, to an unnamed tributary south of Line 3A, at the IAAAP's southwestern boundary, south to the Skunk River.

FIGURES



YARD "L" (BRUSH CREEK)			
Well	Chemical	PRG (ug/L)	Concentration (ug/L)
G49	RDX	2 (HAL)	3.23 *

LINE 1 (BRUSH CREEK)			
Well	Chemical	PRG (ug/L)	Concentration (ug/L)
JAW50	RDX	2 (HAL)	36
H11B4	1,1-DCE	7 (MCL)	8
	TCE	5 (MCL)	6

AMMUNITION BOX CHIPPER DISPOSAL AREA (SPRING CREEK)			
Well	Chemical	PRG (ug/L)	Concentration (ug/L)
JAW620	RDX	2 (HAL)	2.8
	Bis(2-ethylhexyl)phthalate	6 (MCL)	76.7
H06G	RDX	2 (HAL)	4
JAW621	Bis(2-ethylhexyl)phthalate	6 (MCL)	70.8
JAW622	Bis(2-ethylhexyl)phthalate	6 (MCL)	26.4

NORTH BURN PADS (SPRING CREEK)			
Well	Chemical	PRG (ug/L)	Concentration (ug/L)
JAW625	RDX	2 (HAL)	5.6
JAW627	RDX	2 (HAL)	9.4

EAST BURN PADS (SPRING CREEK)			
Well	Chemical	PRG (ug/L)	Concentration (ug/L)
EDA2	RDX	2 (HAL)	77
EDA4	RDX	2 (HAL)	19
G29	RDX	2 (HAL)	5.5
JAW614	RDX	2 (HAL)	3.4
JAW6	TCE	5 (MCL)	8
	Methylene Chloride	5 (MCL)	15
JAW4	Bis(2-ethylhexyl)phthalate	6 (MCL)	16
JAW64	Bis(2-ethylhexyl)phthalate	6 (MCL)	80

WEST BURN PADS (SPRING CREEK)			
Well	Chemical	PRG (ug/L)	Concentration (ug/L)
JAW23	RDX	2 (HAL)	6900
	HMX	400 (HAL)	720
	1,3,5-TNB	1.8 (EPA 9 PRG)	66
	2,4,6-TNT	2 (HAL)	15
	Lead	15 (Action Level)	76
	Cadmium	5 (MCL)	67
	Barium	2,000 (MCL)	2200
JAW24	RDX	2 (HAL)	4.3
	Cadmium	5 (MCL)	51
	Lead	15 (Action Level)	54
JAW25	RDX	2 (HAL)	81
	1,3,5-TNB	1.8 (EPA 9 PRG)	2.1
	Cadmium	5 (MCL)	19
	Lead	15 (Action Level)	20

LINE 9 (BRUSH CREEK)			
Well	Chemical	PRG (ug/L)	Concentration (ug/L)
H11F1	Freon	59,000 (EPA 9 PRG)	229,000
H11F5	Freon	59,000 (EPA 9 PRG)	69,000
H11F7	Freon	59,000 (EPA 9 PRG)	220,000
JAW611	Methylene Chloride	5 (MCL)	8.5
JAW612	Methylene Chloride	5 (MCL)	6.9

LINE 2 (BRUSH CREEK)			
Well	Chemical	PRG (ug/L)	Concentration (ug/L)
H10A	RDX	2 (HAL)	1200
	2,4-DNT	5 (10E-4 Cancer Risk)	7.8 J
H10B	RDX	2 (HAL)	250
	Iron	6,000 (RDA)	16800
H12A	1,3-DNB	1 (HAL)	1.3
H12B	RDX	2 (HAL)	4.9
H12E	Bis(2-ethylhexyl)phthalate	6 (MCL)	6.8
JAW70	RDX	2 (HAL)	1200
	1,3,5-TNB	1.8 (EPA 9 PRG)	9.3
JAW71	RDX	2 (HAL)	9.3
	1,3-DNB	1 (HAL)	2.4
JAW72	RDX	2 (HAL)	1600
	1,3,5-TNB	1.8 (EPA 9 PRG)	13
	2,4-DNT	5 (10E-4 Cancer Risk)	6.3
	TCE	5 (MCL)	8.6
	Bis(2-ethylhexyl)phthalate	6 (MCL)	6.7
JAW73	RDX	2 (HAL)	190
	1,3,5-TNB	1.8 (EPA 9 PRG)	8.8
	Bis(2-ethylhexyl)phthalate	6 (MCL)	7.7
G15	RDX	2 (HAL)	970

FIRE TRAINING AREA (SPRING CREEK)			
Well	Chemical	PRG (ug/L)	Concentration (ug/L)
JAW58	1,1-DCE	7 (MCL)	790
	Tetrachloroethene	5 (MCL)	8.9
	1,1,1-TCA	200 (MCL)	1800
	1,1,2-DCE	5 (MCL)	10
JAW59	1,1-DCE	7 (MCL)	140
	Tetrachloroethene	5 (MCL)	5.4
JAW60	Benzene	5 (MCL)	29
	1,1-DCE	7 (MCL)	440
	1,2-DCA	5 (MCL)	29
	1,1,1-TCA	200 (MCL)	230
	TCE	5 (MCL)	110
JAW61	1,1-DCE	7 (MCL)	21
	Tetrachloroethene	5 (MCL)	36
	TCE	5 (MCL)	16
JAW69	Acetone	610 (EPA 9 PRG)	57000
	MEK	1,900 (EPA 9 PRG)	6300
	1,1-DCA	790 (EPA 9 PRG)	3400
	1,1-DCE	7 (MCL)	3300
	cis-1,2-DCE	70 (HAL)	19000
	Toluene	1,000 (MCL)	20000
	1,1,1-TCA	200 (MCL)	5500
JAW80	1,1-DCE	7 (MCL)	15

LINE 3A (SKUNK RIVER)			
Well	Chemical	PRG (ug/L)	Concentration (ug/L)
JAW15	RDX	2 (HAL)	36
JAW17	RDX	2 (HAL)	10
JAW21	RDX	2 (HAL)	19
JAW22	RDX	2 (HAL)	48

DEMOLITION AREA (SKUNK RIVER)			
Well	Chemical	PRG (ug/L)	Concentration (ug/L)
DA1	RDX	2 (HAL)	2.5
DA2	RDX	2 (HAL)	8.5
G10	RDX	2 (HAL)	6.2
JAW1	RDX	2 (HAL)	6.6

LINE 800/PINK WATER LAGOON (BRUSH CREEK) *							
Chemical	PRG (ug/L)	Well (ug/L)					
		G18	G19	G20	G41	G57	G58
1,3,5-TNB	1.8 (EPA 9 PRG)	190	63	2,600	---	---	---
1,3-DNB	1 (HAL)	110	110	72	---	---	---
2,4,6-TNT	2 (HAL)	2,200	2,000	470	---	---	---
2,4-DNT	5 (10E-4 Cancer Risk)	95	140	96	---	---	---
2,6-DNT	5 (10E-4 Cancer Risk)	75	96	---	---	---	---
RDX	2 (HAL)	8,600	8,400	13,000	12.5	470	1,500
Nitrobenzene	3.4 (EPA 9 PRG)	---	---	170	---	---	---
HMX	400 (HAL)	1,100	980	1,700	---	---	---

* = Jaycor, 1996.

LINE 3 (BRUSH CREEK)			
Well	Chemical	PRG (ug/L)	Concentration (ug/L)
H16A	Nitrobenzene	3.5 (EPA 9 PRG)	4
	Bis(2-ethylhexyl)phthalate	6 (MCL)	10.9
JAW54	RDX	2 (HAL)	1,500
	2,4-DNT	5 (10E-4 Cancer Risk)	10
	1,3,5-TNB	1.8 (EPA 9 PRG)	14
JAW55	Bis(2-ethylhexyl)phthalate	6 (MCL)	6.5

SOUTH BOUNDARY/DOWNSTREAM REACH BRUSH CREEK			
Well	Chemical	PRG (ug/L)	Concentration (ug/L)
G55	RDX	2 (HAL)	2.2
	Manganese	1,700 (RDA)	3,700
	Iron	6,000 (RDA)	20,700
G22	RDX	2 (HAL)	2.3
G24	RDX	2 (HAL)	3.4

LEGEND:

- PLANT PROPERTY BOUNDARY
- *ND* — NO EXPLOSIVES DETECTED
- *3.55* — TOTAL EXPLOSIVES CONCENTRATION (ug/l)
- A — ROAD NAME
- DRAINAGE BOUNDARY

Scale 0 2000 4000 6000 8000 Feet

N

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Figure 5-1

GROUNDWATER CONCENTRATIONS EXCEEDING PRGs

SUPPLEMENTAL GROUNDWATER RI

IOWA ARMY AMMUNITION PLANT

Middletown, Iowa

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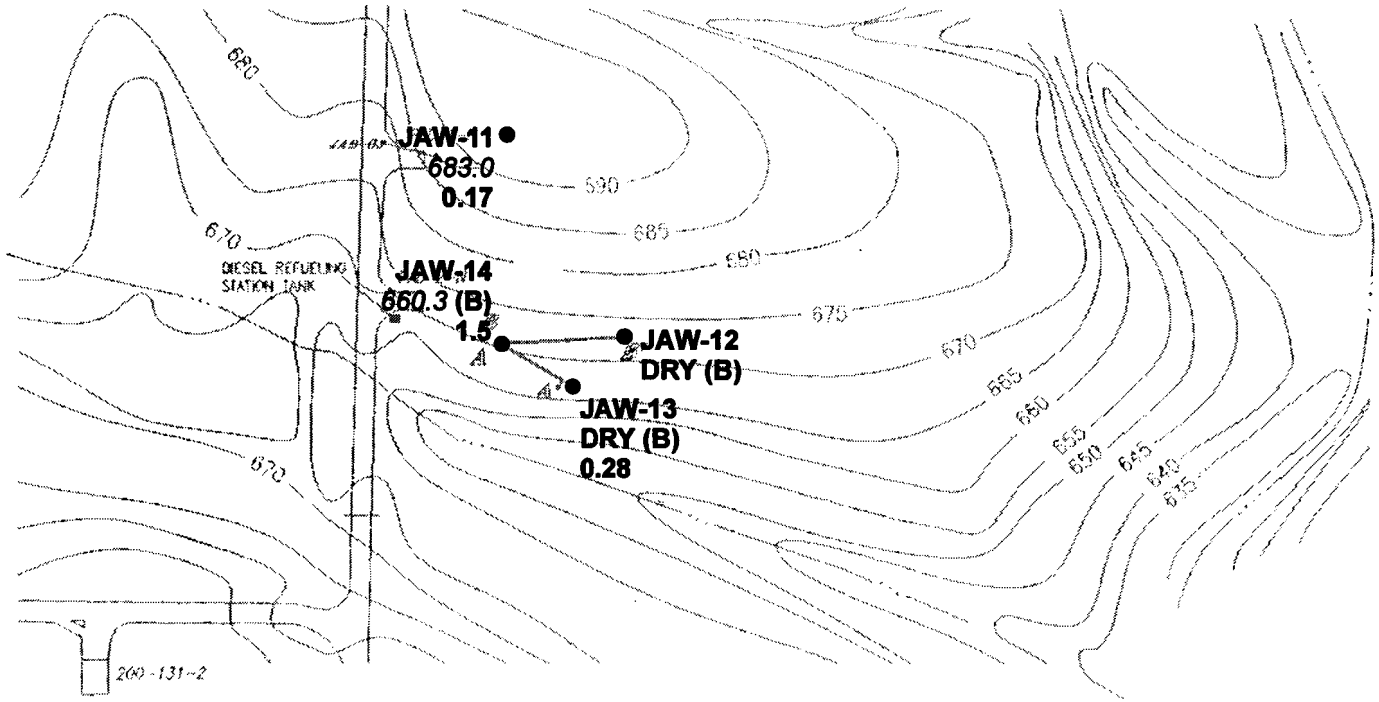

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LEGEND:

●	Monitoring Wells or Sample Locations
680.6	Potentiometric Elevation (Upper drift unless noted)
(B)	Bedrock Well
➚	Approximate Direction of Groundwater Flow
11.05	Total Explosives (ug/L)
(RDX=5.6)	> PRG (ug/L)
ND	Explosives not Detected
NA	Sample Data not Available
	Topographic Contour
	> PRGs (Proposed Preliminary Remedial Goals)

Scale 0 75 150 Feet

SOURCE: Jaycor Environmental (Base map)

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Figure 5-4

EXTENT OF GROUNDWATER CONTAMINATION
NORTH BURN PADS, SPRING CREEK

SUPPLEMENTARY GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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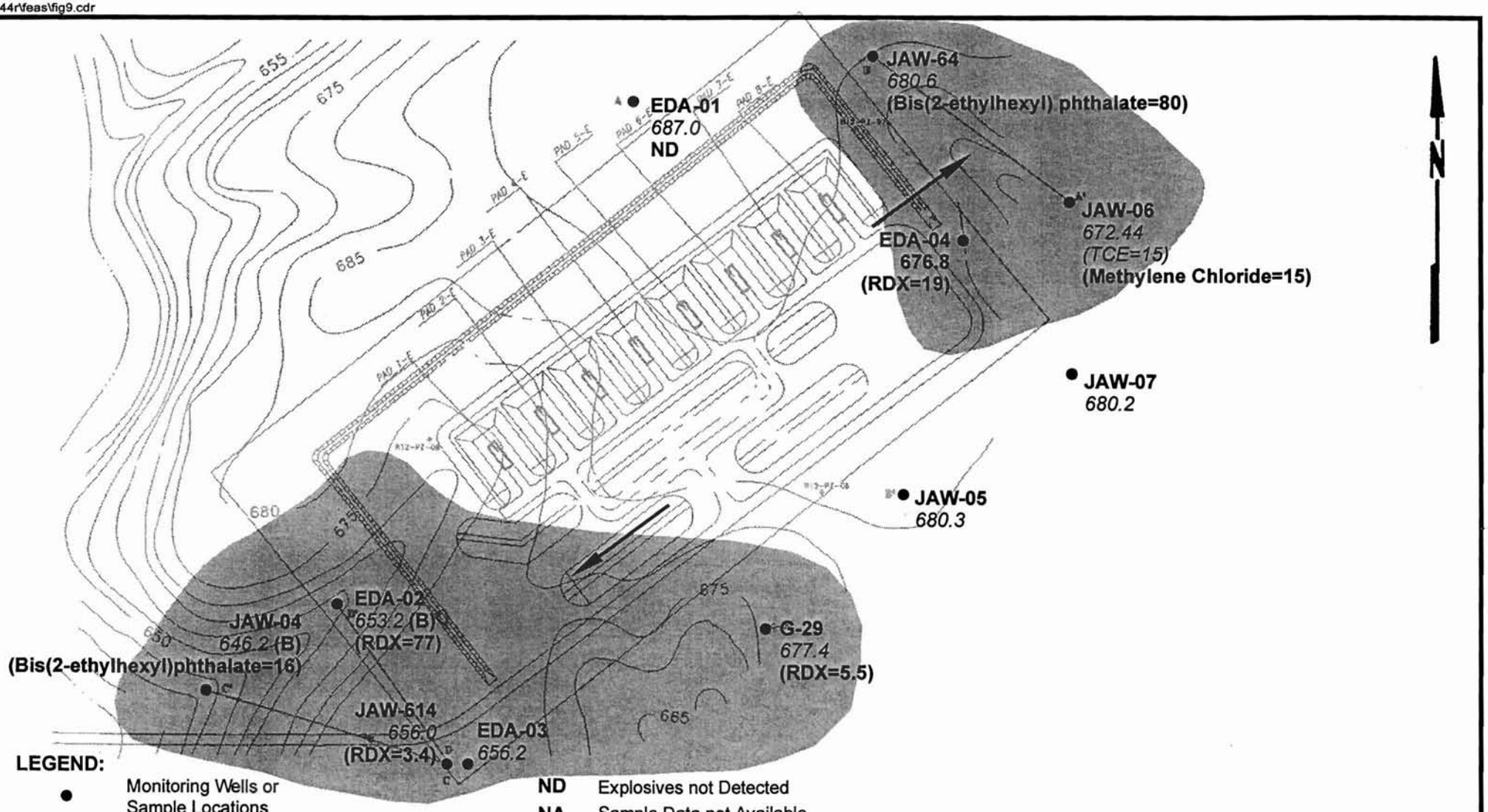

LEGEND:

- ● Monitoring Wells or Sample Locations
- *680.6* Potentiometric Elevation (Upper drift unless noted)
- **(B)** Bedrock Well
- Approximate Direction of Groundwater Flow
- **11.05** Total Explosives (ug/L)
- **(RDX=5.6)** > PRG (ug/L)
- **ND** Explosives not Detected
- **NA** Sample Data not Available
- Topographic Contour
- > PRGs (Proposed Preliminary Remedial Goals)

Scale 0 150 300 Feet
Approximate Scale

SOURCE: Jaycor Environmental (Base map)

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Figure 5-2

EXTENT OF GROUNDWATER CONTAMINATION
EAST BURN PADS LANDFILL, SPRING CREEK

SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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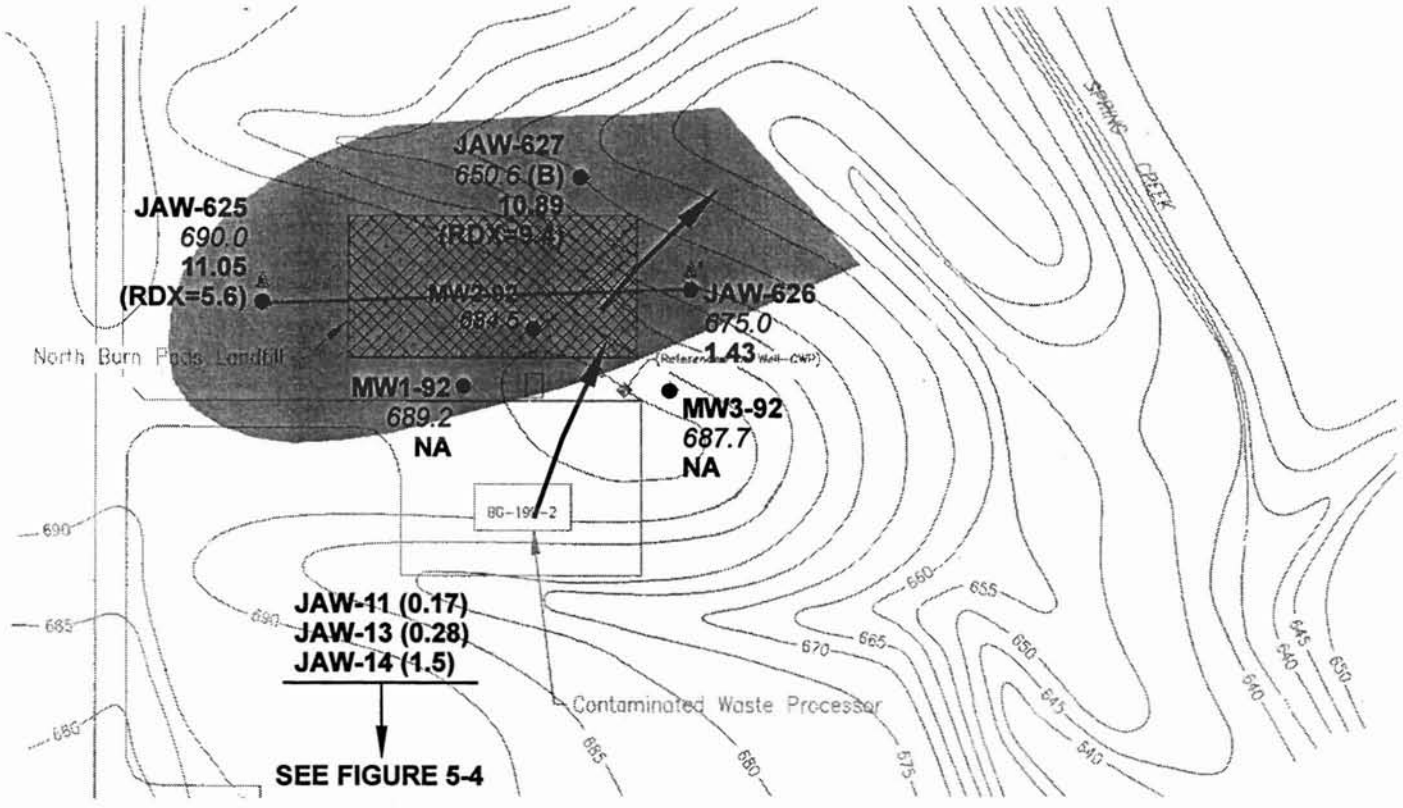

LEGEND:

●	Monitoring Wells or Sample Locations
680.6	Potentiometric Elevation (Upper drift unless noted)
(B)	Bedrock Well
→	Approximate Direction of Groundwater Flow
11.05	Total Explosives (ug/L)
(RDX=5.6)	> PRG (ug/L)
ND	Explosives not Detected
NA	Sample Data not Available
~	Topographic Contour
▒	> PRGs (Proposed Preliminary Remedial Goals)

Scale 0 100 200 Feet
Approximate Scale

SOURCE: Jaycor Environmental (Base map)

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Figure 5-3

EXTENT OF GROUNDWATER CONTAMINATION
NORTH BURN PADS LANDFILL, SPRING CREEK

SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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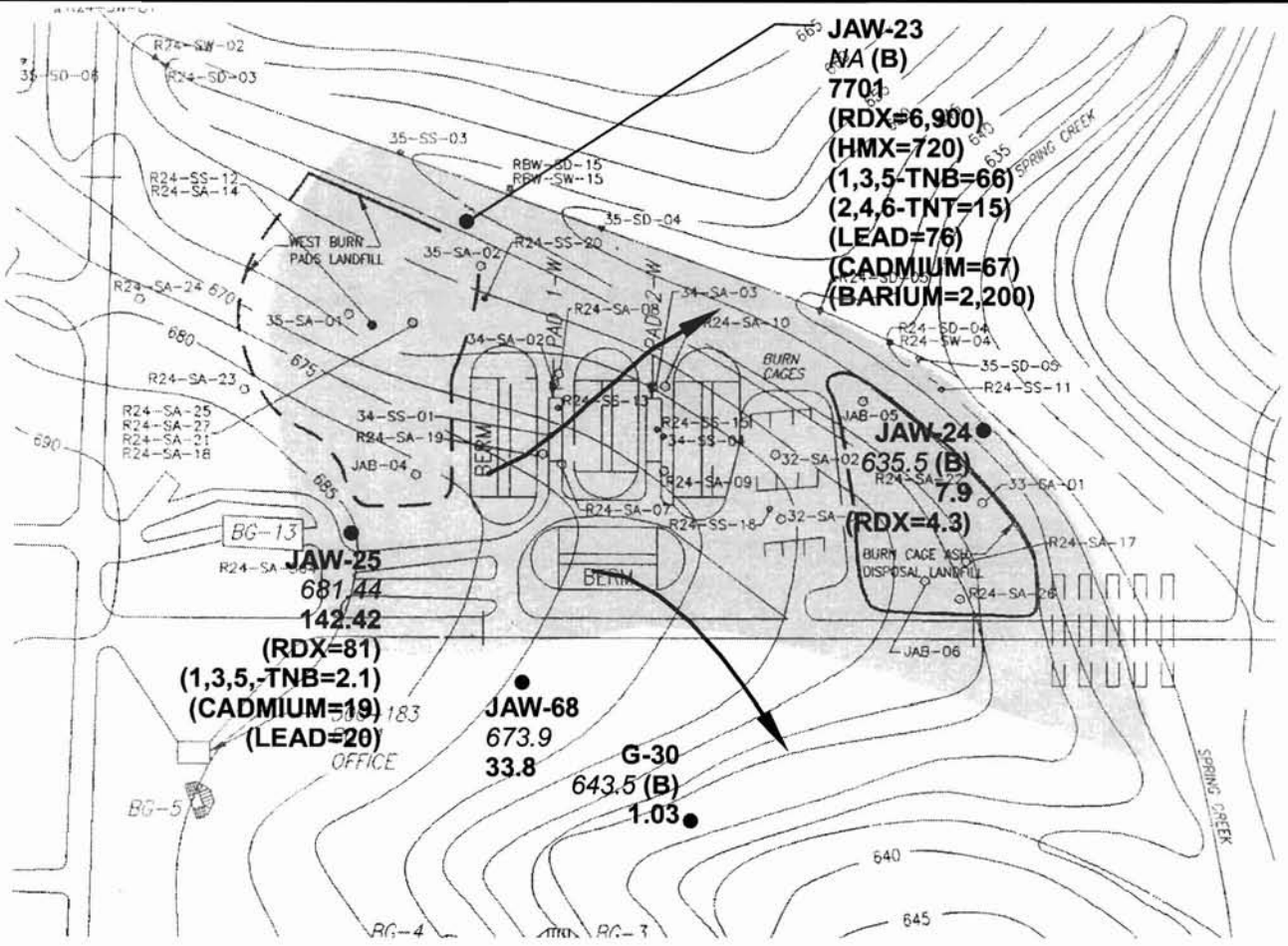

NOTE:
Tape blocked in JAW-23 at time of measurement. No groundwater level available.

LEGEND:

●	Monitoring Wells or Sample Locations
680.6	Potentiometric Elevation (Upper drift unless noted)
(B)	Bedrock Well
➡	Approximate Direction of Groundwater Flow
11.05	Total Explosives (ug/L)
(RDX=5.6)	> PRG (ug/L)
ND	Explosives not Detected
NA	Sample Data not Available
670	Topographic Contour
	> PRGs (Proposed Preliminary Remedial Goals)

SOURCE: Jaycor Environmental (Base map)

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Scale 0 100 200 Feet
Approximate Scale

Figure 5-5

EXTENT OF GROUNDWATER CONTAMINATION
WEST BURN PADS, SPRING CREEK

SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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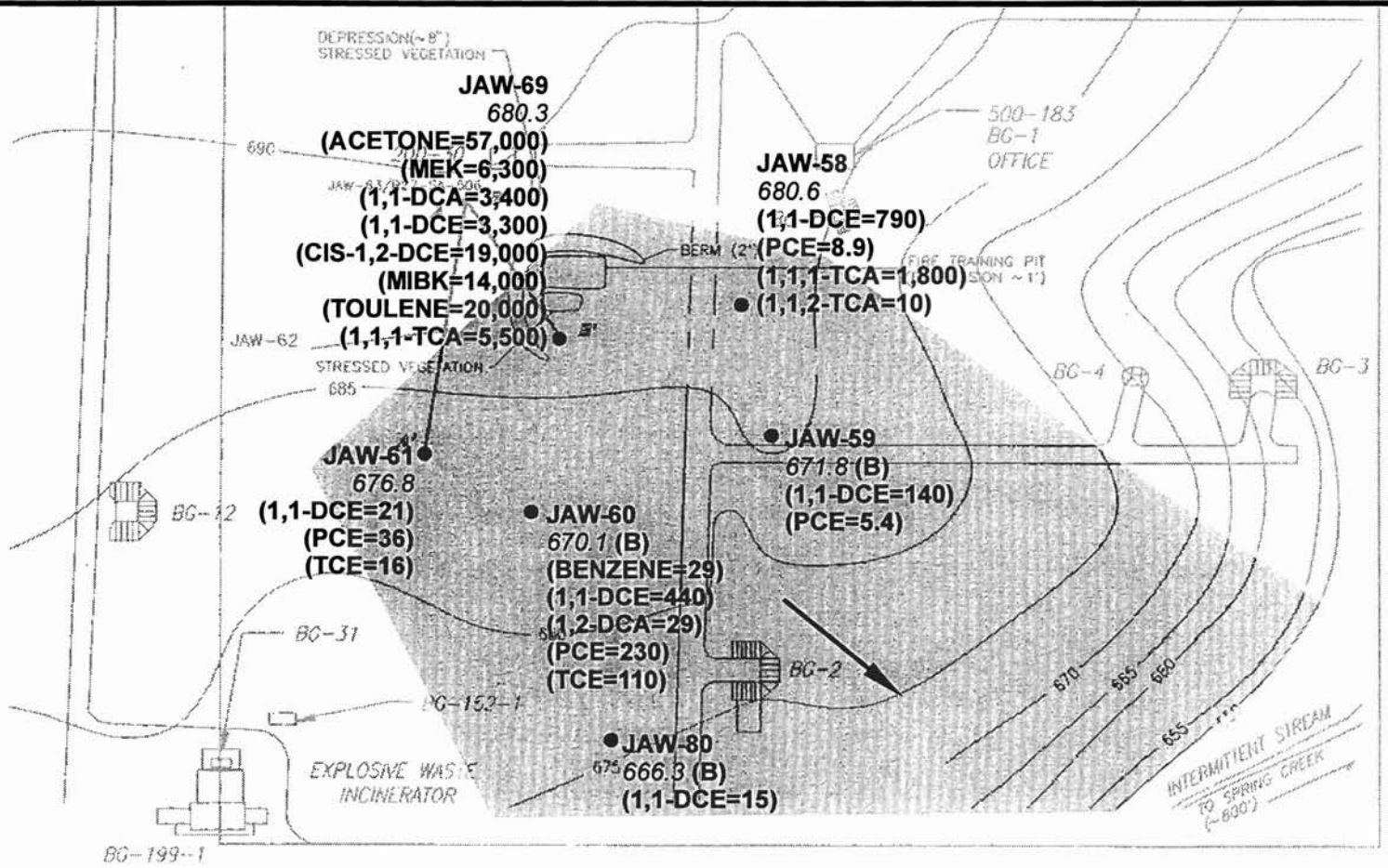

LEGEND:

●	Monitoring Wells or Sample Locations
680.6	Potentiometric Elevation (Upper drift unless noted)
(B)	Bedrock Well
➡	Approximate Direction of Groundwater Flow
11.05	Total Explosives (ug/L)
(RDX=5.6)	> PRG (ug/L)
ND	Explosives not Detected
NA	Sample Data not Available
	Topographic Contour
	> PRGs (Proposed Preliminary Remedial Goals)

SOURCE: Jaycor Environmental (Base map)

Scale 0 125 250 Feet
Approximate Scale

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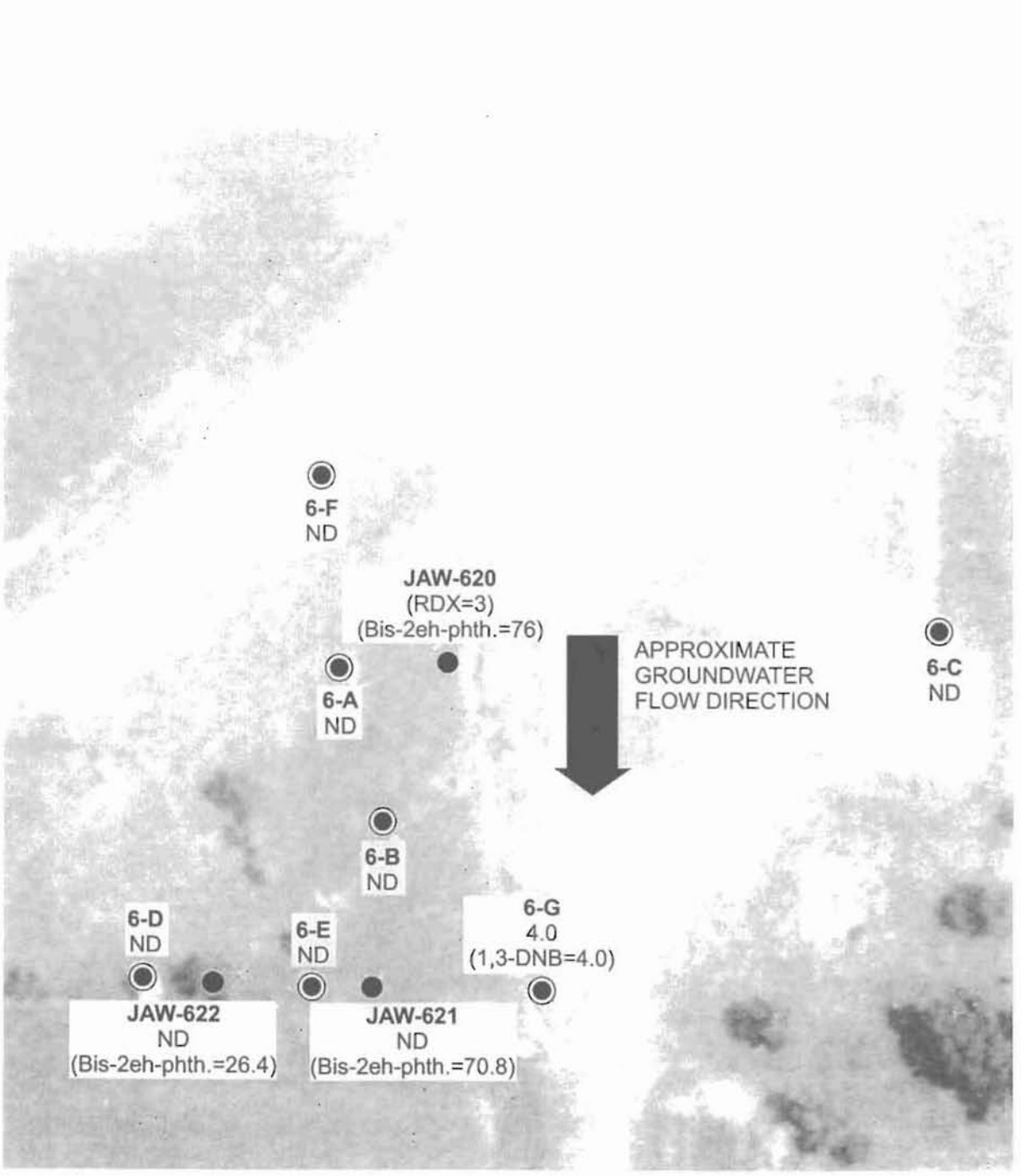
Figure 5-6

EXTENT OF GROUNDWATER CONTAMINATION
FIRE TRAINING PIT, SPRING CREEK

SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa



LEGEND:

- Hydropunch / Temporary Well Location
- Existing Monitoring Well
- 4.0 Total Explosives Concentration in Groundwater (ug/L)
- (___) > PRGs (ug/L)
- **ND** Explosives Not Detected

Scale 0 120 Feet
Approximate Scale

Figure 5-7

EXTENT OF GROUNDWATER CONTAMINATION, AMMUNITION BOX CHIPPER DISPOSAL AREA, (TASK 6) SPRING CREEK

SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

SOURCE: USDA Aerial Photograph 1978

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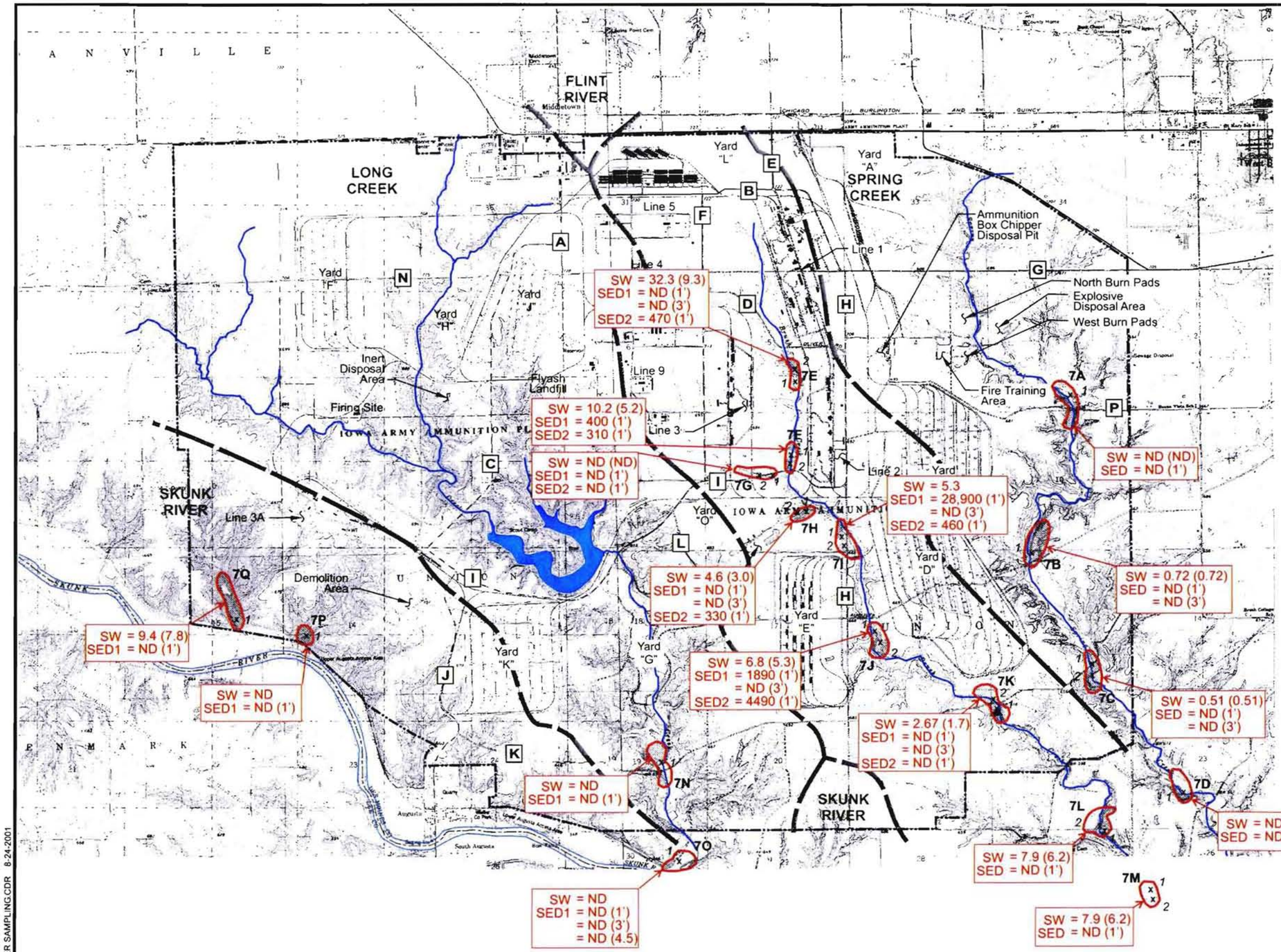

Figure 5-8

ANALYTICAL RESULTS, SEDIMENT AND SURFACE WATER SAMPLING, TASK 7

SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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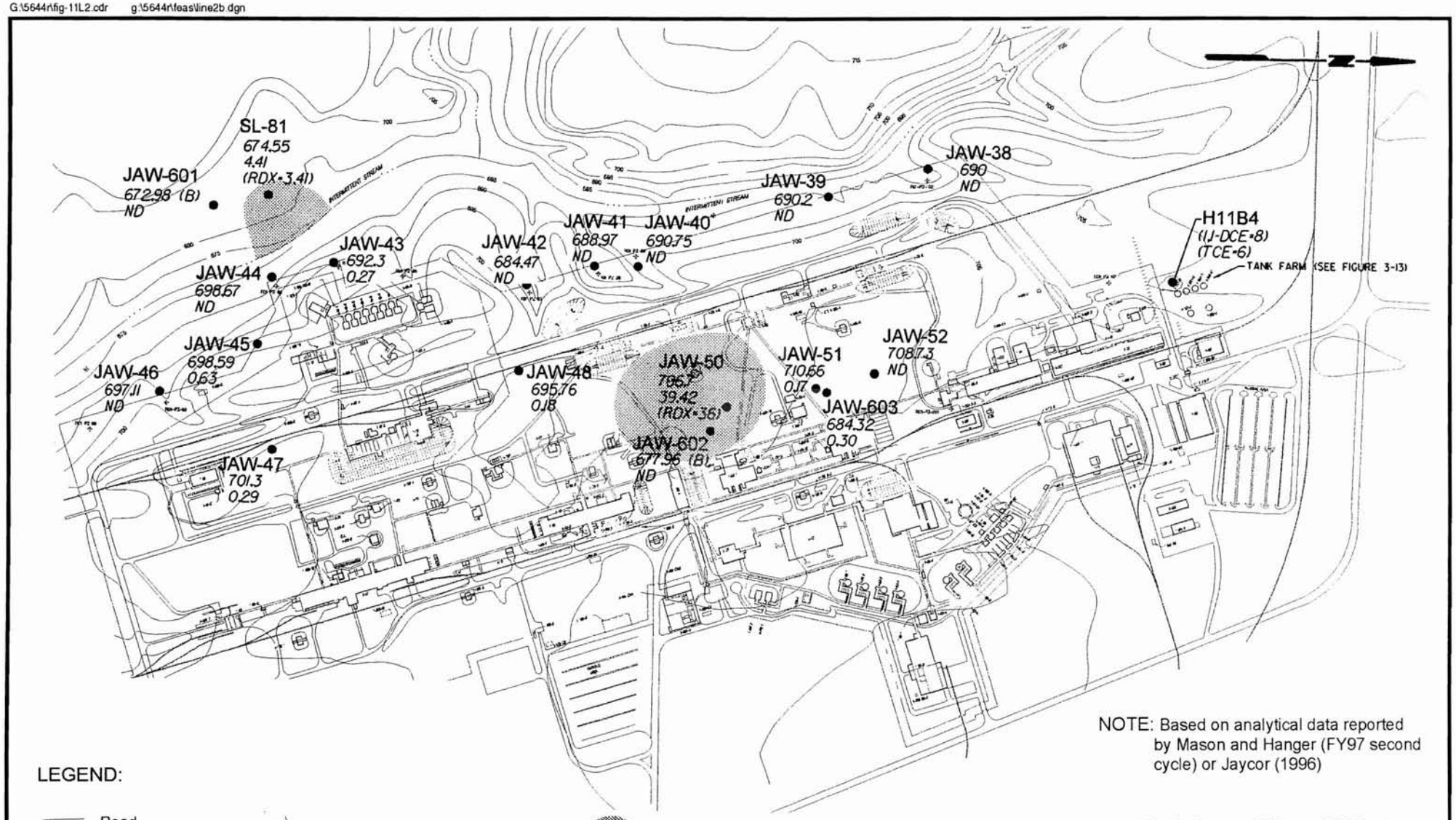

NOTE: Based on analytical data reported by Mason and Hanger (FY97 second cycle) or Jaycor (1996)

LEGEND:

- Road
- Walkway
- Fence
- 7-19-1 Building Number
- Berm (Explosion Protection)
- 690 Topographic Contour, Contour Interval = 5 Feet
- Intermittent Stream
- Monitoring Well / Piezometer
- 36 Total Explosives (ug/L)
- (•) > PRGs (ug/L)
- > PRGs (Approximate Preliminary Remedial Goals)
- 674.55 Potentiometric Elevation

Scale 0 250 500 Feet

Figure 5-9

EXTENT OF GROUNDWATER CONTAMINATION, LINE 1, BRUSH CREEK

SUPPLEMENTAL GROUNDWATER RI

IOWA ARMY AMMUNITION PLANT

Middletown, Iowa

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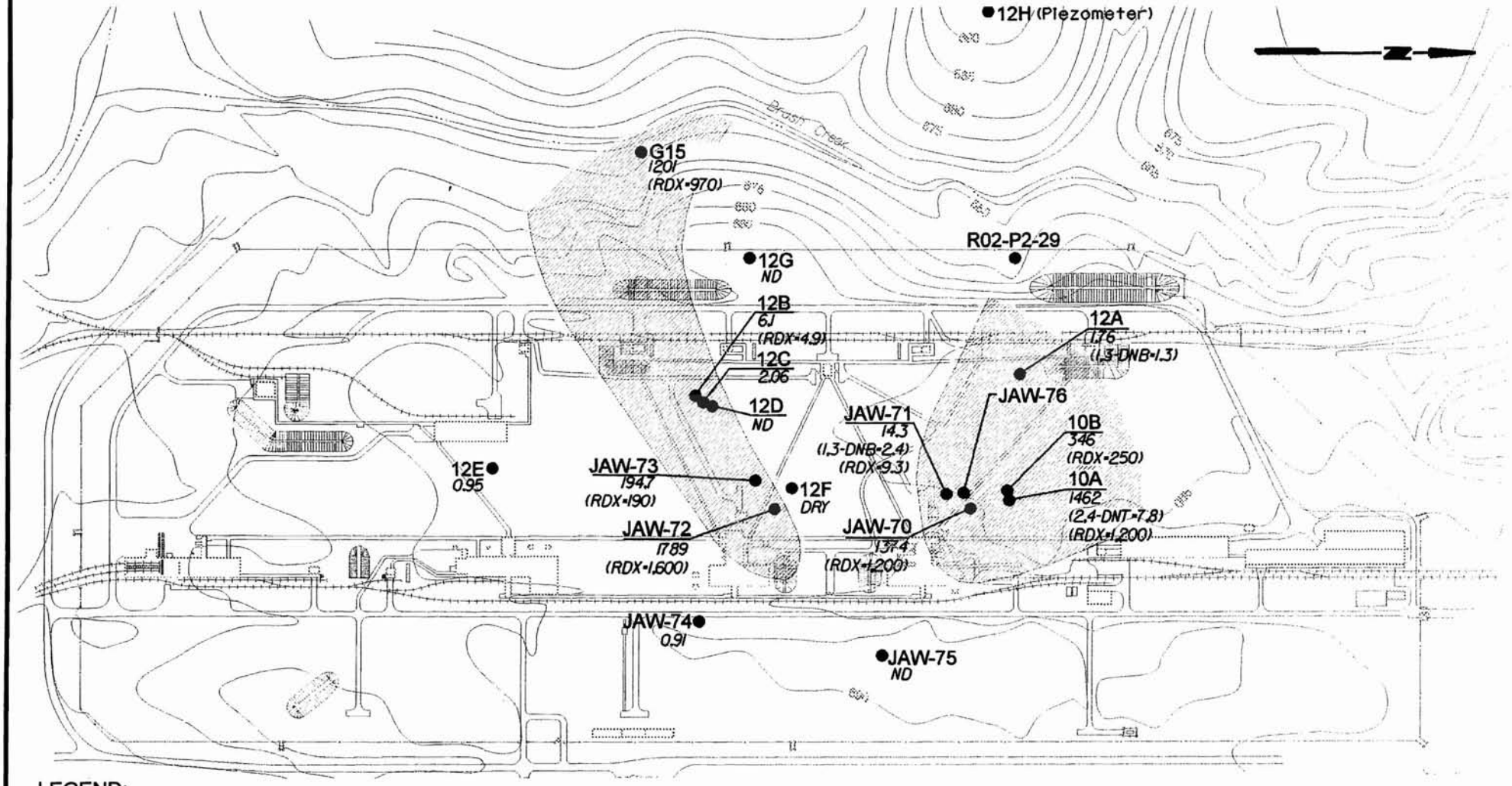

LEGEND:

- Road
- Walkway
- Fence
- Building Number
- Berm (Explosion Protection)
- Topographic Contour Contour Interval = 5 Feet
- Intermittent Stream
- Monitoring Well / Piezometer
- 0.64 Total Explosives (ug/L)
- > PRGs (ug/L)
- ND Explosives Not Detected
- Generalized Extent of Contamination > PRGs

Scale 0 250 500 Feet

NOTE: Groundwater elevations shown on Figure 3-22.

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Figure 5-10

EXTENT OF GROUNDWATER CONTAMINATION, LINE 2 (Task 12)

SUPPLEMENTAL GROUNDWATER RI

IOWA ARMY AMMUNITION PLANT

Middletown, Iowa

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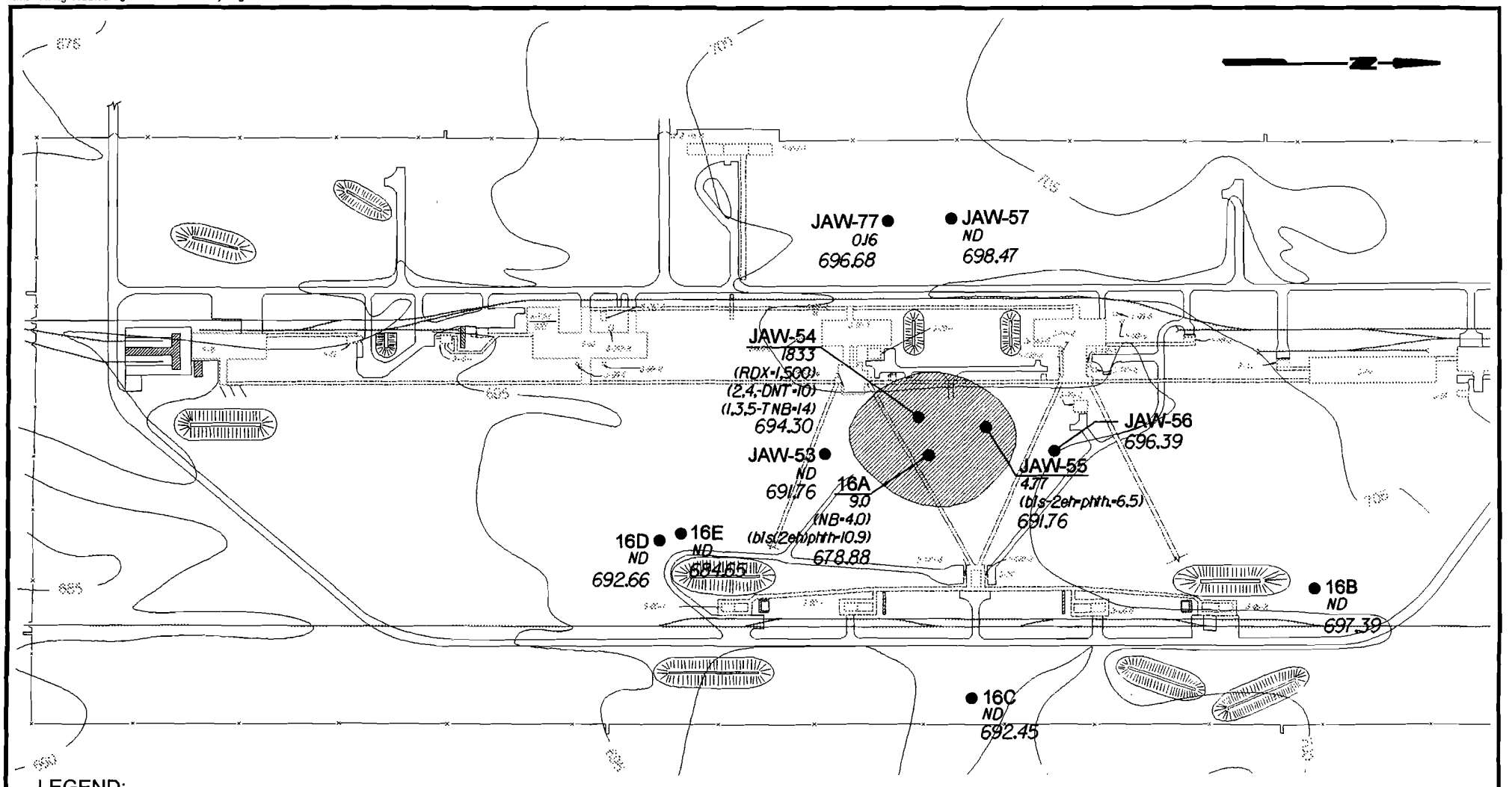

LEGEND:

- Road
- Walkway
- Fence
- Building Number
- 692.66 Groundwater Elevation
- Berm (Explosion Protection)
- Topographic Contour Contour Interval = 5 Feet
- Intermittent Stream
- Monitoring Well / Piezometer
- 0.64 Total Explosives (ug/L)
- (__) > PRGs (ug/L)
- ND Explosives Not Detected
- Generalized Extent of Contamination > PRGs

Scale 0 250 500 Feet

NOTE: Groundwater elevations shown on Figure 3-28.

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Figure 5-11

EXTENT OF GROUNDWATER CONTAMINATION LINE 3 (Task 16)

SUPPLEMENTAL GROUNDWATER RI

IOWA ARMY AMMUNITION PLANT

Middletown, Iowa

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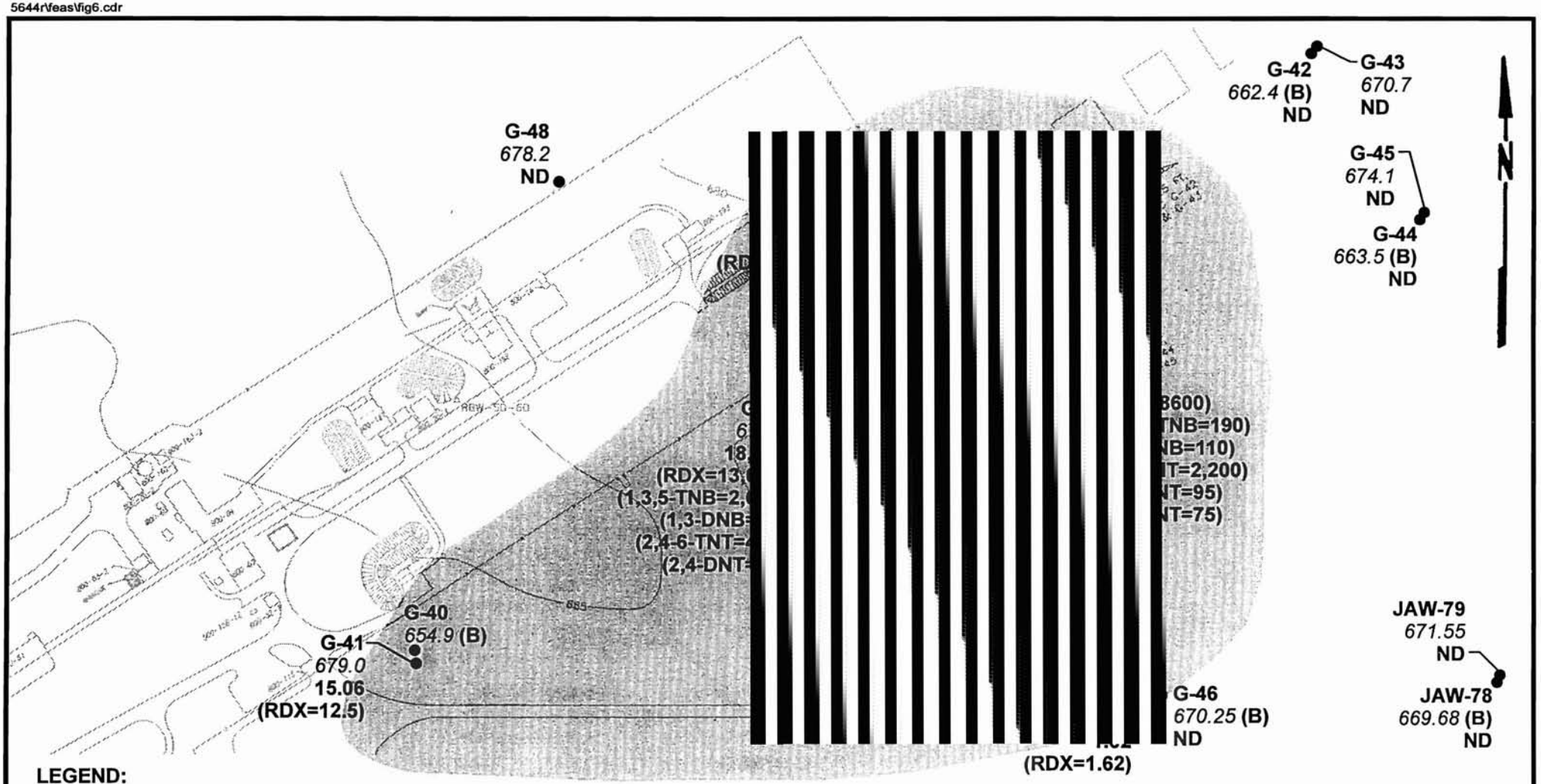

LEGEND:

- ● Monitoring Wells or Sample Locations
- *680.6* Potentiometric Elevation (Upper drift unless noted)
- **(B)** Bedrock Well
- Approximate Direction of Groundwater Flow
- **11.05** Total Explosives (ug/L)
- **(RDX=5.6)** > PRG (ug/L)
- **ND** Explosives not Detected
- **NA** Sample Data not Available
- Topographic Contour
- > PRGs (Proposed Preliminary Remedial Goals)

Scale 0 150 300 Feet
Approximate Scale

SOURCE: Jaycor Environmental (Base map)

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Figure 5-12

EXTENT OF GROUNDWATER CONTAMINATION
LINE 800 / PINK WATER LAGOON, BRUSH CREEK

SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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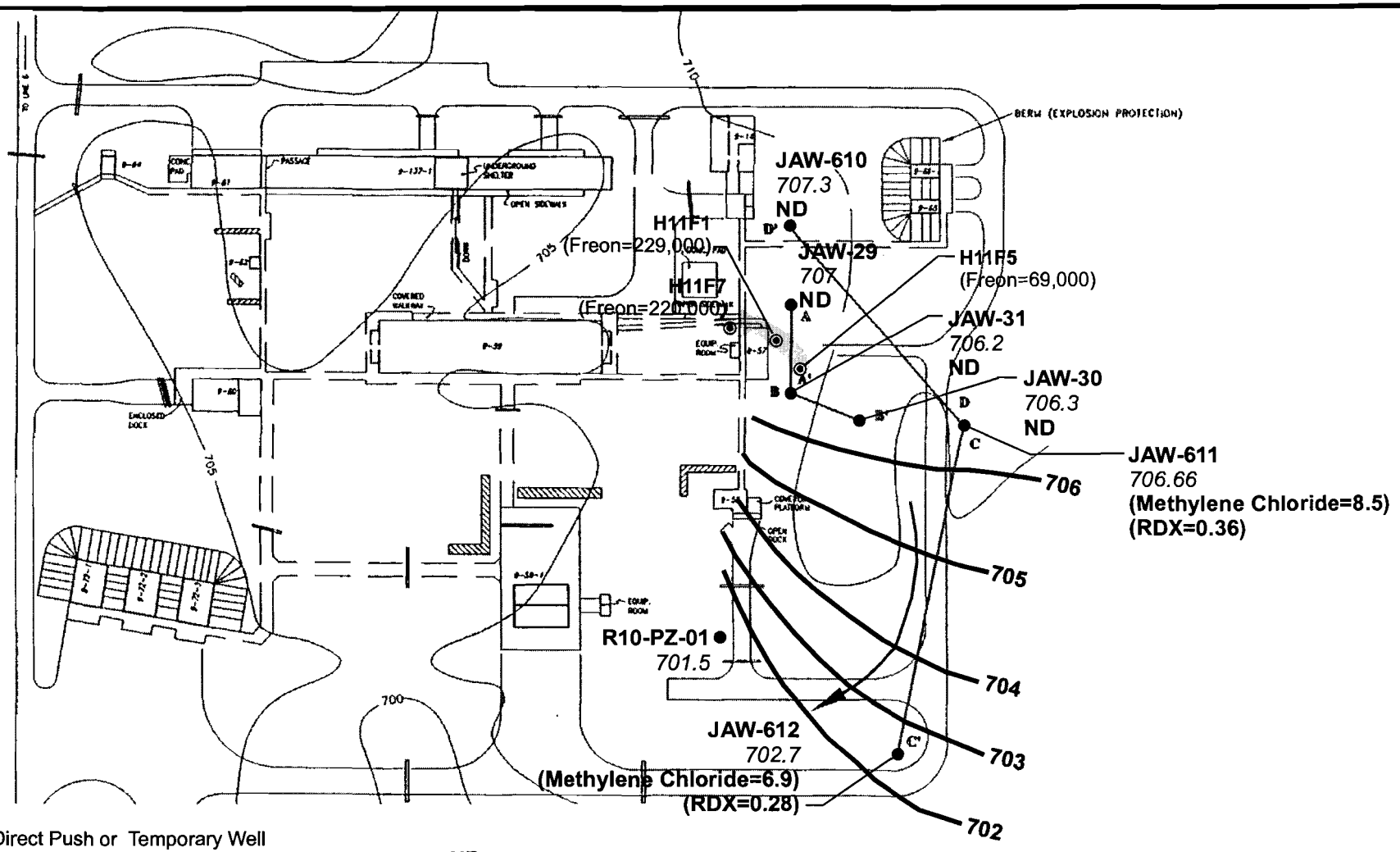

LEGEND:

- ◉ Direct Push or Temporary Well
- ● Monitoring Wells
- *680.6* Potentiometric Elevation
- Approximate Direction of Groundwater Flow
- **11.05** Total Explosives (ug/L)
- **(RDX=5.6)** > PRG (ug/L)
- **ND** Explosives not Detected
- **NA** Sample Data not Available
- 670 Topographic Contour
- > PRGs (Proposed Preliminary Remedial Goals)

Scale 0 150 300 Feet

Approximate Scale

SOURCE: Jaycor Environmental (Base map)

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Figure 5-13

EXTENT OF GROUNDWATER CONTAMINATION
LINE 9, BRUSH CREEK

SUPPLEMENTAL GROUNDWATER RI

IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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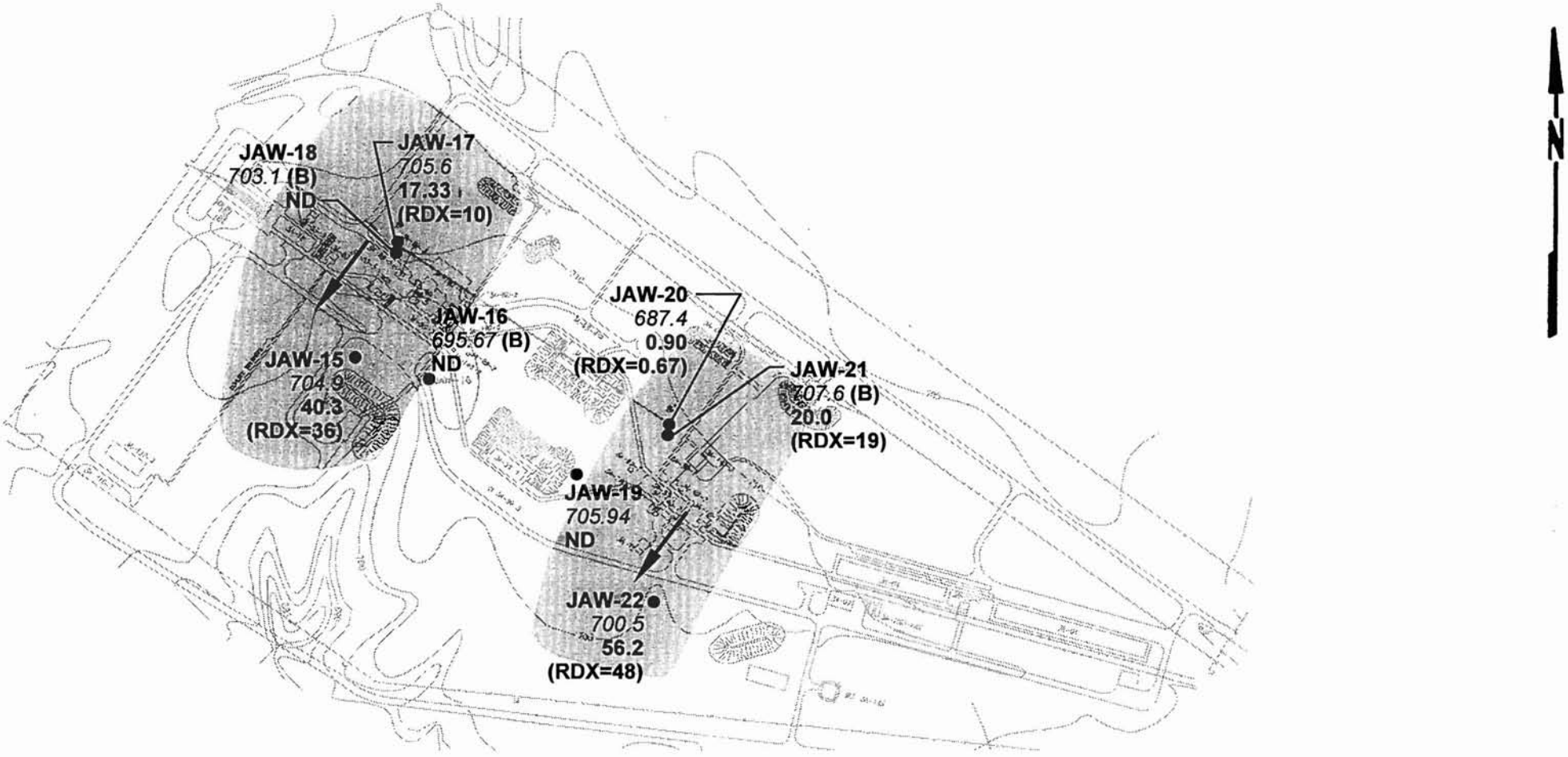

LEGEND:

- ● Monitoring Wells or Sample Locations
- *680.6* Potentiometric Elevation (Upper drift unless noted)
- **(B)** Bedrock Well
- Approximate Direction of Groundwater Flow
- **11.05** Total Explosives (ug/L)
- **(RDX=5.6)** > PRG (ug/L)
- **ND** Explosives not Detected
- **NA** Sample Data not Available
- Topographic Contour
- > PRGs (Proposed Preliminary Remedial Goals)

Scale 0 320 640 Feet
Approximate Scale

SOURCE: Jaycor Environmental (Base map)

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Figure 5-14

EXTENT OF GROUNDWATER CONTAMINATION
LINE 3A, SKUNK RIVER

SUPPLEMENTAL GROUNDWATER RI
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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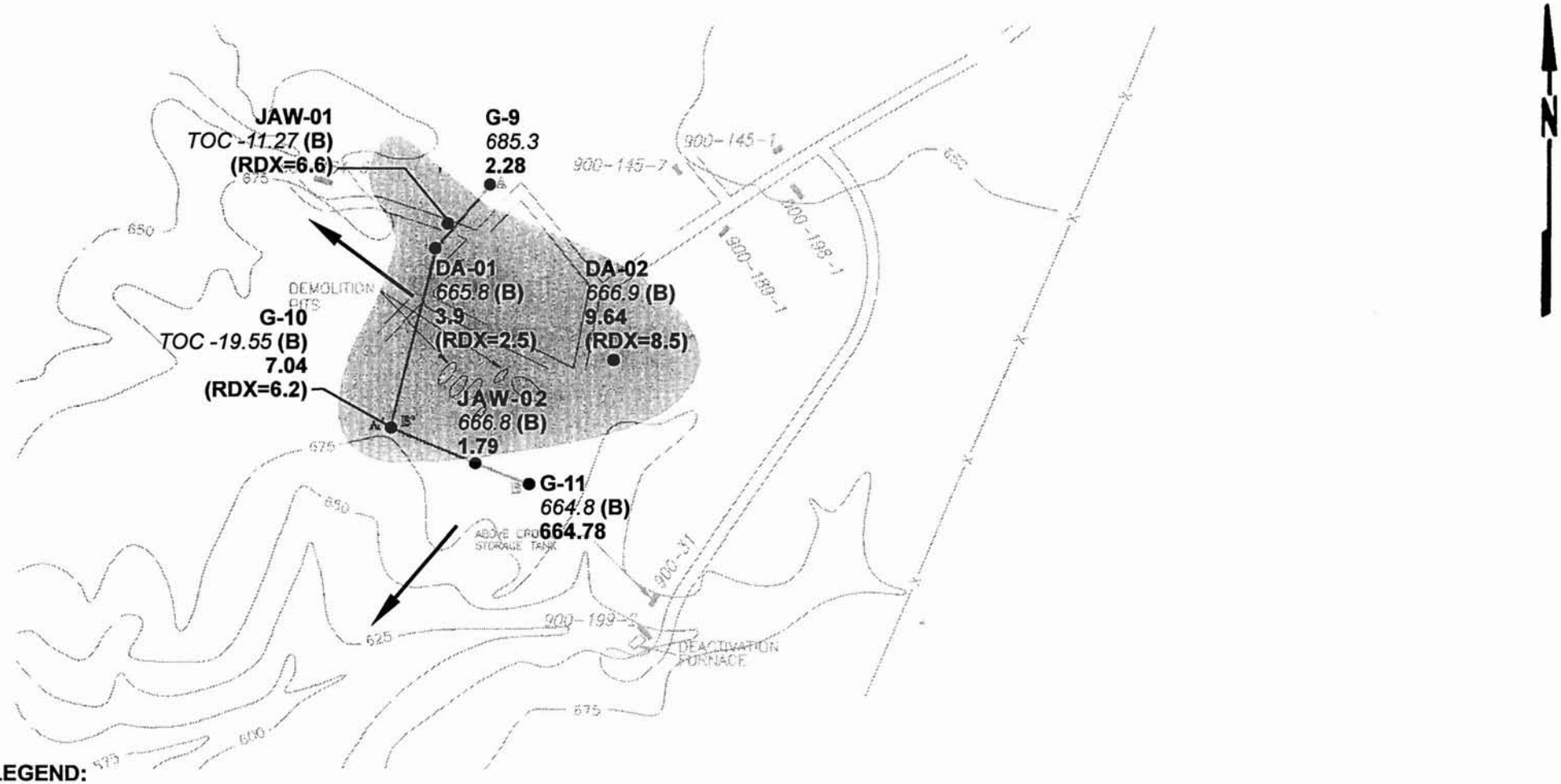

LEGEND:

- ● Monitoring Wells or Sample Locations
- *680.6* Potentiometric Elevation (Upper drift unless noted)
- **(B)** Bedrock Well
- Approximate Direction of Groundwater Flow
- **11.05** Total Explosives (ug/L)
- **(RDX=5.6)** > PRG (ug/L)
- **ND** Explosives not Detected
- **NA** Sample Data not Available
- Topographic Contour
- > PRGs (Proposed Preliminary Remedial Goals)
- *TOC* = Top of Riser Elevation

SOURCE: Jaycor Environmental (Base map)

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Scale 0 300 600 Feet

Approximate Scale

Figure 5-15

EXTENT OF GROUNDWATER CONTAMINATION DEMOLITION AREA, SKUNK RIVER

SUPPLEMENTAL GROUNDWATER RI

IOWA ARMY AMMUNITION PLANT

Middletown, Iowa

6.0 CONTAMINANT FATE AND TRANSPORT

This section summarizes information on the fate and transport of contaminants at IAAAP, adapted principally from JAYCOR (1996). It focuses on groundwater-related fate and transport mechanisms, physical and chemical properties of contaminants, and site characteristics that influence fate and transport. Additional discussion on groundwater migration pathways is derived from data and evaluations in this supplemental RI. Results of fate and transport analyses at specific site facilities is taken from JAYCOR (1996), supplemented by additional evaluations completed in this study. Sections 6.1, 6.2, and 6.3 outline general fate and transport processes. Subsequent sections relate these processes to the IAAAP and specific plant facilities.

6.1 Contaminant Transport Mechanisms

Advection and dispersion/diffusion are suggested to be the groundwater transport mechanisms most important at this site.

Advection. Advection refers to the contaminant transport mechanism by which contaminants dissolved in water (solutes) are transported with the water. In porous media, the solutes are transported along flow lines at the average linear seepage flow velocity. On the macroscopic level, flow rate and direction are governed by the hydraulic properties of the media and the magnitude and direction of hydraulic gradient. In fractured bedrock, flow rate and direction depends on the occurrence, properties, and degree of interconnection of open fractures and bedding planes and direction may be influenced by orientation of individual fractures or groups of fractures.

Dispersion. Dispersion is the process of mechanical mixing caused by water in the subsurface flowing around soil particles, spreading and migrating to both sides. Mechanical mixing can cause contaminants in groundwater to be transported beyond their original occurrences.

Diffusion. Diffusion is the process by which ionic and molecular chemical species dissolved in the water move from areas of higher concentration to areas of lower concentration. The processes of molecular diffusion and mechanical dispersion cannot be separated in flowing groundwater. The two processes are represented by what is called hydrodynamic dispersion. Hydrodynamic dispersion causes the solute front to advance faster than would be predicted by the average linear velocity of groundwater flow. A continuous source of contamination will cause a plume while a spill will cause a slug that grows with time as it moves along with groundwater.

6.2 Fate of Contaminants in the Subsurface

Many complex chemical and microbiological processes affect the fate of contaminants in the subsurface. The processes may retard or enhance contaminant movement or attenuate contaminant concentration. Primary chemical and microbiological processes are described below.

Adsorption. Adsorption is the partitioning of chemical constituents, specifically dissolved

organic contaminants, from ground or surface water to natural subsurface materials. Adsorption to soil organic matter occurs through nonionic (hydrophobic compounds) and ionic (polar organic compounds) reactions. The rate of these reactions and the extent of adsorption depends on a number of variables in the soil, including organic matter content, cation exchange capacity, temperature and pH. Adsorption of chemicals to soil is controlled by electrostatic and chemical forces. Electrostatic forces are caused by electron potential differences between the molecule and soil particle surface, and chemical forces are related to ion exchange and covalent bonding of ions and complexes to specific sites on soil particles. Adsorption of chemical compounds to soil occurs during contaminant transport in groundwater flow. This adsorption is not permanent and chemicals are continually adsorpted and released during transport. The adsorption/release phenomena retards the transport of chemicals in groundwater, thus making estimates of hydrodynamic dispersion conservative.

Biodegradation. Biodegradation is an attenuation process involving transformation of organic substances to smaller molecules via oxidation and reduction mechanisms. A breakdown of organic compounds occurs by microorganisms (bacteria, fungi, algae, and protozoa) under aerobic and anaerobic conditions in soil, surface water, sediments, and groundwater. Biodegradation results from the action of intracellular and extracellular enzymes on organic substrates. The presence of microorganisms can increase the rate of non-biological reactions (i.e., oxidation, hydrolysis). The rate of biodegradation is a function of the size and composition of microbial populations, temperature, substrate concentration, availability of an energy (e.g., carbon) source and essential nutrients, water, and the organic content of soil. Biodegradation may directly affect the transport of contaminants via chemical transformation of a compound that has different adsorption characteristics. Biodegradation may indirectly affect the fate and transport of compounds through changes in the pH and redox potential of environmental media.

Volatilization. Volatilization is a phase change reaction that transfers a chemical from water or soil to air. Chemicals with a high Henry's law constant, H, tend to be highly volatile. The rate of volatilization is influenced by a variety of factors, including polarity and functional groups of the molecule, molecular weight, temperature, wind speed, soil conditions and vapor pressure. Chemicals that are highly volatile generally do not adsorb to soil well.

Hydrolysis Reactions. Hydrolysis occurs when the bonds of an organic compound which are dissolved in water, break, and new bonds are formed with the ions OH^- and H^+. The rate at which organic compounds undergo hydrolysis in water is dependent on the concentration of the compound, temperature, and pH. For most chemicals, hydrolysis has a relatively insignificant effect compared to biodegradation. However, hydrolysis may be significant for chlorinated organics. Other compounds susceptible to hydrolysis reactions include amides, amines, esters, carbamates, and alkyl halides. Alteration of the chemical compound can change its transport characteristics.

Oxidation/Reduction Reactions. Oxidation is the loss of electrons from a chemical; reduction involves the addition of electrons to a chemical. Chemical reduction-oxidation (redox)

reactions can occur with either organic or inorganic chemicals. These reactions are strongly influenced by the electrical potential of the surrounding medium. Redox potentials in the range of 400 to 800 millivolts are associated with well-oxidated, aerated soils, while potentials of -100 to -500 millivolts indicate highly reduced soils. The redox potential of a soil or water medium must be greater or less than an organic compound's potential for oxidation or reduction to occur.

Photolysis/Photodecomposition. Photolysis is the alteration of a chemical molecule due to absorption of light. It is particularly important in aqueous and atmospheric environments, and less so on soil surfaces. Photodecomposition is a similar process. It can also occur as a result of energy transfer from other molecules that have absorbed solar radiation. The significance of both of these reactions varies with latitude, temperature, time of year, and climate. Again, similar to biodegradation, photodegradation can affect transport rate via chemical transformation thus changing the chemical's characteristics.

6.3 Physical and Chemical Properties of Contaminants

Chemical properties that govern the extent to which the various fate and transport processes affect movement and disposition of chemicals in the environment are listed below and outlined in the following paragraphs:

- Molecular weight
- Water solubility
- Density
- Vapor pressure
- Henry's Law constant
- Soil-water (organic carbon) partition coefficient
- Octanol-water partition coefficient
- Bioconcentration factor
- Speciation
- Aerobic Biodegradability Factor

Molecular Weight/Atomic Weight. The molecular weight of organic compounds and atomic weight of elements (i.e., metals) indicate the size of a contaminant and is used in calculations of a number of fate and transport factors.

Water Solubility. Water solubility is the maximum concentration of a chemical that dissolves in a volume of pure water. Temperature, pH, dissolved substances and other environmental conditions influence water solubility. Highly water-soluble chemicals would be expected to migrate further in the subsurface than less soluble compounds and are more susceptible to biodegradation, less strongly adsorbed to soil, and leach rapidly from soil. Chemicals that are not soluble or are only slightly soluble (hydrophobic) are likely to float on water and move through environmental media differently from chemicals that move in a water solution.

Density. Density strongly influences the behavior of immiscible or low-solubility chemicals in surface water and groundwater. Hydrophobic chemicals with a density less that water behave as "floaters" and those with a density greater than water behave as "sinkers." Sinkers usually settle to the bottom of a water table while floaters remain on the top of the water table.

Vapor Pressure. Vapor pressure is the pressure exerted by a chemical in its pure state, when in equilibrium with its solid or liquid form. Vapor pressure affects the rate of volatilization from soil and water, but is not the only factor influencing the rate of volatilization. Molecular weight and water solubility are important factors for chemicals dissolved in water, and the tendency for a chemical to adsorb to soil is an important factor in that medium. Chemicals with low vapor pressures are less likely to volatilize from soils, but may become airborne through adsorption to fugitive dust particles. Chemicals with high molecular weights tend to have low vapor pressures. For comparative purposes, the vapor pressure of water at 20°C is 17.5 mm Hg.

Henry's Law Constant. Henry's law constant (H) is an index of the degree of volatility of a chemical in dilute solutions (mole fraction less than 0.001). It is a function of molecular weight, solubility and vapor pressure and is expressed in units of atm m^3/mole. Values typically range from less than 3E-07 (nonvolatile) to over 1E-3 (highly volatile). Henry's law constants in the range 3E-7 to 1E-5 indicate low volatility, and values in the range 1E-5 to 1E-3 indicate moderate volatility (Lyman et al. 1982).

Soil/Water Partition Coefficient. The organic carbon/water partition coefficient (Koc) indicates the tendency of a chemical in water to adsorb to organic carbon or soil and sediment. The Koc is a unitless number that ranges from one to ten million (1E+7). Higher values of Koc indicate tighter binding to soil. Chemicals with values greater than 10,000 strongly adsorb to soil, while values less than 1,000 indicate negligible sorption (Ney 1990). This number is used when calculating the adsorption or retardation rate of chemicals in soils. Chemicals with log Koc less than 3.0 are considered to be mobile (USEPA 1990). Koc values for chemicals of concern at several sites are listed in Table 6-1 (following text in this section).

Octanol-Water Partition Coefficient. The Octanol-Water Partition Coefficient (Kow) of a chemical indicates how a chemical distributes itself between Octanol, an immiscible organic solvent (that acts as a surrogate compound for fat), and water at equilibrium. The Kow provides an indication of adsorption potential of a compound to soil or an aquifer solid, particularly organic material. The greater the Kow value of a compound, the greater the tendency for adsorption in the subsurface. Chemicals with log Kow less than 3.5 are considered to be mobile. The ratio is also an index of the tendency of a chemical to accumulate in animal fat (lipophilicity). The Kow is inversely correlated with water solubility and directly related to the tendency to bioaccumulate. Chemicals with low Kow values tend not to partition to plants and animals, but rather partition to air or water. The Kow is used to predict bioconcentration in aquatic organisms.

Bioconcentration Factor. The Bioconcentration factor (BCF) is a unitless index of a chemical's tendency to concentrate in the tissues of organisms exposed to contaminated environmental media. Chemicals with a high BCF (Koc greater than 10,000) tend to concentrate in tissues to levels many times greater than are present in soil, water or food (Ney 1990).

Speciation. Speciation refers to the existence of more than one form or valence of an inorganic chemical, such as arsenic III and V, or chromium III and VI. The various forms of the chemical usually have significantly different fate, transport and toxicological properties.

Aerobic Biodegradability Potential. The greater the aerobic biodegradability of a compound, the more likely it is to biologically degrade in the subsurface under aerobic conditions.

6.4 Fate and Transport Processes for Contaminant Groups at IAAAP

Groundwater contaminants of concern at IAAAP are primarily explosives, but also inorganics, VOCs, and SVOCs. This section describes the more significant factors that affect fate and transport processes for these groups of chemicals, based on their properties and most influential characteristics of the environment. Table 6-1 (following text) summarizes the physical and chemical properties of site contaminants.

Explosives. Explosives are expected to be susceptible to a number of fate processes, including adsorption, photolysis and photodecomposition, and biodegradation. Explosives concentrations found in this supplemental RI or reported by Mason & Hanger to exceed proposed PRGs include RDX; HMX; 1,3,5-TNB; 2,4,6-TNT; 1,3-DNB; 2,4-DNT; 2,6-DNT; and nitrobenzene.

Koc values for RDX, HMX, DNT and tetryl indicate these chemicals are likely to be the most mobile of the explosives in groundwater. TNT is the least mobile of all the explosives, with a Koc value 5 times larger than RDX or DNT.

Photolysis is likely to be a major loss process affecting most explosive compounds. Photolysis is expected to be an important degradation process for TNT. TNT is transformed to DNT by photodegradation which makes it more mobile in groundwater.

2,4,6-Trinitrotoluene has been reported to biodegrade in the presence of another carbon source. Although the nitro groups in TNT are reduced by microorganisms, ring cleavage has not been observed. Under aerobic conditions, RDX is not significantly biodegraded. The DNTs are expected to undergo biotransformation reactions in which a nitro group is reduced to an amino group. While the DNTs can be used as a sole source of carbon by microorganisms, complete mineralization to carbon dioxide and water is not expected.

Inorganics. Most of the inorganic contaminants at this site are metals. A number of environmental characteristics affect the fate and transport of metals. These include:

- Other ions that enhance or limit mobility through competitive complex formation
- pH of the medium
- Cation exchange capacity of the medium
- Humic substances, silicates, hydrous oxides and carbonate minerals
- Oxidizing or reducing conditions

Metals detected in this supplemental RI or reported by Mason & Hanger from recent sampling to exceed proposed PRGs (see Section 5.0) include barium, cadmium, lead, iron, and manganese.

Volatile Organic Compounds. VOCs reported above proposed PRGs in this supplemental RI include acetone; benzene; freon; methylene chloride; 1,1,1-DCA; 1,1-DCE; cis-1,2-DCE; TCE; 1,1,1-TCA; 1,1,1-TCA; and methyl ethyl ketone. These chemicals have relatively high volatilities and water solubilities and low Koc values (less than 1E+03), which make them relatively mobile in the environment. These compounds are expected to migrate readily in surface and groundwater and to the air.

Biodegradation of large volatile organic carbon compounds to smaller molecules may be significant in environmental media at this site. For instance, tetrachloroethene is known to biodegrade to trichloroethene. Trichloroethene biodegrades to 1,2-dichloroethylene, which degrades to vinyl chloride. Vinyl chloride can biodegrade to ethylene, although this reaction is slow. These types of reactions generally require high concentrations of substrate and sufficient nutrients and other carbon sources in order to proceed at environmentally significant rates.

Semivolatile Organic Compounds. The mobility of SVOCs is expected to be relatively low based on water solubility, Henry's Law constant, Koc and Kow. This is the case for bis(1-ethylhexyl)phthalate, the only SVOC at the site reported in this supplemental RI to exceed proposed PRGs. Adsorption to soil and sediment is expected to be an important fate process for this contaminant group. Biodegradation, oxidation, and hydrolysis are also expected to be important fate processes in soils.

Radionuclides. Radium 226/228 was reported by Mason & Hanger at the Firing Site above proposed PRGs. Radionuclides are expected to behave in the environment in a fashion similar to metals. In addition, radioactive decay is expected to represent an additional loss process for individual radionuclides, although formation of decay products leads to potential generation of additional contaminants of concern. Volatilization and biodegradation are not important fate processes for radionuclides.

6.5 Contaminant Migration Pathways

This section discusses the principal pathways by which site contaminants at IAAAP may be transported, based on data presented in this report supplemented by qualitative evaluation of

additional factors which have not been specifically examined in this or previous investigations. It focuses on migration pathways which offer greatest potential for off-site contaminant migration; groundwater and surface water.

The principal components of the groundwater pathway are a source of water (i.e. recharge); groundwater flowpaths; and one or more discharge points. Both the drift and upper bedrock units are considered.

Recharge. Drift units at IAAAP are recharged by precipitation and the site is in a regional recharge area, as characterized by downward vertical hydraulic gradients. A majority of the precipitation falling within the plant boundaries is lost to evapotranspiration and surface runoff, the latter directly entering the surface water pathway. The remaining water infiltrates into the drift and is the only significant source of recharge to the drift. Additional recharge from subsurface inflow from off-site, generally from the north and northwest, is considered negligible due to low permeabilities in the drift and generally flat hydraulic gradients (paralleling surface topography). Precipitation may infiltrate relatively rapidly into the very shallow drift soils, which are disturbed by root systems, freeze/thaw effects, and the like. Continued infiltration to greater depths is indicated to be very slow due to the very low soil permeabilities.

The bedrock underlying the drift at IAAAP is recharged primarily by subsurface inflow from upgradient. Secondary sources of recharge to the bedrock within IAAAP are: direct infiltration of precipitation, limited to exposure areas in the southwest and around Mathes Lake; recharge from surface water, apparently limited to and probably caused by Mathes Lake; and downward flow and discharge from the overlying drift, suggested to be very small.

Flowpaths. Groundwater flowpaths within the drift include both horizontal and vertical components. Available permeability data indicate that groundwater flow is slow in either case, in the order of a few feet per year. However, horizontal flow predominates due to higher horizontal, compared to vertical, permeabilities and the sporadic presence of horizontally oriented silt and sand seams. The majority of horizontal flow occurs in the upper drift zone, within 20 to 25 feet of the surface and likely less, as suggested by comparing piezometric data from Line 2 wells 10A and 10B to nearby shallow wells. Therefore, this is judged to be the primary groundwater flowpath in most areas of the site. Downward vertical flow also occurs, as indicated by the vertical hydraulic gradients present throughout the plant. Conceptually, this is judged to be a secondary, and minor, flowpath at the site, but over time could contribute to contaminant transport.

Within the bedrock, groundwater flow is expected to be primarily horizontal, but contained within fractures and bedding planes. Overall, the rate of flow in the bedrock is probably significantly greater than in the drift, with a majority of the flow likely occurring within the upper section, typically more fractured and weathered. However, flow conditions are highly variable and comparatively little of the groundwater flowing within the bedrock system is derived from sources

within IAAAP. Groundwater flow in the bedrock is generally to the south and east, but is effected by topography.

Discharge. Groundwater discharge from the glacial drift is to surface water, for the horizontal component of flow, and to the underlying bedrock, for the vertical component. Since the majority of horizontal flow in the drift appears to occur at shallow depths, most of the discharge from the drift is local, to on-site streams, including Spring, Brush, and Long Creeks and the unnamed creeks in the southwest part of the plant. This is indicated by the direction of groundwater flow in the shallow zone (controlled by topography toward surface drainages), by mini-piezometer data (which indicates each of the site streams is being recharged by groundwater), and by site piezometric data (which show hydraulic gradients from upland areas to the streams). As one result, flowpaths in the shallow drift generally are short compared to the land area occupied by IAAAP. Thus, except for locations near the plant boundaries, this unit alone generally would not provide a complete off-site flowpath. A portion of the groundwater in the drift also is likely to flow beneath and bypass the on-site streams, ultimately discharging to larger drainages off-site or the alluvial materials underlying these drainages. In any case, discharge rates to surface water are small due to the low permeabilities.

Groundwater discharge from the bedrock aquifer is primarily to off-site surface waters in the Skunk River and, ultimately, the Mississippi River, or to the associated alluvial valleys. Because bedrock is exposed or very shallow in the downstream reaches of some on-site drainages, primarily Long and Brush Creeks, discharge to surface water in these creeks also occurs locally within the IAAAP boundaries.

Based on the above, the groundwater flowpath at IAAAP is considered complete, since it provides a source of water, flowpaths, and discharge areas. However, from the perspective of contaminant transport from sources within IAAAP, the following points are noted:

- Because of the low permeabilities in the drift, rates of groundwater recharge and flow are slow. This limits the distance contaminants may be transported via the groundwater pathway over any particular time period. Flow rates are likely to be higher in the upper bedrock aquifer. However, the overlying clayey drift found in most source areas greatly limits the migration of contaminants downward to the bedrock.

- Because most lateral flow in the drift is indicated to be in the shallow zone and flow patterns closely parallel the ground surface, actual migration pathways within IAAAP are likely to be relatively short from potential contaminant source areas to probable discharge points. Thus, in most plant areas the groundwater flowpath would be truncated by discharge to surface water before reaching the site boundaries.

- Known contaminant source areas within IAAAP are localized, when viewed on a basewide scale, and most are considerable distances from the downgradient (generally south) plant

boundary (i.e. Lines 1, 2, 3, 800, etc.). There are exceptions, such as Line 3A, where the groundwater pathway may contribute to direct off-site migration.

Based on the above, the groundwater pathway, taken alone, is locally significant, but may not constitute the primary off-site contaminant transport pathway at IAAAP. Rather, the significance of the groundwater pathway is to provide a transport mechanism from sources within specific source areas to relatively nearby surface streams within IAAAP boundaries. Contaminants then would become highly mobile in surface water and may migrate off-site. Near the downgradient plant boundary, groundwater could transport contaminants directly off-site. However, there are few contaminant sources in these areas, except facilities near Line 3A, where groundwater pathway may contribute to direct off-site migration.

Small concentrations of explosives, some slightly exceeding PRGs, were detected in some wells installed in Task 13 *(Additional Groundwater Data, Downstream Reach of Brush Creek)* on the downstream reaches of Brush Creek and wells on the south and southeast perimeters of the site. As noted previously, soils encountered east of Brush Creek in Task 13 *(Additional Groundwater Data, Downstream Reach of Brush Creek)* and locally elsewhere, such as parts of Line 3, were generally clayey but appeared to contain more silty and sandy seams than typically encountered elsewhere. It is possible that these occurrences relate to differences in depositional environments which in turn may be related to the buried bedrock valley discussed in Section 4.1. If so, the groundwater pathway may play some part in off-site migration of contaminants in the southeast corner of the plant, although no source for this contamination has been identified.

Surface water via streams is the principal off-site migration pathway for contaminants at IAAAP. The surface water contribution to migration is illustrated by the following principal points, based on data collected and evaluated in the supplemental RI.

1. Excluding NPDES discharges, base flow in site streams represents groundwater discharge from the drift aquifer, with stream flows during "dry" periods almost entirely due to groundwater.

2. Again excluding NPDES discharges, and based on data from Brush Creek, base stream flow increases from upstream to downstream, suggesting increasing groundwater discharge rates and greater drainage area. The most likely explanation is increasing hydraulic gradients as the stream becomes more deeply incised in the drift. Base flows of 0.1 to 0.2 cfs are estimated in upstream reaches of Brush Creek, opposite Lines 1, 2, and 3, and from 0.7 to 1.2 cfs in downstream reaches.

3. NPDES discharges to the streams contribute to stream flow, primarily in Brush Creek but also in the unnamed creeks in the southwest of the site.

Contaminant loadings to the stream may be derived from any of the flow contributors: runoff, groundwater or permitted discharges. Runoff probably contributes little to contaminant loading on an routine basis, but may be significant in areas where contaminated surface soils are present and during significant rain events. Groundwater may contribute significantly. However, many of the areas of more significant contamination, such as Line 2, are in upstream reaches of the stream where groundwater inflow is minimal. NPDES discharges, at least theoretically, may be sufficient to account for much of the surface water contamination detected in samples, but probably not all of these occurrences.

6.6 Site-Specific Contaminant Fate and Transport

The hydrodynamic dispersion of contaminates at IAAAP was calculated by JAYCOR (1996) for Lines 1, 2, 3, 800 and the Pink Water Lagoon on Brush Creek, Line 3A on Long Creek, and the EDA on Spring Creek. Similar estimates were completed in this study for the Ammunition Box Chipper Disposal Area in the Spring Creek watershed; the Line 1 Tank Farm and Line 9 in the Brush Creek watershed; and Line 4B and the Firing Site in the Long Creek watershed, as part of this supplemental RI. The hydrodynamic dispersion equation takes into account the hydraulic gradient at the site and the time since release of the contaminants to predict concentrations in groundwater at distances from the initial release and at various time intervals. Adsorption retards transport of contaminants, making hydrodynamic dispersion calculations conservative estimates of contaminant transport.

6.6.1 JAYCOR (1996) Modeling

JAYCOR used two time periods since release in their calculations: 50 years was used to represent time since releases were first made in the 1940's; and 20 years to represent time since releases were halted by improved disposal practices. Hydraulic gradients specific for each site were obtained from geologic profiles in the Draft Final RI Report. Line 1 has the steepest hydraulic gradient (0.026 ft/ft) of any of the sites analyzed in Brush Creek. Line 2 had a hydraulic gradient of 0.01 ft/ft, while Line 3 and the Line 800/Pink Water Lagoon area had a hydraulic gradient of 0.003 ft/ft. The permeability used at all the sites at Brush Creek was 4 x 10-4 cm/sec, which is an average of the slug tests performed in Brush Creek. The hydraulic gradient for both the EDA and Line 3A sites was 0.016 ft/ft. The permeability from slug tests in wells G-3 (Long Creek) and G-29 (Spring Creek) were also the same at 6.7 x 10-5 cm/sec. These values were used in an equation for hydrodynamic dispersion published by Fetter (1988). Principal results reported by JAYCOR are summarized below.

Brush Creek

Line 1: Distance to nearest significant drainage feature is approximately 1000 feet.

20 year estimated distance from source: 700 - 1000 feet with majority between 700 and 800 feet: discharge concentration is approximately 0.24% of initial concentration released.

50 year estimated distance from source: Discharged to Brush Creek in approximately 28 years after release.

Line 2: Distance to significant drainage feature is approximately 1300 feet.

20 year estimated distance from source: 300-600 feet with the majority existing between 300-400 feet.

50 year estimated distance from source: 650-1300 feet with the majority existing between 650- 800 feet. Discharge concentration is approximately 6.5% of initial concentration released.

Line 3: Distance to significant drainage feature is approximately 1500 feet.

20 year estimated distance from source: 100-300 feet with majority existing between 100-150 feet.

50 year estimated distance from source: 250-750 feet with the majority existing between 250 -350 feet.

Line 800: Distance to significant drainage feature is approximately 1100 feet

20 year estimated distance from source: 100-300 feet with majority existing between 100-150 feet.

50 year estimated distance from source: 250-750 feet with the majority existing between 250 -350 feet.

Long Creek/Skunk River

Line 3A: Distance to significant drainage feature is approximately 1000 feet.

20 year estimated distance from source: 75 - 300 feet with the majority between 75- 125 feet.

50 year estimated distance from source: 200-750 feet with the majority between 200 - 350 feet

Spring Creek

EDA: Distance to significant drainage feature is approximately 1000 feet.

20 year estimated distance from source: 75 - 300 feet with the majority between 75- 125 feet.

50 year estimated distance from source: 200-750 feet with the majority between 200 - 350 feet

6.6.2 Supplemental Modeling

To supplement the JAYCOR model evaluations, fate and transport evaluations were completed for additional sites found to contain contaminants in groundwater exceeding PRGs. Additional sites included: the Ammunition Box Chipper Disposal Area; the Line 1 Tank Farm; Line 9; Line 4B; and the Firing Site. Fate and transport was modeled using the solute transport program AT123D. Advective and dispersive transport equations were used to calculate concentrations as functions of location and time. Adsorption was incorporated into the calculations through a retardation factor for each contaminant. Molecular diffusion coefficients were used in calculating the transport of bis (2-ethylhexyl)phthalate; 1,1- dichloroethylene; trichloroethylene; and methylene chloride. Chemicals were calculated separately for sites with multiple contaminants above screening criteria. Wells in which PRGs were exceeded in groundwater and surrounding areas with detectible levels of contamination below PRGs were assumed as source areas. To facilitate calculations, the entire area was assumed to be contaminated at the same level as the highest concentration detected in a well in that area at the time of the sampling. No biodegradation was assumed in the model, a conservative assumption for organics. The source was considered to be a slug discharge. Contaminant concentrations were calculated at the source, at the creek and at various intermediary points for time periods of 10, 20, 30, 40 and 50 years from June 1997, the time of sampling. The results of the modeling are outlined below.

Ammunition Box Chipper Disposal Area - Spring Creek was approximated as 1,000 feet from the source of contamination for all contaminants modeled.

RDX - The initial maximum concentration of RDX in groundwater at the site was 2.8 μg/L. After 50 years the modeled concentration at the source was 0.2 μg/L and the concentration at the creek was 0.02 μg/L. The PRG for RDX is 2 ug/L. The concentration at the source after less than 10 years is 0.4 ug/L, below the PRG.

1,3-Dinitrobenzene - The initial maximum concentration of 1,3-dinitrobenzene in groundwater was 4 μg/L. After 50 years the concentration at the source was estimated to be 0.4 μg/L and the concentration at the creek was estimated to be 0.008 μg/L. The PRG for 1,3-dinitrobenzene in groundwater is 1 μg/L. The concentration at the source is 0.7 μg/L in less than 10 years, below the PRG.

Bis(2-ethylhexyl)phthalate - The initial maximum concentration of bis(2-ethylhexyl)phthalate in groundwater was 76.7 μg/L. After 50 years the concentration at

the source was estimated to be 18 μg/L and the concentration at the creek was estimated to be 0.0 μg/L. The PRG for bis(2-ethylhexyl)phthalate in groundwater is 6 μg/L. The concentration at the source is 18 μg/L after 50 years, remaining above the PRG.

Line 1 Tank Farm - Brush Creek was approximated as 900 feet from the source of contamination for all contaminants modeled.

1,1-Dichloroethylene - The initial maximum concentration of 1,1-dichloroethylene in the groundwater at the site was 8 μg/L. After 50 years the concentration at the source was estimated to be 0.5 μg/L and the concentration at the creek was estimated to be 0.00002 μg/L. The PRG for 1,1-dichloroethylene in groundwater is 7 μg/L. The concentration at the source is 0.8 μg/L in less than 30 years, below the PRG.

Trichloroethylene - The initial maximum concentration of trichloroethylene in the groundwater at the site was 6 μg/L. After 50 years the concentration at the source was estimated to be 0.4 μg/L and the concentration at the creek was estimated to be 0.00002 μg/L. The PRG for trichloroethylene in groundwater is 5 μg/L. The concentration at the source is 1.1 μg/L in less than 10 years, below the PRG.

Line 9 - Brush Creek was approximated as 2,500 feet from the source of contamination for all contaminants modeled.

Freon - The initial maximum concentration of freon in the groundwater at the site was 229,000 μg/L. After 50 years the concentration at the source was estimated to be 5,450 μg/L and the concentration at the creek was estimated to be 0.0002 μg/L. The PRG for freon in groundwater is 59,000 μg/L. The concentration at the source is 22,300 μg/L in less than 10 years, below the PRG.

Methylene Chloride - The initial maximum concentration of methylene chloride in the groundwater at the site was 8.5 μg/L. After 50 years the concentration at the source was estimated to be 0.4 μg/L and the concentration at the creek was estimated to be 0.0006 μg/L. The PRG for methylene chloride in groundwater is 5 μg/L. The concentration at the source is 2.8 μg/L in less than 10 years, below the PRG.

Line 4B - Long Creek was approximated as 3,000 feet from the source.

Methylene Chloride - The initial maximum concentration of methylene chloride in the groundwater at the site was 7.6 μg/L. After 50 years the concentration at the source was estimated to be 1.5 μg/L and the concentration at the creek was estimated to be 0.0 μg/L. The PRG for methylene chloride in groundwater is 5 μg/L. The concentration at the source is 1.9 μg/L in less than 10 years, below the PRG.

Firing Site - The creek was approximated as 300 feet from the source.

Radium 226 - The initial maximum concentration of radium 226 in the groundwater at the site was 62 pCi/L. After 50 years the concentration at the source was estimated to be 0.0002 pCi/L and the concentration at the creek was estimated to be 0.0 pCi/L. The PRG for radium 226 in groundwater is 20 pCi/L. The concentration at the source is 1.8 pCi/L in less than 10 years, below the PRG.

6.6.3 Off-Site

The past detection of explosives in groundwater wells along Brush Creek to the southwest and in Augusta to the south indicates that contaminants have migrated from the IAAAP off-site. There is little data available on the nature and extent of groundwater contamination in these areas and discussion of possible fate and transport is hypothetical. Particularly along Brush Creek, the most likely migration pathway is surface water. Visibly contaminated water ("pink water") was reported in the past to have washed down Brush Creek during high waters. Within the IAAAP and for a few miles downstream, review of surface topography suggests that the creek should continue to be a gaining stream because it remains incised into the drift aquifer and would receive recharge from groundwater. Therefore, in these areas, impacts on adjacent groundwater would have remained minimal and the contaminants would have remained mobile in the surface water. When the creek reaches the flood plain of the Mississippi River to the southwest, near where the contaminated wells were located, surface topography becomes flat and the groundwater table would be expected to be very shallow, equivalent to the water level in the creek. Also, in the Mississippi river valley area, alluvial sediments are expected to consist of sands, silts, and gravels, much more permeable than the glacial drift found within the IAAAP. Because of the flat terrain, surface water gradients would become very flat, allowing any contaminated sediments to settle. Because of the similarly flat and shallow groundwater gradients, and higher permeability of the sediments, the surcharge placed on Brush Creek by flooding would allow loss of surface water to groundwater, allowing any contaminants to impact the adjacent groundwater and the shallow wells.

6.6.4 Summary

The results of fate and transport modeling were reported by JAYCOR (1996) as suggesting that contamination originating at Lines 1 and 2 are discharging to Brush Creek. Line 1 would have already discharged releases from the 1970s and Line 2 is currently releasing discharges that would have originated during production in the 1940s. Also based on these estimates, Line 3, the Pink Water Lagoon/Line 800 area, Line 3A, and the EDA are not yet discharging to their respective creeks.

Results of further modeling in this supplemental RI suggest that concentrations of contaminants may have reached surface water, or could in the future, from modeled source areas at the Ammunition Box Chipper Disposal Area, the Line 1 Tank Farm, Line 9, and the Firing Site. However, modeled concentrations at the creeks are all well below groundwater PRGs, generally by several orders of

magnitude. Contaminants are not indicated to reach Long Creek from Line 4B. Model results estimate that contaminant concentrations in groundwater at the modeled sources will be below PRGs generally within 10 years, except bis(2-ethylhexyl)phthalate at the Ammunition Box Chipper Disposal Area.

Table 6-1. Supplemental Modeling of Contaminant Fate, Various Sites

Watershed	Facility	Chemical	Maximum Concentration (ug/L)	Estimated Plume Dimensions			Assumed Aquifer & Flow Properties				Physical & Chemical Properties							Dispersivity			Final Concentration	
				Thickness (m)	Width (m)	Length (m)	Porosity (%)	Hydraulic Conductivity (m/day)	Hydraulic Gradient (m/m)	Darcy Velocity (m/day)	Bulk Soil Density [c] (kg/m³)	Koc [a] (mg/L)	Kd [b] (m³/kg)	Molecular Difusion [d] (m²/day)	Decay Constant [e] (1/day)	Mass Release (kg)	Distance to Creek (m)	Longitudional (m)	Traneverse (m)	Vertical (m)	at Creek (ug/L)	% of Original Concentration (%)
Spring Creek	Ammunition Box Chipper Disposal Area	RDX	2.8	7.62	60.98	121.95	39%	8.64E-02	0.039	0.0086	1350	1.00E-02	5.00E-04	NA	NA	0.16	300	30	10	1.68	0.025	0.90%
		1,3-DNB	4									1.50E-02	7.50E-04	NA	NA	0.32					0.0086	0.21%
		Bis(2-ethylhexyl)phthalate	76.7									1.00E-05	5.00E-01	3.16E-05	NA	2850					0.0	0.00%
Brush Creek	Line 1 Tank Farm	1,1,-DCE	8	7.62	38.11	30.49	39%	8.64E-02	0.018	0.004	1350	6.50E-01	3.25E-04	9.07E-05	NA	0.06	274	27.4	9.13	1.53	0.0000019	0.00%
		TCE	6									6.50E-01	3.25E-04	7.86E-05	NA	0.06					0.0000016	0.00%
	Line 9	Freon	229000	7.62	68.8	15.24	39%	8.64E-02	0.047	0.0104	1350	1.60E-02	8.00E-04	NA	NA	2900	833	83	27.78	4.67	0.00024	0.00%
		Methylene Chloride	8.5									8.70E+00	4.35E-05	1.01E-04	NA	3					0.00063	0.01%
Long Creek	Line 4B	Methylene Chloride	7.8	7.62	8.1	6.1	43%	8.64E-02	0.0053	0.0011	1350	8.70E+00	4.35E-05	1.01E-04	NA	0.03	915	91.5	30.5	5.12	0.0	0.00%
	Firing Site	Radium 226	62	1	60.98	60.98	43%	8.64E-02	0.02	0.004	1450	NA	4.50E-01	NA	6.17E-04	0.17	100	10	3.33	0.56	0.0	0.00%

NOTES:

(a) Koc = Partition coefficient for organic carbon. Values from JAYCOR, 1996, Table 6.32-2. The value for Freon is that of trichloromonofluoromethane.
(b) Kd = Retardation coefficient (adsorption), calculated from bulk density of soil, Koc, and porosity. Kd value for radium 226 is from Baes, et al., 1984.
(c) Values for bulk density of soil and formulas for longitudinal, transverse and vertical dispersivity are from Center for Exposure Assessment Modeling, MULTIMED, 1996.
(d) Molecular diffusion values from USEPA Soil Screening Guidance, Technical Background Document, 1996d.
(e) Decay Constant for radium 226 is based on a half-life of 1602 days.

7.0 BASELINE RISK ASSESSMENT

A human health Baseline Risk Assessment (BRA) was completed for the IAAAP by JAYCOR and ICAIR Life Systems, Inc. and is provided in the RI Report (JAYCOR, 1996). Therefore, no human health BRA activities were conducted in this supplemental groundwater RI. An ecological risk assessment addendum (ERAA) was prepared previously (Harza, 1998) addressing ecological risks on a watershed basis. Principal findings of these studies are summarized in this section. The human health BRA is outlined with reference to JAYCOR (1996).

7.1 Human Health

The human health BRA for the IAAAP was prepared by JAYCOR and ICAIR (1996) using data collected prior to 1996. The BRA is an analysis of the potential adverse health effects (both current and future) resulting from exposures to hazardous substances in soil, groundwater, surface water and sediments at IAAAP. Major steps in the risk assessment as identified by JAYCOR/ICAIR are summarized below.

7.1.1 Chemicals of Potential Concern

Analytical data from soil, groundwater, surface water and sediments were evaluated to identify chemicals of potential concern at the site. Any chemical detected in a sample was considered to be a possible chemical of concern. Chemicals were eliminated from consideration only if they were detected infrequently or if they are essential nutrients and are nontoxic at the levels encountered at the IAAAP. Chemical groups selected included inorganics, volatiles, semivolatiles, PAHs, phthalates, pesticides/PCBs, explosives, and radionuclides. In total, 88 chemicals were selected.

7.1.2 Exposure Scenarios

Based on a review of site conditions including land use, contamination patterns and human activity patterns, the populations most likely to be exposed are:

- Current on-site workers
- Current off-site residents (adults and children)
- Current on-site visitors

The most important exposure pathways are judged to be:

- Ingestion of contaminated groundwater, soil, surface water and sediments.
- Dermal exposure to soil, sediments, surface water and groundwater.
- Inhalation exposure to VOCs released from groundwater to indoor air.

7.1.3 Estimated Human Health Risks

The risk of cancer from exposure to a chemical is described in terms of the probability that an individual exposed for his or her lifetime will develop cancer. Typically, cancer risks of 1×10^{-6} (one

in one million) or lower are considered to be so small that they are of no practical concern. Higher cancer risk levels may be cause for concern, and the USEPA typically requires remediation if risks exceed $1x10^{-4}$.

The estimated cancer risks for current off-site residents using groundwater wells for household uses range from $1x10^{-5}$ to $5x10^{-5}$. Cancer risks for workers at various IAAAP sites range from $7x10^{-8}$ to $5x10^{-4}$ and for visitors at IAAAP locations from $1x10^{-8}$ to $5x10^{-7}$. Risks for workers at Line 3 and Line 3A are $2x10^{-4}$ and $3x10^{-4}$, respectively. Chemicals contributing to these risks are mainly 2,4,6-TNT and RDX. Radiation risks for workers at Line 1 and the Firing Site are $4x10^{-4}$ and $5x10^{-4}$, respectively. Radionuclides contributing to these risks are mainly potassium 40, thallium 208, actinium 228, and bismuth 214. Subsequent data reported by Mason & Hanger for the Firing Site showed values above proposed PRGs for radium 226/228 and for alpha gross.

Evaluation of noncarcinogenic risk is accomplished by comparing a calculated intake with an acceptable intake for each chemical and for each pathway that contributes to a population's exposure. The ratio of the calculated intake versus the acceptable intake is termed the hazard index (HI).

No HI values greater than 1 are indicated for any current off-site residential or on-site visitor population evaluated at IAAAP, indicating that noncarcinogenic health effects due to these exposures do not appear to be of concern for these populations. For workers, HI values are also less than 1, except at Line 3 and Line 3A, where HI values are 30 and 10, respectively. Chemicals contributing to these HIs are 2,4,6-TNT and RDX. On this basis, it is possible that workers at these locations may be at risk from the noncarcinogenic effects of these chemicals.

7.1.4 Uncertainties

There are a number of stages in the risk assessment process where precise evaluations are not possible. These include uncertainties regarding the true concentrations of chemicals in environmental media, the amount of contaminants taken in by humans, and the likely consequences of the resulting exposure.

While some of these limitations lead to an underestimate of risk (e.g., lack of appropriate toxicity data, inability to quantify some exposure pathways), most assumptions and professional judgments made are more likely to overestimate than underestimate risk. Consequently, the risks derived for this site should be considered approximate and are more likely to be high than low (JAYCOR and ICAIR 1996).

7.2 Ecological Risk Assessment

Based on the ERAA for the IAAAP (Harza, 1998), contaminant pathways to ecological receptors are primarily water borne and include soil erosion and sediment transport, groundwater movement toward drainages and surface water draining the IAAAP. All pathways are likely to be concentrated by or to follow existing surface drainage patterns. Consequently, key receptors selected for the

ERAA include plant and animal individuals and communities found in the flood plain environment. Small mammals inhabiting the flood plains are exposed to contaminants through their diet, burrowing and other activities. These same animals are an important prey item for raptors, including the federally-listed threatened species bald eagle *(Haliaeetus leucocoephalus)*. The white-footed mouse (*Peromyscus leucopus*), meadow vole *(Microtus pennsylvanicus)*, and short-tailed shrew (*Blarina brevicauda*) were identified as receptors. One assessment endpoint used in the ERAA was the viability of the bald eagle population, with the body burdens of contaminants of environmental concern (COECs) in prey as the measurement endpoint. The quality of the flood plain forest community was also a measurement endpoint, using data from Horton *et al.* (1996). They inventoried 30 forest community sites in, or near, the IAAAP and scored them according to six metrics. In addition, there were two aquatic ecosystem endpoints: Aquatic macroinvertebrate community structure in streams draining the IAAAP was measured and assessed using the USEPA's Rapid Bioassessment Protocol (RBP) III technique (Plafkin et al., 1984). Because of its listing as a threatened species by the State of Iowa, the orangethroat darter was selected as a key receptor for the aquatic ecosystem. The levels of COECs bioaccumulated in related darters (*Etheostoma* spp.) were measured.

7.2.1 Brush Creek Watershed

Aquatic Ecosystem. Five explosives, 14 metals, and 2 organic chemicals were identified as aquatic COECs for the Brush Creek watershed. A hazard quotient (HQ) greater than unity suggests a risk of adverse effects. Based upon available data, possible aquatic risks would be expected for lead (HQ=1.1), silver (HQ=14), thallium (HQ=1.7), and barium (HQ=19). Hazard quotients for explosives and other organic chemicals were less than unity. Significant uncertainty is attributed to the risk estimates for metals. The reference toxicity values (RTVs) for the metals showing HQ exceeding unity are poorly developed, particularly for barium and silver, the two metals with the highest HQ. The uncertainty for the risks posed by the explosive and organic COECs is considered to be low to moderate. The RTVs for these compounds were based on species other than the orangethroat darter and the Brush Creek fauna, but have transspecies uncertainty factors taken into account.

The health of the aquatic benthic community was measured using the RBP III. Ten sampling sites throughout the Brush Creek watershed were generally similar to the reference site. Four of the stations were rated as slightly impaired. However, most stations (including the stations that were rated as slightly impaired) scored better than the reference station for several metrics.

The community based risk evaluation using the RBP is the most reliable indicator of ecosystem health. The uncertainty of the RBP is considered to be low. The technique is widely used in the industry for evaluation of aquatic impacts. The RBP includes eight metrics. Impacts not assessed by one metric should be evaluated by another. Hence, the benthic community assessment should provide the greatest level of accuracy with the least uncertainty.

Terrestrial Ecosystem. Five explosives, seven metals, four base neutral organics and six pesticides/PCBs are COECs for the terrestrial ecological risk assessment for the Brush Creek watershed. Terrestrial COECs that tend to biomagnify include mercury, p,p'-DDD, DDT, DDE, dibenzofuran, PCB 1260, and chlordane.

Explosive chemicals do not appear to present any significant risk to small mammals in the Brush Creek watershed. Aluminum and silver may present some level of risk to white-footed mice at some of the sites. Aluminum is naturally present at about 7% by weight so the levels in IAAAP soil are not elevated above typical levels and should not be a hazard to small mammals. The HQ for silver at one site in the watershed is 1.4. The white-footed mouse RTV is a lowest-observed-adverse-effect level (LOAEL) dose, and it would therefore appear that silver contamination at that site presents a risk to small mammal populations. The effects should be limited to the benign discoloration of mouse skin tissue.

The uncertainty associated with the estimate of terrestrial risk is moderate to high, perhaps in part due the conservative assumptions applied throughout this study. Most RTVs used in the terrestrial study are no-observed-adverse-effect level (NOAEL) estimates, more conservative than LOAEL doses for estimating risk. Even HQs exceeding unity may not result in toxic symptoms in an individual associated with the LOAEL dose.

The site quality index prepared by Horton *et al.* (1996) reflects the ecological condition of a site in comparison with other sites within and beyond the Brush Creek watershed. Of the four sites classified in the Brush Creek Watershed, one was classified as having significant value as a natural area and three were classified as having "marginal value as natural areas." North of Plant Road K represents the highest quality forest in the Brush Creek watershed, likely related to its relatively large size (Horton *et al.* 1996). Contamination in the drainage is heaviest in the northern, upland areas of the drainage and affects the site north of Plant Road K more than sites south of that road. Therefore, it appears that IAAAP facility development, through restriction of forest lot size, may be limiting forest quality to the same or more degree as contamination.

7.2.2 Long Creek Watershed

Aquatic Ecosystem. One explosive, twelve metals, and four chlorinated organic chemicals were identified as aquatic COECs in the Long Creek watershed. Of the seventeen COECs identified, three are biomagnifying COECs. Aquatic risks from COECs in the Long Creek drainage are likely limited to barium, with a HQ of 33. A significant uncertainty factor is attributed to the risk estimate for barium. Biomagnifying COECs do not represent any significant risk to darter populations. Concentrations of these chemicals could not be detected and do not appear to be significantly influencing the food chain.

There were three benthos sampling locations on tributaries to Long Creek and two on Long Creek itself, including the reference station. Compared to the reference station. Two of the stations are

considered unimpaired and benthic community structure is not exhibiting ecological stress, as measured by the RBP. The other two stations were rated as slightly impaired. The community based risk evaluation using the RBP is considered to be the reliable indicator of ecosystem health. The uncertainty of the RBP as an indicator of aquatic health is considered to be low.

Terrestrial Ecosystem. COECs identified from screening the Long Creek watershed soils database including five explosives, six metals, three base neutral organics and five pesticides. Calculated HQ values for all COECs were below unity.

Fifteen of the study sites for the forest community quality assessment were in the Long Creek Watershed. Two sites are rated as having exceptional value as natural areas, six are rated as having significant value as natural areas, four as "marginal value as natural areas," and three sites had insufficient data. Sites adjacent to Road K represent some of the highest quality forest in the Long Creek watershed and the entire IAAAP. Horton *et al.* attributed this to the relatively large size and undisturbed nature of the forest tracts in that area. There is no evidence for adverse effects on the terrestrial ecosystem of Long Creek watershed from IAAAP operations.

7.2.3 Spring Creek Watershed

Aquatic Ecosystem. Three explosives, ten metals and one PNA are aquatic COECs. None of the COECs are biomagnifiers. The copper HQ is 3.5, lead HQ is 1.3, and barium HQ is 27, indicating a possibility of adverse effects. Uncertainty is moderate to high for the aquatic metals risks estimate.

Six benthos sampling sites were spaced throughout Spring Creek, extending well downstream of the IAAAP. Two sites within the IAAAP are rated as unimpaired in comparison to the reference and three sites farther downstream are rated as slightly impaired. The RBP provides the greatest level of accuracy with the least uncertainty.

Terrestrial Ecosystem. A hazard quotient ranging from 18 to 23 is indicated for aluminum in risk estimates for the white-footed mouse. As indicated earlier, aluminum is at least 7% of the lithosphere and is within normal levels at IAAAP. Exposure is likely overestimated and aluminum is not likely a significant risk to small mammals living there.

Within the Spring Creek watershed, no terrestrial COECs that would biomagnify were identified. To confirm that bio-magnification of COECs is not posing significant risk to resources of special concern, these chemicals were measured in eagle prey. No detectable residues were found.

Six of the study sites for the forest community quality assessment were in the Spring Creek Watershed. Sites south of Plant Road P and north of Plant Road K represent the highest quality forest in the Spring Creek watershed. The ratings of the two sites as "significant" natural communities are likely related to the large size of the forest in those areas. Relatively small forest

tracts are in the study locales south of Road G and north of Road P. Contamination in the drainage is heaviest in the vicinity of the Explosive Disposal Area, south of Road G/north of Road P where the forests are "considered of marginal value as natural areas" in the SQI rating system. Because the reference station is not contaminated, but is also rated as having "marginal value as a natural area," it appears that IAAAP facility development, through restriction of forest lot size, may be limiting forest quality to the same or a greater degree than contamination.

7.2.4 Skunk River Tributaries Watershed

Aquatic Ecosystem. The aquatic assessment endpoint for the Skunk River watershed is health of the benthic macroinvertebrate community, as measured using the Rapid Bioassessment Protocol III. The small streams in this watershed originate on the IAAAP property and have contaminated areas in their headwaters. Therefore, no reference site is available within the watershed and the reference site used for Long Creek watershed was selected for use in this watershed. In comparison to the reference station, one site was rated as unimpaired and the other was rated as slightly impaired. The benthic community at the latter is likely environmentally stressed, but that stress could result from poor habitat quality and intermittent flow as well as chemical contamination. Identifying the likely cause of the stress at cannot be clearly determined from a comparison with the reference station, but such a comparison suggests physical habitat and flow to play a major role.

No fish samples were taken in the Skunk River tributaries.

Terrestrial Ecosystem. COECs in this watershed include an explosive, five metals, and two pesticides (both of which biomagnify). In risk estimates for the white-footed mouse and the bald eagle, the only HQ greater than unity is for aluminum, HQ=21. Aluminum is not likely a significant risk to small mammals living in the area for reasons discussed above.

The forest communities in the small drainages to the Skunk River are some of the highest quality forests on the IAAAP. Site quality indices indicate exceptional quality forest communities at three sites and significant communities at the other two sites surveyed. Several State-protected plants are recorded in the watershed and are not being threatened by ongoing IAAAP operations.

7.2.5 Summary

The most important and least uncertain indicators of ecological health, the benthic community structure and the forest community structure indicators, show the IAAAP environment to be slightly impaired to unimpaired. The forest community has been impacted by reduced forest plot size more than by contamination.

8.0 SUMMARY AND CONCLUSIONS

This section summarizes principal conclusions reached during the supplemental RI at IAAAP. Conclusions are current as of 1997 when the investigations were performed. Section 8.1 summarizes task-specific conclusions and Section 8.2 basewide issues.

8.1 Site-Specific Conclusions

Task 1. Evaluation of NPDES Discharges (Section 3.1):

1. Discharges to Brush Creek permitted under NPDES comprise a significant proportion of stream flow in Brush Creek.

2. Based on available monitoring data, explosives concentrations are introduced primarily to Brush Creek, but also to Spring Creek and small unnamed creeks in the southwest part of the site.

3. Mass loading estimates coupled with measured streamflows in Brush Creek indicate that NPDES discharges could be responsible for measured concentrations of explosives in surface water along Brush Creek, including off-site.

4. Groundwater contributions to flow (and possible loading) in Brush Creek increase from upstream to downstream and are small in most of the principal production areas of the facility.

Task 2. Monitoring Well Inventory (Section 3.2)

1. Approximately 335 monitoring wells, piezometers, and water supply wells have been installed at IAAAP over a period of many years, in addition to wells installed in this study.

2. Of these, approximately 278 could be located in field inspections. Others have been removed, destroyed, or otherwise compromised.

3. Most wells appear in useable condition. Some require maintenance and a few should be abandoned. Possible maintenance issues were provided to IAAAP separately.

Task 3. Basewide Groundwater Levels (Section 3.3)

1. Groundwater levels were measured in 262 new and existing monitoring wells and piezometers throughout IAAAP over a four day period.

2. Measured wells are located throughout IAAAP and are screened variably in upper, middle, and lower drift units and in the upper bedrock.

3. Measurements are used in evaluation of basewide and site-specific groundwater flow.

Task 4. Resurveying Existing Monitoring Wells (Section 3.4)

1. 304 existing and new monitoring wells and piezometers were resurveyed or surveyed, as applicable, for horizontal (coordinates) and vertical (ground and top of casing elevations) location.

2. Revised locations and elevations were used in this report and are provided in a well inventory data base.

Task 5. Hydraulic Integrity Testing, Existing Monitoring Wells (Section 3.5)

1. Integrity testing was performed on 28 selected monitoring wells throughout IAAAP. Of these, 5 wells were found to perform anomalously and the remainder satisfactorily.

2. The 28 wells tested represent about 1/3 of the wells at IAAAP which are provided with dedicated sampling pumps or bailers. Results of this task suggest that a majority of wells not routinely sampled are in acceptable condition and available for groundwater measurements, if needed. However, each well that was not tested would require evaluation.

3. Results of testing were provided to IAAAP separately so that various maintenance issues could be addressed.

Task 6. Ammunition Box Chipper Disposal Area (Section 3.6)

1. The location of the former ammunition box chipper disposal facility was not evident on historical aerial photographs.

2. Shallow groundwater flow at this site is generally south-southeastward, toward Spring Creek.

3. Groundwater samples were collected from three shallow existing wells and seven temporary wells within, upgradient, and downgradient from the area. RDX (2.8 ug/L) was found in one existing well and 1,3-DNB (4 ug/L) in another, both slightly above the HALs. Bis(2-ethylhexyl)phthalate (26.4 to 76.7 ug/L) also was detected in the three existing wells, above the MCL. Later sampling by Mason & Hanger did not report Bis(2-ethylhexyl)phthalate and, although RDX and 2,4,6-TNT were detected, no explosive constituents exceeded available PRGs.

4. Based on the presence of explosives in two groundwater samples, the ammunition box chipper disposal area is of potential environmental concern. However, no specific contamination source is apparent and concentrations are variable, at times below and at times slightly exceed PRGs. Further monitoring would determine whether explosives consistently exceed available PRGs.

Task 7. Surface Water and Sediment Sampling, Site Drainages (Section 3.7)

1. Sediments in site drainages were found to be thinner than previously thought, generally less than 2 feet thick and rarely more than 4 feet thick.

2. Sampling in the Spring Creek Drainage indicates the presence of small concentrations of the explosive RDX in surface water within the IAAAP; however, explosives were not detected in sediments along this drainage or in the off-site sampling area.

3. Surface water sampling along Brush Creek indicates the presence of several explosive chemicals at all locations, including the downstream off-site locations.

4. Sediment sampling along Brush Creek also indicates the presence of explosive contamination. Concentrations are high in middle reaches of the Creek within IAAAP, particularly the area just downstream from Lines 2 and 3. However, no explosives were detected in sediment in downstream reaches within IAAAP, or further downstream off-site. Therefore, impacts to sediments appear limited to on-site areas.

5. Sampling on Long Creek did not indicate the presence of explosives or other contamination in either surface water or sediment and either on-site or off-site.

6. Sampling in one of two unnamed creeks draining the southwest part of IAAAP identified trace concentrations of the explosives RDX and HMX in surface water. No apparent contamination was detected in the sediment or in samples from the other unnamed creek.

7. Generally, based on all sediment sampling, explosives contamination, where present, is prevalent in the near-surface sediments rather than deeper sediments.

Task 8. Mini-Piezometers, Site Drainages (Section 3.8)

1. Mini-piezometer readings indicate that Brush Creek is a "gaining" stream throughout IAAAP, being recharged from groundwater.

2. Additional mini-piezometer readings in Spring Creek indicate this creek also is "gaining" or in equilibrium.

3. No mini-piezometers could be installed on Long Creek because of shallow bedrock. However, the stream was visibly being recharged by groundwater seeps.

Task 9. Stream Flow Meters, Site Drainages (Section 3.9)

1. Flow in Brush Creek during low flow periods ranges from 0.11 cfs upstream to 2.65 cfs downstream; contributors to flow during these periods are groundwater and plant wastewater discharges.

2. Groundwater contributions increase from upstream to downstream possibly due to increasing head as the streams become more deeply incised.

3. Estimated groundwater contributions to the creek are relatively small in upstream reaches, where most of the plant production facilities are located.

Task 10. Pumping Test, Line 2 (Section 3.10)

1. Soils underlying Line 2 consist of silty, sandy clay tills with thin, intermittent, and discontinuous silt, sand and gravel seams.

2. The clayey soils have low permeabilities and, although saturated below shallow depths, produce little water to wells.

3. Because of these conditions, extraction pumping from wells would be of limited effectiveness, requiring many wells pumping at very slow rates. Wells can be expected to be pumped dry at even slow pumping rates.

4. These conditions are generally characteristic of glacial drift throughout IAAAP. Siltier soils and/or slightly more extensive sand and gravel are present locally and extraction wells could be considered on a site-by-site basis.

Task 11. Soil and Groundwater Sampling for VOCs (Section 3.11)

1. Building 1-03-05. Sampling at this site identified no VOCs in soil or groundwater attributable to the site.

2. Line 1 Tank Farm. VOC contamination, primarily petroleum related hydrocarbons, were detected in soil and groundwater near and generally west of the southernmost above ground storage tank. Follow-on sampling indicated contamination is limited to the immediate area of this tank and does not extend east of the tank. 1,1-DCE at 8 ug/L and TCE at 6 ug/L slightly exceeded PRGs in groundwater. However, VOCs at this site appear localized and at small concentrations.

3. Buildings 2-02 and 2-03. Sampling results suggest that small concentrations of VOCs, variably BTEX and benzene compounds, are present in soil and groundwater locally within this area. Small VOC concentrations, primarily ethyl benzene, xylene and toluene, were found in soils at 10 foot depths and in groundwater just northeast of Building 2-03. Trace VOC concentrations, primarily benzene compounds, also were found in soil and groundwater just southwest of Building 2-02. These chemicals were not found in soil at greater depths. Detections in the two initial groundwater samples included xylenes up to 9 ug/L, benzene at 2 ug/L, and chlorobenzene at 93 ug/L, none exceeding PRGs. No VOCs were detected in follow-on groundwater sampling to determine extent to the north, south, and west. VOCs are present in soil and groundwater at this site, but appear highly localized and at small concentrations.

4. Building 3-03. 1,2,4-trimethylbenzene at (0.03 mg/kg) and freon up to 0.19 mg/kg were detected in soils up to 5 feet deep immediately adjacent to this building. Freon at 11 ug/L was detected in the groundwater sample, well below the PRG. Freon may be present, or could result from previous sampling at Building 9-57 (see below). No VOCs were detected in deeper soils. VOCs at this site appear highly localized and at small concentrations.

5. Building 3A-03-01. VOCs detected in one of the shallow soil samples in the immediate vicinity of this building included 1,2,4-trimethylbenzene (0.028 mg/kg), n-butyl benzene (0.15 mg/kg), sec-butyl benzene (0.13 mg/kg), 4-isopropyl toluene (0.021 mg/kg) and n-propylbenzene (0.008 mg/kg). None of these chemicals were detected in the other soil samples or at greater depth. Freon also was detected in all the soil samples between 0.18 and 3.6 mg/kg and could be present or could be attributed to previous sampling at Building 9-57 (see below). No VOCs were detected groundwater at this site. VOCs are present at this site, but appear localized and at small concentrations and groundwater is not impacted.

6. Building 9-57. VOCs in soil and groundwater at this site are primarily 1,1,2-Trichlorotrifluoroethane (Freon) and are present in soils and groundwater at significant concentrations up to 9,000 mg/kg in soil and 270,000 ug/L in groundwater. Three groundwater samples exceeded the PRG for freon of 59,000 ug/L. The principal area of freon contamination extends about 50 feet east from Building 9-57. However, freon at 270,000 ug/L also was detected in groundwater immediately northwest of the building. Beyond that, freon was detected in soils, but at much lower concentrations. Freon detections also extend to drilled depths of 33 and 36 feet, although concentrations decrease at greater depths. Groundwater impacts below PRGs in the shallow drift extends throughout the area of investigation east, southeast, north, and northwest of Building 9-57.

Task 12. Additional Groundwater Data, Line 2 (Section 3.12)

1. Soils underlying Line 2 consist of dense, silty clay/clay silt till approximately 110 feet thick, overlying limestone. The silty/clayey drift contains sporadic sand and silt seams which are saturated, but appear discontinuous.

2. Shallow drift groundwater levels beneath Line 2 are within 10 feet of the surface. Groundwater flow parallels surface topography, which is undulating. Overall, flow is to Brush Creek. Downward vertical gradients also exist within the drift and between the drift and the bedrock.

3. Groundwater beneath portions of Line 2 is contaminated with explosive chemicals. Significant groundwater contamination appears limited laterally to an area in the center of Line 2, near the production facilities, RDX up to 1,600 ug/L exceeded the PRG in five wells. Other contaminants exceeding PRGs are HMX at 470 ug/L in one well and 1,3-DNB at 1.3 ug/L in another. Lateral migration has occurred to the west and south, toward Brush Creek. However, no explosives were detected in well (12G) due west from the area, suggesting that migration occurs in an oblique direction with respect to the creek.

4. The groundwater contamination found in Line 2 appears limited to the shallow drift in which most wells are screened. Significant contamination in wells 10A and 10B, screened across shallow and intermediate drift zones, probably derives from the shallow soils. These wells should be properly abandoned or pumped to avoid cross-contamination.

5. Contaminants in groundwater from Line 2, although concentrated in central parts of the site, are judged to have reached Brush Creek.

Task 13. Additional Groundwater Data, Downstream Reach of Brush Creek (Section 3.13)

1. Drilling completed along "K" Road in this Task identified shallow (7.5 feet) bedrock above the west side of Brush Creek valley and deep (>80 feet) beneath the east side. These data delimit a portion of a buried bedrock valley identified in Task 14 *(Additional Bedrock Topography Data)*. Overlying soils are predominantly silty sandy clay till, but silt and clayey silt materials are also present.

2. Potentiometric measurements indicate groundwater flow to Brush Creek from both east and west at this location.

3. Trace concentrations of explosives were detected in a shallow bedrock well west of the creek, a shallow drift well immediately adjacent to the creek (probably reflecting surface water), and two deep drift wells beneath and east of the creek. No explosives were detected in shallow drift wells east of the creek. RDX at 2.2 ug/L slightly exceeded the PRG in a shallow existing well (G54). Other occurrences were below PRGs.

4. The occurrence of trace explosives concentrations at this site suggests that local groundwater is impacted by Brush Creek, despite apparent inward gradient, or that groundwater in this part of IAAAP is impacted by migration of contaminants from further north and northwest. However, no local sources are present.

Task 14. Additional Bedrock Topography Data (Section 3.14)

1. Limestone bedrock is exposed intermittently in the southwest portion of IAAAP from Mathes Lake to the west boundary and along the Skunk River valley bluff. Most exposures are in the deeper stream valleys.

2. Subsurface data indicate the bedrock surface beneath IAAAP has been incised by an ancient valley, now buried beneath glacial drift. The buried valley extends from the west central and northwest parts of the plant east-southeastward toward the southeast portion and probably is tributary to the ancestral Mississippi valley.

3. The bedrock topography is not reflected by present surface topography; generally, drift is thickest in the deeper parts of the buried valley and thinnest outside the valley, particularly to the southwest.

Task 15. Evaluation of Vertical Hydraulic Gradients (Section 3.15)

1. Potentiometric data from all available monitoring well pairs and clusters at IAAAP indicate downward vertical hydraulic gradients through the glacial drift and from the drift to the upper bedrock.

2. The magnitude of vertical gradient varies between about 0.05 and 1.2 ft/ft.

3. Measurements in Task 8 *(Mini-Piezometer Testing, Brush Creek)* indicate that groundwater is recharging Brush Creek and other site drainages. Therefore, upward vertical gradients are present in the immediate vicinity of these drainages.

Task 16. Additional Groundwater Data, Line 3 (Section 3.16)

1. Soils underlying Line 3 consist predominantly of silty clay till with interbedded silt and clay/silt and sporadic thin sand seams. Bedrock was encountered at a depth of 109.5 feet.

2. The tills at Line 3 are saturated within 10 feet of the surface and flow is eastward, toward Brush Creek. Downward vertical gradients also exist within the drift.

3. Significant concentrations of explosives (1,833 ug/L total explosives) was detected in groundwater in existing well JAW-54 with RDX at 1,500 ug/L and 2,4-DNT at 10 ug/L exceeding PRGs. Nitrobenzene at 4 ug/L also exceeded the PRG in deep well 12A, but may relate to well installation. Trace concentrations of explosives, below PRGs, also were detected in nearby wells JAW-55 and 16A. These are located in the center of Line 3 just west of production facilities. All wells downgradient from this area to the east, southeast and northeast were non-detect. Groundwater contamination at Line 3 appears to be a limited problem with little lateral migration.

4. Most wells at Line 3 are screened in the shallow drift. However, well 16A, where 9 ug/L total explosives were detected, is screened just above the bedrock at about 110 feet. This result could suggest that downward vertical migration of contaminants has occurred, but could relate to well installation. Further monitoring should be conducted in this well to determine if detections persist.

5. Migration of contaminants from Line 3 does not appear to have reached Brush Creek.

8.2 Principal Basewide Conclusions

Following are conclusions derived from this study regarding basewide findings and focusing on potential off-site migration of contaminants.

1. Site contaminants occur in groundwater, soil, sediment, and surface water and include primarily explosive chemicals and locally volatile organics and some metals. Most areas of contamination appear localized, except explosives detected in Brush Creek surface water and some sediments.

2. Based on site geology and hydrogeology, the principal off-site migration pathway for site contaminants is surface water, primarily Brush Creek and the small unnamed creeks in the southwest.

3. Site geology and hydrogeology suggest that groundwater is an important migration pathway from internal source areas within the IAAAP to surface water, which then can transport contaminants off-site. However, groundwater is only of secondary importance compared to surface water as a pathway for direct off-site migration of contaminants. Exceptions include the southeast corner of the base where explosives slightly exceeding PRGs have been detected near the perimeter, and Line 3A, where contaminant migration in groundwater may be occurring off-site.

4. Permitted wastewater discharges appear to be a significant contributor to off-site contamination and could account for much of the explosives detected in surface water, including off site. Controlling contaminant migration via this pathway may be more cost-effective than groundwater solutions.

5. Based on soil conditions, groundwater extraction using pumping wells generally would be less cost effective than interceptor trenches or similar technology.

6. Concentrations of contaminants, particularly explosives, found in surface water and in groundwater near the IAAAP boundary are less than 10 ug/L, but locally exceed available PRGs. No specific source for the groundwater contamination is apparent at the plant boundary.

7. Based on supplemental fate modeling, contaminants in the Ammunition Box Chipper Disposal Area, Line 1 Tank Farm, Line 9, Line 4B, and the Firing Site are estimated to dissipate naturally to levels below proposed PRGs in less than 10 years, except bis(2-ethylhexyl)phthalate at the Ammunition Box Chipper Disposal Area.

8. Contaminants reported to variably exceed proposed PRGs in groundwater at different sites within IAAAP include:

   - **Explosives:** RDX; HMX; 1,3,5-TNB; 2,4,6-TNT; 1,3-DNB; 2,4-DNT; 2,6-DNT; and nitrobenzene;
   - **VOCs:** acetone; benzene; freon; methylene chloride; 1,1,1-DCA; 1,1-DCE; cis-1,2-DCE; TCE; 1,1,1-TCA; 1,1,1-TCA; and methyl ethyl ketone;
   - **Metals:** barium, cadmium, lead, iron, and manganese;
   - **SVOC:** bis(2-ethylhexyl)phthalate; and
   - **Radionuclides:** Radium 226/228 and gross alpha.

9.0 REFERENCES

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LIST OF ACRONYMS

AA	Atomic Adsorption
AO	American Ordnance
ARDL	Applied Research Development Laboratory
ASC	American Survey Consultants, P. C.
BRA	Baseline Risk Assessment
BGS	Below Ground Surface
BOD	Biological Oxygen Demand
CDM	Camp, Dresser, McKee
CERCLA	Comprehensive Emergency Response, Compensation and Liability Act
cfs	Cubic feet per second
cm/sec	centimeters per second
CMP	Corrugated Metal Pipe
CN	Curve Number
COEC	Chemical of Environmental Concern
DCA	Dichloroethane
DCE	Dichloroethene
DNB	Dinitrobenzene
DNT	Dinitrotoluene
EDA	Explosive Disposal Area
ERAA	Ecological Risk Assessment Addendum
Freon	1,1,2-trichlorotrifluoroethane
FS	Feasibility Study
FSP	Field Sampling Plan
ft	Feet
ft/day	Feet per day
ft/ft	Feet per feet (hydraulic gradient)
ft/sec	Feet per second
gal	Gallon
gpm	Gallons per minute
GPS	Global Positioning System
GW	Groundwater
HAL	Health Advisory Level
HI	Hazard Index
HMX	Octahydro-1,3,5,7-tetrazocine
HRS	Hazard Ranking Score
HSA	Hollow Stem Augers
HSWA	Hazardous and Solid Waste Amendments
i	Hydraulic gradient
IAAAP	Iowa Army Ammunition Plant
ICP	Inductively Coupled Plasma
ID	Inner Diameter
IDW	Investigation Derived Waste
IGS	Iowa Geological Survey
J	Estimated value below the reporting limit
k	Hydraulic Conductivity
LOAEL	Lowest Observed Adverse Effect Level
MCL	Maximum Contaminant Level
mg/kg	milligram per kilogram
mg/L	milligrams per liter
MRL	Missouri River Division Laboratory
MSL	Mean Sea Level
MWH	Montgomery Watson Harza
NA	Not Available
ND	Not detected
NGS	National Geodetic Survey
NOAEL	No Observed Adverse Effect Level
NPL	National Priority List
NT	Nitrotoluene
NPDES	National Pollutant Discharge Elimination System
PA	Preliminary Assessment
PID	Photoionization Detector
PNA	Polynuclear Aromatic Hydrocarbon
ppb	Parts per billion
PPE	Personal Protective Equipment
PRG	Preliminary Remedial Goal
PVC	Polyvinyl Chloride
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
QCSR	Quality Control Summary Report
RA	Risk Assessment
RBP	Rapid Bioassessment Protocol
RCRA	Resource Conservation and Recovery Act
RDA	Recommended Daily Allowance
RDX	Hexahydro-1,3,5-trinitro-1,3,5-triazine
RI	Remedial Investigation
RTK	Real Time Kinematic survey technique
RTV	Reference Toxicity Values
SCFS	Sample Collection Field Sheet
SI	Site Investigation
SVOC	Semi-Volatile Organic Chemical
t_c	Time of concentration
TAL	Target Analyte List
TCE	Trichloroethane
TCE	Trichloroethene
TNB	Trinitrotoluene
TNT	Trinitrotoluene
TOC	Top of Casing
TSS	Total Suspended Solids
tvoc	Total VOC concentration (soil gas)
µg/L	micrograms per liter
µg/kg	micrograms per kilogram
USACE	U. S. Army Corps of Engineers
USEPA	U. S. Environmental Protection Agency
v	Velocity (flow)
VOC	Volatile Organic Chemical

APPENDIX A
GEOLOGIC BORING LOGS

A-1	Task 6.	Ammunition Box Chipper Disposal Area (Temporary Wells)
A-2	Task 10.	Pumping Test, Line 2
A-3	Task 11.	VOC Sampling (Temporary Wells)
A-4	Task 12.	Additional Groundwater Data, Line 2
A-5	Task 13.	Groundwater Data, Downstream Reach, Brush Creek
A-6	Task 14.	Bedrock Surface/Piezometers
A-7	Task 16.	Additional Groundwater Data, Line 3

APPENDIX A
GEOLOGIC BORING LOGS

A-1 Task 6. Ammunition Box Chipper Disposal Area (Temporary Wells)

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HTW DRILLING LOG

HOLE No. 6-A

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.
2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 3 SHEETS	
3. PROJECT	Iowa Army Ammunition Plant
4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	Alan Oaks
6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech 750C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/4" ID Hollow Stem Augers 4" OD CME continuous soil sampler
8. HOLE LOCATION	Ammunition Box Chipper Disposal Area
9. SURFACE ELEVATION	Ground: 702.08
10. DATE STARTED	June 16, 1997
11. DATE COMPLETED	June 16, 1997
12. OVERBURDEN THICKNESS	Bedrock not encountered
15. DEPTH GROUNDWATER ENCOUNTERED	6 feet (approx.)
13. DEPTH DRILLED INTO ROCK	Bedrock not encountered
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE	15 feet
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
None						NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Temporary well installed for groundwater sampling.		X	NA	Kurt Kraske

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	TOPSOIL (OL): Black; slightly moist; silty clay with rootlets.	PID = 0 ppm (0-5 ft)	Continuous Sampler			
	1						
	2	SILTY CLAY (CL): Gray; mottled brown and black; moist; contains rootlets.					
	3						
	4	Sandy Silt (ML): Dry; light brown; about 35% fine sand/65% silty fines; contains caliche cemented nodules.					
	5						

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HTW DRILLING LOG

HOLE No. 6-A

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: KURT KRASKE

SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		See Above	PID = 0 ppm (5-10 ft)				
	6	6 ft.: Very moist.					6 ft.:
	7	7 ft.: Rootlets stop.					
	8						
	9	SANDY CLAY (CL): Dark Gray and brown; higher sand content than above; very moist.		Continuous Sample			
	10						Time = 1344 hrs: Drove Hydropunch 10-15 ft. Not sufficient water for sampling.
	11						
	12						
	13						
	14						

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HTW DRILLING LOG

HOLE No. 6-A

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR

SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		See Above			6/116/97 GW Sample: H06A0 10400		
	15						
		BORING COMPLETE AT 15 FT. INSTALLED TEMPORARY 2" PVC WELL ON JUNE 16, 1997. ABANDONED AND GROUTED NOVEMBER 1997.					
	16						
	17						
	18						
	19						
	20						

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HTW DRILLING LOG

HOLE No. 6-B

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 3 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Alan Oaks	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech 750C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-1/4" ID Hollow Stem Augers; 4" OD CME continuous soil sampler	8. HOLE LOCATION: Ammunition Box Chipper Disposal Area	
	9. SURFACE ELEVATION: Ground: 700.05	
	10. DATE STARTED: June 16, 1997	11. DATE COMPLETED: June 17, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: 4 feet (approx.)	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE: 15 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
1 (Groundwater sample from temporary well)						NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Temporary well installed for groundwater sampling.		X	NA	Kurt Kraske

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	TOPSOIL (OL): Black; dry; medium soft; sandy-silty clay with rootlets and fine sand.	PID = 0 ppm CGI = 0% (breathing zone) PID = 0 ppm (0-5 ft)	Continuous Sampler			
	1						
		SILTY CLAY (CL): Gray; mottled brown and black; grading to brown; contains fine sand; contains rootlets; medium soft.					
	2						
	3						
	4	4 ft.: Wet					4 ft. (approx)
	5						

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HTW DRILLING LOG

HOLE No. 6-B

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: KURT KRASKE

SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		See Above	PID = 0 ppm (5-10 ft)				
	6	6 ft.: Becoming browner with more coarse sand; rootlets absent.					
	7						
		SANDY CLAY (CL): Gray; wet; tight; stiff; sand coarse.					
	8						
	9			Continuous Sample			
	10	10 ft.: Sandy Clay contains pea-size gravel.					6/17/97 Time = 1551 hrs: Drove Hydropunch 10-15 ft. Insufficient water for sampling. Installed temporary well.
	11						
	12						
	13	13 ft.: Color lightens toward 15 ft.					
	14						

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HTW DRILLING LOG

HOLE No. 6-B

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR

SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		See Above					
	15						
		BORING COMPLETE AT 15 FT. INSTALLED TEMPORARY 2" PVC WELL ON JUNE 17, 1997. ABANDONED AND GROUTED NOVEMBER 1997.					
	16						
	17						
	18						
	19						
	20						

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HTW DRILLING LOG

HOLE No. 6-C

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 2 SHEETS			
3. PROJECT	Iowa Army Ammunition Plant	4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	Alan Oaks	6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech 750C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/4" ID Hollow Stem Augers 4" OD CME continuous soil sampler	8. HOLE LOCATION	Ammunition Box Chipper Disposal Area
		9. SURFACE ELEVATION	
		10. DATE STARTED	June 16, 1997
11. DATE COMPLETED	June 16, 1997		
12. OVERBURDEN THICKNESS	Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED	7 feet (approx.)
13. DEPTH DRILLED INTO ROCK	Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE	10 feet (Hydropunch to 15 ft.)	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	EXPLOSIVES	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
1 (Hydropunch groundwater sample)		1 x 1 L.	1 x 1 L.			NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Kurt Kraske

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	TOPSOIL (OL): Black; slightly moist; medium soft; silty clay with rootlets.	PID = 0 ppm CGI = 0% (0-5 ft.) (breathing zone) Background PID = 3.1 ppm	Continuous Sampler			
	1						
	2						
	3	SILTY CLAY (CL): mottled gray, black and orange; moist; contains some coarse sand; contains rootlets; medium soft.					
	4	4 ft.: Wet					4 ft. (approx)
	5						

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PROJECT IOWA ARMY AMMUNITION PLANT HOLE No. 6-C

HTW DRILLING LOG

HOLE No. 6-C

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: KURT KRASKE

SHEET 2 OF 2 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		See Above	PID = 0 ppm (5-10 ft)				
	6						
	7	7 ft.: Becomes wet.					7 ft. (approx.)
		SANDY CLAY (CL): Gray; wet; tight; stiff; sand coarse.					
	8						
	9			Continuous Sample			
	10						
		BORING COMPLETE AT 10 FT. DROVE HYDROPUNCH 10-15 FT. FOR GROUNDWATER SAMPLIE; BORING BACKFILLED WITH CUTTINGS AND NATIVE SOIL.				6/16/97 Time = 1230 hr Hydropunch groundwater sample H06C010400	6/16/97 Time = 1052 hrs: Drove Hydropunch 10-15 ft.
	11						
	12						
	13						
	14						

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HTW DRILLING LOG

HOLE No. 6-D

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 3 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Alan Oaks	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech 750C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-1/4" ID Hollow Stem Augers; 4" OD CME continuous soil sampler	8. HOLE LOCATION: Ammunition Box Chipper Disposal Area	
	9. SURFACE ELEVATION	
	10. DATE STARTED: June 17, 1997	11. DATE COMPLETED: June 17, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: 6.5 feet (approx.)	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE: 15 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	EXPLOSIVES	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
1 (Groundwater sample from temporary well)		1 x 1L	1 x 1L			NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Temporary well installed for groundwater sampling.		X	NA	Kurt Kraske

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	TOPSOIL (OL): Black; crumbly; dry; loose; silt with some clay and trace sand; contains rootlets.	PID = 0 ppm (0-5 ft)	Continuous Sampler			
	1						
	2						
	3	CLAY (CL): Dark gray to black; trace fine sand; moist; medium soft.					
	4						
		SANDY CLAY (CL): Brown; mottled gray and black; sand is coarse; moist; medium soft.					
	5		PID = 0 ppm (5-8 ft.)				

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HTW DRILLING LOG

HOLE No. 6-D

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: KURT KRASKE

SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		See Above					
	6						
		SILTY SANDY CLAY (CL): Dark gray; mottled brown to black; wet; soft; some coarse sand.					
	7						
	8						
	9	SANDY CLAY (CL): Gray; mottled brown; coarse wand and pea-size gravel; some 1" limestone and chert fragments; medium soft.		Continuous Sample			
	10						
	11						
	12						
		SANDY CLAY (CL): Brown with some mottled gray; sand is coarse with pea-size gravel; medium soft.					
	13						
	14						

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HTW DRILLING LOG

HOLE No. 6-D

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR

SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		See Above					
	15						
		BORING COMPLETE AT 15 FT. INSTALLED TEMPORARY 2" PVC WELL ON JUNE 17, 1997; 1553 HRS. ABANDONED AND GROUTED NOVEMBER 1997.					
	16						
	17						
	18						
	19						
	20						

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HTW DRILLING LOG

HOLE No. 6-E

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 3 SHEETS			
3. PROJECT	Iowa Army Ammunition Plant	4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	Alan Oaks	6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech 750C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/4" ID Hollow Stem Augers 4" OD CME continuous soil sampler	8. HOLE LOCATION	Ammunition Box Chipper Disposal Area
		9. SURFACE ELEVATION	
		10. DATE STARTED	June 17, 1997
		11. DATE COMPLETED	June 17, 1997
12. OVERBURDEN THICKNESS	Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED	6.5 feet (approx.)
13. DEPTH DRILLED INTO ROCK	Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE	15 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	EXPLOSIVES	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
1 (Groundwater sample from temporary well)		1 x 1L	1 x 1L			NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Temporary well installed for groundwater sampling.		X	NA	Kurt Kraske

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	TOPSOIL (OL): Black; moist; silty clay; stiff; contains some fine sand; contains rootlets.	PID = 0 ppm (0-5 ft)	Continuous Sampler			
	1						
		SILTY CLAY (CL): Gray; mottled black and brown; some fine sand; medium soft.					
	2						
	3						
	4	4 ft.: Color change to orange.					
	5						

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HTW DRILLING LOG

HOLE No. 6-E

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: KURT KRASKE

SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		See Above					
	6						
		SANDY CLAY (CL): Gray; wet; soft.					
	7						
	8						
	9			Continuous Sample			
	10						
		SANDY CLAY (CL): Gray; mottled brown and black; wet; soft; contains some silt and trace pea-size gravel.					
	11						
	12						
	13						
	14						

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HTW DRILLING LOG

HOLE No. 6-E

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR

SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		See Above					
	15						
		BORING COMPLETE AT 15 FT. INSTALLED TEMPORARY 2" PVC WELL ON JUNE 17, 1997; 1745 HRS. ABANDONED AND GROUTED NOVEMBER 1997.					
	16						
	17						
	18						
	19						
	20						

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HTW DRILLING LOG

HOLE No. 6-F

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 3 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Alan Oaks	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech 750C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-1/4" ID Hollow Stem Augers; 4" OD CME continuous soil sampler	8. HOLE LOCATION: Ammunition Box Chipper Disposal Area	
	9. SURFACE ELEVATION	
	10. DATE STARTED: June 17, 1997	11. DATE COMPLETED: June 17, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: 10 feet (approx.)	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE: 15 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	EXPLOSIVES	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
1 (Groundwater sample from temporary well)		1 x 1L	1 x 1L			NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Temporary well installed for groundwater sampling.		X	NA	Kurt Kraske

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	TOPSOIL (OL): Black; moist; sandy-silty clay; medium soft; contains some fine sand; contains rootlets.	PID = 0 ppm (0-5 ft)	Continuous Sampler			
	1						
	2						
		SILTY CLAY (CL): Gray; mottled black and brown; some fine sand; medium soft.					
	3						
	4						
	5						

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HTW DRILLING LOG

HOLE No. 6-F

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: KURT KRASKE

SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		See Above	PID = 0 ppm (5-10 ft.)				
	6						
	7						
	8						
	9			Continuous Sample			
	10	SANDY CLAY (CL): Brown; mottled gray and black locally; wet; sand is coarse; contains some pea-size gravel.					10 ft. (approx.)
	11						
	12						
	13						
	14						

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HTW DRILLING LOG

HOLE No. 6-F

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR

SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		See Above					
	15						
		BORING COMPLETE AT 15 FT. INSTALLED TEMPORARY 2" PVC WELL ON JUNE 17, 1997; 1340 HRS. ABANDONED AND GROUTED NOVEMBER 1997.					
	16						
	17						
	18						
	19						
	20						

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HTW DRILLING LOG

HOLE No. 6-G

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.
2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 3 SHEETS	
3. PROJECT	Iowa Army Ammunition Plant
4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	Alan Oaks
6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech 750C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/4" ID Hollow Stem Augers 4" OD CME continuous soil sampler
8. HOLE LOCATION	Ammunition Box Chipper Disposal Area
9. SURFACE ELEVATION	
10. DATE STARTED	June 16, 1997
11. DATE COMPLETED	June 17, 1997
12. OVERBURDEN THICKNESS	Bedrock not encountered
15. DEPTH GROUNDWATER ENCOUNTERED	4.5 feet (approx.)
13. DEPTH DRILLED INTO ROCK	Bedrock not encountered
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE	15 feet
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	EXPLOSIVES	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
1 (Groundwater sample from temporary well)		1 x 1L	1 x 1L			NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Temporary well installed for groundwater sampling.		X	NA	Kurt Kraske

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	TOPSOIL (OL): Black; dry; sandy-silty clay; crumbly; contains fine sand; contains rootlets.	PID = 0 ppm (0-5 ft)	Continuous Sampler			
	1						
	2						
		SILTY CLAY (CL): Gray; mottled brown; some contains coarse sand.					
	3						
	4						
		4.5 ft.: Wet					4.5 ft. (approx.)
	5						

c:\cdr\misc\htw1.cdr

HTW DRILLING LOG

HOLE No. 6-G

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR KURT KRASKE

SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		See Above	PID = 0 ppm (5-10 ft.)				
	6						
	7						
		CLAYEY SAND (SC): Very dark gray to black; wet; loose; friable; sand angular; grades to more clay toward 10 ft.					
	8						
	9			Continuous Sample			
	10						6-17-97/1630 hrs. Drove Hydropunch 10-15 ft. Insufficient water to sample.
	11	SILTY CLAY (CL): Gray; mottled brown; wet; contains coarse sand and some small to large gravel.					
	12						
	13						
	14						

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HTW DRILLING LOG

HOLE No. 6-G

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR

SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		See Above					
	15						
		BORING COMPLETE AT 15 FT. INSTALLED TEMPORARY 2" PVC WELL ON JUNE 17, 1997; 0826 HRS. ABANDONED AND GROUTED NOVEMBER 1997.					
	16						
	17						
	18						
	19						
	20						

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APPENDIX A
GEOLOGIC BORING LOGS

A-2 Task 10. Pumping Test, Line 2

HTW DRILLING LOG

HOLE No. 10-A

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 6 SHEETS			
3. PROJECT	Iowa Army Ammunition Plant	4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER		6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech GP-1100C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	6-1/4" Hollow stem augers 5 ft CME split spoon sampler	8. HOLE LOCATION	Line 2 (N 298819, E 2271165)
		9. SURFACE ELEVATION	Ground = 681.65, TOC = 683.75
		10. DATE STARTED	May 5, 1997
		11. DATE COMPLETED	May 5, 1997
12. OVERBURDEN THICKNESS	Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED	8.5 ft. (approx.)
13. DEPTH DRILLED INTO ROCK	Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE	50.4 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	4.07 ft (TOC) after development.

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	1	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	None					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
		X	NA	Joe Mark

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Brown with rust-colored mottles; moist; stiff; trace sand and small gravel.		Continuous Sampler			
	1						
	2						
	3						
	4						
	5						

c:\cad\misc\htw1.cdr

HTW DRILLING LOG

HOLE No. 10-A

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 2 OF 6 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	6						
		SILTY CLAY (CL): Brown with rust and gray colored mottles; moist; soft; trace sand and small gravel.					
	7						
	8			Continuous Sample			
		CLAYEY SAND (SC): Brown; very wet; loose; well graded.					
	9	SILTY CLAY (CL): Brown with rust and gray colored mottles; moist; stiff; trace sand and small gravel.					
	10			H10A010210			
	11						
	12						
	13						
		SILTY CLAY (CL): Gray; moist; stiff; trace sand and fine gravel.					
	14						

c:\cdrhmisc\htw2.cdr

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HTW DRILLING LOG

HOLE No. 10-A

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Joe Mark

SHEET 3 OF 6 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	15						
	16						
	17			Continuous Sample			
	18						
	19						
	20						
	21						
	22						
	23				H11F8040123		

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HTW DRILLING LOG

HOLE No. 10-A

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Joe Mark

SHEET 4 OF 6 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	24						
	25						
	26			Continuous Sample			
	27						
	28						
	29						
	30						
	31						
	32						

c:\cdrh\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 10-A

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 5 OF 6 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
		33 ft.: 1/2" thick, saturated clay seam, soft; gray.					
	33	SILTY CLAY (CL): Gray; moist; stiff; trace sand and small to large gravel.					
	34	SILTY CLAY (CL): Gray; moist; very stiff; trace sand and small gravel.					
	35	35-38 ft.: Scattered wet clay areas, generally <1/2" thick; appear disc-ontinuous; appeared siltier, but are not bedding seams.		Continuous Sample			NOTE: Silty areas in cores do not seem to be producing water to the boring; sampler is dry and no water is being brought to the ground surface by the augers.
	36						
	37						
	38						
	39						
	40						
	41						

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HTW DRILLING LOG

HOLE No. 10-A

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 6 OF 6 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	42			Continuous Sample			
	43						
	44						
	45						
	46						
	47						
	48						
	49						
	50	BORING COMPLETE AT 50.4 FEET. MONITORING/TEST WELL INSTALLED WITH 4" PVC.					

c:\cdr\misc\htw2.cdr

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HTW DRILLING LOG

HOLE No. 10-B

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 6 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech GP-1100C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 6-1/4" Hollow stem augers; 5 ft CME split spoon sampler	8. HOLE LOCATION: Line 2 (N 298,806; E 2,271,151)	
	9. SURFACE ELEVATION: Ground = 681.55, TOC = 683.94	
	10. DATE STARTED: May 1, 1997	11. DATE COMPLETED: May 5, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: 13 ft. (approx.)	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE: 50.4 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): 4.28 ft (TOC) after development.	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	1	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	None					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
		X	NA	Joe Mark

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	CLAY (CL): Black; moist; stiff; contains organics.	PID = 0 ppm CGI = 0%	Continuous Sampler			
	1	CLAY (CL): Brown with rust and gray colored mottles; moist; stiff; trace sand.					
	2						
	3						
	4						
	5		PID = 0 ppm CGI = 0%				

c:\cdr\misc\htw1.cw

HTW DRILLING LOG

HOLE No. 10-B

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 2 OF 6 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0%				
	6						
		SILTY CLAY (CL): Brown with rust and gray colored mottles; moist; soft; trace sand.					
	7						
	8			Continuous Sample			
	9	CLAY (CL): Brown with gray and rust colored mottles; moist; stiff.	PID = 0 ppm CGI = 0%				
	10						
	11						
	12						
	13	SANDY CLAY (CL): Brown; loose; wet; w/silt.	PID = 0 ppm CGI = 0%				
		CLAY (CL): Gray; moist; very stiff; trace sand.					
	14						

c:\cdr\misc\htw2.cdr

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HTW DRILLING LOG

HOLE No. 10-B

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Joe Mark

SHEET 3 OF 6 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		CLAY (CL): Gray; moist; very stiff; trace sand and small gravel.	PID = 0 ppm CGI = 0%				
	15						
	16						
	17		PID = 0 ppm CGI = 0%	Continuous Sample			
	18						
	19						
	20		PID = 0 ppm CGI = 0%				
	21						
			PID = 0 ppm CGI = 0%				
	22						
	23	Clay with trace coarse sand.	PID = 0 ppm CGI = 0%				

c:\cdr\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 10-B

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 4 OF 6 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		CLAY (CL): Gray; moist; very stiff; trace coarse and fine sand.					
	24						
	25		PID + 0 ppm CGI = 0%				
	26			Continuous Sample			
	27						
	28						
	29		PID + 0 ppm CGI = 0%				
	30						
	31						
	32		PID + 0 ppm CGI = 0%				

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HTW DRILLING LOG

HOLE No. 10-B

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Joe Mark

SHEET 5 OF 6 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	33	CLAY (CL): Gray; moist; very stiff; contains silt; trace sand and small gravel.	PID = 0 ppm CGI = 0%	Continuous Sample			
	34						
	35		PID = 0 ppm CGI = 0%				
	36						
	37						
	38		PID = 0 ppm CGI = 0%				
	39	Clay contains silt and trace gravel.					
	40		PID = 0 ppm CGI = 0%				
	41		PID = 0 ppm CGI = 0%				

c:\cdr\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 10-B

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 6 OF 6 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		CHAY (CL): Gray; moist; very stiff; contains silt and trace sand to small gravel; larger clasts (1" diam.) are faceted.	PID = 0 ppm CGI = 0%				
	43			Continuous Sample			
	44						
	45		PID = 0 ppm CGI = 0%				
	46						
	47						
	48						
	49						
			PID = 0 ppm CGI = 0%	H10B010250			
	50						
		BORING COMPLETE AT 50 FEET. MONITORING/TEST WELL INSTALLED WITH 2" PVC.					

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APPENDIX A
GEOLOGIC BORING LOGS

A-3 Task 11. VOC Sampling (Temporary Wells)

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HTW DRILLING LOG

HOLE No. 11-A1

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.
2. DRILLING SUBCONTRACTOR	Not Applicable
SHEET 1 OF 1 SHEETS	
3. PROJECT	Iowa Army Ammunition Plant
4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	Not Applicable
6. MANUFACTURER'S DESIGNATION OF DRILL	Not Applicable
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	hand Auger
8. HOLE LOCATION	Line 1, North of Building 1-03-5
9. SURFACE ELEVATION	Not surveyed
10. DATE STARTED	June 5, 1997
11. DATE COMPLETED	June 5, 1997
12. OVERBURDEN THICKNESS	Bedrock not encountered
15. DEPTH GROUNDWATER ENCOUNTERED	Groundwater not encountered
13. DEPTH DRILLED INTO ROCK	Bedrock not encountered
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	Groundwater not encountered
14. TOTAL DEPTH OF HOLE	5 feet
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	Groundwater not encountered

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown to black; moist; soft to medium stiff; contains rootlets.	PID = 0 ppm (0-5 ft)	Continuous Sampler	H11A1020100 Time=1200 hrs		
	1	SILTY CLAY (CL): Yellowish gray to dark yellowish orange; moist; soft; contains rootlets.					
	2						
	3						
	4				H11A1020104 Time=1220 hrs		
	5						
		Hand auger boring complete at 5 ft. Backfilled with cuttings.					

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HTW DRILLING LOG

HOLE No. 11-A2

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: Not Applicable	SHEET 1 OF 1 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Not Applicable	6. MANUFACTURER'S DESIGNATION OF DRILL: Not Applicable	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: hand Auger	8. HOLE LOCATION: Line 1, North of Building 1-03-5	
	9. SURFACE ELEVATION: Not surveyed	
	10. DATE STARTED	11. DATE COMPLETED
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: Groundwater not encountered	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Groundwater not encountered	
14. TOTAL DEPTH OF HOLE: 5 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): Groundwater not encountered	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown to black; moist; soft to medium stiff; contains rootlets.	PID = 0 ppm (0-5 ft)	Continuous Sampler	H11A2020100		
	1	SILTY CLAY (CL): Yellowish gray to dark yellowish orange; moist; soft; contains rootlets.					
	2	SILTY CLAY (CL): Gray; mottled brown and black; moist; contains rootlets.					
	3						
	4				H11A2020104		
	5	Hand auger boring complete at 5 ft. Backfilled with cuttings.					

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HTW DRILLING LOG

HOLE No. 11-A3

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.
2. DRILLING SUBCONTRACTOR	Not Applicable
SHEET 1 OF 2 SHEETS	
3. PROJECT	Iowa Army Ammunition Plant
4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	Alan Oaks
6. MANUFACTURER'S DESIGNATION OF DRILL	Not Applicable
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/4" Hollow stem auger 5' CME split spoon sampler
8. HOLE LOCATION	Line 1, North of Building 1-03-5
9. SURFACE ELEVATION	Not surveyed
10. DATE STARTED	June 5, 1997
11. DATE COMPLETED	June 5, 1997
12. OVERBURDEN THICKNESS	Bedrock not encountered
15. DEPTH GROUNDWATER ENCOUNTERED	5 ft. (approx.)
13. DEPTH DRILLED INTO ROCK	Bedrock not encountered
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE	7 feet
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown to black; moist; soft to medium stiff; contains rootlets.	PID = 0 ppm CGI = 0% (0-7 ft)		H11A3010100 Time=0952 hrs		
		SILTY CLAY (CL): Yellowish gray to dark yellowish orange; moist; soft; contains rootlets.					
	1						
	2	SILTY CLAY (CL): Gray; mottled brown and black; moist; contains rootlets.		Continuous Sampler			
	3						
	4				H11A3020104 Time=0957 hrs		
	5						

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HTW DRILLING LOG

HOLE No. 11-A3

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 2 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		See Above					
	6	SANDY SILTY CLAY (CL): Light olive brown; moist; soft to medium stiff; sand is very fine to fine grained with occassional medium to coarse sand.					
	7	BORING COMPLETE AT 7 FEET. BACKFILLED WITH CUTTINGS.					
	8						
	9	SANDY CLAY (CL): Dark Gray and brown; higher sand content than above; very moist.		Continuous Sample			
	10						Time = 1344 hrs: Drove Hydropunch 10-15 ft. Not sufficient water for sampling.
	11						
	12						
	13						
	14						

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HTW DRILLING LOG

HOLE No. 11-B1

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: Not Applicable	SHEET 1 OF 1 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Not Applicable	6. MANUFACTURER'S DESIGNATION OF DRILL: Not Applicable	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: hand Auger	8. HOLE LOCATION: Line 1 Tank Farm, Inside Berm	
	9. SURFACE ELEVATION: Not surveyed	
	10. DATE STARTED: June 4, 1997	11. DATE COMPLETED: June 4, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: Groundwater not encountered	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Groundwater not encountered	
14. TOTAL DEPTH OF HOLE: 5 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): Groundwater not encountered	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown to black; moist; soft to medium stiff; contains rootlets.	PID = 0 ppm CGI = 0% (0-5 ft)	Continuous Sampler	H11B1010100 Time=1627 hrs		
	1	SILTY CLAY (CL): Yellowish gray to dark yellowish orange; moist; soft; contains rootlets.					
	2						
		SILTY CLAY (CL): Pale blue to dark yellowish orange; moist; soft; contains rootlets.					Odors detected at 2.5 ft. No response on PID.
	3						
	4				H11B1020104 Time=1700 hrs		
	5						
		Hand auger boring complete at 5 ft. Backfilled with cuttings.					

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HTW DRILLING LOG

HOLE No. 11-B2

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: Not Applicable	SHEET 1 OF 1 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Not Applicable	6. MANUFACTURER'S DESIGNATION OF DRILL: Not Applicable	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: hand Auger	8. HOLE LOCATION: Line 1 Tank Farm, Inside Berm	
	9. SURFACE ELEVATION: Not surveyed	
	10. DATE STARTED: June 5, 1997	11. DATE COMPLETED: June 5, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: Groundwater not encountered	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Groundwater not encountered	
14. TOTAL DEPTH OF HOLE: 5 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): Groundwater not encountered	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	FILL: Gravel; white to gray; loose; dry.	PID = 0 ppm CGI = 0% (0-5 ft)	Continuous Sampler	H11B2010100 Time=0855 hrs		
	1	SILTY CLAY (CL): Yellowish gray to dark yellowish orange; moist; soft; contains rootlets.					
	2						
	3	SILTY CLAY (CL): Pale blue to dark yellowish orange; moist; soft.					Odors detected at 2.5 ft. No response on PID.
	4				H11B2020104 Time=0907 hrs		
	5	Hand auger boring complete at 5 ft. Backfilled with cuttings.					

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HTW DRILLING LOG

HOLE No. 11-B3

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: Not Applicable	SHEET 1 OF 1 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Not Applicable	6. MANUFACTURER'S DESIGNATION OF DRILL: Not Applicable	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: hand Auger	8. HOLE LOCATION: Line 1 Tank Farm, Southeast Corner, Inside Berm	
	9. SURFACE ELEVATION: Not surveyed	
	10. DATE STARTED: June 5, 1997	11. DATE COMPLETED: June 5, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: Groundwater not encountered	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Groundwater not encountered	
14. TOTAL DEPTH OF HOLE: 5 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): Groundwater not encountered	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	CLAY (CL): Moderate brown; soft to stiff; moist; contains rootlets.	PID = 0 ppm CGI = 0% (0-5 ft)	Continuous Sampler	H11B3010100		
	1						
	2						
		SILTY CLAY (CL): Pale blue to dark yellowish orange; moist; soft.					
	3						
	4				H11B3020104		
	5						
		Hand auger boring complete at 5 ft. Backfilled with cuttings.					

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HTW DRILLING LOG

HOLE No. 11-B4

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.
2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 2 SHEETS	
3. PROJECT	Iowa Army Ammunition Plant
4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	Alan Oaks
6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech GP-1100C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/2" Hollow stem augers 5 ft CME split spoon sampler
8. HOLE LOCATION	West of Line 1 Tank Farm
9. SURFACE ELEVATION	Not surveyed
10. DATE STARTED	June 4, 1997
11. DATE COMPLETED	June 5, 1997
12. OVERBURDEN THICKNESS	Bedrock not encountered
15. DEPTH GROUNDWATER ENCOUNTERED	6.5 ft. (approx.)
13. DEPTH DRILLED INTO ROCK	Bedrock not encountered
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE	13 feet
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	3					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY/CLAYEY SILT (CL/ML): Dark brown to black; moist; soft to stiff; contains rootlets.	PID = 0 ppm CGI = 0% (0-5 ft.)	Continuous Sampler	H11B4010100 Time=1507 hrs		
	1						
		SILTY CLAY/CLAYEY SILT (CL/ML): Mottled dark yellowish orange, pale green, dark brown; moist; soft; contains trace fine sand and occasional very coarse sand; contains rootlets.					
	2						
	3						
	4	SILTY CLAY (CL): Pale blue grayish red; moist; soft to medium stiff; contains rootlets.					
	5	SILTY CLAY (CL): Blackish red; moist; medium stiff.	PID = 20 ppm on soil (0 ppm in Brthng. Zn). CGI = 0%		H11B4020104		

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HTW DRILLING LOG

HOLE No. 11-B4

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 2 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Contains trace fine to very coarse sand.	PID = 54.5 ppm in soil (0 ppm in brthng. Zn). CGI = 0%				
	6						
		CLAY (CL): Mottled light greenish gray-grayish black-light olive gray; contains silt; moist; soft to medium stiff; contains trace fine to very coarse sand.	PID = 23.2 ppm in soil (0 ppm in brthng. Zn). CGI = 0%				
	7						
							Odors detected in soil.
	8		PID = 0 ppm in soil and brthng. Zn). CGI = 0%				
	9	CLAY (CL): Mottled dark yellowish orange-light bluish gray-light olive gray; contains silt; moist; medium stiff to stiff; contains trace fine to very coarse sand.		Continuous Sample	H11B4030110 Time=0817 hrs		
	10						
	11						
	12		PID = 0 ppm in soil and brthng. Zn). CGI = 0%				
	13	BORING COMPLETE AT 13 FEET. BACKFILLED WITH CUTTINGS.					
	14						

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HTW DRILLING LOG

HOLE No. 11-B5

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 2 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Alan Oaks	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech GP-750C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-1/2" Hollow stem augers; 5 ft CME split spoon sampler	8. HOLE LOCATION: Line 1 Tank Farm, West of Tank 1-152-12	
	9. SURFACE ELEVATION: Not surveyed	
	10. DATE STARTED: June 4, 1997	11. DATE COMPLETED: June 5, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: 5 ft. (approx.)	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE: 10 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY/CLAYEY SILT (CL/ML): Dark brown to black; moist; stiff; contains rootlets.			H11B4010100 Time=1507 hrs		
	1	CLAY (CL): Mottled dark yellowish orange to pale olive; moist; soft to medium stiff; contains rootlets to 3 feet below grade.					
	2		PID = 0 ppm CGI = 0% (0-5 ft.)	Continuous Sampler			
	3						
	4				H11B5010103		
	5						

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HTW DRILLING LOG

HOLE No. 11-B5

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 2 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	6	CLAY (CL): Blackish red with brown mottling; moist; stiff; contains occassional medium to coarse sand.					
	7						
	8		PID = 0 ppm CGI = 0% (5-10 ft.)	Continuous Sample			
	9	SANDY SILTY CLAY (CL): Mottled light olive gray-pale brown-dark brown; moist; soft to medium stiff; sand is medium to coarse grained with occassional very coarse sand.			H11B5020100		
	10	BORING COMPLETE AT 10 FEET. BACKFILLED WITH CUTTINGS.					
	11						
	12						
	13						
	14						

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HTW DRILLING LOG

HOLE No. 11-B6

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 2 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Alan Oaks	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech GP-750C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-1/2" Hollow stem augers; 5 ft CME split spoon sampler	8. HOLE LOCATION: Line 1 Tank Farm, West of Tank 1-152-12	
	9. SURFACE ELEVATION: Not surveyed	
	10. DATE STARTED: June 13, 1997	11. DATE COMPLETED: June 13, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: Groundwater not encountered	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Groundwater not encountered	
14. TOTAL DEPTH OF HOLE: 10 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): Groundwater not encountered	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY/CLAYEY SILT (CL/ML): Dark brown to black; moist; stiff; contains rootlets.			H11B4010100 Time=1507 hrs		
	1						
		CLAY (CL): Mottled dark yellowish orange to pale olive; moist; soft to medium stiff.					
	2		PID = 0 ppm CGI = 0% (0-5 ft.)	Continuous Sampler			
	3						
	4				H11B6010103		
	5						

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HTW DRILLING LOG

HOLE No. 11-B6

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 2 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	6	CLAY (CL): Blackish red with some brown mottling; moist; stiff; contains occassional medium to coarse sand.					
	7						
	8		PID = 0 ppm CGI = 0% (5-10 ft.)	Continuous Sample			
		SANDY SILTY CLAY (CL): mottled light gray to brown; moist; soft to medium stiff; contains medium to coarse sand.			H11B6020108		
	9						
	10						
		BORING COMPLETE AT 10 FEET. BACKFILLED WITH CUTTINGS.					
	11						
	12						
	13						
	14						

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HTW DRILLING LOG

HOLE No. 11-B7

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.
2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 2 SHEETS	
3. PROJECT	Iowa Army Ammunition Plant
4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	Alan Oaks
6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech GP-750C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/2" Hollow stem augers 5 ft CME split spoon sampler
8. HOLE LOCATION	Line 1 Tank Farm, West of Tank
9. SURFACE ELEVATION	Not surveyed
10. DATE STARTED	June 12, 1997
11. DATE COMPLETED	June 12, 1997
12. OVERBURDEN THICKNESS	Bedrock not encountered
13. DEPTH DRILLED INTO ROCK	Bedrock not encountered
14. TOTAL DEPTH OF HOLE	10 feet
15. DEPTH GROUNDWATER ENCOUNTERED	6 ft (approx) not encountered
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown to black; some yellowish mottling in lower 6"; moist to wet; soft to medium stiff; contains rootlets.	PID = 0 ppm CGI = 0% (0-5 ft.)	Continuous Sampler	H11B4010100 Time=1507 hrs		
	1						
	2	CLAY (CL): Mottled yellowish gray to pale olive; moist; soft.					
	3						
	4				H11B7010103		
		CLAY (CL): Blackish redd with some brown mottling; moist; soft to medium stiff.					
	5						

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HTW DRILLING LOG

HOLE No. 11-B7

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 2 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	6	SANDY SILTY CLAY (CL): mottled light gray to brown; moist; soft; contains medium to coarse sand; contains occasional gravel to 1/2" diam..					
	7						
	8		PID = 0 ppm CGI = 0% (5-10 ft.)	Continuous Sample			
	9				H11B7020108		
	10	BORING COMPLETE AT 10 FEET. BACKFILLED WITH CUTTINGS.					
	11						
	12						
	13						
	14						

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HTW DRILLING LOG

HOLE No. 11-B8

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 2 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Alan Oaks	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech GP-750C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-1/2" Hollow stem augers; 5 ft CME split spoon sampler	8. HOLE LOCATION: Line 1 Tank Farm, South of Tank 1-152-12	
	9. SURFACE ELEVATION: Not surveyed	
	10. DATE STARTED: June 12, 1997	11. DATE COMPLETED: June 12, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: 5 ft. (approx.)	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE: 10 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown to black; moist; medium stiff; contains rootlets.			H11B4010100 Time=1507 hrs		
	1	CLAY (CL): Mottled dark yellowish orange-light brown-yellowish gray; moist to wet; soft to medium stiff; contains black staining; contains trace fine sand and occasional medium to very coarse sand.					
	2		PID = 0 ppm CGI = 0% (0-5 ft.)	Continuous Sampler			
	3						
	4				H11B8010103		
		CLAY (CL): Blackish redd with some brown mottling; moist; soft to medium stiff.					
	5						

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HTW DRILLING LOG

HOLE No. 11-B8

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Roger A. Wilson

SHEET 2 OF 2 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	6						
		SILTY CLAY (CL): Blackish redd with brown mottling; moist; soft to medium stiff; contains occasional medium to very coarse sand.					
	7						
	8		PID = 0 ppm CGI = 0% (5-10 ft.)	Continuous Sample			
		SANDY SILTY CLAY (CL): Mottled light olive gray-pale brown with some dark brown; moist; soft to medium stiff; sand is medium to coarse with occasional very coarse.			H11B8020108		
	9						
	10						
		BORING COMPLETE AT 10 FEET. BACKFILLED WITH CUTTINGS.					
	11						
	12						
	13						
	14						

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HTW DRILLING LOG

HOLE No. 11-C1

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 5 SHEETS			
3. PROJECT	Iowa Army Ammunition Plant	4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	Alan Oaks	6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech GP-750C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/2" Hollow stem augers 5 ft CME split spoon sampler	8. HOLE LOCATION	Line 2
		9. SURFACE ELEVATION	Not surveyed
		10. DATE STARTED	June 4, 1997
		11. DATE COMPLETED	June 4, 1997
12. OVERBURDEN THICKNESS	Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED	Groundwater not encountered
13. DEPTH DRILLED INTO ROCK	Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	Groundwater not encountered
14. TOTAL DEPTH OF HOLE	35 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	Groundwater not encountered

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	5 Soil 1 Groundwater					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Joe Mark

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	FILL: Crushed limestone with clay (railroad track bed material).	PID = 0 ppm CGI = 0%	Continuous Sampler	H11C1010100		
	1						
	2						
	3	CLAY (CL): black mottled greenish gray; moist; soft; contains organic material.	PID = 0 ppm CGI = 0%				
	4						
		CLAY (CL): Blackish redd with some brown mottling; moist; soft to medium stiff.					
	5						

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HTW DRILLING LOG

HOLE No. 11-C1

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Joe Mark

SHEET 2 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	6	CLAY (CL): Greenish gray with occasional rust colored mottles; moist; stiff; trace silt.					
	7						
	8			Continuous Sample			
	9						
	10				H11C1020110 Dupe. 4		
	11						
	12	12 ft.: Same as above except no rust-colored mottles.					
	13						
	14						

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HTW DRILLING LOG

HOLE No. 11-C1

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Joe Mark

SHEET 3 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		CLAY (CL): Greenish gray; moist; stiff; trace silt.	PID = 0 ppm cgi = 0%				
	15	CLAY (CL): Greenish gray with rust-colored mottles; moist; soft; trace silt.	PID = 0 ppm cgi = 0%				
	16						
	17			Continuous Sample			
	18						
	19				H11C1020110 Dupe. 4		
	20	CLAY (CL): Brown with rust-colored mottles; moist; stiff; trace silt.	PID = 0 ppm cgi = 0%				
	21	12 ft.: Same as above except no rust-colored mottles.					
	22						
	23						

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HTW DRILLING LOG

HOLE No. 11-C1

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 4 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as Above					
					H11C1010400		
	24						
	25		PID = 1 ppm (transient) cgi = 0%				
					H11C1030125		
	26	CLAY (CL): Brown with gray mottles; moist; medium stiff; trace sand; trace small gravel.	PID = 1 ppm (transient) cgi = 0%	Continuous Sample			
	27						
	28						
	29						
	30						
	31						
	32						

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HTW DRILLING LOG

HOLE No. 11-C1

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 5 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		CLAY (CL): Brown; wet; soft; tract sand and small gravel.	PID = 0 ppm cgi = 0%	Continuous Sample	H11C1010133		
	33						
	34						
	35						
		BORING COMPLETE AT 35 FEET. TREMIE GROUTED WITH HI-SOLIDS BENTONITE GROUT.					

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HTW DRILLING LOG

HOLE No. 11-C2

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.
2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 2 SHEETS	
3. PROJECT	Iowa Army Ammunition Plant
4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	Alan Oaks
6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech GP-750C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/2" Hollow stem augers; 5 ft CME split spoon sampler
8. HOLE LOCATION	Line 2
9. SURFACE ELEVATION	Not surveyed
10. DATE STARTED	June 5, 1997
11. DATE COMPLETED	June 5, 1997
12. OVERBURDEN THICKNESS	Bedrock not encountered
15. DEPTH GROUNDWATER ENCOUNTERED	Groundwater not encountered
13. DEPTH DRILLED INTO ROCK	Bedrock not encountered
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	Groundwater not encountered
14. TOTAL DEPTH OF HOLE	10 feet
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	Groundwater not encountered

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	4 Soil					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Temporary 2" PVC monitoring well installed for groundwater sampling.		X	NA	Joe Mark

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	FILL: Crushed limestone (railroad track bed material).	PID = 0 ppm CGI = 0%	Continuous Sampler	H11BC2010100		
	1						
		CLAY (CL): black with grayish green mottles; moist; soft; very organic.	PID = 0 ppm CGI = 0%				
	2						
	3						
	4		PID = 0 ppm CGI = 0%		H11C2020104 Dupe #7		
	5						

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HTW DRILLING LOG

HOLE No. 11-C2

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 2 OF 2 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI - 0%	Continuous Sample			
	6						
	7		PID = 0 ppm CGI - 0%				
	8						
	9						
	10		PID = 0 ppm CGI - 0%		H11C2030110		
		BORING COMPLETE AT 10 FEET. TEMPORARY MONITORING WELL INSTALLED FOR GROUNDWATER SAMPLING. ABANDONED AND GROUTED NOVEMBER 1997.					
	11						
	12						
	13						
	14						

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HTW DRILLING LOG

HOLE No. 11-C3

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 3 SHEETS			
3. PROJECT	Iowa Army Ammunition Plant	4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	Alan Oaks	6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech GP-750C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/2" Hollow stem augers 5 ft CME split spoon sampler	8. HOLE LOCATION	Line 2
		9. SURFACE ELEVATION	Not surveyed
		10. DATE STARTED	June 14, 1997
		11. DATE COMPLETED	June 14, 1997
12. OVERBURDEN THICKNESS	Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED	Groundwater not encountered
13. DEPTH DRILLED INTO ROCK	Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	Groundwater not encountered
14. TOTAL DEPTH OF HOLE	20 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	Groundwater not encountered

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
						NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Temporary 2" PVC monitoring well installed for groundwater sampling		X	NA	Rodger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown to black; damp to moist; medium stiff.	PID = 0 ppm CGI = 0% (0 - 5 ft.)	Continuous Sampler			
	1						
		SILTY CLAY (CL): Mottled dark yellowish brown to pale olive; moist; soft to medium stiff; contains fine sand and fine to small gravel.					
	2						
	3						
	4	CLAY SILT (ML): Dark brown with some greenish gray mottling to 6"; soft to medium stiff; contains wood fragments.					
	5						

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HTW DRILLING LOG

HOLE No. 11-C3

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
			PID = 0 ppm CGI = 0% (5 - 10 ft)				
	6						
	7						
	8			Continuous Sample			
	9						
	10	SILTY CLAY (CL): Mottled greenish gray to light olive brown; moist; soft to medium stiff; some black staining.					
	11						
	12						
	13		PID = 0 ppm CGI = 0% (5 - 10 ft)				
	14						

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HTW DRILLING LOG

HOLE No. 11-C3

PROJECT	INSPECTOR	SHEET 3 OF 3 SHEETS
IOWA ARMY AMMUNITION PLANT	Roger A. Wilson	

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
			PID = 0 ppm cgi = 0%				
	15	SILTY CLAY/CLAYEY SILT (CL/ML): Dark yellowish orange to light brownish gray; moist to wet; soft to stiff; contains very fine to fine sand and occasional coarse to very coarse sand. fractured, with black staining on fracture surfaces.	PID = 0 ppm cgi = 0%				
	16						
	17		PID = 0 ppm CGI = 0% (15-20 ft.)	Continuous Sample			
	18						
	19						
	20	BORING COMPLETE AT 20 FEET. TEMPORARY MONITORING WELL INSTALLED FOR GROUNDWATER SAMPLING. ABANDONED AND GROUTED NOVEMBER 1997.					

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HTW DRILLING LOG

HOLE No. 11-C4

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.
2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 3 SHEETS	
3. PROJECT	Iowa Army Ammunition Plant
4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	Alan Oaks
6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech GP-750C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/2" Hollow stem augers 5 ft CME split spoon sampler
8. HOLE LOCATION	East of Building 2-03 (about 75'), Line 2
9. SURFACE ELEVATION	Not surveyed
10. DATE STARTED	June 13, 1997
11. DATE COMPLETED	June 14, 1997
12. OVERBURDEN THICKNESS	Bedrock not encountered
15. DEPTH GROUNDWATER ENCOUNTERED	15 feet (approx.)
13. DEPTH DRILLED INTO ROCK	Bedrock not encountered
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE	20 feet
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
						NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Temporary 2" PVC monitoring well installed for groundwater sampling		X	NA	Rodger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown to black; moist; medium stiff; contains rootlets.		Continuous Sampler			
		Sandy Gravel layer, 0.5' thick.					
	1						
	2						
	3	SILTY CLAY (CL): Mottled dark yellowish brown to pale olive; moist; soft to medium stiff; contains fine to medium sand; contains rootlets.					
	4						
	5	SILTY CLAY (CL): Mottled dark yellowish orange to olive gray; moist; stiff; contains black silt pockets.					

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HTW DRILLING LOG

HOLE No. 11-C4

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	6						
	7						
	8	CLAYEY SILT (ML): Dark brown with some greenish gray mottles; moist; soft to medium stiff.		Continuous Sample			
	9						
	10						
	11						
	12						
	13	SILTY CLAY (CL): Olive gray to greenish gray; moist; stiff.					
	14						

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HTW DRILLING LOG

HOLE No. 11-C4

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Roger A. Wilson

SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	15						Installed Hydropunch 15-20 ft. Insufficient water for sampling 6/14/97 Time=0837 hrs.
	16						
	17			Continuous Sample			
	18						
	19						
	20	BORING COMPLETE AT 20 FEET. TEMPORARY MONITORING WELL INSTALLED FOR GROUNDWATER SAMPLING. ABANDONED AND GROUTED NOVEMBER 1997.					

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HTW DRILLING LOG

HOLE No. 11-C5

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 3 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Alan Oaks	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech GP-750C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-1/2" Hollow stem augers; 5 ft CME split spoon sampler	8. HOLE LOCATION: Southeast of Building 2-03 (about 150'), Line 2	
	9. SURFACE ELEVATION: Not surveyed	
	10. DATE STARTED: June 13, 1997	11. DATE COMPLETED: June 14, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: Groundwater not encountered	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Groundwater not encountered	
14. TOTAL DEPTH OF HOLE: 20 feet (Sampled to 15 ft.)	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): Groundwater not encountered	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
						NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Temporary 2" PVC monitoring well installed for groundwater sampling		X	NA	Rodger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown to black; moist; medium stiff; contains rootlets.	PID = 0 ppm CGI = 0% (0-5 ft.)	Continuous Sampler			
	1						
		SILTY CLAY (CL): Mottled dark yellowish brown to pale olive; moist; soft to medium stiff; contains fine to medium sand; contains rootlets.					
	2						
	3						
		SILTY CLAY (CL): Mottled dark yellowish orange to olive gray; moist; stiff; contains black silt pockets; contains rootlets.					
	4						
	5						

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HTW DRILLING LOG

HOLE No. 11-C5

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0% (5-10 ft.)				
	6						
	7	CLAYEY SILT (ML): Dark brown with some greenish gray mottles; moist; soft to medium stiff.					
	8			Continuous Sample			
	9						
	10		PID = 0 ppm CGI = 0% (10-15 ft.)				
	11						
	12	SILTY CLAY (CL): Olive gray to greenish gray; moist; stiff.					
	13						
	14						

c:\cdr\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 11-C5

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	15						Installed Hydropunch 15-20 ft. Insufficient water for sampling 6/14/97 Time=0835 hrs.
	16						
	17			Continuous Sample			
	18						
	19						
	20						
		BORING COMPLETE AT 20 FEET. TEMPORARY MONITORING WELL INSTALLED FOR GROUNDWATER SAMPLING. ABANDONED AND GROUTED NOVEMBER 1997.					

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HTW DRILLING LOG

HOLE No. 11-C6

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 3 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Alan Oaks	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech GP-750C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-1/2" Hollow stem augers; 5 ft CME split spoon sampler	8. HOLE LOCATION: South of Building 2-02, Line 2	
	9. SURFACE ELEVATION: Not surveyed	
	10. DATE STARTED: June 14, 1997	11. DATE COMPLETED: June 14, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: 8 feet (approx.)	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE: 15 Feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
						NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Temporary 2" PVC monitoring well installed for groundwater sampling		X	NA	Rodger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	FILL: Silty clay (CL): Light brown to yellowish brown; damp to moist; stiff.	PID = 0 ppm CGI = 0% (0-5 ft.)	Continuous Sampler			
	1	FILL: Gravel and asphalt.					
		SILTY CLAY (CL): Dark brown to black; moist; stiff.					
	2						
	3						
		SILTY CLAY (CL): Mottled dark yellowish orange to olive gray; moist; soft to medium stiff.					
	4						
	5	SILTY CLAY (CL): Light olive gray to light olive brown; moist; medium stiff to stiff; blocky soil structure; contains roots to 9 ft.					

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HTW DRILLING LOG

HOLE No. 11-C6

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0% (5-10 ft.)	Continuous Sample			Tar-like material observed between 5 and 8 ft.
	6						
	7						
	8						
	9						
	10		PID = 0 ppm CGI = 0% (10-15 ft.)				
	11						
	12						
	13						
	14						

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HTW DRILLING LOG

HOLE No. 11-C6

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Roger A. Wilson

SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	15						
		BORING COMPLETE AT 15 FEET. TEMPORARY MONITORING WELL INSTALLED FOR GROUNDWATER SAMPLING. ABANDONED AND GROUTED NOVEMBER 1997.					
	16						
	17						
	18						
	19						
	20						

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HTW DRILLING LOG

HOLE No. 11-D1

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 3 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Alan Oaks	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech GP-750C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-1/2" Hollow stem augers; 5 ft CME split spoon sampler	8. HOLE LOCATION: Line 3	
	9. SURFACE ELEVATION: Not surveyed	
	10. DATE STARTED: June 3, 1997	11. DATE COMPLETED: June 3, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: 12.7 ft.	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE: 15 Feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	4 Soil					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Joe Mark

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	FILL: Crushed limestone (Railroad track bed material).	PID = 0 ppm CGI = 0%	Continuous Sampler	H11D1010100		
	1						
	2						
	3						
	4						
	5	CLAY (CL): Black with occasional gray-green mottles; moist; soft, very organic.	PID = 0 ppm CGI = 0%		H11D1020105		

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HTW DRILLING LOG

HOLE No. 11-D1

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0% (5-10 ft.)	Continuous Sample			Tar-like material observed between 5 and 8 ft.
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13				H11D1030113 DUP 0601		
					H11D1010400		
	14						

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HTW DRILLING LOG

HOLE No. 11-D1

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Joe Mark

SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0%				
	15						
		BORING COMPLETE AT 15 FEET. BACKFILLED WITH CUTTINGS.					
	16						
	17						
	18						
	19						
	20						

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HTW DRILLING LOG

HOLE No. 11-E1

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.
2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 2 SHEETS	
3. PROJECT	Iowa Army Ammunition Plant
4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	Richard Carroll
6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech GP-750C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/2" Hollow stem augers; 5 ft CME split spoon sampler
8. HOLE LOCATION	Line 3A
9. SURFACE ELEVATION	Not surveyed
10. DATE STARTED	June 4, 1997
11. DATE COMPLETED	June 4, 1997
12. OVERBURDEN THICKNESS	Bedrock not encountered
15. DEPTH GROUNDWATER ENCOUNTERED	8 ft. (approx.)
13. DEPTH DRILLED INTO ROCK	Bedrock not encountered
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	5.3 ft after approximately 50 minutes.
14. TOTAL DEPTH OF HOLE	12 Feet
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	4 Soil 1 Groundwater					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Joe Mark

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	FILL: Crushed limestone (Railroad track bed material).	PID = 0 ppm CGI = 0%	Continuous Sampler	H11E1010100		
	1						
	2						
	3						
		CLAY (CL): Gray with rust-colored mottles; moist; soft; plastic; trace sand.	PID = 0 ppm CGI = 0%				
	4						
	5				H11DE020105		

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HTW DRILLING LOG

HOLE No. 11-E1

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0%				
	6						
	7						
	8	8 ft. (approx.): Very thin wet zone.		Continuous Sample			
	9						
	10		PID = 0 ppm CGI = 0%		H11E1030110 DUP. #9		
	11						
	12		PID = 0 ppm CGI = 0%		H11E1010400		
		BORING COMPLETE AT 12 FEET. BACKFILLED WITH CUTTINGS.					
	13						
	14						

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HTW DRILLING LOG

HOLE No. 11-E2

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: Not Applicable	SHEET 1 OF 1 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Not Applicable	6. MANUFACTURER'S DESIGNATION OF DRILL: Not Applicable	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: hand Auger	8. HOLE LOCATION: Line 3A, South of Building 3A-03-01	
	9. SURFACE ELEVATION: Not surveyed	
	10. DATE STARTED: June 5, 1997	11. DATE COMPLETED: June 5, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: Groundwater not encountered	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Groundwater not encountered	
14. TOTAL DEPTH OF HOLE: 5 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): Groundwater not encountered	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SANDY GRAVEL (GP): White to yellowish brown, loose.	PID = 0 ppm (0-5 ft)	Continuous Sampler	H11E2010100 Time=1514 hrs		
	1						
		CLAY (CL): Dark brown to black; moist; medium stiff.					
	2	CLAY (CL): Dark gray to dark brown; moist; medium stiff.					
	3						
	4				H11E1020104 Time=1545 hrs		
	5						
		Hand auger boring complete at 5 ft. Backfilled with cuttings.					

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HTW DRILLING LOG

HOLE No. 11-F1

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 5 SHEETS			
3. PROJECT	Iowa Army Ammunition Plant	4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	Alan Oaks	6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech GP-750C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/2" Hollow stem augers 5 ft CME split spoon sampler	8. HOLE LOCATION	Line 9, Building 9-57
		9. SURFACE ELEVATION	Not surveyed
		10. DATE STARTED	June 3, 1997
		11. DATE COMPLETED	June 3, 1997
12. OVERBURDEN THICKNESS	Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED	Groundwater not encountered
13. DEPTH DRILLED INTO ROCK	Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	Groundwater not encountered
14. TOTAL DEPTH OF HOLE	35 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	Groundwater not encountered

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	5					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown to black; moist; soft to medium stiff; contains rootlets.	PID = 0 ppm CGI = 0% (0-5 ft.)	Continuous Sampler			
	1	SILTY CLAY (CL): Mottled light brown-tan-moderate brown; moist to wet; medium stiff; contains rootlets. 1.5 ft.: 2" thick gravel layer, wet.					
	2	CLAY (CL): Mottled very pale green-dark yellowish brown; soft to medium stiff; contains rootlets and black staining along root tracks.			H11F1010100 Time=1039 hrs.		
	3						
	4						
		SILTY CLAY (CL): Pale olive with some dark yellowish brown mottling; soft to medium stiff; contains rootlets and some black staining along root tracks; fissured.					
	5				H11F1020105 Time=1050 hrs.		NOTE: Sewage odor in sample collected from 5-6 ft.

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HTW DRILLING LOG

HOLE No. 11-F1

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
			PID = 0 ppm CGI = 0% (5-10 ft.)				
	6						Hydropunch GW sample collected from 6-11 ft.
	7						
	8	SANDY SILTY CLAY (CL): Yellowish gray to light olove gray; moist to wet; medium stiff; sand is fine to medium grained with occasional coarse to very coarse sand; contains charcoal.		Continuous Sample			
	9						
	10		PID = 0 ppm CGI = 0% (10-13 ft.)				
	11	SANDY SILTY CLAY/CLAYEY SILT (CL/ML): Yellowish gray to dark yellowish orange with some black staining; moist; soft; contains fine to medium sand with occasional very coarse sand.					
	12						
	13		headspace screening: PID = 4.5 ppm (13-15 ft.)		H11F1030113		
	14						

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HTW DRILLING LOG

HOLE No. 11-F1

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 3 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	15		Headspace screening: PID = 3.6 ppm (15-20 ft.)				
	16	SANDY CLAYEY SILT (ML): Yellowish gray to reddish brown; moist to wet; stiff; sand is very fine to medium with occasional coarse to very coarse; contains occasional gravel to 1.5"; fractured w/ black stain on surfaces.					
	17			Continuous Sample			
	18						
	19		Max. PID reading at 19 ft.				19 ft.: Possible free product.
	20		Headspace screening: PID = 3.5 ppm (20-25 ft.)				
	21	SILTY CLAY (CL): Light bluish gray to yellowish brown; moist; stiff to very stiff; contains trace fine to very coarse sand.					
	22						
	23				H11F1040123		

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HTW DRILLING LOG

HOLE No. 11-F1

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 4 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as Above					
	24						
	25	SILTY CLAY (CL): Dark yellowish orange to yellowish gray; moist; stiff; contains trace fine to very coarse sand.	Headspace screening: PID = 0 ppm (25-30 ft)				25-30 ft.: During drilling, possible free product observed in cuttings.
	26			Continuous Sample			
	27						
	28						
	29	SANDY CLAYEY SILT (ML): Dark yellowish orange to light brown; moist; stiff to very stiff; sand is fine to mediumw/occasional coarse to very coarse; fractured w/black stain on surfaces.					
	30		Headspace screening: PID = 0 ppm (30-35 ft)				
	31						
	32						

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HTW DRILLING LOG

HOLE No. 11-F1

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Roger A. Wilson

SHEET 5 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	Headspace screening: PID = 0 ppm (30-35 ft.)	Continuous Sample	H11F1050133		
	33						
	34						
	35	BORING COMPLETE AT 35 FEET. TREMIE GROUTED WITH HI-SOLIDS BENTONITE GROUT.					

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HTW DRILLING LOG

HOLE No. 11-F2

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.
2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 5 SHEETS	
3. PROJECT	Iowa Army Ammunition Plant
4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	Richard Carroll
6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech GP-750C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/2" Hollow stem augers 5 ft CME split spoon sampler
8. HOLE LOCATION	Line 9, Building 9-57
9. SURFACE ELEVATION	Not surveyed
10. DATE STARTED	June 2, 1997
11. DATE COMPLETED	June 2, 1997
12. OVERBURDEN THICKNESS	Bedrock not encountered
15. DEPTH GROUNDWATER ENCOUNTERED	Groundwater not encountered
13. DEPTH DRILLED INTO ROCK	Bedrock not encountered
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	Groundwater not encountered
14. TOTAL DEPTH OF HOLE	35 feet
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	Groundwater not encountered

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	5					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Joe Mark

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SANDY CLAY (CL): Black, dry, contains sand and grass roots.	PID = 0 ppm CGI = 0%	Continuous Sampler	H11F2010100		
	1						
	2						
	3						
	4						
	5	CLAY (CL): Light gray with rust-colored mottles; moist; soft; trace sand.			H11F2020105		

c:\cdr\misc\htw1.cdr

HTW DRILLING LOG

HOLE No. 11-F2

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Joe Mark

SHEET 2 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
			PID = 0 ppm CGI = 0% (5-10 ft.)				
	6						
	7	CLAY (CL): Gray with rust-colored mottles; moist; stiff; trace sand.	PID = 0 ppm CGI = 0%				
	8			Continuous Sample			
	9						
	10	CLAY (CL): Light gray with rust-colored mottles; moist; soft; plastic; trace sand.	PID = 0 ppm CGI = 0%				
	11						
	12	CLAY (CL): Light brown; moist; soft; trace sand; plastic.	Headspace screening: PID = 5.3 ppm CGI = 0%				
	13				H11F2030113		
	14						

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HTW DRILLING LOG

HOLE No. 11-F2

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Joe Mark

SHEET 3 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	15	CLAY (CL): Brown with gray mottles; moist; stiff; trace sand.	PID = 0 ppm CGI = 0%				Clear liquid with "sweet" odor draining from soil core and evaporating.
	16	CLAY (CL): Brown with gray mottles; moist; soft; trace sand.	PID = 10.4 ppm CGI = 0%				
	17	CLAY (CL): Brown with gray mottles; moist; stiff; trace sand.	PID = 0 ppm CGI = 0%	Continuous Sample			
	18						
	19		Max. PID reading at 19 ft.				19 ft.: Possible free product.
	20		Headspace screening: PID = 3.5 ppm (20-25 ft.)				
	21						
	22						
	23		PID = 1.4 ppm (outside core) PID = 0 ppm (fresh surfaces) CGI = 0%		H11F2040123		

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HTW DRILLING LOG

HOLE No. 11-F2

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 4 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	24						
		CLAY (CL): Brown with gray mottles; moist; stiff; trace sand.					
	25						
	26	CLAY (CL) Rusty brown; moist; stiff; contains sand and small gravel.	PID = 1.4 ppm (on core surface) PID = 0 ppm (on fresh surface) CGI = 0%	Continuous Sample			Clear liquid noted above may be migrating down outside of soil core.
	27						
	28						
	29	CLAY (CL): Gray with rust-colored mottles; moist; stiff; trace sand and small gravel.					
	30		Headspace screening: PID = 0 ppm (30-35 ft)				
	31						
	32						

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HTW DRILLING LOG

HOLE No. 11-F2

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 5 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 2.4 ppm (on core surface) PID = 0 (on fresh surface) CGI = 0%	Continuous Sample	H11F2050133		
	33						
	34						
	35	BORING COMPLETE AT 35 FEET. TREMIE GROUTED WITH HI-SOLIDS BENTONITE GROUT.					

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HTW DRILLING LOG

HOLE No. 11-F3

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 5 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Alan Oaks	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech GP-1100C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-1/2" Hollow stem augers; 5 ft CME split spoon sampler	8. HOLE LOCATION: Line 9, Building 9-57	
	9. SURFACE ELEVATION: Not surveyed	
	10. DATE STARTED: June 2, 1997	11. DATE COMPLETED: June 2, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: 9.5 ft. (approx.)	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE: 40 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	6					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown to black; damp; medium stiff; contains rootlets.	PID = 0 ppm CGI = 0% (0-5 ft.)	Continuous Sampler	H11F3010100		
	1						
	2	SILTY CLAY (CL): Dark brown to yellowish brown; damp to moist; medium stiff; contains rootlets.			H11F1010100 Time=1039 hrs.		
	3						
	4	SANDY GRAVEL (GP): Light brown to yellowish brown; moist; loose; sand is fine to very coarse; gravel up to 2" diam..					
	5	SILTY CLAY (CL): Mottled greenish gray to yellowish brown; moist; soft; contains trace fine sand.			H11F3020105 Time=1011 hrs.		

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HTW DRILLING LOG

HOLE No. 11-F3

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
			PID = 0 ppm CGI = 0% (5-10 ft.)				
	6						
	7						
	8			Continuous Sample			
	9						
		SILTY CLAY/CLAYEY SILT (CL/ML): Mottled medium brown to yellowish brown; moist to wet; medium stiff; contains fine to medium sand with occasional very coarse sand.	PID = 0 ppm CGI = 0% (10-13 ft.)				9.5 ft.: Ground-water encountered.
	10						
	11						
	12	SANDY CLAYEY SILT (ML): Light bluish gray to moderate brown; moist to wet; soft; sand is fine to medium grained.					
	13				H11F3030113 Time=1016 hrs.		
	14						

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HTW DRILLING LOG

HOLE No. 11-F3

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 3 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		SILTY SAND (SP): Yellowish brown; wet; loose; sand fine to coarse w/occasional very coarse; contains occasional gravel to 2" dia.	PID = 0 ppm CGI = 0% (15-20 ft.)				
	15						
	16						
	17			Continuous Sample			
	18	CLAYEY SILT (ML): Mottled grayish orange to moderate reddish brown; moist; stiff..					
	19	SILTY CLAY (CL): Medium brown to yellowish brown; moist; medium stiff; contains local black staining.					
	20		PID = 0 ppm CGI = 0% (20-25 ft.)				
	21						
	22						
	23				H11F3040123 Time=1055 hrs.		

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HTW DRILLING LOG

HOLE No. 11-F3

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 4 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as Above					
	24						
	25		PID = 0 ppm CGI = 0% (25-30 ft.)				
	26			Continuous Sample			
	27						
	28						
	29						
	30		HNU displayed screening: PID = 0 ppm (30-35 ft)				
	31						
	32	SAND (SW): Yellowish brown; moist; loose; medium grained with occasional coarse to very coarse; contains local silty clay zones; contains gravel to 3/4" diam.	PID = 49 ppm		H11F3050132		

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HTW DRILLING LOG

HOLE No. 11-F3

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 5 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = <20 ppm (30-35 ft.)				
	33	SANDY CLAYEY SILT (ML): Yellowish brown to tan; moist; medium stiff; sand is fine to medium grained with trace coarse to very coarse; occasional gravel to 3/4" diam.		Continuous Sample			
	34						
	35		PID = 36 ppm CGI = 0% (35-37 ft.)				
	36				H11F3060136		
	37						
	38	SAND (SP): Yellowish brown to light brown; moist; medium dense; sand is fine to medium grained.	PID = 0 ppm CGI = 0% (37-40 ft.)				
	39						
	40	BORING COMPLETE AT 40 FEET. TREMIE GROUTED WITH HI-SOLIDS BENTONITE GROUT.					

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HTW DRILLING LOG

HOLE No. 11-F4

1. COMPANY NAME HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 5 SHEETS
3. PROJECT Iowa Army Ammunition Plant	4. LOCATION Middletown, Iowa	
5. NAME OF DRILLER Alan Oaks	6. MANUFACTURER'S DESIGNATION OF DRILL Gus Pech GP-1100C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-1/2" Hollow stem augers; 5 ft CME split spoon sampler	8. HOLE LOCATION Line 9, East of Building 9-57	
	9. SURFACE ELEVATION Not surveyed	
	10. DATE STARTED June 3, 1997	11. DATE COMPLETED June 4, 1997
12. OVERBURDEN THICKNESS Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED 8 ft. (approx.)	
13. DEPTH DRILLED INTO ROCK Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE 35 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	7					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown to black with some light brown mottles; dry to moist; soft to medium; contains rootlets.	PID = 0 ppm CGI = 0% (0-5 ft.)	Continuous Sampler	H11F4010100 Time=1527 hrs.		
	1	1.0 ft.: Thin gravel layer.					
	2	SILTY CLAY (CL): Light brown to tan; moist; soft to medium stiff; contains rootlets.			H11F1010100 Time=1039 hrs.		
	3						
	4						
	5	CLAY (CL): Very pale green to dark yellowish brown; moist; soft to medium stiff; contains rootlets and black staining on root tracks.			H11F4020105 Time=1535 hrs.		

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HTW DRILLING LOG

HOLE No. 11-F4

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0% (5-10 ft.)		H11F4010406 H11DWP0104 Time=0740 hrs.		
	6						
	7						
	8			Continuous Sample			
	9	SANDY SILTY CLAY (CL): Yellowish gray to light olove gray; moist to wet; medium stiff; sand is fine to medium grained with occasional coarse to very coarse sand; contains charcoal.					
	10		PID = 14.8 ppm CGI = 0% (10-15 ft.)				
	11						
	12	SANDY SILTY CLAY/CLAYEY SILT (CL/ML): Yellowish gray to dark yellowish orange with some black staining; moist; soft to medium stiff; sand is fine to medium with occasional coarse to very coarse; contains black staining.					
	13				H11F4030113 Time=0820 hrs.		
	14						

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HTW DRILLING LOG

HOLE No. 11-F4

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 3 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	15	CLAYEY SAND (SC): Dark yellowish orange; wet; loose; sand is medium grained with trace fine, coarse, and very coarse.	PID = 59.8 ppm CGI = 0% (15-17 ft.)		H11F4040115 H11DWP0801 Time=0835 hrs.		
	16						
	17	SANDY CLAYEY SILT (ML): Yellowish gray to reddish brown; moist; stiff; sand is very fine to medium with occasional coarse to very coarse; contains occasional gravel to 1.5"; fractured w/ black stain on surfaces.		Continuous Sample			
	18						
	19						
	20		PID = 0 ppm CGI = 0% (20-25 ft)				
	21	SILTY CLAY (CL): Light olive gray to yellowish orange; moist; stiff; contains fine to medium sand with occasional coarse to very coarse.					
	22						
	23				H11F4040123 Time=0845 hrs.		

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HTW DRILLING LOG

HOLE No. 11-F4

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 4 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as Above					
	24						
	25		Headspace screening: PID = 0 ppm (25-30 ft., except as noted)				
	26	SILTY SANDY CLAY (CL): Light olive gray to yellowish orange; moist; stiff; sand is fine to medium grained with occasional coarse to very coarse; occasional gravel to 1.5" diam.		Continuous Sample			
	27						
	28		PID = 49.2 ppm CGI = 0% (at 28 ft.)				
	29						
	30	SANDY CLAYEY SILT/SILTY CLAY (ML/CL): Dark yellowish orange to light olive gray; moist; stiff; sand is very fine to very coarse; fractured w/black staining on surfaces.	PID = 0 ppm CGI = 0% (30-35 ft.)				
	31						
	32						

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HTW DRILLING LOG

HOLE No. 11-F4

PROJECT	INSPECTOR	SHEET 5 OF 5 SHEETS
IOWA ARMY AMMUNITION PLANT	Roger A. Wilson	

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	Headspace screening: PID = 0 ppm (30-35 ft.)	Continuous Sample	H11F4060133 Time=0915 hrs.		
	33						
	34						
	35	BORING COMPLETE AT 35 FEET. TREMIE GROUTED WITH HI-SOLIDS BENTONITE GROUT.					

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HTW DRILLING LOG

HOLE No. 11-F5

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 5 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Alan Oaks	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech GP-1100C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-1/2" Hollow stem augers; 5 ft CME split spoon sampler	8. HOLE LOCATION: Line 9, Building 9-57	
	9. SURFACE ELEVATION: Not surveyed	
	10. DATE STARTED: June 2, 1997	11. DATE COMPLETED: June 3, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: 5.5 ft. (approx.)	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE: 35 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	6					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown to black; moist; soft; contains rootlets.	PID = 0 ppm CGI = 0% (0-5 ft.)	Continuous Sampler	H11F5010100 Time=1600 hrs.		
	1						
	2	SILTY CLAY (CL): Mottled yellowish brown to light gray to dark gray; moist; soft; contains rootlets; trace very fine to fine sand.					
	3						
	4						
	5	5.0-5.5 ft.: Wet.			H11F5020105 Time=1615 hrs.		

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HTW DRILLING LOG

HOLE No. 11-F5

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0% (5-10 ft.)				
	6						
	7	SILTY CLAY/CLAYEY SILT (CL/ML): Light gray with some yellowish brown mottles; moist to wet; soft to medium stiff; trace fine sand.					
	8			Continuous Sample	H11F5010400 MRDL Split: MS/MSD Time=0800 hrs.		Drove Hydropunch from 8-13 ft; collected water sample
	9						
	10		PID = 0 ppm CGI = 0% (10-13 ft.)				
	11	SANDY CLAYEY SILT/SILTY CLAY (ML/CL): Light olive brown to light olive gray; moist to wet; soft; sand is fine to medium grained with occasional coarse to very coarse; occasional gravel to 3/4" diam.					
	12						
	13				H11F5030113 Time=0840 hrs.		
	14	SANDY SILT (ML): Dark yellowing orange; moist; medium stiff; sand is very fine to fine grained with occasional coarse to very coarse					

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HTW DRILLING LOG

HOLE No. 11-F5

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 3 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	15	SANDY SILTY CLAY (CL): Moderate olive brown; moist; stiff; contains fine to medium sand and occasional coarse to very coarse; fractured w/black staining on surfaces.	PID = 0 ppm CGI = 0% (15-20 ft.)				
	16						
	17			Continuous Sample			
	18						
	19						
	20		PID = 0 ppm CGI = 0% (20-25 ft.)				
	21						
	22						
	23	SILTY CLAY (CL): Light bluish gray to yellowish brown; moist; stiff; contains trace fine to very coarse sand.			H11F5040123		

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HTW DRILLING LOG

HOLE No. 11-F5

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 4 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as Above	PID = 0 ppm CGI = 0% (23-28 ft.)				Odor noted from boring. No response on PID.
	24						
	25						
	26			Continuous Sample			
	27						
		SANDY CLAYEY SILT (ML): Dark yellowish orange to light brown; moist; stiff to very stiff; sand is fine to medium w/occasional coarse to very coarse; fractured w/black stain on surfaces.					
	28		PID = 0 ppm CGI = 0% (28-33 ft.)				
	29						
	30						
	31						
	32						

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HTW DRILLING LOG

HOLE No. 11-F5

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Roger A. Wilson

SHEET 5 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
					H11F5050133		
	33		PID = 0 ppm CGI = 0% (33-35 ft.)	Continuous Sample			
	34						
	35						
		BORING COMPLETE AT 35 FEET. TREMIE GROUTED WITH HI-SOLIDS BENTONITE GROUT.					

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HTW DRILLING LOG

HOLE No. 11-F6

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: Not Applicable	SHEET 1 OF 1 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Not Applicable	6. MANUFACTURER'S DESIGNATION OF DRILL: Not Applicable	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: hand Auger	8. HOLE LOCATION: Line 9, South of Building 9-57.	
	9. SURFACE ELEVATION: Not surveyed	
	10. DATE STARTED: June 4, 1997	11. DATE COMPLETED: June 4, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: Groundwater not encountered	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Groundwater not encountered	
14. TOTAL DEPTH OF HOLE: 5 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): Groundwater not encountered	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown to black; moist; soft to medium stiff; contains rootlets.	PID = 0 ppm (0-5 ft)	Continuous Sampler	H11F6010100 Time=1125 hrs		
	1	SILTY CLAY (CL): light brown to pale olive; moist; soft to medium stiff; contains rootlets.					
	2						
	3						
	4				H11F6020104 Time=1210 hrs		
	5	Hand auger boring complete at 5 ft. Backfilled with cuttings.					

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HTW DRILLING LOG

HOLE No. 11-F7

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 5 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Richard Carroll	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech GP-750C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-1/2" Hollow stem augers; 5 ft CME split spoon sampler	8. HOLE LOCATION: Line 9, Building 9-57	
	9. SURFACE ELEVATION: Not surveyed	
	10. DATE STARTED: June 3, 1997	11. DATE COMPLETED: June 3, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: 34 ft. (approx.)	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE: 35 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	6					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Joe Mark

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	CLAY (CL): Black; dry; soft; contains sand; contains grass roots; very organic.		Continuous Sampler	H11F7010100		
	1						
	2						
		CLAY (CL): Light gray with rust-colored mottles; moist; soft; trace sand.	PID = 0 ppm CGI = 0%				
	3						
	4						
	5	5 ft.: Very plastic.	PID = 0 ppm CGI = 0%		H11F7020105		

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HTW DRILLING LOG

HOLE No. 11-F7

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 2 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0%				
	6						
	7						
	8			Continuous Sample			
	9	CLAY (CL): Gray; moist; stiff; slightly plastic; contains sand.					
	10		PID = 0 ppm CGI = 0%				
	11	11 ft.: Same as above with rust-colored mottles.					
	12						
	13	CLAY (CL): Brown; moist; stiff; contains sand; slightly plastic.	PID = 0 ppm CGI = 0%		H11F7030113		
	14						

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HTW DRILLING LOG

HOLE No. 11-F7

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 3 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	15						
	16		PID = 32.3 ppm CGI = 0%				
	17			Continuous Sample			
	18						
	19		PID = 48 ppm CGI = 0%				
		CLAY (CL): Gray with rust-colored mottles; moist; stiff; contains sand.					NOTE: 'Sweet' odor from soil samples.
	20		PID = 48 ppm CGI = 0%		H11F7040120		
	21						
	22		PID = 0 ppm CGI = 0%				
	23		PID = 0 ppm CGI = 0%				

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HTW DRILLING LOG

HOLE No. 11-F7

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 4 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	24	CLAY (CL): Gray with rust-colored mottles; moist; stiff' contains sand and small gravel.	PID = 0 ppm CGI = 0%				
	25						
	26	CLAY (CL) Rusty brown; moist; stiff; contains sand and small gravel.	PID = 0 ppm CGI = 0%	Continuous Sample			
	27		PID = 0 ppm CGI = 0%				
	28						
	29		PID = 0 ppm CGI = 0%				
	30	30 ft.: Same as above but fractures are visible in clay.					
	31						
	32		PID = 58 ppm (on fresh surface) CGI = 0%				

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HTW DRILLING LOG

HOLE No. 11-F7

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 5 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	33	CLAY (CL): Gray with rust-colored mottles; moist; stiff; contains sand and fine gravel; fractured with dark stains on vertical surfaces.	PID = 58 ppm (on fresh surface) CGI = 0%	Continuous Sample	H11F7050133		
	34		No recovery				
		CLAY (CL): Gray; moist; stiff; contains sand and small gravel.					
	35						
		BORING COMPLETE AT 35 FEET. INSTALLED TEMPORARY MONITORING WELL FOR SAMPLING. HOLE TREMIE GROUTED WITH HI-SOLIDS BENTONITE GROUT AFTER SAMPLING.					

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HTW DRILLING LOG

HOLE No. 11-F8

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 5 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER:	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech GP-750C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-1/2" Hollow stem augers; 5 ft CME split spoon sampler	8. HOLE LOCATION: Line 9	
	9. SURFACE ELEVATION: Not surveyed	
	10. DATE STARTED: June 2, 1997	11. DATE COMPLETED: June 2, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: Groundwater not encountered	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Groundwater not encountered	
14. TOTAL DEPTH OF HOLE: 35 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): Groundwater not encountered	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	5					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Joe Mark

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	CLAY (CL): Black; dry; soft; contains sand; contains grass roots.	PID = 0 ppm CGI = 0%	Continuous Sampler	H11F8010100		
	1						
	2	CLAY (CL): Light gray with rust-colored mottles; moist; soft; tract sand.	PID = 0 ppm CGI = 0%				
	3						
	4						
	5				H11F8020105		

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HTW DRILLING LOG

HOLE No. 11-F8

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 2 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		CLAY (CL): Gray with rust-colored mottles; moist; firm; moderately plastic; trace sand.	PID = 0 ppm CGI = 0%	Continuous Sample			
	6						
	7						
	8						
	9	CLAY (CL): Gray with rust-colored mottles; moist; firm; trace sand; less plastic than above.	PID = 0 ppm CGI = 0%				
	10						
	11						
	12						
	13		PID = 0 ppm CGI = 0%		H11F8030113		
	14						

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HTW DRILLING LOG

HOLE No. 11-F8

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 3 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		CLAY (CL): Gray with rust-colored mottles; moist; firm; trace sand.	PID = 0 ppm CGI = 0%	Continuous Sample			
	15	CLAY (CL): Brown; wet; very soft; trace sand; trace gravel; fractured with dark brown to black faces; contains thin (<1/2") thick sandier wet zones.	PID = 0 ppm CGI = 0%				
	16						
	17						
	18	CLAY (CL): Brown; moist; firm; contains sand; trace gravel.	PID = 0 ppm CGI = 0%				
	19						
	20	CLAY (CL): Gray with rust-colored mottles; moist; hard; trace sand and small gravel.					
	21						
	22						
	23				H11F8040123		

HTW DRILLING LOG

HOLE No. 11-F8

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Joe Mark

SHEET 4 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		CLAY (CL): Gray with rust-colored mottles; moist; hard; trace sand and small gravel.	PID = 0 ppm CGI = 0%	Continuous Sample			
	24						
	25						
	26						
	27	CLAY (CL): Rusty brown; moist; very stiff; contains sand; trace small gravel; small scale (<1/4") bedding observed in this unit.	PID = 0 ppm CGI = 0%				
	28						
	29						
	30						
	31						
	32						

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HTW DRILLING LOG

HOLE No. 11-F8

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Joe Mark

SHEET 5 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
					H11F8050133		
	33			Continuous Sample			
	34						
	35						
		BORING COMPLETE AT 35 FEET. TREMIE GROUTED WITH HI-SOLIDS BENTONITE GROUT.					

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HTW DRILLING LOG

HOLE No. 11-F9

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 3 SHEETS			
3. PROJECT	Iowa Army Ammunition Plant	4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	Alan Oaks	6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech GP-750C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/2" Hollow stem augers 5 ft CME split spoon sampler	8. HOLE LOCATION	Line 9, 23 ft. East of boring F3
		9. SURFACE ELEVATION	Not surveyed
		10. DATE STARTED: June 10, 1997	11. DATE COMPLETED: June 11, 1997
12. OVERBURDEN THICKNESS	Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED	6 ft. (approx.)
13. DEPTH DRILLED INTO ROCK	Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE	15 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown to black; damp to moist; soft to medium stiff; contains rootlets.	PID = 0 ppm CGI = 0% (1-5 ft.)	Continuous Sampler	H11F8010100		
	1						
	2	CLAY (CL): Mottled dark yellowish orange to pale olive; moist; soft to medium stiff; contains rootlets; trace fine to medium sand.					
	3						
	4				H11F9010503		
	5						

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HTW DRILLING LOG

HOLE No. 11-F9

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	6						
	7						Set Hydropunch at 7 ft. Pushed at 1645 hrs/removed at 1648 hrs.
	8			Continuous Sample			
		SANDY CLAY (CL): Olive gray; moist to wet; soft; sand is fine to medium with trace coarse to very coarse.					
	9						
	10						
	11	SILTY CLAY (CL): Mottled dark yellowish orange to grayish green; moist; medium stiff to stiff; contains fine to medium sand and occasional coarse to very coarse sane; locally clayey sand.					
	12						
	13				H11F9020113		
	14	14 ft.: 2" thick, medium grained SAND; Saturated.					

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HTW DRILLING LOG

HOLE No. 11-F9

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Roger A. Wilson

SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	15						
		Boring complete at 15 feet. Grouted with Hi-Solids Bentonite grout.					

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HTW DRILLING LOG

HOLE No. 11-F10

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.
2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 3 SHEETS	
3. PROJECT	Iowa Army Ammunition Plant
4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	Alan Oaks
6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech GP-750C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/2" Hollow stem augers; 5 ft CME split spoon sampler
8. HOLE LOCATION	Line 9, 23 ft. East of boring F3
9. SURFACE ELEVATION	Not surveyed
10. DATE STARTED	June 10, 1997
11. DATE COMPLETED	June 11, 1997
12. OVERBURDEN THICKNESS	Bedrock not encountered
15. DEPTH GROUNDWATER ENCOUNTERED	6 ft. (approx.)
13. DEPTH DRILLED INTO ROCK	Bedrock not encountered
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE	15 feet
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown to black; damp to moist; soft to medium stiff; contains rootlets.	PID = 0 ppm CGI = 0% (1-5 ft.)	Continuous Sampler			
	1						
	2	CLAY (CL): Mottled dark yellowish orange to pale olive; moist; soft to medium stiff; contains rootlets; trace fine to medium sand; becomes silty with depth.					
	3						
	4				H11F10010103		
	5						

HTW DRILLING LOG

HOLE No. 11-F10

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0% (5-7 ft.)				
	6						
	7	7-10 ft.: Locally silty.	PID = 0 ppm CGI = 0% (7-10 ft.)				Set Hydropunch at 7 ft. Pushed at 1723 hrs/removed at 1725 hrs.
	8			Continuous Sample			
	9						
	10		PID = 0 ppm CGI = 0% (10-15 ft.)				
	11						
	12						
	13	SILTY CLAY (CL): Mottled dark yellowish orange to grayish green; moist; medium stiff to stiff; contains fine to medium sand and occasional coarse to very coarse sane; locally sandy clay.					
	14						

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HTW DRILLING LOG

HOLE No. 11-F10

PROJECT	INSPECTOR	SHEET 3 OF 3 SHEETS
IOWA ARMY AMMUNITION PLANT	Roger A. Wilson	

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	15						
		Boring complete at 15 feet. Grouted with Hi-Solids Bentonite grout.					

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HTW DRILLING LOG

HOLE No. 11-F11

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 3 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Alan Oaks	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech GP-750C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-1/2" Hollow stem augers; 5 ft CME split spoon sampler	8. HOLE LOCATION: Line 9, East of northeast corner of Building 9-57	
	9. SURFACE ELEVATION: Not surveyed	
	10. DATE STARTED: June 11, 1997	11. DATE COMPLETED: June 11, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: Broundwater not encountered	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Broundwater not encountered	
14. TOTAL DEPTH OF HOLE: 17 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): Broundwater not encountered	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown to black; damp to moist; medium stiff to stiff; contains rootlets.	PID = 0 ppm CGI = 0% (0-5 ft.)	Continuous Sampler			
		0.5 ft.: 2" thick gravel layer.					
	1						
		CLAY (CL): Mottled dark yellowish orange to pale olive; moist to wet; soft to medium stiff.					
	2						
	3						
	4				H11F11010103		
	5						

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HTW DRILLING LOG

HOLE No. 11-F11

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0% (5-7 ft.)				
	6						
	7		PID = 0 ppm CGI = 0% (7-10 ft.)				Set Hydropunch at 7 ft.
	8	SANDY CLAY (CL): Yellowish brown; moist to wet; soft; sand is fine to medium grained with occasional coarse to very coarse.		Continuous Sample			
	9						
	10		PID = 0 ppm CGI = 0% (10-15 ft.)				
	11	SILTY CLAY (CL): Mottled dark yellowish orange to grayish green; moist; medium stiff; contains fine to medium sand and occasional coarse to very coarse sane; locally sandy clay and silty.					
	12						
	13		PID = 21 ppm				
	14						

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HTW DRILLING LOG

HOLE No. 11-F11

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Roger A. Wilson

SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	15		PID = 32 ppm CGI = 0%				
	16				H11F11020115		
			PID = 0 ppm CGI = 0%				
	17	Boring complete at 17 feet. Grouted with Hi-Solids Bentonite grout.					

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HTW DRILLING LOG

HOLE No. 11-F12

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 3 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Alan Oaks	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech GP-750C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-1/2" Hollow stem augers; 5 ft CME split spoon sampler	8. HOLE LOCATION: Line 9, adjacent to JAW-31	
	9. SURFACE ELEVATION: Not surveyed	
	10. DATE STARTED: June 11, 1997	11. DATE COMPLETED: June 11, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: 6 ft. (approx.)	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE: 15 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown to black; damp to moist; medium stiff; contains rootlets.	PID = 0 ppm CGI = 0% (0-5 ft.)	Continuous Sampler			
		0.5 ft.: 2" thick gravel layer.					
	1						
		CLAY (CL): Mottled dark yellowish orange to pale olive; moist to wet; soft; contains rootlets; local black zones; trace very fine to find sand.					
	2						
	3						
	4				H11F12010103		
	5						

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HTW DRILLING LOG

HOLE No. 11-F12

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0% (5-7 ft.)				
	6						Set Hydropunch at 6 ft.
	7		PID = 0 ppm CGI = 0% (7-10 ft.)				
	8	SILTY CLAY (CL): Mottled dark yellowish orange to light gray; moist to wet; soft to medium stiff; contains rootlets; stained black locally.		Continuous Sample			
	9						
		SANDY CLAY (CL): Olive gray; moist to wet; soft; sand is fine to medium grained with trace coarse to very coarse.					
	10		PID = 0 ppm CGI = 0% (10-15 ft.)				
	11						
	12	SILTY CLAY (CL): Mottled dark yellowish orange to grayish green; moist; medium stiff to stiff; contains fine to medium sand and occasional coarse to very coarse sand; locally sandy, clayey, and silty.					
	13				H11F12020113		
	14		PID = 14.8 ppm				

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HTW DRILLING LOG

HOLE No. 11-F12

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Roger A. Wilson

SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm				
	15						
		Boring complete at 15 feet. Grouted with Hi-Solids Bentonite grout.					

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HTW DRILLING LOG

HOLE No. 11-F13

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 3 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Alan Oaks	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech GP-750C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-1/2" Hollow stem augers; 5 ft CME split spoon sampler	8. HOLE LOCATION: Line 9, northeast of Building 9-57	
	9. SURFACE ELEVATION: Not surveyed	
	10. DATE STARTED: June 11, 1997	11. DATE COMPLETED: June 12, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: 6 ft. (approx.)	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE: 15 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown to black; damp to moist; medium stiff; contains rootlets.	PID = 0 ppm CGI = 0% (0-5 ft.)	Continuous Sampler			
	1						
		CLAY (CL): Mottled dark yellowish orange to pale olive; moist to wet; soft; contains rootlets; local black zones; trace very fine to find sand.					
	2						
	3						
	4	CLAY (CL): Light olive gray; moist to wet; soft; trace fine sand.			H11F13010103		
	5						

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HTW DRILLING LOG

HOLE No. 11-F13

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0% (5-10 ft.)				
	6						Set Hydropunch at 6 ft.
	7						
	8			Continuous Sample			
		SANDY CLAY (CL): Pale yellowish brown; moist to wet; soft; sand is fine to medium grained with occasional very coarse sand and gravel to 3/4" diam.					
	9						
	10		PID = 0 ppm CGI = 0% (10-15 ft.)				
	11						
	12						
	13						
		SILTY CLAY (CL): Dark yellowish orange to pale olive; moist; medium stiff to stiff; contains fine to medium sand and occasional very coarse sand.	PID = 0 ppm CGI = 0%		H11F13020113		
	14						

c:\cdr\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 11-F13

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Locally sand and silt; contains occasional gravel to 1/2" diam.					
	15	Boring complete at 15 feet. Grouted with Hi-Solids Bentonite grout.					

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HTW DRILLING LOG

HOLE No. 11-F14

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 3 SHEETS			
3. PROJECT	Iowa Army Ammunition Plant	4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	Alan Oaks	6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech GP-750C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/2" Hollow stem augers 5 ft CME split spoon sampler	8. HOLE LOCATION	Line 9, northeast of Building 9-57
		9. SURFACE ELEVATION	Not surveyed
		10. DATE STARTED	June 11, 1997
		11. DATE COMPLETED	June 12, 1997
12. OVERBURDEN THICKNESS	Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED	6 ft. (approx.)
13. DEPTH DRILLED INTO ROCK	Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE	15 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2					NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown to black; damp to moist; medium stiff; contains rootlets.	PID = 0 ppm CGI = 0% (0-5 ft.)	Continuous Sampler			
	1						
	2	CLAY (CL): Mottled dark yellowish orange to pale olive; moist to wet; soft; contains rootlets; some black staining.					
	3						
	4				H11F14010103		
	5						

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HTW DRILLING LOG

HOLE No. 11-F14

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0% (5-7 ft.)				
	6						
	7		PID = 0 ppm CGI = 0% (7-10 ft.)				Set Hydropunch at 7 ft.
	8			Continuous Sample			
	9						
	10	SANDY CLAY (CL): Pale yellowish brown; moist to wet; loose to medium stiff; sand is fine to medium grained with occasional very coarse; occasional gravel to 3/4" diam.	PID = 0 ppm CGI = 0% (10-15 ft.)				
	11						
	12	SILTY CLAY (CL): Dark yellowish orange to pale olive; moist; medium stiff to stiff; contains fine to medium sand and occasional very coarse sand; locally sandy and silty.					
	13		PID = 0 ppm CGI = 0%		H11F14020113		
	14						

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HTW DRILLING LOG

HOLE No. 11-F14

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Roger A. Wilson

SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	15	Boring complete at 15 feet. Grouted with Hi-Solids Bentonite grout.					

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APPENDIX A
GEOLOGIC BORING LOGS

A-4 Task 12. Additional Groundwater Data, Line 2

HTW DRILLING LOG

HOLE No. 12-A

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.
2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 3 SHEETS	
3. PROJECT	Iowa Army Ammunition Plant
4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	Alan Oaks
6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech GP-1100C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/2" Hollow stem augers 5 ft CME split spoon sampler
8. HOLE LOCATION	Line 2, north of Building 2-082. (N 298,785; E 2,270,801)
9. SURFACE ELEVATION	Ground: 679.14; TOC: 681.25
10. DATE STARTED	May 8, 1997
11. DATE COMPLETED	May 8, 1997
12. OVERBURDEN THICKNESS	Bedrock not encountered
15. DEPTH GROUNDWATER ENCOUNTERED	Groundwater not encountered
13. DEPTH DRILLED INTO ROCK	Bedrock not encountered
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	Groundwater not encountered
14. TOTAL DEPTH OF HOLE	20.5 feet
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	8.15 ft., During basewide water level measurements.

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	1	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
						NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
		X	NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	CLAYEY SILT/SILTY CLAY (CL/ML): Dark brown; moist; medium stiff; contains rootlets.					12A drilled for well installation after 12A-AB was completed dry.
	1						
	2	SILTY CLAY (CL): Mottled yellow brown to gray; moist; medium stiff to stiff; contains <5% fine to coarse sand, angular to sub-rnd'd; contains occasional gravel to 1.5" diam; contains charcoal fragments.		Continuous Sampler			
	3						
	4						
	5		PID = 0 ppm CGI = 0%				

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HTW DRILLING LOG

HOLE No. 12-A

PROJECT	INSPECTOR	SHEET 2 OF 3 SHEETS
IOWA ARMY AMMUNITION PLANT	Roger A. Wilson	

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	6						
	7	7 ft.: <1/2" wet zone.					
	8			Continuous Sample			
		SILTY CLAY (CL): Mottled yellowish brown to light brown; moist; medium stiff; contains <5% very fine to very coarse, angular to sub-rnd'd, sand; contains occasional charcoal fragments.					
	9						
	10		PID = 0 ppm CGI = 0% (10-15 ft.)				
	11						
		SILTY CLAY (CL): Mottled yellowish brown and light brown; moist; stiff; contains angular to sub-rnd'd., fine to very coarse sand.					
	12						
		SILTY CLAY/CLAYEY SILT (CL/ML): Mottled yellowish brown to olive gray; moist; medium stiff; contains fine to very coarse sand.					
	13						
		SILTY CLAY/CLAYEY SILT (CL/ML): Mottled yellowish brown and light brown; moist; stiff; contains fine to very coarse, subangular to sub-rnd'd. sand.					
	14						

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HTW DRILLING LOG

HOLE No. 12-A

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	15						
	16	CILTY CLAY (CL): Mottled gray to light brown to dark brown; moist; medium stiff to stiff; contains fine to very coarse, angular to sub-md'd. sand; contains large wood frags. and organic material at 15.5 ft.; occasional gravel to 1.5" diam.		H12A010216			
	17						
	18						
	19						
	20		PID = 0 ppm CGI = 0%				
		Boring complete at 20.5 feet. Completed as monitoring well with 2" PVC.					

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HTW DRILLING LOG

HOLE No. 12-A-AB

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.
2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 5 SHEETS	
3. PROJECT	Iowa Army Ammunition Plant
4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	Alan Oaks
6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech GP-1100C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/2" Hollow stem augers 5 ft CME split spoon sampler
8. HOLE LOCATION	Line 2, north of Building 2-082
9. SURFACE ELEVATION	Not surveyed
10. DATE STARTED	May 8, 1997
11. DATE COMPLETED	May 8, 1997
12. OVERBURDEN THICKNESS	Bedrock not encountered
13. DEPTH DRILLED INTO ROCK	Bedrock not encountered
14. TOTAL DEPTH OF HOLE	20.5 feet
15. DEPTH GROUNDWATER ENCOUNTERED	Groundwater not encountered
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	Groundwater not encountered
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	8.15 ft., During basewide water level measurements.

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
						NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X		NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	CLAYEY SILT/SILTY CLAY (CL/ML): Dark brown; moist; medium stiff; contains rootlets.					12A-AB was dry. well installed in 12A boring separately.
	1	CILTY CLAY (CL): Mottled yellow brown to gray; moist; medium stiff; contains rootlets and trace sand; sand fine to very coarse; contains black organic material.					
	2	SILTY CLAY (CL): Mottled yellow brown to gray; moist; medium stiff to stiff; contains <5% fine to coarse sand, angular to sub-md'd; contains occasional gravel to 1.5" diam.		Continuous Sampler			
	3						
	4						
	5		PID = 0 ppm CGI = 0%				

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HTW DRILLING LOG

HOLE No. 12-A-AB

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	6						
	7	SANDY CLAY (CL): Gray; moist; medium stiff; sand fine to medium grained; occasional gravel to 1" diam..					
	8			Continuous Sample			
	9	SILTY CLAY (CL): Yellowish brown; moist; medium stiff; contains occasional angular gravel to 1/2" diam; contains black organic material.					
	10		PID = 0 ppm CGI = 0%				
		SILTY CLAY (CL): Gray with some yellow mottling; moist; medium stiff; trace fine to medium sand; contains black, rock fragments.					
	11						
	12						
	13	SANDY CLAY (CL): Gray; moist; stiff; sand fine to medium grained; occasional gravel to 2.5" diam, angular.					
	14						

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HTW DRILLING LOG

HOLE No. 12-A-AB

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 3 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	15	SILTY CLAY (CL): Green; medium stiff to stiff; contains very fine to very coarse; angular to sub-rnd'd sand; occasional gravel to 1-1/4" diam.; contains wood and occasional charcoal fragments.	PID = 0 ppm CGI = 0%				
	16						
	17						
	18						
	19						
	20		PID = 0 ppm CGI = 0%				
	21						
		SILTY CLAY (CL): Mottled gray and tan; moist; stiff.					
	22	SILTY CLAY/CLAYEY SILT (CL/ML): Olive gray; moist; stiff; contains <5% fine to coarse sand; occasional angular limestone gravel to 2" diam.; occasional granitic gravel to 1/2" dia.					
	23						

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HTW DRILLING LOG

HOLE No. 12-A-AB

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 4 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		SILTY CLAY (CL): w/sand; Olive gray; moist; stiff.					
	24	SILTY CLAY (CL): w/sand; gray; moist; stiff; sand fine to very coarse, angular to sub-rnd'd; contains limestone and granitic gravel to 2" diam.					
	25	SILTY CLAY (CL): w/sand; mottled gray and tan; moist; stiff.	PID = 0 ppm CGI = 0%				
		SILTY CLAY/CLAYEY SILT (ML/CL): Olive gray; moist; stiff; <5% fine to coarse sand; occasional angular limestone gravel to 2" diam.; occasional sub-rnd'd. granitic gravel to 1/2".					
	26						
	27						
	28	28 ft.: 1/2" silty sand layer.					
	29						
	30		PID = 0 ppm CGI = 0%				
	31	SILTY CLAY (CL): w/sand; Olive gray; moist; stiff; sand is fine to coarse; occasional gravel to 2" diam.					
	32						

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HTW DRILLING LOG

HOLE No. 12-A-AB

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 5 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	33						
	34						
	35	SILTY CLAY (CL): Olive gray; wet; soft; contains wood fragments.	PID = 0 ppm CGI = 0%				
	36	SANDY SILT (CL): Olive gray; moist; stiff; sand is fine to very coarse; occasional gravel to 2" diam.					
	37						
	38						
	39						
		SANDY SILT (ML): Olive gray; moist; medium dense; contains subangular to subrounded gravel to 1.5" diam.	PID = 0 ppm CGI = 0%				
	40						
		BORING COMPLETE AT 40 FEET. TREMIE GROUTED WITH HI-SOLIDS BENTONITE GROUT.					

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HTW DRILLING LOG

HOLE No. 12-D

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.
2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 15 SHEETS	
3. PROJECT	Iowa Army Ammunition Plant
4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	
6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech GP-1100C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/2" Hollow stem augers; 5 ft CME split spoon sampler; PX diamond core.
8. HOLE LOCATION	Line 2 (N 297,913; E 2,270,838)
9. SURFACE ELEVATION	Ground: 689.28; TOC: 691.26
10. DATE STARTED	May 7, 1997
11. DATE COMPLETED	
12. OVERBURDEN THICKNESS	110 ft.
15. DEPTH GROUNDWATER ENCOUNTERED	
13. DEPTH DRILLED INTO ROCK	20 ft.
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE	130 ft.
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	44.53 ft., During basewide water level measurements.

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	1

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
						90 %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
		X	NA	Joe Mark

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Black; moist; medium stiff; contains organic matter (topsoil).	PID = 0 ppm CGI = 0%	Continuous Sampler			NOTE: Borelog for cluster of wells 12-B,12-C and 12-D.
	1						
	2						
	3	CLAY (CL): brown with rust and gray mottles; moist; medium stiff; trace sand.					
	4						
	5						

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HTW DRILLING LOG

HOLE No. 12-D

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 2 OF 15 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	6						
	7		PID = 0 ppm CGI = 0%				
	8			Continuous Sample			
		SILTY CLAY (CL): Brown with rust and gray mottles; moist; stiff; trace sand.					
	9						
	10	SILTY CLAY (CL): Light gray; moist; stiff; trace sand.	PID = 0 ppm CGI = 0%				
	11						
	12						
	13	SILTY CLAY (CL): Brown with rust and gray mottles; moist; stiff; trace sand.	PID = 0 ppm CGI = 0%				
	14						

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HTW DRILLING LOG

HOLE No. 12-D

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 3 OF 15 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		SILTY CLAY (CL): Brown with rust and gray mottles; moist; stiff; trace sand.	PID = 0 ppm CGI = 0%				
	15	15-16 ft.: No sample recovery; Sampler wet. very silty/clayey water in sampler.					
	16	SILTY CLAY (CL): Brown with rust and gray mottles; moist; stiff; trace sand.	PID = 0 ppm CGI = 0%				
	17						
	18	SILTY CLAY (CL): Brown with rust and gray mottles; moist; soft; trace sand.	PID = 0 ppm CGI = 0%				
	19	SILTY CLAY (CL): Brown with rust and gray mottles; moist; stiff; trace sand.	PID = 0 ppm CGI = 0%				
	20						
	21						
	22						
	23	23.4 ft.: 0.5" thick moist silt seam.					

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HTW DRILLING LOG

HOLE No. 12-D

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 4 OF 15 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0%				
	24						
	25	SILTY CLAY (CL): Gray; moist; very stiff; trace sand and small gravel.	PID = 0 ppm CGI = 0%				
	26						
	27		PID = 0 ppm CGI = 0%				
	28						
	29						
	30		PID = 0 ppm CGI = 0%				
	31						
	32		PID = 0 ppm CGI = 0%				

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HTW DRILLING LOG

HOLE No. 12-D

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Joe Mark

SHEET 5 OF 15 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	33						
		SAND (SW): Gray; wet; loose; well graded; contains small gravel; sand and gravel are very angular.	PID = 0 ppm CGI = 0%				
	34						
		SILTY CLAY (CL): Gray; moist; very stiff; trace sand and small gravel.					
	35						
	36						
	37						
			PID = 0 ppm CGI = 0%				
	38						
	39						
	40		PID = 0 ppm CGI = 0%				
	41		PID = 0 ppm CGI = 0%				

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HTW DRILLING LOG

HOLE No. 12-D

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 6 OF 15 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	42						
	43		PID = 0 ppm CGI = 0%				
	44						
	45						
	46						
	47						
	48		PID = 0 ppm CGI = 0%				
	49						
	50						

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HTW DRILLING LOG

HOLE No. 12-D

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Joe Mark

SHEET 7 OF 15 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	51						
	52		PID = 0 ppm CGI = 0%				
	53						
	54						
	55						
	56						
	57						
	58						
	59						

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HTW DRILLING LOG

HOLE No. 12-D

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Joe Mark

SHEET 8 OF 15 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	60						
	61		PID = 0 ppm CGI = 0%				
	62						
	63	SANDY CLAY (CL): Gray; moist; very stiff; trace small gravel.	PID = 0 ppm CGI = 0%				
	64						
	65		PID = 0 ppm CGI = 0%				
	66						
	67						
	68		PID = 0 ppm CGI = 0%				

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HTW DRILLING LOG

HOLE No. 12-D

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Joe Mark

SHEET 10 OF 15 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	78						
	79		PID = 0 ppm CGI = 0%				
	80						
	81		PID = 0 ppm CGI = 0%				
	82						
	83		PID = 0 ppm CGI = 0%				
	84						Drilling very slowly.
	85						
	86						

c:\cad\misc\htw2.dir

HTW DRILLING LOG

HOLE No. 12-D

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 11 OF 15 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	87						
	88		PID = 0 ppm CGI = 0%				
	89						
	90						
	91						
	92						
	93	SAND (SW): Wet; loose; well-graded; trace silt; angular.	PID = 0 ppm CGI = 0%				Drilling very slowly.
	94						
		SILTY CLAY (CL): Gray; moist; very stiff; trace sand and limestone gravel.	PID = 0 ppm CGI = 0%				
	95						

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HTW DRILLING LOG

HOLE No. 12-D

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Joe Mark

SHEET 12 OF 15 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	96						
	97						
	98	98 ft.: Well preserved wood fragment; 3" long by 1/2" thick.	PID = 0 ppm CGI = 0%				
	99						
	100						
	101						
	102						Drilling very slowly.
	103						
	104						

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HTW DRILLING LOG

HOLE No. 12-D

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 13 OF 15 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	105	105-105.5 ft.: Fragments of light gray; broken limestone in clay.	PID = 0 ppm CGI = 0%				
	106						
	107						
	108						
	109						
		110.0 ft.: Top of Bedrock					
	110	LIMESTONE: Gray; cherty; highly weathered; contains small areas of calcareous silt.	PID = 0 ppm CGI = 0%	110-120 ft.: 85% Recovery			Photographed core w/camera #1 on 5/9/97
	111						
	112						
	113	113 ft.: Limestone hard; massive; gray with chert nodules.					

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HTW DRILLING LOG

HOLE No. 12-D

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Joe Mark

SHEET 14 OF 15 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Limestone: Same as above					
	114		PID = 0 ppm CGI = 0%				
	115						
	116						
	117						
	118						
	119						
	120		PID = 0 ppm CGI = 0%	120-130 ft.: 100% Recovery			Photographed core w/camera #1 on 5/9/97
	121						
	122						

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HTW DRILLING LOG

HOLE No. 12-D

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 15 OF 15 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Limestone: Same as above					
	123						
	124						
	125						
	126	LIMESTONE: Gray; hard; massive; contains fossils (bivalves and crinoids).	PID = 0 ppm CGI = 0%				
	127						
	128						
	129		PID = 0 ppm CGI = 0%				
	130						
		BORING COMPLETE AT 130 FEET. CONSTRUCTED AS 2-INCH PVC MONITORING WELL.					

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HTW DRILLING LOG

HOLE No. 12-E

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 3 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Alan Oaks	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech GP-1100C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-1/2" Hollow stem augers; 5 ft CME split spoon sampler	8. HOLE LOCATION: Line 2 (N 297,294; E 2,271,126)	
	9. SURFACE ELEVATION: Ground: 688.53 / TOC: 690.37	
	10. DATE STARTED: June 10, 1997	11. DATE COMPLETED: June 11, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: 15 ft. (approx.)	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE: 20 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): 8.20 ft. during basewide water level measurements	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	1	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
						NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
		X	NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY/CLAYEY SILT (ML/CL): Dark brown; moist; soft to medium stiff; contains rootlets; occasional subangular to subrounded gravel to 1.5" diam.	PID = 0 ppm CGI = 0% (0-3 ft.)	Continuous Sampler			0-5 ft.: Sampler recovered only 3 ft. of sample.
	1						
	2						
	3	SILTY CLAY (CL): Mottled gray to rust colored; moist; soft; trace sand and small rootlets.					
	4						
	5		PID = 0 ppm CGI = 0% (5-10 ft.)				

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HTW DRILLING LOG

HOLE No. 12-E

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	6						
	7	SILTY CLAY (CL): Mottled gray and rust-colored; moist; stiff; trace sand and small rootlets.					
	8			Continuous Sample			
	9	SILTY CLAY (CL): Mottled medium brown to gray; moist; medium stiff; trace sand and organic flecks.					
	10		PID = 0 ppm CGI = 0% (10-15 ft.)				
	11	SILTY CLAY (CL): Mottled gray to rust-colored; moist; medium stiff; contains fine to very coarse, angular to rounded sand (<5%); contains small flecks of organic material.					
	12						
	13						
	14						

HTW DRILLING LOG

HOLE No. 12-E

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Roger A. Wilson

SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	15						
	16						
	17	SILTY CLAY (CL): Mottled gray to rust-colored; wet; soft; contains <5% very fine to very coarse, angular to rounded sand; trace black organic matter.					
	18	SILTY CLAY (CL): Mottled gray to rust-colored; moist; medium stiff; contains <5% very fine to very coarse, angular to rounded sand; trace black organic matter.		H12E010218			
	19						
		SAND (SP): Rust colored; wet; loose; fine to very coarse; subangular to rounded; contains gravel to 3/4" diam.					
	20						
		Boring complete at 20 feet. Completed as 2-inch diam. PVC monitoring well.					

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HTW DRILLING LOG

HOLE No. 12-F

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.
2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 6 SHEETS	
3. PROJECT	Iowa Army Ammunition Plant
4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	
6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech GP-1100C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/2" Hollow stem augers 5 ft CME split spoon sampler
8. HOLE LOCATION	Line 2 (N 298,193; E 2,271,212)
9. SURFACE ELEVATION	Ground: 688.26; TOC: 690.54
10. DATE STARTED	May 9, 1997
11. DATE COMPLETED	May 9, 1997
12. OVERBURDEN THICKNESS	50.4 ft.
15. DEPTH GROUNDWATER ENCOUNTERED	7 ft. (approx.)
13. DEPTH DRILLED INTO ROCK	Bedrock not encountered
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE	Bedrock not encountered
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	Dry during basewide water level measurements.

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	1	None	None

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
						NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
		X	NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Mottled yellowish brown to tan; moist; soft; contains rootlets in upper 2 ft.	PID = 0 ppm CGI = 0% (0-5 ft.)	Continuous Sampler			0-5 ft.: Recovered 4 ft. sample.
	1						
	2						
	3						
	4						
	5						

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HTW DRILLING LOG

HOLE No. 12-F

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 6 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	6						
	7	SILTY CLAY (CL): Gray with some yellowish borwn mottles; wet; soft; trace fine to medium sand.					
	8	SILTY CLAY/CLAYEY SILT (CL/ML): Mottled gray to yellowish brown; moist to wet; soft to medium stiff; trace fine to very coarse, angular to subrounded sand; occasional grabel to 1" diam.		Continuous Sample			
	9						
	10		PID = 0.7-1.4 ppm CGI = 0%				
	11						
	12	SILTY SAND (SM): Yellowish brown; wet; loose; occasional gravel to 1" diam.; sand is fine grained.					
	13		PID = 0 ppm CGI = 0%				
		SANDY SILT (ML): Yellowish brown; moist to wet; soft.					
	14	SILTY CLAY (CL): Mottled yellowish brown to tan; moist; soft; contains fine sand.					

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HTW DRILLING LOG

HOLE No. 12-F

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 3 OF 6 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	15		PID = 0.7-1.4 ppm CGI = 0%				
	16						
	17	SILTY CLAY (CL): w/sand; Mottled brown to gray; moist; stiff; sand is fine to medium grained with occasional very coarse; occasional subangular to subrounded gravel to 2.5" diam.					
	18						
	19						
	20	SILTY CLAY/CLAYEY SILT (CL/ML): Gray; moist; stiff; contains fine to medium w/ occasional very coarse sand; occasional subangular to subrounded gravel to 2" diam.	PID = 0.7-1.4 ppm CGI = 0%				
	21						
	22						
	23						

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HTW DRILLING LOG

HOLE No. 12-F

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 4 OF 6 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					20-25 ft.: Only upper 1.5 ft. recovered.
	24						
	25		PID = 0.7-1.4 ppm CGI = 0%				
	26			Continuous Sample			
	27						
	28		PID = 0 ppm CGI = 0%				
	29						
	30						
	31	SILTY CLAY/CLAYEY SILT (CL/ML): Olive gray; moist; stiff to very stiff; <5% fine to very coarse, angular to rounded sand; trace wood fragments to 1/4" long; occasional angular to sub-rnd'd gravel to 2" diam.; locally sandy and gravelly.					
	32						

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HTW DRILLING LOG

HOLE No. 12-F

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 5 OF 6 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	33		PID = 0 ppm CGI = 0%				
	34						
			PID = 0 ppm CGI = 0%				
	35						
							35-40 ft.: 3 ft. recovery.
	36						
				Continuous Sample			
	37						
	38						
	39						
	40		PID = 0 ppm CGI = 0%				
	41						

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HTW DRILLING LOG

HOLE No. 12-F

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 6 OF 6 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	42	SILTY CLAY/CLAYEY SILT (CL/ML): Mottled olive gray to medium brown; moist; medium stiff to stiff; <5% fine to coarse, angular to sub-rnd'd sand; contains wood fragments; occasional gravel to 1/2"; locally silty.					
	43						
	44			Continuous Sample			
	45		PID = 0 ppm CGI = 0%				
	46						
	47						
	48						
	49						
	50	BORING COMPLETE AT 50.4 FEET. COMPLETED WITH 2" DIAM. PVC MONITORING WELL.	PID = 0 ppm CGI = 0%				

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HTW DRILLING LOG

HOLE No. 12-G

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 3 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Alan Oakes	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech GP-1100C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-1/2" Hollow stem augers; 5 ft CME split spoon sampler	8. HOLE LOCATION: Line 2, west perimeter (N 298,035; E 2,270,441)	
	9. SURFACE ELEVATION: Ground: 687.97; TOC: 690.00	
	10. DATE STARTED: May 9, 1997	11. DATE COMPLETED: May 9, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: Groundwater not encountered	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Groundwater not encountered	
14. TOTAL DEPTH OF HOLE: 20.3 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): 8.04 ft., During basewide water level measurements.	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	2	None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
						NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
		X	NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY/SANDY SILT (CL/ML): Yellowish brown; moist; soft; trace fine to medium sand; contains rootlets.		Continuous Sampler			
	1						
	2						
	3						
	4						
	5	SILTY CLAY (CL): Yellowish brown; moist; stiff; trace fine to medium, angular sand; contains angular gravel to 1-1/4" diam; contains rootlets and charcoal.					

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HTW DRILLING LOG

HOLE No. 12-G

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	6						
		SILTY CLAY/CLAYEY SILT (CL/ML): Mottled tan to medium brown; moist; stiff; trace fine to very coarse, angular to subrounded sand; occasional angular gravel to 1" diam.					
	7						
	8			Continuous Sample			
	9						
		SILTY CLAY (CL): Mottled yellowish brown to tan; moist; stiff; trace fine to very coarse, angular to rounded sand; occasional angular gravel to 1" diam.; contains charcoal fragments.					
	10						
	11						
	12	11.9 ft.: 1/4" thick, fine to medium sand seam; wet.					
		12.3 ft.: 1/4" thick, fine to medium sand seam; moist to wet.					
	13						
				H12G010212.5			
	14						

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HTW DRILLING LOG

HOLE No. 12-G

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0%				
	15						
	16						
	17	SILTY CLAY (CL): Gray; moist; stiff to very stiff; trace very fine to very coarse sand; contains wood fragments <1" long; occasional angular to subrounded gravel to 2" diam.					
	18						
	19			H12G010219			
	20		PID = 0 ppm CGI = 0%				
		Boring complete at 20.3 feet. Completed as monitoring well with 2" PVC.					

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HTW DRILLING LOG

HOLE No. 12-H

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 4 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Alan Oakes	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech GP-1100C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-1/2" Hollow stem augers; 5 ft CME split spoon sampler	8. HOLE LOCATION: Line 2 (N 298,714; E 2,269,728)	
	9. SURFACE ELEVATION: Ground: 688.13; TOC: 689.60	
	10. DATE STARTED: April 29, 1997	11. DATE COMPLETED: April 29, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: 18 ft. and 30 ft. (approx.)	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE: 30 ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): 6.00 ft., During basewide water level measurements.	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	NA

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
			X			NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	PIEZOMETER	23. SIGNATURE OF INSPECTOR
			NA	Joe Mark

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Black; moist; very stiff; contains organic matter (topsoil).	PID = 0 ppm CGI = 0%	Continuous Sampler			
	1						
	2						
	3	CLAY (CL): brown with rust and gray mottles; moist; very stiff.					
	4						
	5						

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HTW DRILLING LOG

HOLE No. 12-H

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 2 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0%	Continuous Sample			
	6						
	7						
	8						
	9						
		CLAY (CL): Brown with rust and gray colored mottles; moist; very stiff; trace sand.	PID = 0 ppm CGI = 0%				
	10						
	11						
	12						
	13						
	14						

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HTW DRILLING LOG

HOLE No. 12-H

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 3 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0%				
	15						
	16						
	17						
	18	SAND (SW): Light brown; wet; loose; very well sorted; sharp, well defined contact.	PID = 0 ppm CGI = 0%				
	19	CLAY (CL): Brown with rust and gray colored mottles; moist; very stiff; trace sand; contained a 2" diam. clast of weathered granite.					
	20		PID = 0 ppm CGI = 0%				
	21						
	22						
	23						

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HTW DRILLING LOG

HOLE No. 12-H

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 4 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0%				
	24	CLAY (CL): Gray; moist; very stiff.	PID = 0 ppm CGI = 0%				
	25						
	26						
	27	CLAY (CL): Brown; moist; very stiff; trace small gravel.	PID = 0 ppm CGI = 0%				
	28						
	29						
		Clay wet.	PID = 0 ppm CGI = 0%				
	30	BORING COMPLETE AT 30 FEET. CONSTRUCTED AS PIEZOMETER WITH 1" DIAM. PVC RISER AND POROUS TIP.					
	31						
	32		PID = 0 ppm CGI = 0%				

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APPENDIX A
GEOLOGIC BORING LOGS

A-5 Task 13. Groundwater Data, Downstream Reach, Brush Creek

HTW DRILLING LOG

HOLE No. 13-B

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.
2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 6 SHEETS	
3. PROJECT	Iowa Army Ammunition Plant
4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	Richard Carroll
6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech GP-1100C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	6-1/4" Hollow stem augers; 5 ft CME split spoon sampler; PQ diamond core barrel
8. HOLE LOCATION	K Road, west of Brush Creek Bridge (N 287,786, E 2,277,256)
9. SURFACE ELEVATION	Ground = 627.67, TOC = 629.54
10. DATE STARTED	May 14, 1997
11. DATE COMPLETED	May 16, 1997
12. OVERBURDEN THICKNESS	7.5 feet
15. DEPTH GROUNDWATER ENCOUNTERED	Not encountered during drilling
13. DEPTH DRILLED INTO ROCK	37.9 feet
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE	45.4 feet
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	21.62 ft (TOC) during basewide measurements

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	None	None	

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
						100 %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
		X	NA	Joe Mark

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown; moist; stiff; contains organics.	PID = 0 ppm CGI = 0%	Continuous Sampler			
	1						
	2	SILTY CLAY (CL): Yellowish brown; moist; stiff; contains chert to 3" diam.	PID = 0 ppm CGI = 0%				
	3						
	4						
	5		PID = 0 ppm CGI = 0%				

c:\cad\misc\htw1.cdr

HTW DRILLING LOG

HOLE No. 13-A

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 2 OF 6 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0%	Continuous Sample			
	6						
	7						Reamed with 6-1/4" HSA to rock. PQ core to TD at 45.4 ft.
		TOP OF BEDROCK 7.5 FT.					
		LIMESTONE: Light gray; hard; fractured; dry; appears quite weathered; contains chert; horizontally bedded.	PID = 0 ppm CGI = 0%				
	8						
	9						
	10			10-16.4 ft.: 100% Rec.			
	11						
	12						
	13						
	14		PID = 0 ppm CGI = 0%				

c:\cad\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 13-B

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 3 OF 6 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		LIMESTONE: Light gray; hard; with chert nodules; horizontally bedded; dry; occasional 1" thick units of "dirty" limestone scattered through core.	PID = 0 ppm CGI = 0%				
	15						
	16						
				16.4-26.4 ft. 100% Rec.			
	17	LIMESTONE: Light gray; hard; occasional chert nodules; horizontally bedded; vuggy; calcite crystals in vugs.					
	18	Same as above with iron staining; rock dry.					
	19						
	20						
	21						
	22						
	23						

c:\cdr\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 13-B

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 4 OF 6 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		LIMESTONE: Light gray; hard; contains fossils (coral, crinoids) and occasional sutures; dry.	PID = 0ppm CGI = 0%				
	24						
	25						
	26						
				26.4-36.4 ft.: 100% Rec.			
	27						
	28						
	29						
	30						
	31						
	32	LIMESTONE: Light tan; hard; contains chert; vuggy; dry.					

c:\cdrt\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 13-B

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 5 OF 6 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	33						
	34	LIMESTONE: Gray; hard; massive; contains sutures; dry.	PID = 0 ppm CGI = 0%				
	35						
		LIMESTONE: Light tan to gray; hard; contains chert; dry.	PID = 0 ppm CGI = 0%				
	36						
				36.4-45.4 ft. 100% Rec.			
	37	37-37.5 ft.: Chert.					
		38 ft.: 1/4-1/2" fossil and limestone dirbris layer.					
	38	LIMESTONE: Light tan; hard; contains chert; hortzontal bedding; dry.	PID = 0 ppm CGI = 0%				
	39						
	40						
	41						

c:\cdr\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 13-B

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Joe Mark

SHEET 6 OF 6 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	42	Same as above	PID = 0 ppm CGI = 0%	100% Rec.			
	43						
	44	44.1 ft.: 1" thick silt seam; dry.					
	45						
	46	BORING COMPLETE AT 45.4 FEET. MONITORING WELL INSTALLED WITH 2" PVC.					
	47						
	48						
	49						
	50						

c:\cdr\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 13-D

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.
2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 10 SHEETS	
3. PROJECT	Iowa Army Ammunition Plant
4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	
6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech GP-1100C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/2" Hollow stem augers 5 ft CME split spoon sampler
8. HOLE LOCATION	K Road east of Brush Creek (N 288,128; E 2,278,282)
9. SURFACE ELEVATION	Ground: 652.84; TOC: 654.59
10. DATE STARTED	May 15, 1997
11. DATE COMPLETED	May 16, 1997
12. OVERBURDEN THICKNESS	Bedrock not encountered
15. DEPTH GROUNDWATER ENCOUNTERED	24 ft. (approx.)
13. DEPTH DRILLED INTO ROCK	NA
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE	85 ft.
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	37.30 ft., During basewide water level measurements.

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	1	None	NA

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
						NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
		X	NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	CLAYEY SILT (CL): Dark yellowish brown; dry to moist; soft; trace fine sand; contains rootlets.					
	1						
	2	SANDY SILTY CLAY (CL): Medium brown with some dark yellowish orange mottling; moist; soft; sand is fine grained; contains rootlets.		Continuous Sampler			
	3						
	4						
	5		PID = 0 ppm CGI = 0%				

c:\cdr\misc\htw1.cdr

HTW DRILLING LOG

HOLE No. 13-D

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 10 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	6						
	7	SANDY CLAYEY SILT (ML): Mottled dark yellow orange-medium & dark brown; moist; soft-very stiff; sand fine-medium; trace very coarse angular to subrounded; contains rootlets; locally clayey and sandy; occasional gravel to 1".					
	8			Continuous Sample			
	9						
	10		PID = 0 ppm CGI = 0%				
	11						
		11.5-13.5 ft.: Soft.					
	12						
	13						
	14						

c:\cdr\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 13-D

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Roger A. Wilson

SHEET 3 OF 10 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0%				
	15						
	16						
	17						
	18						
	19						
	20	20-25 ft.: NO CORE RECOVERY DUE TO 3.5', ANGULAR COBBLE.	PID = 0 ppm CGI = 0%				
	21						
	22						
	23						

c:\cad\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 13-D

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 4 OF 10 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	24						
		SANDY CLAYEY SILT (ML): Mottled light olive gray-greenish gray; moist; stiff; sand fine grained; occasional coarse to very coarse; angular to subrounded; occasional gravel to 2" diam.; contains wood fragments 1/2" by 1/8".	PID = 0 ppm CGI = 0%				NOTE: Tip of sampler wet.
	25						
	26						
	27			Continuous Sample			
	28						
	29						
	30		PID = 0 ppm CGI = 0%				
	31						
	32	SAND (SW): Greenish gray; wet; loose; fine to medium; occasional coarse to very coarse.					

c:\cdrh\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 13-D

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Roger A. Wilson

SHEET 5 OF 10 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	33						
		SANDY SILTY CLAY (CL): Gray; moist; stiff; sand fine to medium grained; occasional coarse to very coarse; occasional gravel to 3" diam.; contains wood fragments 1/2" by 1/2" size.					
	34						
	35		PID = 0 ppm CGI = 0%				No recovery between 35 and 40 ft. due to cobble in sampler.
	36						
	37						
	38						
	39						
	40		PID = 0 ppm CGI = 0%				
	41		PID = 0 ppm CGI = 0%				

c:\cdr\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 13-D

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 6 OF 10 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	42	SANDY SILT (ML): Greenish gray; moist; stiff; sand very fine to fine; occasional angular coarse to very coarse.					
	43	SILTY SANDY CLAY (CL): Light to dark gray; moist; stiff; sand very fine to fine; occasional medium to very coarse.					
	44						
	45		PID = 0 ppm CGI = 0%				
	46						
	47						
	48						
	49	SANDY CLAYEY SILT (ML): Light to dark gray; soft to medium stiff; contains lots of organic matter incl. rootlets and wood fragments to 2" by 1/2"; sand fine grained; locally organic silt.					
	50		PID = 0 ppm CGI = 0%				

c:\cdr\misc\htw2.cdr

380

HTW DRILLING LOG

HOLE No. 13-D

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Roger A. Wilson

SHEET 7 OF 10 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	51	SILTY CLAY (CL): Gray; moist; stiff; trace fine to very fine sand.					
	52						
	53	SANDY SILT (ML): Gray; moist; stiff; sand very fine to fine grained; contains organics.					
	54	SILTY CLAY (CL): Gray; moist; stiff; trace very fine to fine sand.					
		54.5 ft.: 1" thick organic silt layer.					
	55		PID = 0 ppm CGI = 0%				
	56						
	57						
		CLAYEY SAND (SP): Gray; moist to wet; medium dense; medium to very coarse.					
	58						
	59	SILTY SANDY CLAY (CL): Greenish gray, some olive mottling; moist; stiff; sand fine to medium grained; occasional gravel to 1" diam.					

c:\cdr\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 13-D

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 8 OF 10 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	60		PID = 0 ppm CGI = 0%				Water on tip of sampler.
	61	SILTY CLAY (CL): Mottled dusky yellow-pale green; moist to wet; stiff to verystiff; contains fine to medium sand; blocky structure locally; locally sandy.					
	62	62 ft.: 1/8" to 1/4" thick clayey sand seam; wet.					
	63						
	64						
	65		PID = 0 ppm CGI = 0%				
	66						
	67						
	68						

c:\cdr\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 13-D

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Roger A. Wilson

SHEET 9 OF 10 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	69	69 ft.: 2" thick wet gravelly sand.					
		SAND (SP): w/silt and gravel; olive gray; moist; dense; sand medium grained with fine and coarse; occasional very coarse; gravel angular to subangular, to 1/2" diam.					
	70		PID = 0 ppm CGI = 0%				
	71	SANDY SILT/SILTY SAND (ML/SM): Olive Gray; wet to saturated; medium stiff; sand fine to coarse; occasional very coarse; occasional gravel to 3/4" diam.					
	72						
	73						
	74	SANDY SILT (ML): Olive to pale gray; moist; stiff; sand fine to medium grained; occasional very coarse, angular.	PID = 0 ppm CGI = 0%				
	75						
	76						
	77						

c:\cdr\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 13-D

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 10 OF 10 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	78						
		SILTY SAND (SM): Olive gray; moist; medium stiff; fine to medium; occasional coarse to very coarse.					
	79		PID = 0 ppm CGI = 0%				
	80	SANDY SILT/SILTY SAND (ML/SW): Olive gray; moist; medium stiff; sand fine to coarse; occasional very coarse; occasional gravel to 3/4" diam.					
	81						
	82						
	83						
		SILT (ML): Olive gray; moist; stiff; trace very fine to fine sand; contains 1/16" by 3/4" wood fragments.					
	84		PID = 0 ppm CGI = 0%				
	85						
		BORING COMPLETE AT 85 FEET. CONSTRUCTED AS MONITORING WELL WITH 2" PVC CASING AND SCREEN.					
	86						

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HTW DRILLING LOG

HOLE No. 13-F

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 7 SHEETS
3. PROJECT	Iowa Army Ammunition Plant	4. LOCATION Middletown, Iowa	
5. NAME OF DRILLER		6. MANUFACTURER'S DESIGNATION OF DRILL Gus Pech GP-1100C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/2" Hollow stem augers 5 ft CME split spoon sampler	8. HOLE LOCATION K Road east of Brush Creek (N 288,227; E 2,278,612)	
		9. SURFACE ELEVATION Ground: 685.65; TOC: 660.44	
		10. DATE STARTED May 16, 1997	11. DATE COMPLETED May 16, 1997
12. OVERBURDEN THICKNESS	Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED 20 ft. (approx.)	
13. DEPTH DRILLED INTO ROCK	NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE	55 ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) 52.56 ft., During basewide water level measurements.	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	1	None	Not applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
						NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
		X	NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown;; moist; soft; contains rootlets.					
	1						
	2	SILTY CLAY (CL): Mottled yellowish orange to medium brown; soft to medium stiff; trace fine sand; contains rootlets.		Continuous Sampler			
	3						
	4						
	5		PID = 0 ppm CGI = 0%				

c:\cdr\misc\htw1.cdr

HTW DRILLING LOG

HOLE No. 13-F

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 7 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	6						
	7						
	8			Continuous Sample			
	9						
	10		PID = 0 ppm CGI = 0%				
	11	SANDY CLAYEY SILT (ML): Yellowish orange; some dark brown mottling; moist; soft to medium stiff; sand is very fine to fine; occasional coarse to very coarse.					
	12						
	13						
	14						

c:\cdr\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 13-F

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Roger A. Wilson

SHEET 3 OF 7 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
			PID = 0 ppm CGI = 0%				
	15						
							Tip of sampler wet.
	16	SILTY CLAY/CLAYEY SILT (CL/ML): Yellowish to red brown; moist; stiff; contains fine to medium sand; occasional gravel to 3/4" dia.					
	17						
	18						
	19						
	20		PID = 0 ppm CGI = 0%				
	21						
	22						
	23	CLAYEY SANDY SILT (ML): Tan to yellowish brown; moist to wet; stiff; sand very fine to fine; occasional coarse to very coarse; occasional gravel to 1" dia.; charcoal fragments.					

c:\cdr\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 13-F

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 4 OF 7 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	24						
	25		PID = 0 ppm CGI = 0%				
	26						
		26.5 ft.: Wet to saturated.					
	27	SANDY SILT (ML): Gray to tan; moist to wet; stiff; sand is very fine to fine grained; occasional coarse to very coarse; occasional gravel to 1" diam.					
	28						
	29						
	30	SANDY CLAYEY SILT (ML): Gray to olive gray; moist; stiff to very stiff; sand very fine to fing; occasional coarse to very coarse; occasional gravel to 1.5" diam.; contains wood fragments.	PID = 0 ppm CGI = 0%				
	31						
	32		PID = 0 ppm CGI = 0%				

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HTW DRILLING LOG

HOLE No. 13-F

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 5 OF 7 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	33						
	34						
	35						
		SILTY CLAY (CL): Gray; moist; stiff; contains very fine to fine sand; occasional coarse to very coarse; occasional gravel to 1.5" diam.	PID = 0 ppm CGI = 0%				
	36						
	37						
	38						
	39	CLAYEY SILT (ML): Olive gray to gray; moist; stiff; contains very fine to fine sand and occasional gravel to 1.5" diam.					
		SILTY SANDY CLAY (CL): Gray; moist; stiff; sand is very fine to fine grained; occasional gravel to 1.5" diam.					
	40						
	41						

c:\cdrtmisc\htw2.cdr

HTW DRILLING LOG

HOLE No. 13-F

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 6 OF 7 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	42						
			PID = 0 ppm CGI = 0%				
	43						
	44						
	45	CLAYEY SILTY SAND (SM): Gray to olive gray; moist; loose; fine to medium grained.					
		SILT (ML): Dark brown to black; moist; soft; contains organic material, including wood fragments; contains fine sand.					
	46						
	47						
			PID = 0 ppm CGI = 0%				
	48						
	49						
	50						

c:\cdr\misc\htw2.cdr

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HTW DRILLING LOG

HOLE No. 13-F

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Roger A. Wilson

SHEET 7 OF 7 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	51						
	52		PID = 0 ppm CGI = 0%				
	53						
	54						
			PID = 0 ppm CGI = 0%				
	55						
		BORING COMPLETE AT 55 FEET. CONSTRUCTED AS MONITORING WELL WITH 2 INCH PVC CASING AND SCREEN.					
	56						
	57						
	58						
	59						

c:\cdr\misc\htw2.cdr

APPENDIX A
GEOLOGIC BORING LOGS

A-6 Task 14. Bedrock Surface/Piezometers

392

HTW DRILLING LOG

HOLE No. 14-A

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 2 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech GP-1100C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 6-1/4" Hollow stem augers; 5 ft CME split spoon sampler	8. HOLE LOCATION: Yard C (N 298,163, E 2,275,920)	
	9. SURFACE ELEVATION: Ground = 691.57, TOC = 693.83	
	10. DATE STARTED: April 22, 1997	11. DATE COMPLETED: April 22, 1997
12. OVERBURDEN THICKNESS: 47.5 ft.	15. DEPTH GROUNDWATER ENCOUNTERED: 16 ft. & 47.5 ft. (approx.)	
13. DEPTH DRILLED INTO ROCK: 20 ft.	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 20.86 ft. on 4/23/97	
14. TOTAL DEPTH OF HOLE: 67.5 feet	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): 33.68 ft (TOC) during basewide measurements	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
		None	Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
						NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
			Piezometer	Janusz Pyrich

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Black; with organics; topsoil.	PID = 0 ppm CGI = 0%	Continuous Sampler			
	5	CLAY (CL): Brown; wet; plastic.	PID = 0 ppm CGI = 0%				
	10	SILTY CLAY (CL): Gray; dry.					
		SILTY CLAY (CL): Brown; dry.	PID = 0 ppm CGI = 0%				
	15	CLAY (CL): Brown to gray; trace subrounded gravel to 1/2" diam.	PID = 0 ppm CGI = 0%				
		SILTY CLAY (CL): Brown to gray; very silty; wet.					
	20	SANDY CLAY (CL): Brown to gray; contains rounded gravel to 1/2" diam.	PID = 0 ppm CGI = 0%				
	25						

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HTW DRILLING LOG

HOLE No. 14-A

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Janusz Pyrich

SHEET 2 OF 2 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0%				
		SAND (SP): coarse, clayey, gravelly.					
	30	SAND (SP): Saturated; coarse to medium; gravelly.	PID = 0 ppm CGI = 0%	Continuous Sample			
		CLAY (CL): Gray to greenish.					
	35	CLAY (CL): Gray to greenish with seams of fine to medium sand.	PID = 0 ppm CGI = 0%				
		SAND (SP): Brown, saturated; fine grained.					
	40	CLAY (CL): Brown; wet; plastic; contains fine to medium sand; contains rounded gravel to 1/2" diam.	PID = 0 ppm CGI = 0%				
	45	CLAY (CL): Brown, dry.					
		TOP OF BEDROCK @ 47.5 FT.					
		LIMESTONE: dolomitic; very fractured; cherty; vuggy with gray shale partings.	PID = 0 ppm CGI = 0%				
		48.7-53.2 ft.: Cherty limestone; few 1/8" vugs.		Rec. 4.1/4.5 ft. 91%			
	50	51.9 ft.: Gray shale partings, clay seam. 52-65 ft.: No vugs. 53.2-57.1: Gray limestone; massive.	PID = 0 ppm CGI = 0%				
				Rec. 4.2/4.5 ft. 93%			
	55		PID = 0 ppm CGI = 0%				
		58-60.2 ft.: Shale interbed.		Rec. 4.8/4.8 ft. 100%			
	60	61-61.2 ft.: Shale seam.					
		62.5 ft.: Vertical fracture.	PID = 0 ppm CGI = 0%	Rec. 4.9/5.0 ft. 98%			
	65	65-67.5 ft.: Contains small 1/8" vugs.	PID = 0 ppm CGI = 0%				
		BORING COMPLETE AT 67.5 FEET. CONSTRUCTED AS PIEZOMETER WITH 1" PVC RISER AND POROUS TIP.					

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HTW DRILLING LOG

HOLE No. 14-B

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 3 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Richard Carroll	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech GP-1100C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 6-1/4" Hollow stem augers; 5 ft CME split spoon sampler	8. HOLE LOCATION: Yard C (N 298,163, E 2,275,920)	
	9. SURFACE ELEVATION: Ground = 691.57, TOC = 693.83	
	10. DATE STARTED: April 23, 1997	11. DATE COMPLETED: April 24, 1997
12. OVERBURDEN THICKNESS: 77.2 ft.	15. DEPTH GROUNDWATER ENCOUNTERED: 41.5 ft. (approx.)	
13. DEPTH DRILLED INTO ROCK: 20.8 ft.	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 16 ft. on 4/23/97	
14. TOTAL DEPTH OF HOLE: 98.0 ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): 49.74 ft (TOC) during basewide measurements	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: Not Applicable

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
						NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
			Piezometer	Janusz Pyrich

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Black; with organics; topsoil.	PID = 0 ppm CGI = 0%	Continuous Sampler			
		CLAY (CL): Greenish brown, very soft; plastic.					
	5	CLAY (CL): Brown; very soft; very plastic.	PID = 0 ppm CGI = 0%				
	10	CLAY (CL): Brown gray; very soft.	PID = 0 ppm CGI = 0%				Water at 13 and 16 ft.
	15	SILTY CLAY (CL): Brownish gray with reddish brown mottles; contains subrounded gravel to 2" diam. and cobbles.	PID = 0 ppm CGI = 0%				
	20		PID = 0 ppm CGI = 0%				
	25						

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HTW DRILLING LOG

HOLE No. 14-B

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Janusz Pyrich

SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		CLAY (CL): Gray; very hard; contains rock fragments to 4" diam.	PID = 0 ppm CGI = 0%	Continuous Sample			
	30	SANDY CLAY (CL): Gray; sand fine to medium grained; contains gravel to 1/2" diam.	PID = 0 ppm CGI = 0%				
	35	35.75-36.5 ft.: SAND, fine to medium with rounded gravel to 1/8" diam.					
		SILTY CLAY (CL): Very dark gray; laminated.	PID = 0 ppm CGI = 0%				
	40	41.5-42.2 ft.: SAND (SP): Gray; fine; silty; trace rounded gravel to 1/2" diam.	PID = 0 ppm CGI = 0%				
		42.2-42.3 ft.: Gray-greenish clay.					
		SAND (SP): Greenish gray; fine grained; trace gravel to 1" diam.; subrounded to angular.					
	45	SANDY CLAY (SC): Gray to green; fine to coarse; contains gravel to 1/4" diam.					
		SAND (SP): Gray; fine to medium; saturated.	PID = 0 ppm CGI = 0%				
	50	CLAY (CL): gray to dark gray; tough; contains sand and small gravel; dry.					
		SAND (SP): Gray; fine to medium and coarse; wet to saturated; locally gravelly to 1/4" diam.; locally silty.	PID = 0 ppm CGI = 0%				
		52-52.8 ft.: SILT: gravelly.					
	55	54.5-55 ft.: CLAY, gray, gravelly, tough; dry.					
		57-57.5 ft.: CLAY (CL): Gray; tough; trace sand.	PID = 0 ppm CGI = 0%				
		57.75-58 ft.: Sand coarse grained; gravelly.					
		58-58.75 ft.: CLAY (CL): tough.					
	60	SILTY CLAY (CL): Gray; contains rounded gravel to 1" diam.	PID = 0 ppm CGI = 0%				
	65	65-66.5 ft.: Clay tough with coarse sand.					
		SAND (SP): Fine grained, saturated; locally clayey.	PID = 0 ppm CGI = 0%				
	70	69.5-70 ft.: Clay.					Heaving sand in augers.
		CLAY (CL): Gray; silty at bottom; contains coarse to very coarse sand.	PID = 0 ppm CGI = 0%				

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HTW DRILLING LOG

HOLE No. 14-B

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Janusz Pyrich

SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0%				
	75						
		TOP OF BEDROCK 77.2 FT.					
		LIMESTONE: Dolomitic; shaley; gray; fossiliferous; contains shale seams; locally vuggy; cherty. 77.7-78.1: Shale.	PID = 0 ppm CGI = 0%	Rec. 4.8/4.8 ft. 100%			
	80						
		81.7 ft.: 1" diam. solution cavity. 81.7-82 ft.: vertical fracture. 81.2-81.6 ft.: Shale.	PID = 0 ppm CGI = 0%	Rec. 5.0/5.0 ft. 100%			
	85						
			PID = 0 ppm CGI = 0%	Rec. 4.8/5.0 ft. 96%			
		LIMESTONE; Cherty; white; fractured vertically.					
	90						
			PID = 0 ppm CGI = 0%	Rec. 4.5/6.0 ft. 75%			
	95	92.1-92.4 ft.: Chert.					
			PID = 0 ppm CGI = 0%				
	100	END OF BORING AT 98.0 FEET. CONSTRUCTED AS PIEZOMETER WITH 1-INCH PVC RISER AND 2-FOOT LONG POROUS TIP.					

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HTW DRILLING LOG

HOLE No. 14-C

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.
2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 3 SHEETS	
3. PROJECT	Iowa Army Ammunition Plant
4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	Richard Carroll
6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech GP-1100C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	6-1/4" Hollow stem augers; 5 ft CME split spoon sampler
8. HOLE LOCATION	On Road A (N 290,753, E 2,276,162)
9. SURFACE ELEVATION	Ground = 684.35, TOC = 696.24
10. DATE STARTED	April 17, 1997
11. DATE COMPLETED	April 18, 1997
12. OVERBURDEN THICKNESS	56.0 ft.
15. DEPTH GROUNDWATER ENCOUNTERED	17 ft. (approx.)
13. DEPTH DRILLED INTO ROCK	21.1 ft.
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	37.36 ft. on 4/21/97
14. TOTAL DEPTH OF HOLE	77.1 ft.
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	40.22 ft. (TOC) during basewide measurements

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
		None	

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
						%

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
			Piezometer	Janusz Pyrich

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Black/brown; dry; organics; topsoil.	PID = 0 ppm CGI = 0%	Continuous Sampler			0-5 ft.: 1.5 ft. recovery
	5	CLAY (CL): Brown; dry; plastic; trace silt.	PID = 0 ppm CGI = 0%				5-10 ft.: 3 ft. recovery
	10	CLAY (CL): Light gray/brown; trace silt; trace very coarse, rounded sand; dry.	PID = 0 ppm CGI = 0%				10-15 ft.: lost sample. Went back down to recover.
	15	CLAYEY SAND (SC): Brown, fine grained; saturated; gravel to 1" diam.	PID = 0 ppm CGI = 0%				
		SILTY CLAY (CL): Brown.					
	20	CLAYEY SILT (ML): Brown.	PID = 0 ppm CGI = 0%				
	25	SAND (SP): Brown; coarse grained; saturated; contains gravel to 1/2" diam.; clayey.					

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HTW DRILLING LOG

HOLE No. 14-C

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Janusz Pyrich

SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		27-30 ft.: SAND; fine to coarse; saturated.	PID = 0 ppm CGI = 0%	Continuous Sample			Water about 5 ft. depth during drilling.
	30						
		33.8-34 ft.: Contains gravel to 2.5" diam.	PID = 0 ppm CGI = 0%				
	35						
		CLAY (CL): Gray, tough.	PID = 0 ppm CGI = 0%				
		SAND (SP): Gravelly; coarse-grained; gravel to 1/4" diam., subrounded; saturated.					
	40	CLAYEY SILT (ML): Gray; increasing clay content with depth.					40-45 ft.: No recovery; heaving sand.
		CLAY (CL): Gray; very hard; contains shale fragments.	PID = 0 ppm CGI = 0%				Water about 209 ft. depth.
	45						
			PID = 0 ppm CGI = 0%				
	50						50-55 ft.: recovery 3.5 ft.
			PID = 0 ppm CGI = 0%				
		TOP OF BEDROCK @ 54.5 FT.					
	55	SHALE: Weathered; clayey.					
		LIMESTONE: Light gray; shaley; vuggy; vugs to 1/2" diam. (most 1/8"); fractured.	PID = 0 ppm CGI = 0%	Rec. 4.0/5.0 ft. 80%			
	60	60-60.5 ft.: Shale interbed.					
		61.5-61.7: Shale seam.		Rec. 4.0/5.0 ft. 80%			
		62.25 ft.: Vertical fractures in core for next 7-10 ft..	PID = 0 ppm CGI = 0%				
	65			Rec. 3.5/5.0 ft. 70%			
			PID = 0 ppm CGI = 0%				
	70			Rec. 3.3/5.0 ft. 66%			
			PID = 0 ppm CGI = 0%				

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HTW DRILLING LOG

HOLE No. 14-C

PROJECT	INSPECTOR	SHEET 3 OF 3 SHEETS
IOWA ARMY AMMUNITION PLANT	Janusz Pyrich	

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above 73-75 ft.: Shale interbed.	PID = 0 ppm CGI = 0%				
	75						
		END OF BORING AT 77.1 FEET. CONSTRUCTED AS PIEZOMETER WITH 2-INCH PVC RISER AND 2-FOOT LONG POROUS TIP.					

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HTW DRILLING LOG

HOLE No. 14-D

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.
2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 2 SHEETS	
3. PROJECT	Iowa Army Ammunition Plant
4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	
6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech GP-1100C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	6-1/4" Hollow stem augers 5 ft CME split spoon sampler
8. HOLE LOCATION	Road K (N 287,167, E 2,273,458)
9. SURFACE ELEVATION	Ground = 676.81, TOC = 679.05
10. DATE STARTED	April 21, 1997
11. DATE COMPLETED	April 21, 1997
12. OVERBURDEN THICKNESS	22.5 ft.
15. DEPTH GROUNDWATER ENCOUNTERED	20 ft. (approx.)
13. DEPTH DRILLED INTO ROCK	21.1 ft.
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	10.72 ft. on 4/25/97
14. TOTAL DEPTH OF HOLE	43.6 ft.
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	12.33 ft (TOC) during basewide measurements

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
		None	

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
						%

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
			Piezometer	Janusz Pyrich

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Black; with organics; topsoil.					
		CLAY (CL): Brown/gray; plastic.	PID = 0 ppm CGI = 0%				
	5		PID = 0 ppm CGI = 0%				
	10		PID = 0 ppm CGI = 0%	Continuous Sampler			
	15	SILTY CLAY (CL): Brown to gray; trace fine sand.					
		SILTY CLAY (CL): Brown; very soft; wet.	PID = 0 ppm CGI = 0%				
	20	SANDY CLAY (CL): Brown; saturated; contains sandstone gravel to 1" diam. 22.25-22.5 ft.: Clayey SAND; saturated. TOP OF BEDROCK AT 22.5 FT.					
		SHALE: Weathered	PID = 0 ppm CGI = 0%				22.5-30.5 ft.: No sample. weathered bedrock.
	25						

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HTW DRILLING LOG

HOLE No. 14-D

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Janusz Pyrich

SHEET 2 OF 2 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
			PID = 0 ppm CGI = 0%				
	30			Rec. 4.2/5.0 ft. 84%			
		30.5 ft.: LIMESTONE: Cherty, fractured, vertical fractures filled with calcite; fossiliferous; cherts are 2" diametered, very fractured.	PID = 0 ppm CGI = 0%				
	35			Rec. 3.0/5.0 ft 60%			
			PID = 0 ppm CGI = 0%				
	40	41.6-42.0 ft: SAND, brown, fine-grained		Rec. 2.3/3/6 ft 64%			
			PID = 0 ppm CGI = 0%				
	45	BORING COMPLETE AT 43.6 FEET. CONSTRUCTED AS PIEZOMETER WITH 1" PVC RISER AND POROUS TIP.					
	50						
	55						
	60						
	65						
	70						

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HTW DRILLING LOG

HOLE No. 14-E

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 3 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Richard Carroll	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech GP-1100C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 6-1/4" Hollow stem augers; 5 ft CME split spoon sampler	8. HOLE LOCATION: On Road A (N 298,556, E 2,262,676)	
	9. SURFACE ELEVATION: Ground = 689.81, TOC = 691.28	
	10. DATE STARTED: April 15, 1997	11. DATE COMPLETED: April 17, 1997
12. OVERBURDEN THICKNESS: 88.5 ft.	15. DEPTH GROUNDWATER ENCOUNTERED: 16 ft. (Approx.)	
13. DEPTH DRILLED INTO ROCK: 20.0 ft.	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 46.46 ft. On 4/25/97	
14. TOTAL DEPTH OF HOLE: 108.5 ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
		None	

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
						%

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
			Piezometer	Janusz Pyrich

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	TOPSOIL/CLAY (CL): Brown, silty.	PID = 0 ppm CGI = 0%	Continuous Sampler			0-5 ft.: 1.5 ft. recovery
	5	CLAY (CL): Gray, silty, dry.	PID = 0 ppm CGI = 0%				5-10 ft.: 3 ft. recovery
	10	Sandy CLAY (CL): Dry; sand fine to medium grained; silty with gravel; gravel angular to 1" diam.	PID = 0 ppm CGI = 0%				10-15 ft.: lost sample. Went back down to recover.
	15	Silty CLAY (CL): Brown, saturated at 16'; contains sand and gravel; gravel rounded to 1/4"; some angular to 1-1/2".	PID = 0 ppm CGI = 0%				16 ft. ▼
	20	CLAY (CL): Brown; contains trace rounded gravel to 1/4".	PID = 0 ppm CGI = 0%				
	25	CLAY (CL): Light brown; silty with gravel to 1/4".					

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HTW DRILLING LOG

HOLE No. 14-E

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Janusz Pyrich

SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
			PID = 0 ppm CGI = 0%				
		29.5-30 ft.: SAND(SP); Brown; fine grained; saturated.					
	30	CLAY (CL): Light brown; contains seams of sand 0.3' to 0.5' thick; sand fine grained; trace subrounded gravel to 1/4" diam.					
			PID = 0 ppm CGI = 0%	Continuous Sample			
		32.5-33 ft.: Fine SAND with rounded gravel to 1/4".					
	35	CLAY (CL): Dark gray with seams of medium to coarse sand and small gravel to 1/8".					
			PID = 0 ppm CGI = 0%				
		38-38.3 ft.: Medium-coarse SAND.					
		39.3-40 ft.: Fine-coarse SAND.					
	40						
		41-41.2 ft.: Coarse SAND.					
			PID = 0 ppm CGI = 0%				
		42.5-43 ft.: Fine SAND.					
		43.5-44 ft.: Light gray SAND.					
	45	SAND (SP): Gray; saturated; medium to coarse grained.					Heaving sand in augers.
		CLAY (CL): Gray, sandy.	PID = 0 ppm CGI = 0%				
		CLAY (CL): Gray; silty; very hard.					
	50						
			PID = 0 ppm CGI = 0%				
	55	CLAY (CL): Gray; very hard; trace small gravel to 1/8" diam.					
			PID = 0 ppm CGI = 0%				
	60						
			PID = 0 ppm CGI = 0%				
	65						
			PID = 0 ppm CGI = 0%				
	70						

HTW DRILLING LOG

HOLE No. 14-E

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Janusz Pyrich

SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0%				
	75						
			PID = 0 ppm CGI = 0%				
	80						
			PID = 0 ppm CGI = 0%				
		CLAY (CL): Gray with weathered limestone.					
	85	CLAY (CL): Gray with weathered limestone and shale.					
			PID = 0 ppm CGI = 0%				
		TOP OF BEDROCK 88.5 FT.					
		LIMESTONE: Light gray; dolomitic; contains thin interbeds of green shale, fractured.		Rec. 3.5/5 ft. 70%			
	90						
			PID = 0 ppm CGI = 0%				
				Rec. 6.5/10 ft. 65%			
	95						
			PID = 0 ppm CGI = 0%				
	100						
			PID = 0 ppm CGI = 0%				
				Rec. 3.5/5 ft. 70%			
	105						
			PID = 0 ppm CGI = 0%				
	110	END OF BORING AT 108.5 FEET. CONSTRUCTED AS PIEZOMETER WITH 1-INCH PVC RISER AND 2-FOOT LONG POROUS TIP.					

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HTW DRILLING LOG

HOLE No. 14-F

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 2 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Richard Carroll	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech GP-1100C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 6-1/4" Hollow stem augers; 5 ft CME split spoon sampler	8. HOLE LOCATION: Road K (N 285,499, E 2,260,874)	
	9. SURFACE ELEVATION: Ground = 675.16, TOC = 677.20	
	10. DATE STARTED: April 24, 1997	11. DATE COMPLETED: April 24, 1997
12. OVERBURDEN THICKNESS: 21.6 ft.	15. DEPTH GROUNDWATER ENCOUNTERED	
13. DEPTH DRILLED INTO ROCK: 21.9 ft.	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE: 43.5 ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): 21.60 ft (TOC) during basewide measurements.	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
		None	

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
						%

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
			Piezometer	Janusz Pyrich

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	TOPSOIL, CLAY (CL): Brown, silty, plastic.	PID = 0 ppm CGI = 0%	Continuous Sampler			
		CLAY (CL): Brown, plastic, very soft.					
	5		PID = 0 ppm CGI = 0%				
	10	CLAY (CL): Brown, very silty with sand seams..	PID = 0 ppm CGI = 0%				
	15	16.5-17 ft.: Very sandy CLAY, coarse.	PID = 0 ppm CGI = 0%				
		17.75-18 ft: Coarse Sand with gravel to 1" diam. 19.25-19.5 ft.: Medium-fine sand.					
	20	TOP OF BEDROCK 20.0 FEET.					
		SHALE, Weathered; no sample.					
		LIMESTONE: Light gray; very shaley; contains 1-1/2" cavity.	PID = 0 ppm CGI = 0%	Rec. 3.8/5.6 ft. 68%			Start Coring 21.6 ft.
	25			Rec. 2.2/3 ft. 73%			

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HTW DRILLING LOG

HOLE No. 14-F

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Janusz Pyrich

SHEET 2 OF 2 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0%				
	30	LIMESTONE: Light gray; dolomitic; cherty; very shaley.		Rec. 9.1/10 ft. 91%			
			PID = 0 ppm CGI = 0%				
	35						
			PID = 0 ppm CGI = 0%				
	40	40 ft.: Vuggy horizon. Vugs to 1/8".		Rec. 3.8/5 ft. 76%			
			PID = 0 ppm CGI = 0%				
	45	BORING COMPLETE AT 45.0 FEET. CONSTRUCTED AS PIEZOMETER WITH 1" PVC RISER AND POROUS TIP.					
	50						
	55						
	60						
	65						

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APPENDIX A
GEOLOGIC BORING LOGS

A-7 Task 16. Additional Groundwater Data, Line 3

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HTW DRILLING LOG

HOLE No. 16-A

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.
2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 13 SHEETS	
3. PROJECT	Iowa Army Ammunition Plant
4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	
6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech GP-1100C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/2" Hollow stem augers 5 ft CME split spoon sampler
8. HOLE LOCATION	Line 3 (N 299,601; E 2,267,991)
9. SURFACE ELEVATION	Ground: 694.35; TOC: 696.30
10. DATE STARTED	May 12, 1997
11. DATE COMPLETED	
12. OVERBURDEN THICKNESS	109.5 ft.
15. DEPTH GROUNDWATER ENCOUNTERED	
13. DEPTH DRILLED INTO ROCK	0.5 ft.
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE	110 ft.
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	17.42 ft., during basewide water level measurements.

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	1	None	NA

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
						NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
		X	NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown; moist; soft; contains rootlets.		Continuous Sampler			0-5 ft.: Recovered 3 ft. sample.
	1						
	2						
	3						
	4	4 ft.: Yellowish brown mottling.					
	5	SILTY CLAY (CL): Mottled gray and yellowish brown, some black; moist; soft to stiff; trace fine to very coarse, angular to subrounded sand; occasional angular gravel to 3/4" diam.	PID = 0 ppm CGI = 0%				

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HTW DRILLING LOG

HOLE No. 16-A

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 13 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	6						
	7						
	8			Continuous Sample			
	9						
	10		PID = 0 ppm CGI = 0%				
		SANDY SILTY CLAY/CLAYEY SILT (CL/ML): Yellowish brown; some gray and black mottling; moist to wet; soft to stiff; sand fine to very coarse, angular to subrounded; occasional gravel to 3/4" diam..					
	11						
		11.5 ft: 1 ft. thick soft wet zone.					
	12						
	13						
	14	SILTY CLAY (CL): Mottled pale green-yellowish brown; moist to wet; stiff; trace fine to very coarse, angular to subrounded sand; occasional gravel to 2" diam.					

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HTW DRILLING LOG

HOLE No. 16-A

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Roger A. Wilson

SHEET 3 OF 13 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
			PID = 0 ppm CGI = 0%				
	15						
	16						
	17						
	18						
	19						
	20		PID = 0 ppm CGI = 0%				
	21						
	22						
	23	SANDY CLAYEY SILT (ML): Yellowish brown; moist; stiff; sand fine to very coarse, angular to subrounded; occasional angular to subrounded gravel to 1.5" diam.					

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HTW DRILLING LOG

HOLE No. 16-A

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 4 OF 13 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	24						
	25		PID = 0 ppm CGI = 0%				
	26	26 ft.: Becomes streaked with light gray.					
	27		PID = 0 ppm CGI = 0%				
	28						
	29						
	30		PID = 0 ppm CGI = 0%				
	31						
	32						

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HTW DRILLING LOG

HOLE No. 16-A

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Roger A. Wilson

SHEET 5 OF 13 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	33						
	34						
	35		PID = 0 ppm CGI = 0%				
	36						
	37						
	38						
	39						
	40		PID = 0 ppm CGI = 0%				
	41						

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HTW DRILLING LOG

HOLE No. 16-A

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 6 OF 13 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	42						
	43						
	44						
	45	SILTY CLAY (CL): Mottled olive gray and medium brown; moist; medium stiff to stiff; contains fine to very coarse, angular to sub-rounded sand; occasional gravel to 1" diam.	PID = 0 ppm CGI = 0%				
	46						
	47						
	48						
	49						
	50		PID = 0 ppm CGI = 0%				

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HTW DRILLING LOG

HOLE No. 16-A

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 7 OF 13 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	51						
	52						50-55 ft.: 3 ft. of sample recovery. Probably due to loose sand.
	53	SAND (SP): Gray; wet; loose; fine to medium grained; subangular to subrounded.					
	54	SILTY SANDY CLAY (CL): Mottled gray, olive gray, yellowish brown; moist; stiff; sand angular to subrounded, fine to very coarse; contains small wood fragments (<1/2").	PID = 0 ppm CGI = 0%				
	55						
	56						
	57						
	58						
	59						

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HTW DRILLING LOG

HOLE No. 16-A

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 8 OF 13 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0%				
	60						
	61						
	62	SANDY SILTY CLAY (CL): Mottled light olive gray to medium dark gray; moist; stiff; trace fine to very coarse, subangular to subrounded sand; occasional gravel to 2" diam.					
	63						
	64						
	65		PID = 0 ppm CGI = 0%				
	66						
	67		PID = 0 ppm CGI = 0%				
	68						

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HTW DRILLING LOG

HOLE No. 16-A

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Roger A. Wilson

SHEET 9 OF 13 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	69						
	70						
	71						
	72		PID = 0 ppm CGI = 0%				
	73						
	74						
	75		PID = 0 ppm CGI = 0%				
	76						
	77						

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HTW DRILLING LOG

HOLE No. 16-A

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 10 OF 13 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	78						
	79						
	80						
	81	81 ft.: 1-2" saturated sand seam.					
	82						
	83						
		81 ft.: 1-2" saturated sand seam.					
	84						
		81 ft.: 1-2" saturated sand seam.					
	85		PID = 0 ppm CGI = 0%				
	86	SILTY SAND (SP): Yellowish brown; saturated; medium dense; very fine to medium.					

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HTW DRILLING LOG

HOLE No. 16-A

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 11 OF 13 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	87	SILTY CLAY (CL): Mottled light olive gray to medium gray; moist to wet; stiff; trace fine to coarse sand.					
	88	SILTY SAND (SP): Gray; saturated; loose; fine to very coarse.					
	89	SANDY SILTY CLAY (CL): Mottled light olive gray to medium gray; moist to wet; stiff to hard; trace fine to coarse sand; occasional angular gravel to 1" diam.; contains wood fragments.					
	90	90-95 ft.: Sand stringers <1/8" thick.	PID = 0 ppm CGI = 0%				
	91						
	92	92 ft.: 1 ft. thick soft layer.					
	93						
	94						
	95		PID = 0 ppm CGI = 0%				

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HTW DRILLING LOG

HOLE No. 16-A

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 12 OF 13 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	96						
	97	97-99 ft.: Locally sandy.					
	98						
	99						
	100		PID = 0 ppm CGI = 0%				
	101	101 ft.: Becomes hard.					
	102						
	103						
	104						

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HTW DRILLING LOG

HOLE No. 16-A

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Roger A. Wilson

SHEET 13 OF 13 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	105		PID = 0 ppm CGI = 0%				
	106						
	107						
	108	GRAVELLY SAND (SP): w/silt;gray; wet; loose; fine to very coarse, angular to subrounded; gravel is angular to 2" diam.					
	109			H16A0102109			
		TOP OF BEDROCK @ 109.5 FT.					
		LIMESTONE (NOT SAMPLED)					
	110						
		END OF BORING AT 110 FEET. COMPLETED AS MONITORING WELL WITH 2 INCH PVC CASING AND SCREEN.					
	111						
	112						
	113						

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HTW DRILLING LOG

HOLE No. 16-B

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.
2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 4 SHEETS	
3. PROJECT	Iowa Army Ammunition Plant
4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	Alan Oakes
6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech GP-1100C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/2" Hollow stem augers; 5 ft CME split spoon sampler
8. HOLE LOCATION	Line 3 (N 300,701; E 2,268,410)
9. SURFACE ELEVATION	Ground: 699.15; TOC: 701.10
10. DATE STARTED	May 14, 1997
11. DATE COMPLETED	May 14, 1997
12. OVERBURDEN THICKNESS	Bedrock not encountered
15. DEPTH GROUNDWATER ENCOUNTERED	2 ft. (approx.)
13. DEPTH DRILLED INTO ROCK	Bedrock not encountered
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE	25.2 ft.
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	3.71 ft. during basewide groundwater measurements

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	1	None	NA

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
			X			NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	PIEZOMETER	23. SIGNATURE OF INSPECTOR
		X	NA	Roger A. Allison

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown to black; moist to wet; soft; contains rootlets.		Continuous Sampler			
	1						
	2						
		SILTY CLAY (CL): Mottled reddish brown and gray; moist; soft to medium stiff; trace fine to medium sand.					
	3						
	4						
		SANDY SILTY CLAY (CL): Mottled light gray to yellowish brown; moist to wet; soft to medium stiff; sand is fine to medium grained, angular to subrounded.					
	5		PID = 0 ppm CGI = 0%				

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HTW DRILLING LOG

HOLE No. 16-B

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	6						
		SILTY CLAYEY SAND (SC): Yellowish brown; wet; loose; fine to medium grained.					
	7						
		8 ft.: 2.5" diam. subangular gravel.					
	8	SANDY SILTY CLAY (CL): Mottled yellowish brown to light gray; moist; medium stiff; sand fine to medium grained.		Continuous Sample			
	9	SANDY SILTY CLAY/CLAYEY SILT (CL/ML): Mottled yellowish brown to gray; moist to wet; soft to medium stiff; sand fine to coarse; occasional very coarse.					
	10		PID = 0 ppm CGI = 0%				
	11						
	12						
		SANDY SILTY CLAY (CL): Yellowish brown; wet; soft; sand fine to coarse with occasional very coarse; contains subangular gravel to 2" diam.; contains charcoal fragments.					
	13						
	14						

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HTW DRILLING LOG

HOLE No. 16-B

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 3 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0%				
	15						
	16						
	17						
	18						
	19	19 ft.: becomes mottled yellowish brown and gray.					
			PID = 0 ppm CGI = 0%				
	20						
	21	SANDY SILTY CLAY/CLAYEY SILT (CL/ML): Yellowish brown; locally mottled w/gray; moist; stiff; sand fine to very coarse, angular to subrounded; occasional gravel to 2" diam.					
	22			H16B010222			
	23						

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HTW DRILLING LOG

HOLE No. 16-B

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 4 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	24		PID = 0 ppm CGI = 0%				
	25						
		BORING COMPLETE AT 25.2 FEET. CONSTRUCTED AS MONITORING WELL WITH 2" DIAM. PVC RISER AND SCREEN.					
	26						
	27						
	28						
	29						
	30						
	31						
	32						

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HTW DRILLING LOG

HOLE No. 16-C

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 4 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER: Alan Oakes	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech GP-1100C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-1/2" Hollow stem augers; 5 ft CME split spoon sampler	8. HOLE LOCATION: Line 3 (N 300,002; E 2,268,671)	
	9. SURFACE ELEVATION: Ground: 695.66; TOC: 697.69	
	10. DATE STARTED: May 12, 1997	11. DATE COMPLETED: May 12, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: 3 ft. (approx.)	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE: 25.6 ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): 4.74 ft. during basewide groundwater measurements	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	1	None	NA

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
			X			NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	PIEZOMETER	23. SIGNATURE OF INSPECTOR
		X	NA	Roger A. Allison

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown; moist to wet; medium stiff; contains rootlets.					0-5 ft.: 3 ft. sample recovery.
	1						
	2			Continuous Sampler			
	3	SILTY CLAY (CL): Mottled gray to yellowish brown; moist; stiff; trace fine to medium sand; contains rootlets.					
	4						
	5	SANDY SILTY CLAY (CL): Mottled light gray to yellowish brown; moist to wet; soft to medium stiff; sand is fine to medium grained, angular to subrounded.	PID = 0 ppm CGI = 0%				

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HTW DRILLING LOG

HOLE No. 16-C

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					5-10 ft.: 4 ft. sample recovery.
	6						
		6.5 ft.: Becomes very soft and wet.					
	7						
	8	SILTY CLAY (CL): mottled gray to olive gray and yellowish brown; moist; stiff, trace fine to medium sand.		Continuous Sample			
	9						
		9.5 ft.: 0.5 ft. thick, soft, yellowish brown, silty clay with trace fine to very coarse sand.					
	10		PID = 0 ppm CGI = 0%				
	11						
	12						
	13	SILTY CLAY/CLAYEY SILT (CL/ML): Yellowish brown with dark brown & gray mottles; moist; stiff to very stiff; trace very coarse angular sand; occasional angular to subrounded gravel to 1/2" diam.					
	14						

c:\cdr\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 16-C

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 3 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0%				
	15						
	16	CLAYEY SANDY SILT (ML): Yellowish brown w/light gray streaks; moist to wet; medium stiff to stiff; contains angular to subrounded fine to very coarse sand; occasional angular gravel to 1" diam.; locally clayey.					
	17						
	18						
	19						
	20		PID = 0 ppm CGI = 0%				
	21						
	22		PID = 0 ppm CGI = 0%				
	23						

c:\cdr\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 16-C

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 4 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	24			H16C010224			
	25		PID = 0 ppm CGI = 0%				
	26	BORING COMPLETE AT 25.6 FEET. CONSTRUCTED AS MONITORING WELL WITH 2" DIAM. PVC RISER AND SCREEN.					
	27						
	28						
	29						
	30						
	31						
	32						

c:\cdr\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 16-D

1. COMPANY NAME	HARZA ENVIRONMENTAL SERVICES, INC.
2. DRILLING SUBCONTRACTOR	USACE/Omaha District, Geotechnical Branch
SHEET 1 OF 4 SHEETS	
3. PROJECT	Iowa Army Ammunition Plant
4. LOCATION	Middletown, Iowa
5. NAME OF DRILLER	Alan Oakes
6. MANUFACTURER'S DESIGNATION OF DRILL	Gus Pech GP-1100C
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-1/2" Hollow stem augers 5 ft CME split spoon sampler
8. HOLE LOCATION	Line 3 (N 298,983; E 2,268,246)
9. SURFACE ELEVATION	Ground: 695.77; TOC: 697.66
10. DATE STARTED	May 14, 1997
11. DATE COMPLETED	May 14, 1997
12. OVERBURDEN THICKNESS	Bedrock not encountered
13. DEPTH DRILLED INTO ROCK	Bedrock not encountered
14. TOTAL DEPTH OF HOLE	25 ft.
15. DEPTH GROUNDWATER ENCOUNTERED	2 ft. (approx.)
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	5.00 ft. during basewide groundwater measurements

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	1	None	NA

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
			X			NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	PIEZOMETER	23. SIGNATURE OF INSPECTOR
		X	NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown to black; moist; soft; contains rootlets.					
	1						
		SILTY CLAY (CL): Yellowish brown to gray; moist; soft; trace fine to medium grained sand; contains rootlets.					
	2			Continuous Sampler			
	3						
	4						
	5		PID = 0 ppm CGI = 0%				

c:\adrhmisc\htw1.cdr

HTW DRILLING LOG

HOLE No. 16-D

PROJECT	INSPECTOR	SHEET 2 OF 4 SHEETS
IOWA ARMY AMMUNITION PLANT	Roger A. Wilson	

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	6	SILTY CLAY (CL): Mottled medium brown to gray; moist to wet; soft to medium stiff; trace fine to medium sand; contains black organic matter.					
	7						
	8			Continuous Sample			
	9						
	10		PID = 0 ppm CGI = 0%				
	11						
	12						
	13	13 ft.: wet zone.					
	14	SANDY SILTY CLAY/CLAYEY SILT (CL/ML): Yellowish brown, some gray mottling; moist to wet; very soft to medium stiff; sand is angular to subrounded, fine to very coarse.					

c:\cdrh\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 16-D

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 3 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0%				
	15						
	16	SANDY CLAYEY SILT (ML): Yellowish brown; moist to wet; soft; sand is fine to coarse; occasional very coarse; angular to sub-rounded.					
	17			H16D010217			
		SILTY CLAY (CL): Yellowish brown; moist; medium stiff; contains fine to medium sand; occasional very coarse sand; occasional charcoal fragment.					
	18						
	19						
		SANDY SILTY CLAY (CL): Mottled yellowish brown to gray; moist; stiff to very stiff; sand is fine to coarse, angular to subrounded; occasional very coarse angular sand.	PID = 0 ppm CGI = 0%				
	20						
	21						
	22						
	23						

c:\cdi\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 16-D

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 4 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	24						
			PID = 0 ppm CGI = 0%				
	25						
		BORING COMPLETE AT 25 FEET. CONSTRUCTED AS MONITORING WELL WITH 2" DIAM. PVC RISER AND SCREEN.					
	26						
	27						
	28						
	29						
	30						
	31						
	32						

c:\cdr\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 16-E

1. COMPANY NAME: HARZA ENVIRONMENTAL SERVICES, INC.	2. DRILLING SUBCONTRACTOR: USACE/Omaha District, Geotechnical Branch	SHEET 1 OF 7 SHEETS
3. PROJECT: Iowa Army Ammunition Plant	4. LOCATION: Middletown, Iowa	
5. NAME OF DRILLER	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech GP-1100C	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-1/2" Hollow stem augers; 5 ft CME split spoon sampler	8. HOLE LOCATION: Line 3 (N 298,986; E 2,268,236)	
	9. SURFACE ELEVATION: Ground: 695.69; TOC: 697.55	
	10. DATE STARTED: May 14, 1997	11. DATE COMPLETED: May 14, 1997
12. OVERBURDEN THICKNESS: Bedrock not encountered	15. DEPTH GROUNDWATER ENCOUNTERED: 11 ft. (approx.)	
13. DEPTH DRILLED INTO ROCK: Bedrock not encountered	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE: 55 ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): 12.90 ft., during basewide water level measurements.	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	1	None	NA

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	SVOC	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
						NA %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
		X	NA	Roger A. Wilson

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	0	SILTY CLAY (CL): Dark brown to black; soft to medium stiff; contains rootlets.					
	1						
	2	SILTY CLAY (CL): Mottled yellowish brown to gray; moist; soft to medium stiff; trace fine to medium sand; contains rootlets.		Continuous Sampler			
	3						
	4						
	5		PID = 0 ppm CGI = 0%				

c:\cd\misc\htw1.cdr

HTW DRILLING LOG

HOLE No. 16-E

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 2 OF 7 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	6						
	7	SILTY CLAY (CL): Mottled medium brown to gray; moist to wet; soft to medium stiff; trace fine to medium sand; contains black organic material.					
	8			Continuous Sample			
	9						
	10		PID = 0 ppm CGI = 0%				
	11						
	12	SANDY SILTY CLAY/CLAYEY SILT (CL/ML): Yellowish brown with some gray mottling; moist to wet; very soft to medium stiff; sand is angular to subrounded, fine to very coarse.					
	13						
	14						

c:\cad\misc\htw2.cdr

435

HTW DRILLING LOG

HOLE No. 16-E

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Roger A. Wilson

SHEET 3 OF 7 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above	PID = 0 ppm CGI = 0%				
	15						
	16						
		SANDY CLAYEY SILT (ML): Yellowish brown; moist to wet; soft; sand is fine to coarse with occasional very coarse.					
	17	SILTY CLAY (CL): Yellowish brown; moist; medium stiff; contains fine to medium grained sand with occasional very coarse; occasional charcoal fragments.					
	18						
	19						
		SANDY SILTY CLAY (CL): Mottled yellowish brown to gray; moist; stiff to very stiff; sand is fine to coarse with occasional very coarse, angular; occasional angular gravel to 3/4" diam.					
	20		PID = 0 ppm CGI = 0%				
	21						
	22						
	23						

c:\adt\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 16-E

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 4 OF 7 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	24						
	25		PID = 0 ppm CGI = 0%				
	26						
	27						
	28	SILTY CLAY/CLAYEY SILT (CL/ML): Mottled yellowish brown to gray; moist; stiff to very stiff; trace angular to subrounded fine to very coarse sand; occasional gravel to 1" diam. 28.7 ft.: 6-inch layer of white, blocky clay.					
	29						Stopped CGI monitoring. Battery dead.
	30		PID = 0 ppm CGI = 0%				
	31	31-31.5 ft.: Decomposed fragments of igneous rock.					
	32						

c:\cad\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 16-E

PROJECT IOWA ARMY AMMUNITION PLANT

INSPECTOR Roger A. Wilson

SHEET 5 OF 7 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
	33	SAND (SP): Yellowish brown; moist; loose; fine to medium grained; angular to sub-rounded.					
	34	SILTY CLAY (CL): Yellowish brown to light gray mottling; moist; medium stiff to stiff; trace fine to very coarse, angular to sub-rounded sand; contains angular gravel to 1" diam.					
	35		PID = 0 ppm CGI = 0%				
	36						
	37						
	38	SILTY CLAY (CL): Gray; moist; stiff; trace fine to medium sand.					
	39	SANDY SILTY CLAY/CLAYEY SILT (CL/ML): Mottled yellowish brown to medium brown; moist to wet; soft to stiff; trace fine to coars, angular to subrounded sand with occasional very coarse; occasional gravel to 1" diam.; some gray streaking. Locally clayey, silty and sandy.					
	40		PID = 0 ppm CGI = 0%				
	41						

c:\cdr\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 16-E

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 6 OF 7 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	42						
		42.8-44 ft.: Wet and very soft.					
	43						
	44						
	45		PID = 0 ppm CGI = 0%				
	46						
	47						
	48						
	49						
	50		PID = 0 ppm CGI = 0%				

c:\cdr\misc\htw2.cdr

HTW DRILLING LOG

HOLE No. 16-E

PROJECT: IOWA ARMY AMMUNITION PLANT

INSPECTOR: Roger A. Wilson

SHEET 7 OF 7 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX No. e	ANALYTICAL SAMPLE No. f	BLOW COUNTS g	REMARKS h
		Same as above					
	51						
		51.5 ft.: 1/8 inch thick sand layer.					
	52			H16E010252			
	53						
	54						
		54.5 ft.: 1/2 inch thick sand layer.	PID = 0 ppm CGI = 0%				
	55						
		BORING COMPLETE AT 55 FEET. COMPLETED AS MONITORING WELL WITH 2-INCH DIAM. PVC CASING AND SCREEN.					

c:\cad\misc\htw2.cdr

APPENDIX B
GEOTECHNICAL TEST DATA
(Missouri River Laboratory, Corps of Engineers)

M.R. LAB NO. 4578

DEPARTMENT OF THE ARMY
MISSOURI RIVER LABORATORY
CORPS OF ENGINEERS
OMAHA, NEBRASKA 68102

19 JUN 1997

Subject: Mechanical Analysis and Hydrometer Tests on Soil

Project: Iowa AAP; Middletown
Intended Use:
Source of Material: Wells 10A through 16E

Submitted by: Chief, CEMRO-ED-GG
Date Sampled: , Date Received: 5/21/97
Method of Test or Specification: EM 1110-2-1906
ASTM D-2487
References: Omaha District Requesition No. 71439949 dated 5/28/97

1. Subject testing has been performed in accordance with the above test method and reference. Test results are shown in Figures 1 and 15. No results are reported for Well 12A; the sample was compromised during testing. All tests were performed on specimens obtained from jar samples. Preliminary results were sent on 18 June 1997.

2. Unless otherwise notified, all remaining material will be disposed of 90 days after the date of this report.

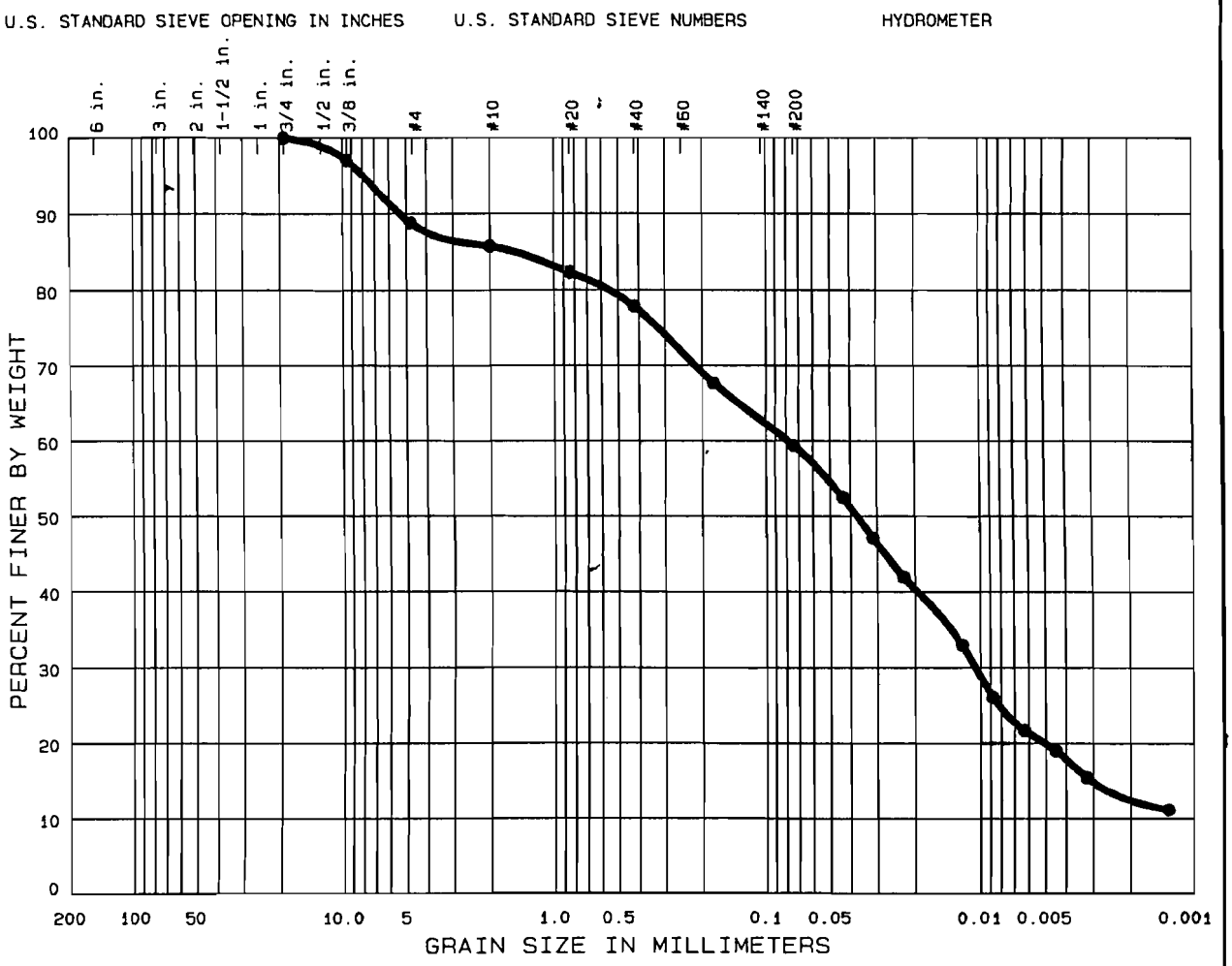
Submitted by:

David E. Spleichel

for DOUGLAS B. TAGGART
Director, M.R. Laboratory

Hankins/(402)444-4309

W.O. No. IAAP-10a
Req. No. 71439949
Contract No.



	% COBBLES	% GRAVEL	% SAND	% SILT OR CLAY	
●	0.0	11.2	29.4	39.5	19.9

	Sample No.	Elev or Depth	Nat W%	LL	PL	PI	C_c	C_u
●	10A	10.0'-10.5'						

CLASSIFICATION

● Sandy Clay
Specific Gravity = 2.70

Remarks:

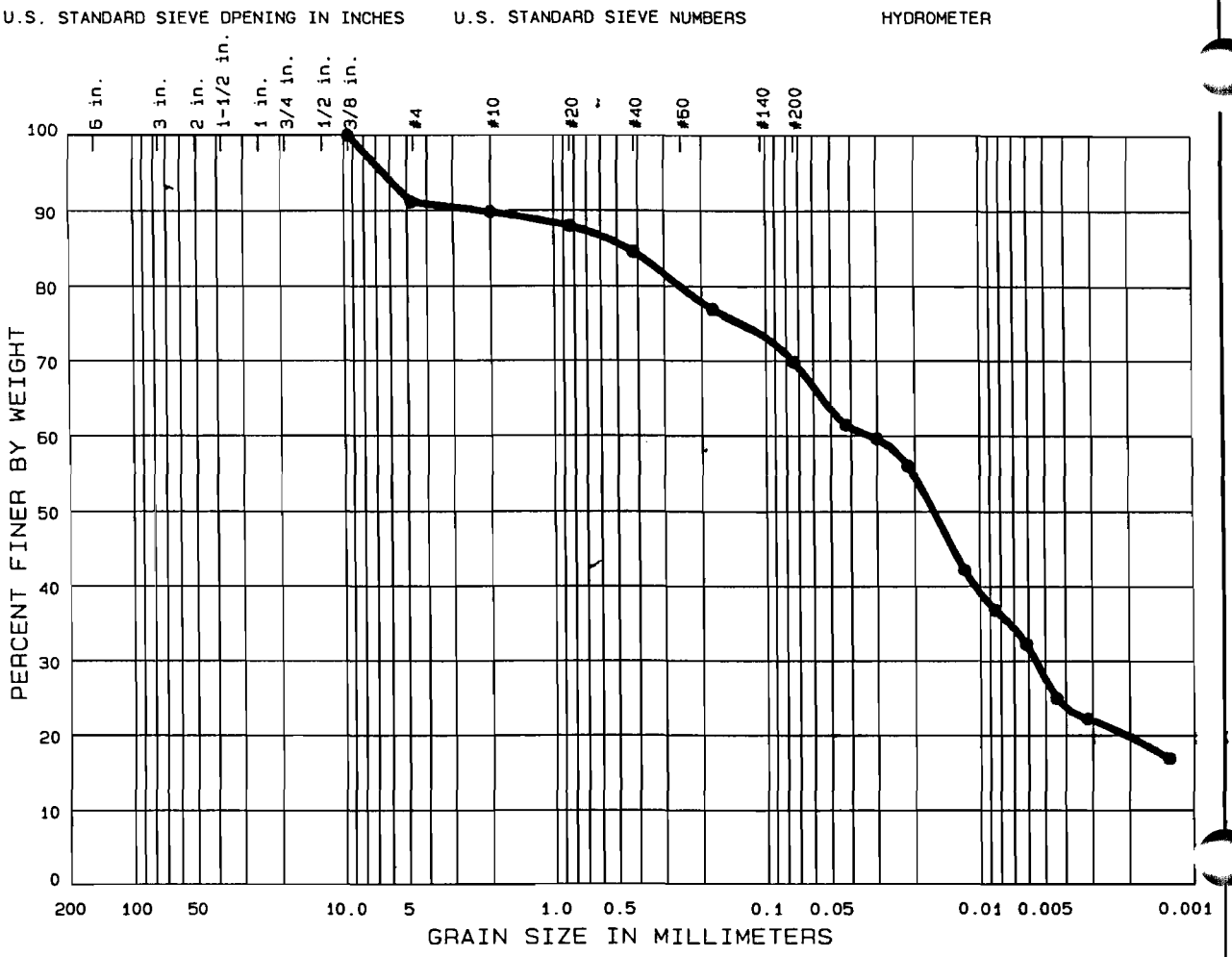
Project Iowa AAP
Ground Water Investigation
Lab No. 4578
Area

Boring No. 10A Date 6/10/97

GRADATION CURVES Figure 1

CORPS OF ENGINEERS, MISSOURI RIVER DIVISION LAB
420 SOUTH 18th STREET - OMAHA, NE 68102-2586

W.O. No. IAAP-10b
Req. No. 71439949
Contract No.



	% COBBLES	% GRAVEL	% SAND	% SILT OR CLAY	
●	0.0	8.8	21.3	42.3	27.6

	Sample No.	Elev or Depth	Nat W%	LL	PL	PI	C_c	C_u
●	10B	49.5-50.0						

CLASSIFICATION

● Sandy Clay
Specific Gravity = 2.68

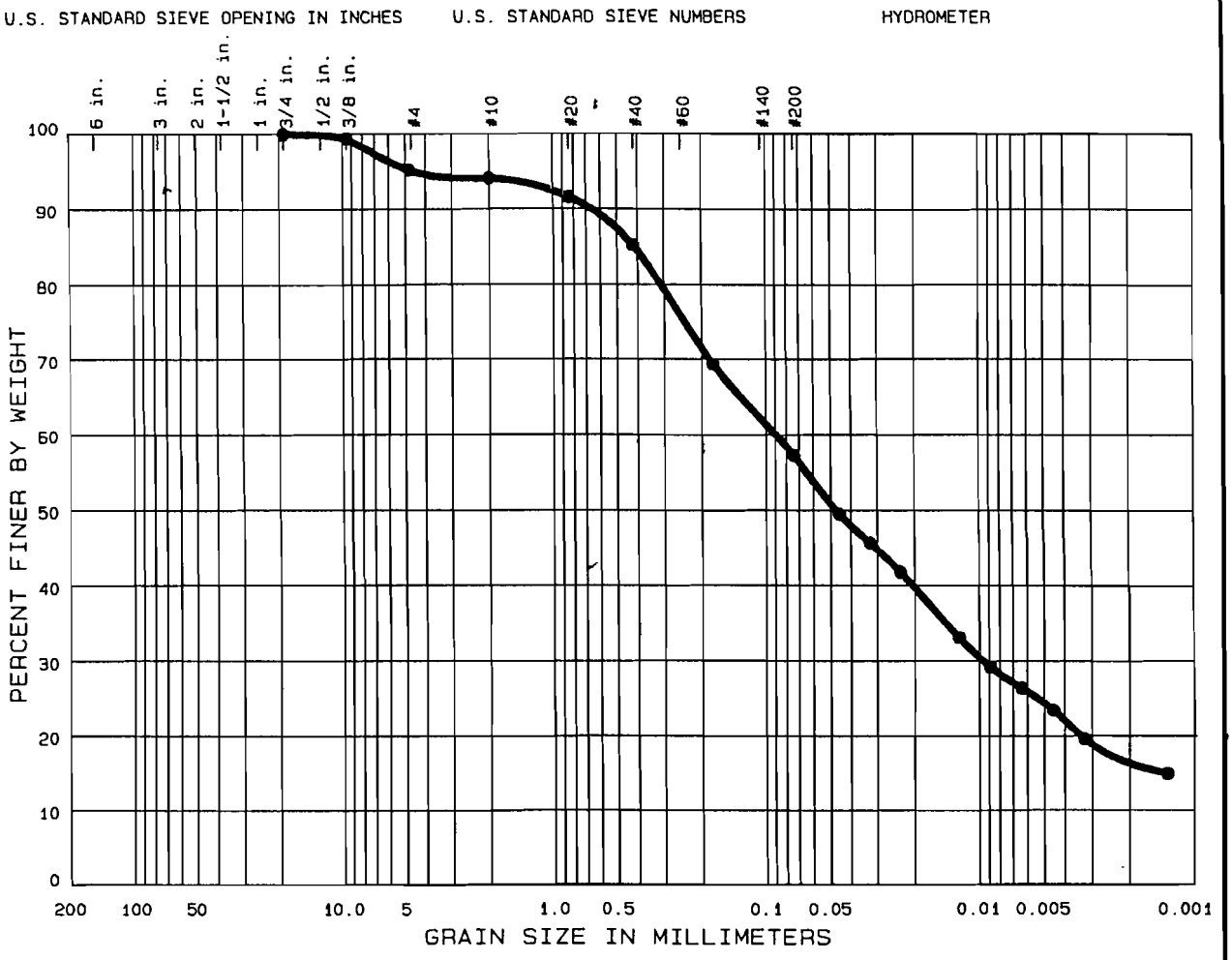
Remarks:

Project Iowa AAP
Ground Water Investigation
Lab No. 4578
Area

Boring No. 10B Date 6/17/97

GRADATION CURVES Figure 2

CORPS OF ENGINEERS, MISSOURI RIVER DIVISION LAB
420 SOUTH 18th STREET - OMAHA, NE 68102-2586



	% COBBLES	% GRAVEL	% SAND	% SILT OR CLAY	
●	0.0	4.8	37.9	32.8	24.5

	Sample No.	Elev or Depth	Nat W%	LL	PL	PI	C_c	C_u
●	12C	45.0-46.5						

CLASSIFICATION

● Sandy Clay
Specific Gravity = 2.64

Remarks:

Project Iowa AAP
Ground Water Investigation
Lab No. 4578
Area

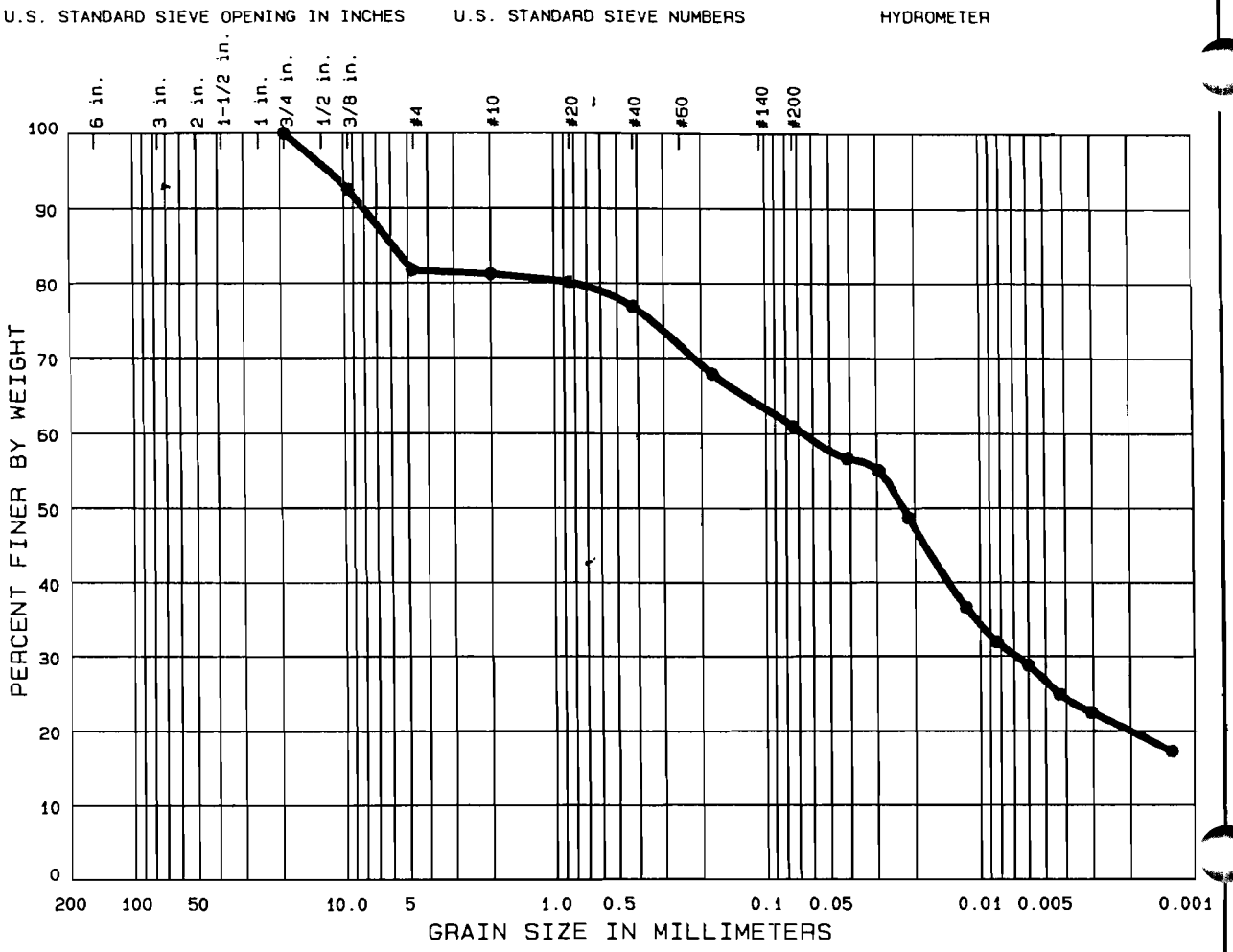
Boring No. 12C Date 6/17/97

GRADATION CURVES Figure 3

W.O. No. IAAP-12c
Req. No. 71439949
Contract No.

CORPS OF ENGINEERS, MISSOURI RIVER DIVISION LAB
420 SOUTH 18th STREET - OMAHA, NE 68102-2586

W.O. No. IAAP-12d
Req. No. 71439949
Contract No.



	% COBBLES	% GRAVEL	% SAND	% SILT OR CLAY	
●	0.0	18.3	20.7	34.3	26.7

	Sample No.	Elev or Depth	Nat W%	LL	PL	PI	C_c	C_u
●	12D	15.0-16.5						

CLASSIFICATION

● Sandy Clay with gravel
Specific Gravity = 2.74

Remarks:

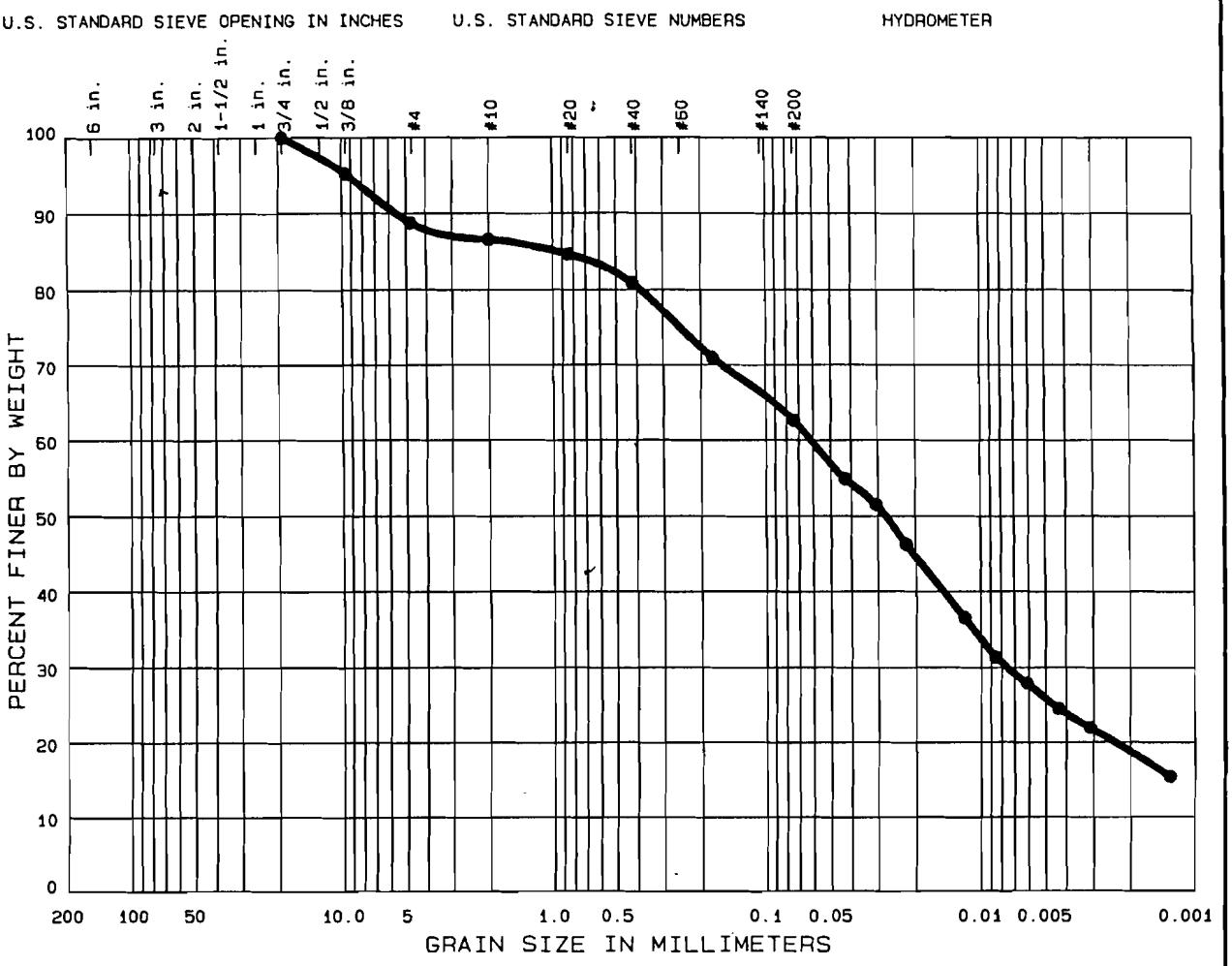
Project Iowa AAP
Ground Water Investigation
Lab No. 4578
Area

Boring No. 12D Date 6/17/97

GRADATION CURVES Figure 4

CORPS OF ENGINEERS, MISSOURI RIVER DIVISION LAB
420 SOUTH 18th STREET - OMAHA, NE 68102-2586

W.O. No. IAAP-12e
Req. No. 71439949
Contract No.



	% COBBLES	% GRAVEL	% SAND	% SILT OR CLAY	
●	0.0	11.2	26.1	36.8	25.9

	Sample No.	Elev or Depth	Nat W%	LL	PL	PI	C_c	C_u
●	12E	17.0-18.0						

CLASSIFICATION

● Sandy Clay
Specific Gravity = 2.71

Remarks:

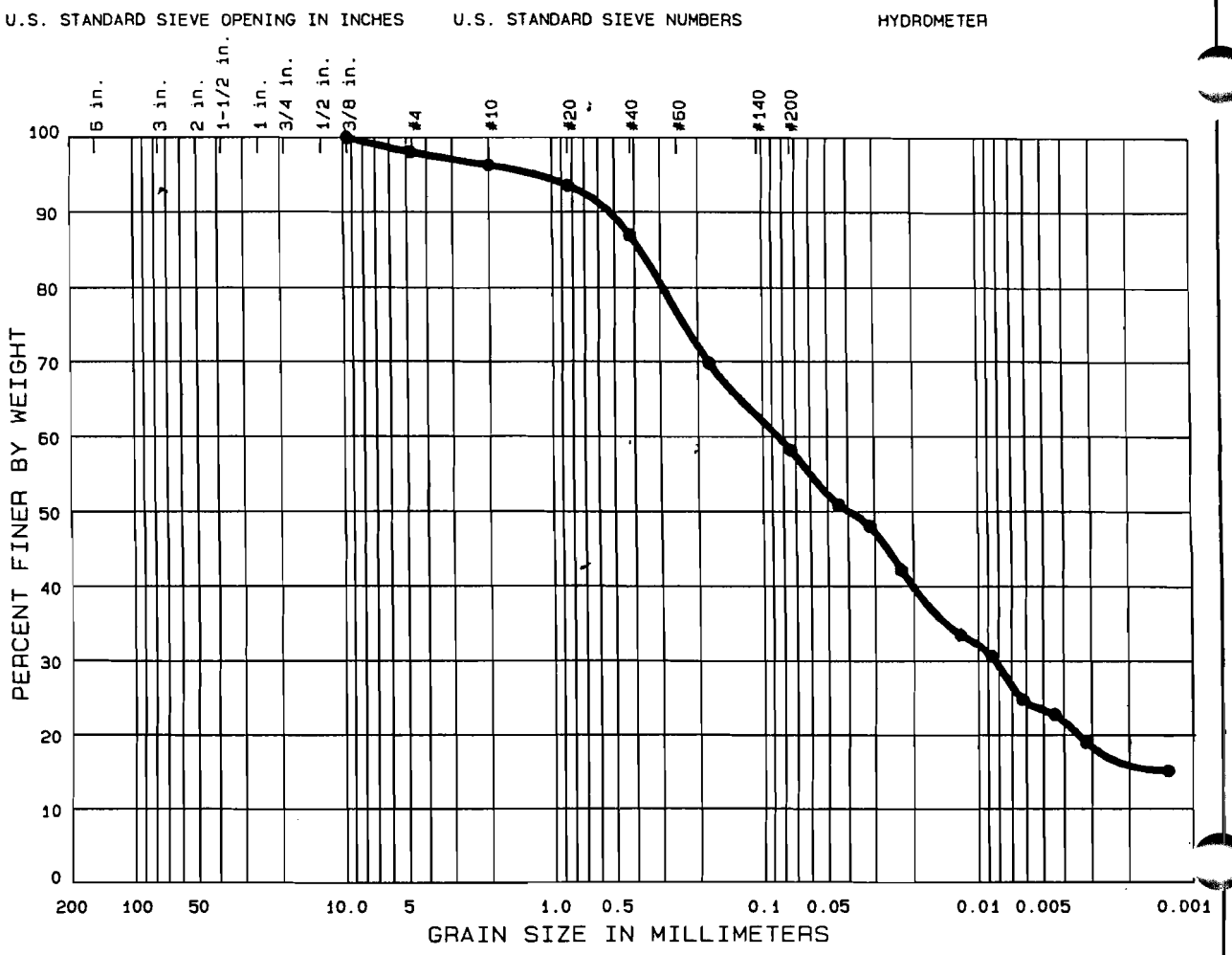
Project Iowa AAP
Ground Water Investigation
Lab No. 4578
Area

Boring No. 12E Date 6/17/97

GRADATION CURVES

Figure 5

CORPS OF ENGINEERS, MISSOURI RIVER DIVISION LAB
420 SOUTH 18th STREET - OMAHA, NE 68102-2586



	% COBBLES	% GRAVEL	% SAND	% SILT OR CLAY	
●	0.0	1.9	39.9	34.8	23.4

	Sample No.	Elev or Depth	Nat W%	LL	PL	PI	C_c	C_u
●	12F	45.5-46.0						

CLASSIFICATION

● Sandy Clay
Specific Gravity = 2.72

Remarks:

Project Iowa AAP
Ground Water Investigation
Lab No. 4578
Area

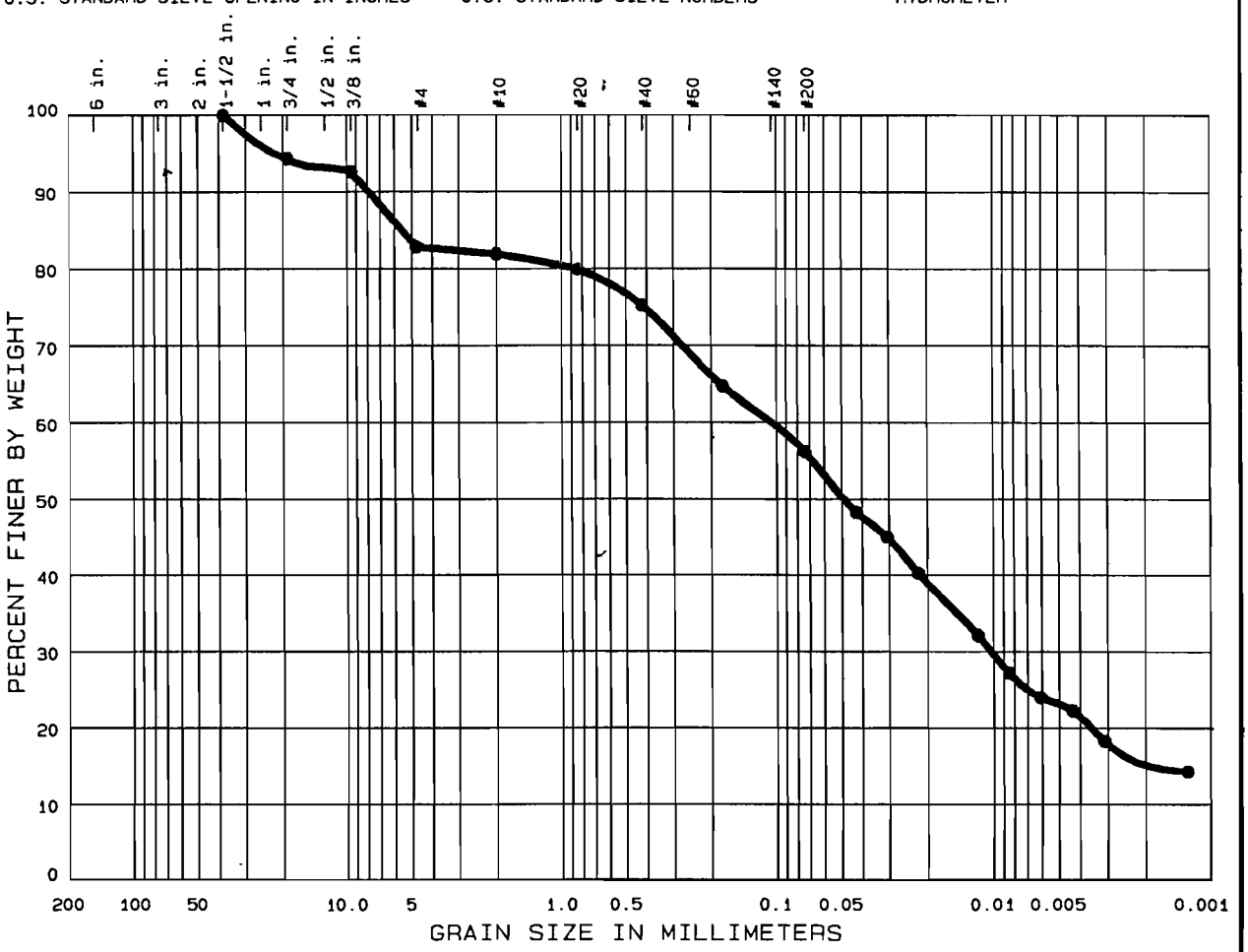
Boring No. 12F Date 6/17/97

GRADATION CURVES Figure 6

W.O. No. IAAP-12f
Req. No. 71439949
Contract No.

CORPS OF ENGINEERS, MISSOURI RIVER DIVISION LAB
420 SOUTH 18th STREET - OMAHA, NE 68102-2586

W.O. No. IAAP-12g
Req. No. 7143949
Contract No.



	% COBBLES	% GRAVEL	% SAND	% SILT OR CLAY	
●	0.0	17.2	26.6	33.0	23.2

	Sample No.	Elev or Depth	Nat W%	LL	PL	PI	C_c	C_u
●	12G	12.3-12.5						

CLASSIFICATION

● Sandy Clay with gravel
Specific Gravity = 2.76

Remarks:

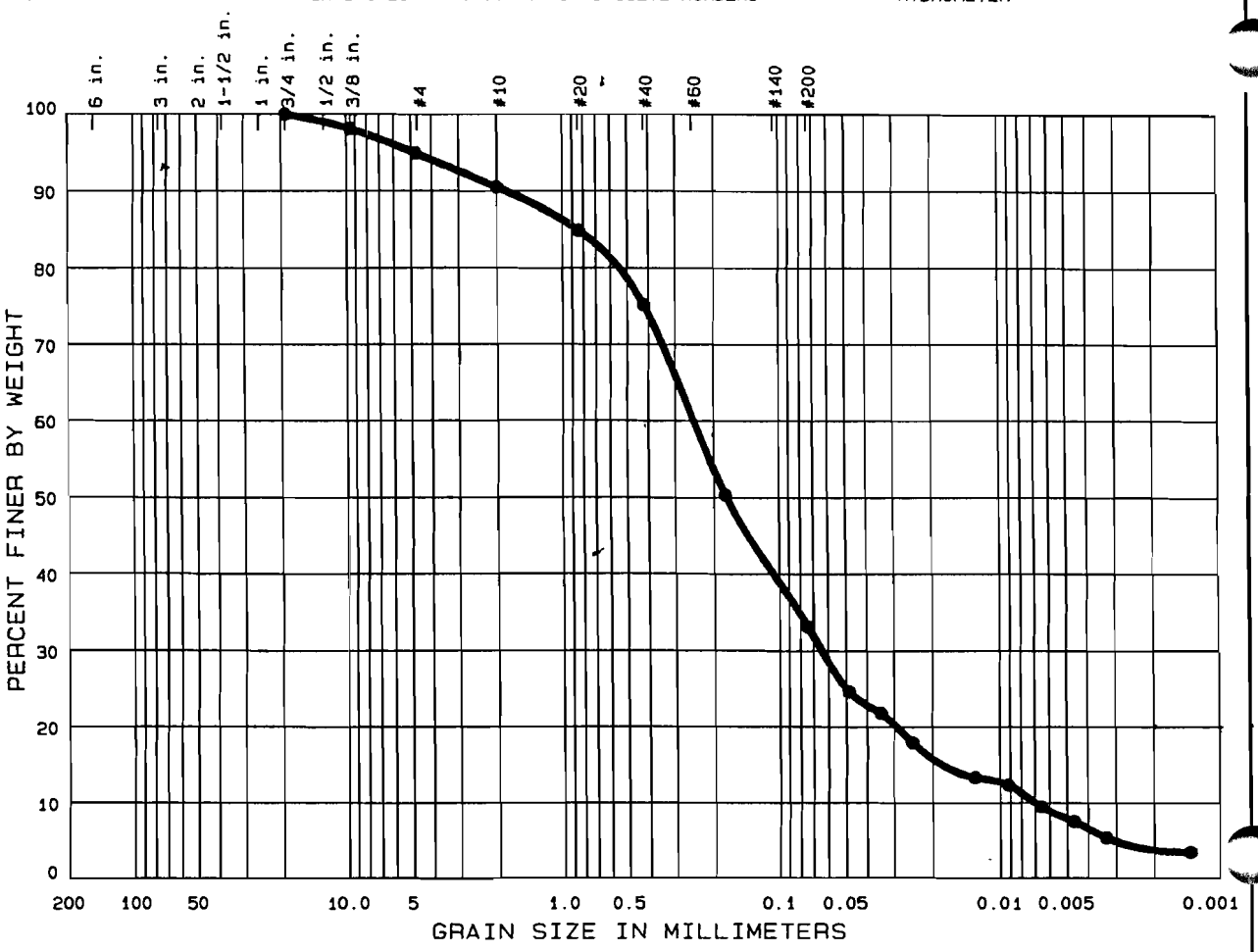
Project Iowa AAP
Ground Water Investigation
Lab No. 4578
Area

Boring No. 12G Date 6/17/97

GRADATION CURVES Figure 7

CORPS OF ENGINEERS, MISSOURI RIVER DIVISION LAB
420 SOUTH 18th STREET - OMAHA, NE 68102-2586

W.O. No. IAAP-13d
Req. No. 71439949
Contract No.



	% COBBLES	% GRAVEL	% SAND	% SILT OR CLAY	
●	0.0	5.1	61.7	25.3	7.9

	Sample No.	Elev or Depth	Nat W%	LL	PL	PI	C_c	C_u
●	13D	78.5-79.0					2.40	35.5

CLASSIFICATION

● Clayey Sand
Specific Gravity = 2.68

Remarks:

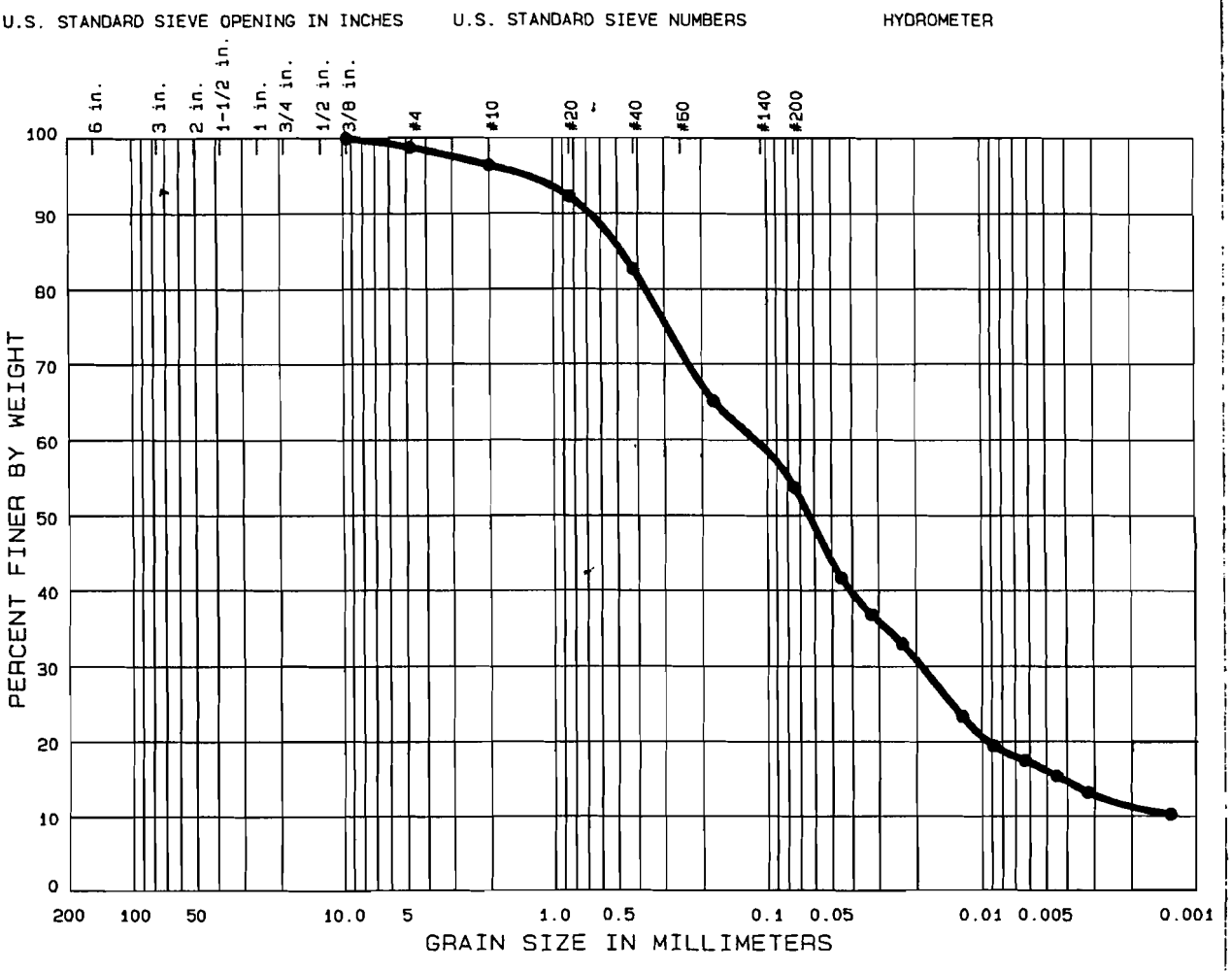
Project Iowa AAP
Ground Water Investigation
Lab No. 4578
Area

Boring No. 13D Date 6/17/97

GRADATION CURVES Figure 8

CORPS OF ENGINEERS, MISSOURI RIVER DIVISION LAB
420 SOUTH 18th STREET - OMAHA, NE 68102-2586

W.O. No. IAAP-13e
Req. No. 71439949
Contract No.



	% COBBLES	% GRAVEL	% SAND	% SILT OR CLAY	
●	0.0	1.2	45.1	37.6	16.1

	Sample No.	Elev or Depth	Nat W%	LL	PL	PI	C_c	C_u
●	13E	26.0-26.5						

CLASSIFICATION

● Sandy Clay
Specific Gravity = 2.74

Remarks:

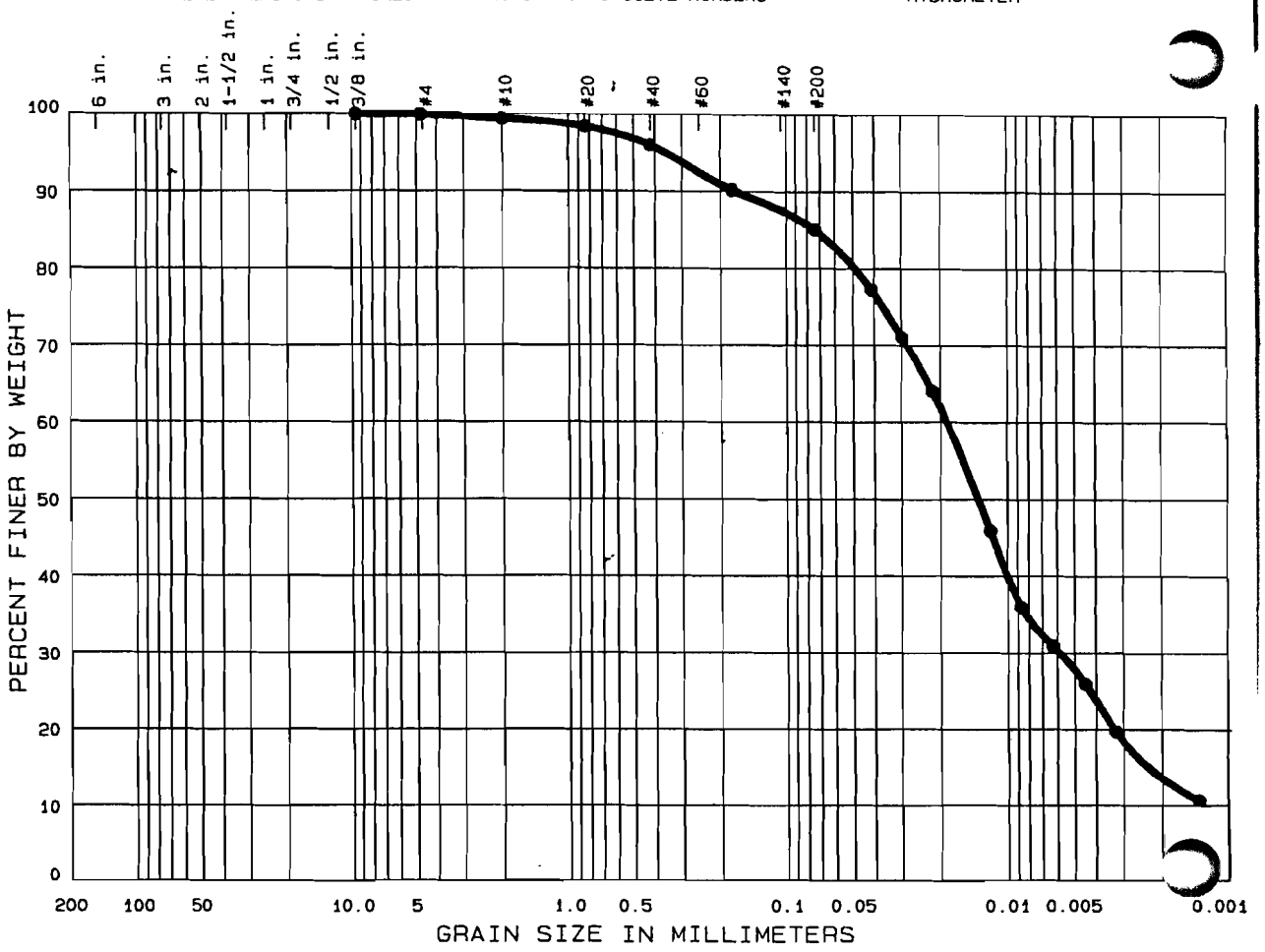
Project Iowa AAP
Ground Water Investigation
Lab No. 4578
Area

Boring No. 13E Date 6/17/97

GRADATION CURVES Figure 9

CORPS OF ENGINEERS, MISSOURI RIVER DIVISION LAB
420 SOUTH 18th STREET - OMAHA, NE 68102-2586

W.O. No. IAAP-13f
Req. No. 71439949
Contract No.



	% COBBLES	% GRAVEL	% SAND	% SILT OR CLAY	
●	0.0	0.1	14.8	57.3	27.8

	Sample No.	Elev or Depth	Nat W%	LL	PL	PI	C_c	C_u
●	13F	52.0-52.5						

CLASSIFICATION

● Clay
Specific Gravity = 2.64

Remarks:

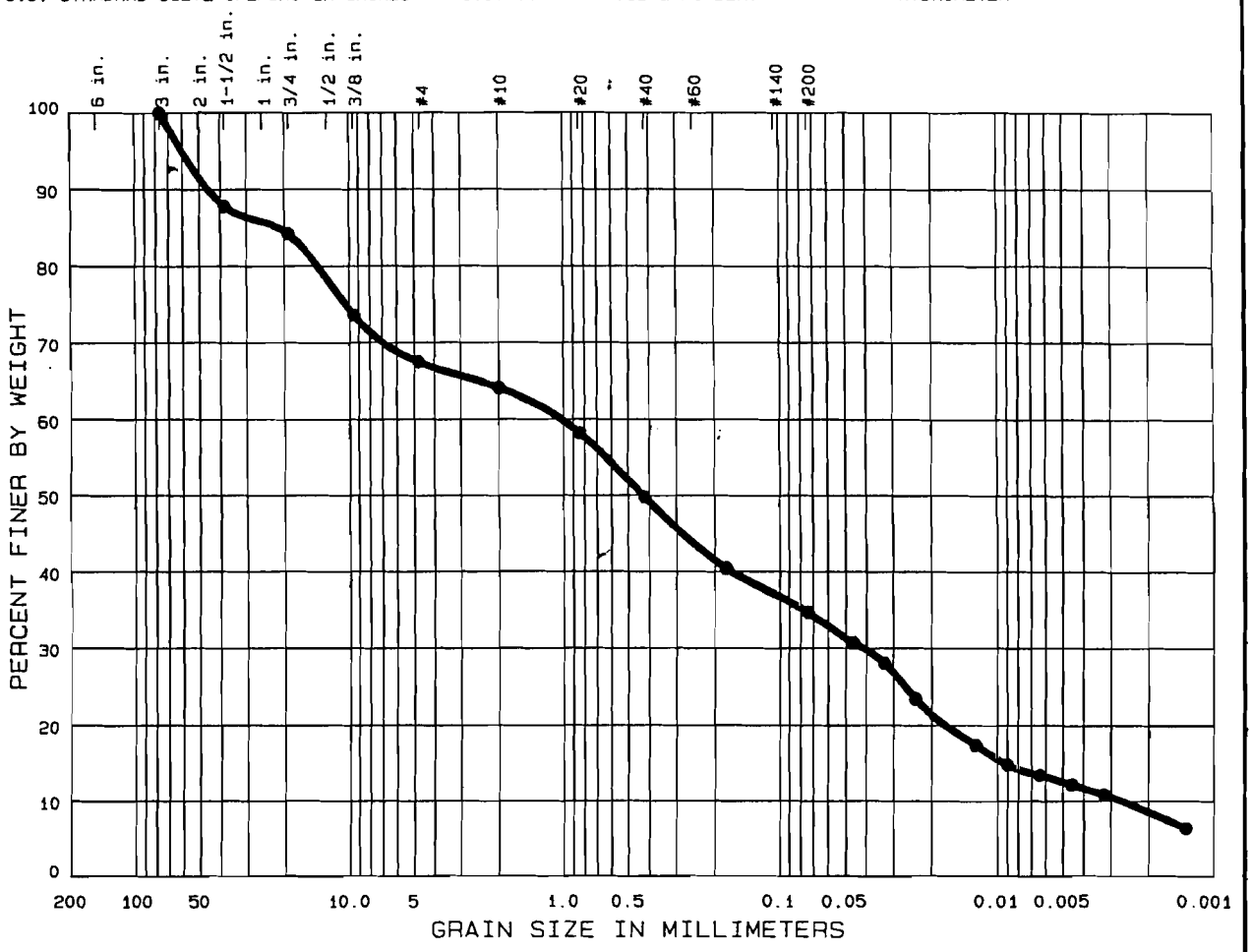
Project Iowa AAP
Ground Water Investigation
Lab No. 4578
Area

Boring No. 13F Date 6/17/97

GRADATION CURVES Figure 10

CORPS OF ENGINEERS, MISSOURI RIVER DIVISION LAB
420 SOUTH 18th STREET - OMAHA, NE 68102-2586

W.O. No. IAAP-16a
Req. No. 71439949
Contract No.



	% COBBLES	% GRAVEL	% SAND	% SILT OR CLAY	
●	0.0	32.5	32.8	22.2	12.5

	Sample No.	Elev or Depth	Nat W%	LL	PL	PI	C_c	C_u
●	16A	108.5-109.0					0.63	380.2

CLASSIFICATION

● Clayey Sand with gravel
Specific Gravity = 2.67

Remarks:

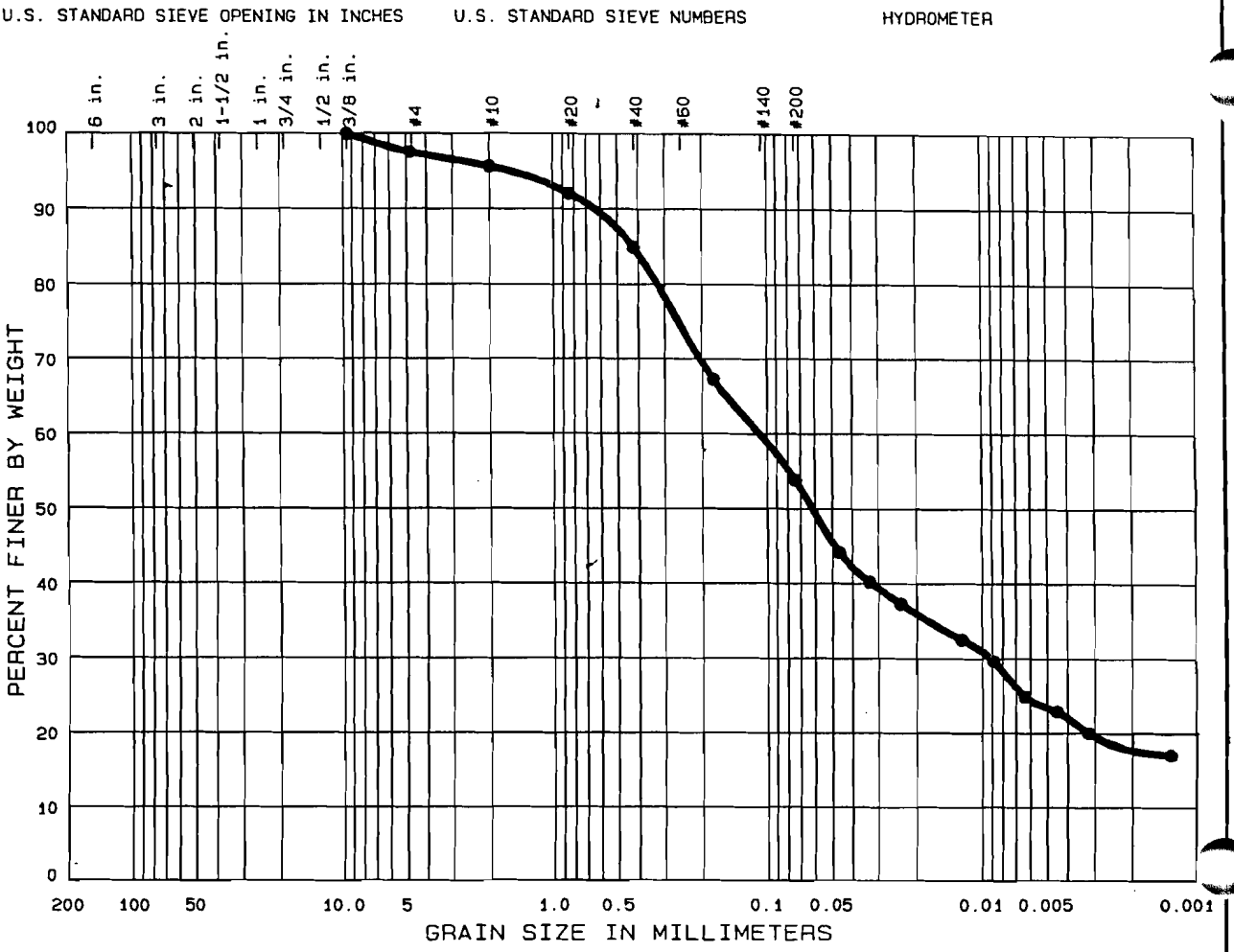
Project Iowa AAP
Ground Water Investigation
Lab No. 4578
Area

Boring No. 16A Date 6/17/97

GRADATION CURVES Figure 11

CORPS OF ENGINEERS, MISSOURI RIVER DIVISION LAB
420 SOUTH 18th STREET - OMAHA, NE 68102-2586

W.O. No. IAAP-16b
Req. No. 71439949
Contract No.



	% COBBLES	% GRAVEL	% SAND	% SILT OR CLAY	
●	0.0	2.4	43.7	30.5	23.4

	Sample No.	Elev or Depth	Nat W%	LL	PL	PI	C_c	C_u
●	16B	22.0-22.5						

CLASSIFICATION

● Sandy Clay
Specific Gravity = 2.67

Remarks:

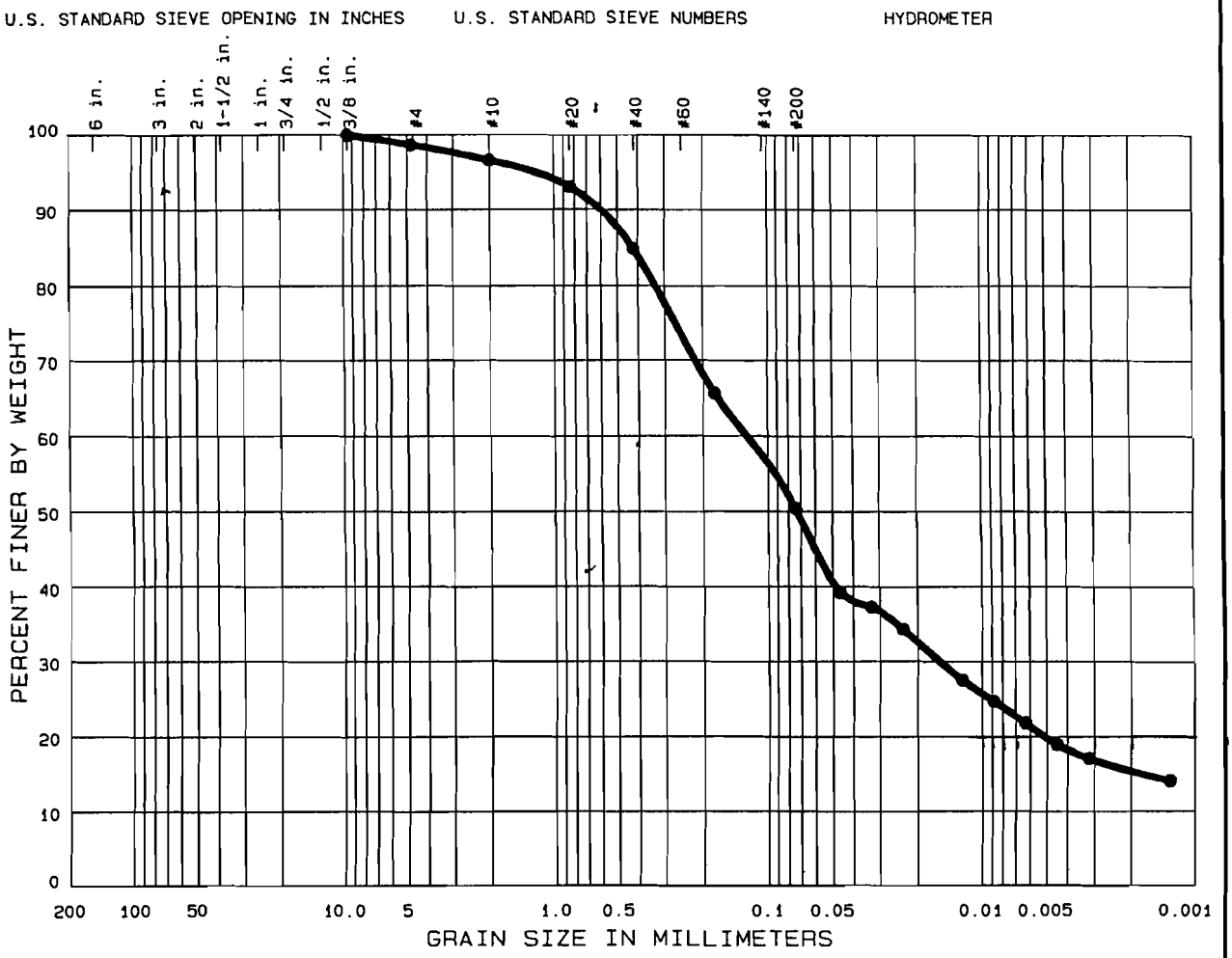
Project Iowa AAP
Ground Water Investigation
Lab No. 4578
Area

Boring No. 16B Date 6/17/97

GRADATION CURVES Figure 12

CORPS OF ENGINEERS, MISSOURI RIVER DIVISION LAB
420 SOUTH 18th STREET - OMAHA, NE 68102-2586

W.O. No. IAAP-16c
Req. No. 71439949
Contract No.



	% COBBLES	% GRAVEL	% SAND	% SILT OR CLAY	
●	0.0	1.3	48.3	30.6	19.8

	Sample No.	Elev or Depth	Nat W%	LL	PL	PI	C_c	C_u
●	16C	23.5-24.0						

CLASSIFICATION

● Sandy Clay
Specific Gravity = 2.73

Remarks:

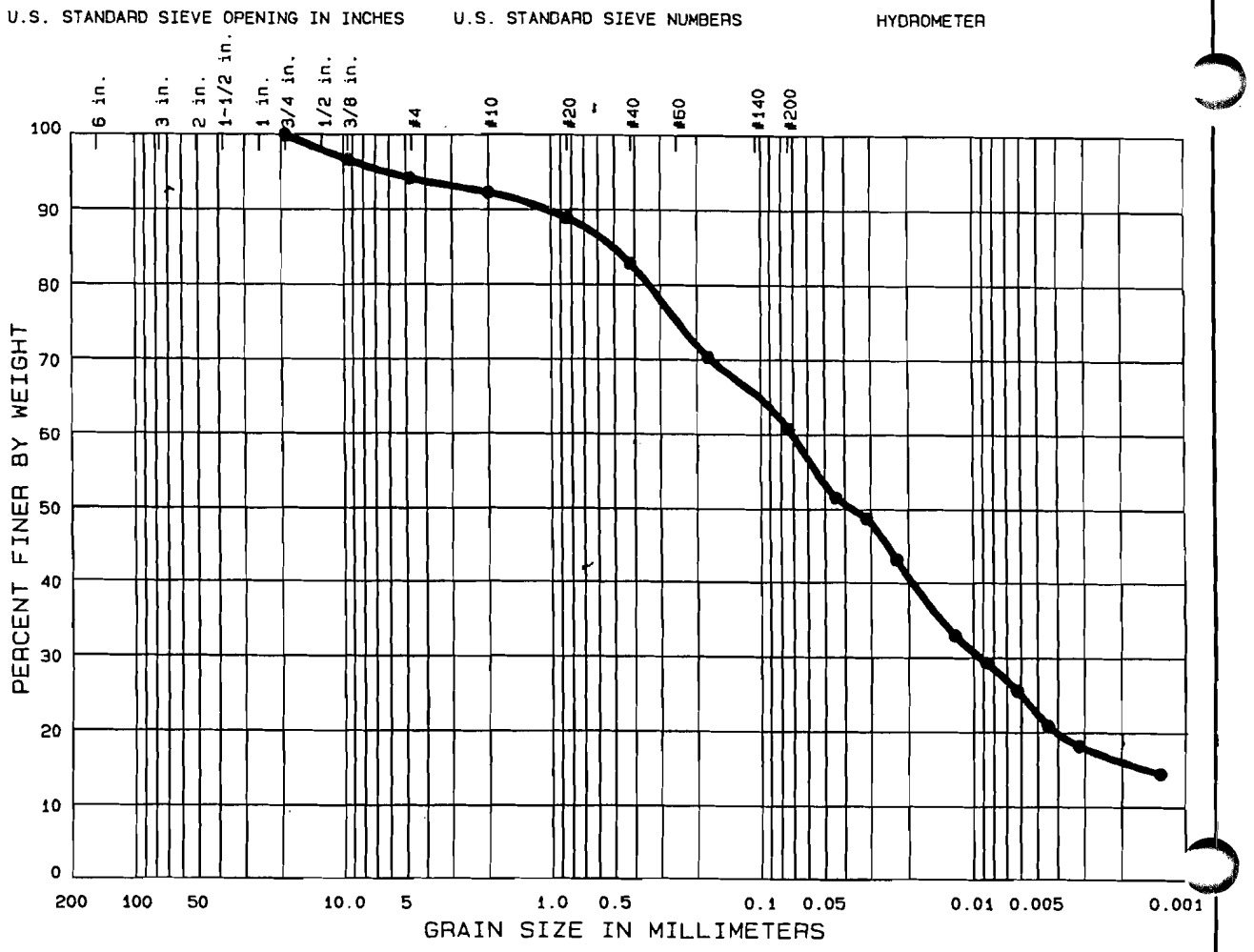
Project Iowa AAP
Ground Water Investigation
Lab No. 4578
Area

Boring No. 16C Date 6/17/97

GRADATION CURVES Figure 13

CORPS OF ENGINEERS, MISSOURI RIVER DIVISION LAB
420 SOUTH 18th STREET - OMAHA, NE 68102-2586

W.O. No. IAAP-16d
Req. No. 71439949
Contract No.



	% COBBLES	% GRAVEL	% SAND	% SILT OR CLAY	
●	0.0	5.8	33.4	38.4	22.4

	Sample No.	Elev or Depth	Nat W%	LL	PL	PI	C_c	C_u
●	16D	17.0-17.2						

CLASSIFICATION

● Sandy Clay
Specific Gravity = 2.71

Remarks:

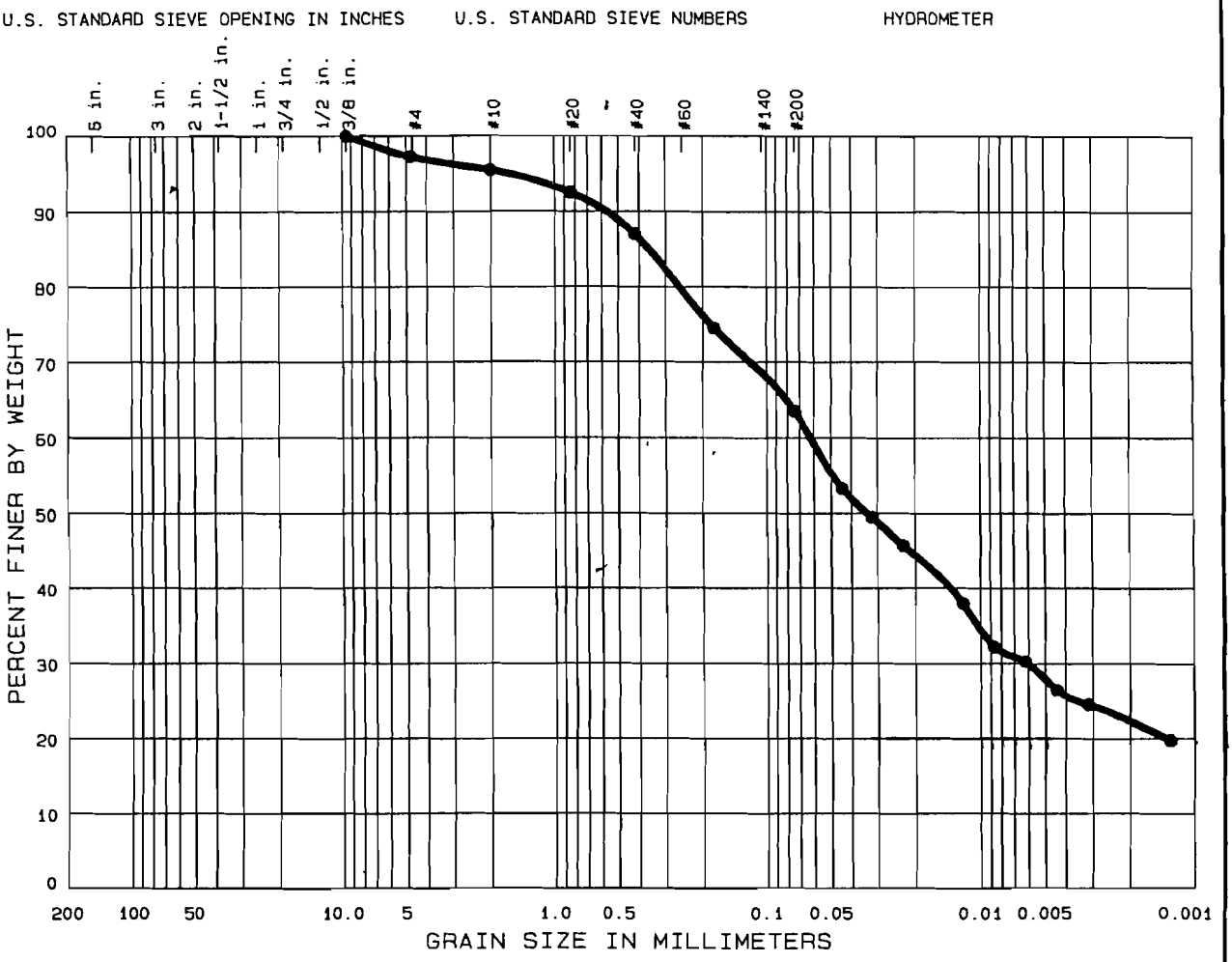
Project Iowa AAP
Ground Water Investigation
Lab No. 4578
Area

Boring No. 16D Date 6/17/97

GRADATION CURVES Figure 14

CORPS OF ENGINEERS, MISSOURI RIVER DIVISION LAB
420 SOUTH 18th STREET - OMAHA, NE 68102-2586

W.O. No. IAAP-16e
Req. No. 71439949
Contract No.



	% COBBLES	% GRAVEL	% SAND	% SILT OR CLAY	
●	0.0	2.7	33.8	35.6	27.9

	Sample No.	Elev or Depth	Nat W%	LL	PL	PI	C_c	C_u
●	16E	52.0-52.5						

CLASSIFICATION

● Sandy Clay
Specific Gravity = 2.70

Remarks:

Project Iowa AAP
Ground Water Investigation
Lab No. 4578
Area

Boring No. 16E Date 6/17/97

GRADATION CURVES Figure 15

CORPS OF ENGINEERS, MISSOURI RIVER DIVISION LAB
420 SOUTH 18th STREET - OMAHA, NE 68102-2586

APPENDIX C
WELL CONSTRUCTION DRAWINGS

C-1 Gradation Curve, Filter Sand

C-2 Task 6. Ammunition Box Chipper Disposal Area (Temporary Wells)

C-3 Task 10. Pumping Test, Line 2

C-4 Task 11. VOC Sampling (Temporary Wells)

C-5 Task 12. Additional Groundwater Data, Line 2

C-6 Task 13. Groundwater Data, Downstream Reach, Brush Creek

C-7 Task 14. Bedrock Surface/Piezometers

C-8 Task 16. Additional Groundwater Data, Line 3

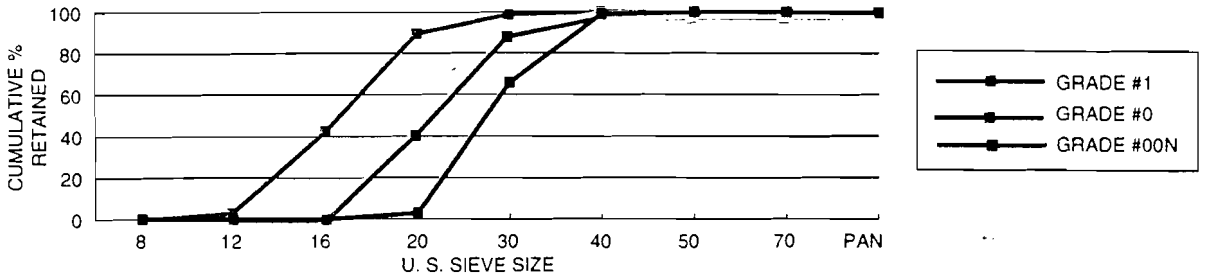
APPENDIX C
WELL CONSTRUCTION DRAWINGS

C-1 Gradation Curve, Filter Sand

MORIE SCREENINGS

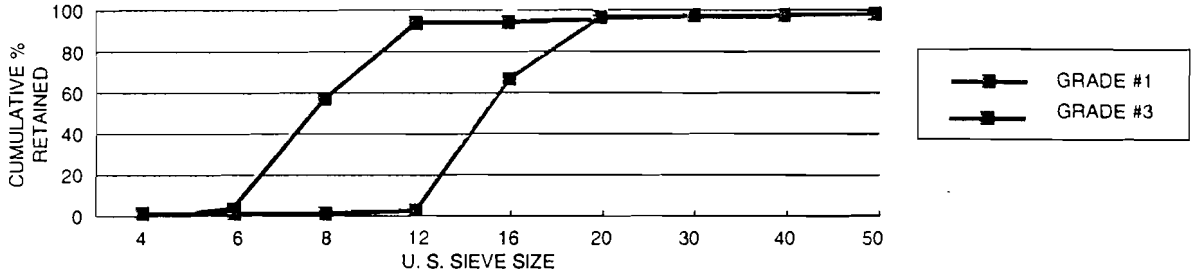
SOUTHERN DIVISION WELL GRAVELS

GEORGIA WELL GRAVELS



OPENING IN INCHES	0.094	0.066	0.047	0.033	0.023	0.016	0.012	0.008		SLOT
US SIEVE SIZE	8	12	16	20	30	40	50	70	PAN	SIZE
GRADE #1	0.0	3.2	42.1	89.1	98.2	99.5	99.8	99.9	100.0	25
GRADE #0	0.0	0.0	0.9	42.6	90.1	99.1	99.6	99.8	100.0	20
GRADE #00N	0.0	0.0	0.0	3.2	65.6	98.7	99.9	100.0	100.0	15

ALABAMA WELL GRAVELS



OPENING IN INCHES	0.187	0.132	0.094	0.066	0.047	0.033	0.023	0.016	0.012	SLOT
US SIEVE SIZE	4	6	8	12	16	20	30	40	50	SIZE
GRADE #1	0.0	0.0	0.0	0.3	66.6	97.0	98.6	99.0	100.0	30
GRADE #3	0.0	0.7	60.1	98.5	100.0	100.0	100.0	100.0	100.0	60

SO MANY CONSIDERATIONS ENTER INTO THE MAKING OF A GOOD WELL THAT, WHILE WE BELIEVE SLOT SIZES FURNISHED OR RECOMMENDED FROM SAND SAMPLES ARE CORRECT, WE ASSUME NO RESPONSIBILITY FOR THE SUCCESSFUL OPERATION OF THE WELL SCREENS.

NSF

Certified to ANSI/NSF 61

WARNING: This product contains crystalline silica. Do not breathe dust; may cause delayed lung injury (Silicosis). May also cause lung cancer, follow OSHA guidelines for control of crystalline silica. For industrial use only, see Material Safety Data Sheet for detailed information. CAS No. 14808-60-7.

DISCLAIMER: All products are sold without warranty expressed or implied and seller specifically does not warrant that these products are suitable for a particular purpose or purposes or are merchantable. Buyer agrees it does not rely on seller's skill or judgement to select or furnish these products. Buyer shall make its own test to determine the suitability of such products for its purposes. Caution should be exercised when exposing these products to the elements. Staining could occur because of varying levels of iron bearing minerals in the deposits.

THE MORIE COMPANY, INC.
MINERS OF INDUSTRIAL SAND AND GRAVEL
Main Office: 1201 N. High Street, Millville, NJ 08332-2580
800 / 257-7034 • Fax #609 / 327-4107

Georgia Silica Div.
Junction City, GA 31812
706 / 269-3294
Fax# 706 / 269-3191

Alabama Silica Div.
Tuscaloosa, AL 35401
205 / 758-8353
Fax# 205 / 758-2177

Tennessee Silica Div.
Camden, TN 38302
901 / 584-8201
Fax# 901 / 584-3272

MORIE
THE MORIE COMPANY, INC.
1201 N. High Street, Millville, NJ

APPENDIX C
WELL CONSTRUCTION DRAWINGS

C-2 Task 6. Ammunition Box Chipper Disposal Area (Temporary Wells)

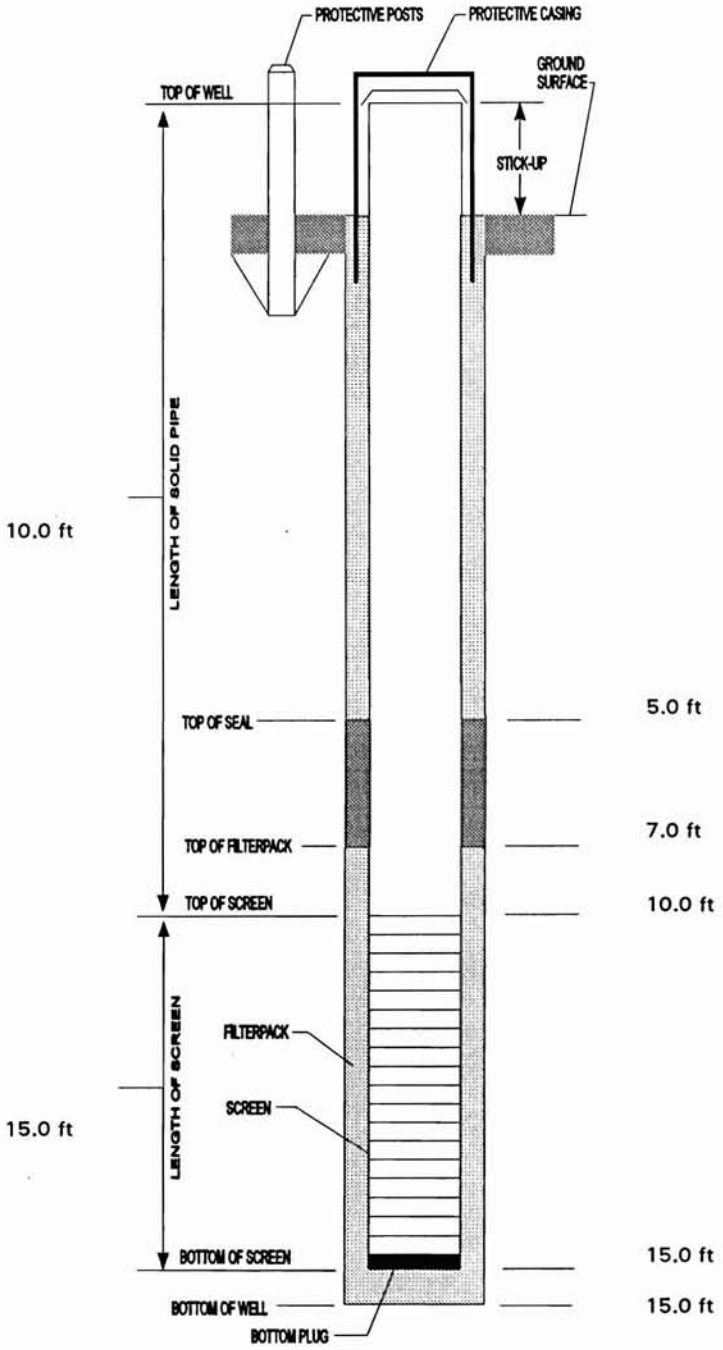
HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: NA			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 6-16-97	STARTED: 1455	COMPLETED: 1525	LOCATION (Coordinates or Station): Ammunition Box Chipper Disposal Area (not surveyed)
ELEVATION TOP OF HOLE: NA			SIGNATURE OF INSPECTOR: Kurt Kraske
TOTAL DEPTH OF HOLE: 15.0 ft.			HOLE No.: **6A**

(ALL MEASUREMENTS FROM GROUND SURFACE)

NOTE: TEMPORARY WELL FOR SAMPLING. ABANDONED AND GROUTED NOVEMBER 1997.



PROTECTIVE CASING: NA		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	10-Slot	
SCHEDULE:	40	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: NA		
TIME SPENT DEVELOPING:		
VOLUME OF WATER REMOVED:		
VOLUME OF WATER ADDED:		
DESCRIPTION OF PREDEVELOPMENT WATER:		
DESCRIPTION OF POST DEVELOPMENT WATER:		

WATER LEVEL MEASUREMENTS:

DATE	TIME	DEPTH
DEPTH FROM TOC AFTER DEVELOPMENT:		

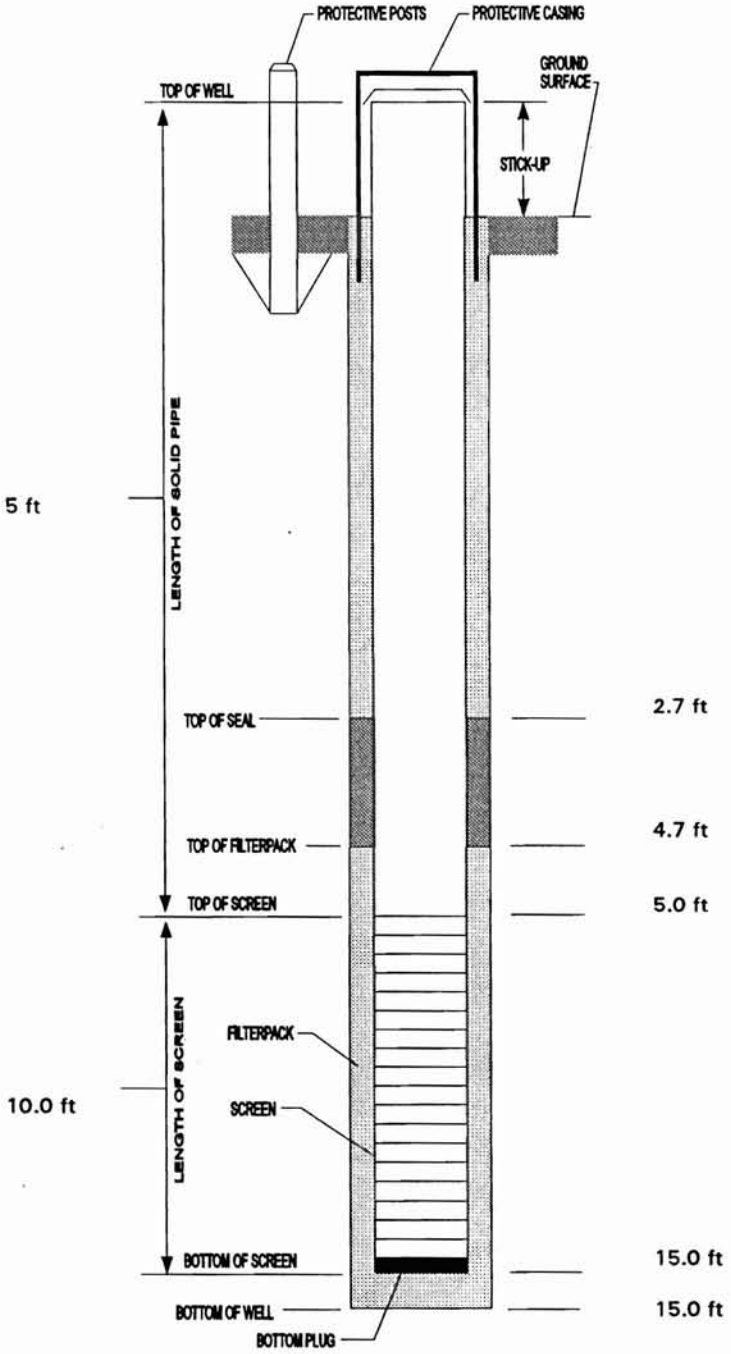
HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: NA			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 6-17-97	STARTED: 0900	COMPLETED: 1004	LOCATION (Coordinates or Station): Ammunition Box Chipper Disposal Area (not surveyed)
ELEVATION TOP OF HOLE: NA			SIGNATURE OF INSPECTOR: Kurt Kraske
TOTAL DEPTH OF HOLE: 15 ft.			HOLE No.: **6B**

(ALL MEASUREMENTS FROM GROUND SURFACE)

NOTE: TEMPORARY WELL FOR SAMPLING. ABANDONED AND GROUTED NOVEMBER 1997.



PROTECTIVE CASING: 6 in. Square		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	0.010	
SCHEDULE:	40	
MATERIAL:	PVC xxx	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Not applicable		
TIME SPENT DEVELOPING:		
VOLUME OF WATER REMOVED:		
VOLUME OF WATER ADDED:		
DESCRIPTION OF PREDEVELOPMENT WATER:		
DESCRIPTION OF POST DEVELOPMENT WATER:		

WATER LEVEL MEASUREMENTS:

DATE	TIME	DEPTH
DEPTH FROM TOC AFTER DEVELOPMENT:		

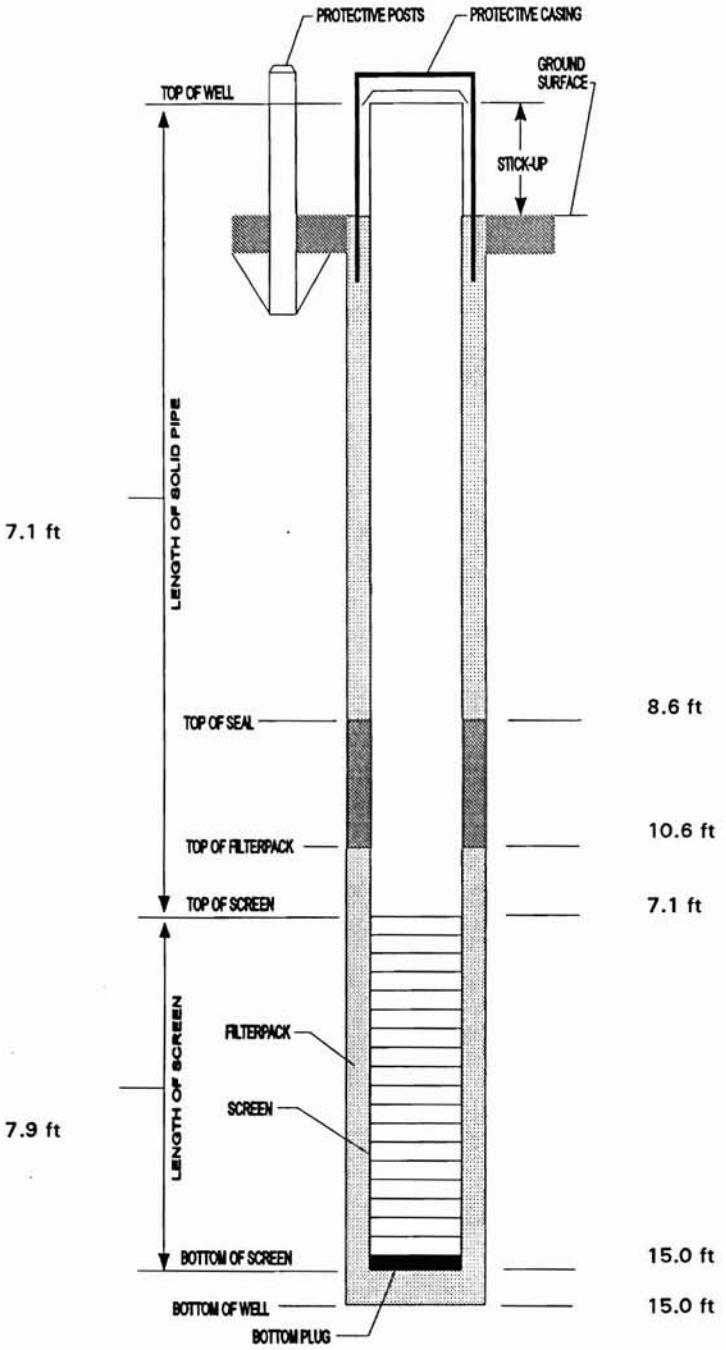
HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: NA			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 6-17-97	STARTED: 1430	COMPLETED: 1615	LOCATION (Coordinates or Station): Ammunition Box Chipper Disposal Area (not surveyed)
ELEVATION TOP OF HOLE: NA			SIGNATURE OF INSPECTOR: Kurt Kraske
TOTAL DEPTH OF HOLE: 15.0 ft.			HOLE No.: **6D**

(ALL MEASUREMENTS FROM GROUND SURFACE)

NOTE: TEMPORARY WELL FOR SAMPLING. ABANDONED AND GROUTED NOVEMBER 1997.



PROTECTIVE CASING: NA		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	10-Slot	
SCHEDULE:	40	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: NA		
TIME SPENT DEVELOPING:		
VOLUME OF WATER REMOVED:		
VOLUME OF WATER ADDED:		
DESCRIPTION OF PREDEVELOPMENT WATER:		
DESCRIPTION OF POST DEVELOPMENT WATER:		

WATER LEVEL MEASUREMENTS:

DATE	TIME	DEPTH
DEPTH FROM TOC AFTER DEVELOPMENT:		

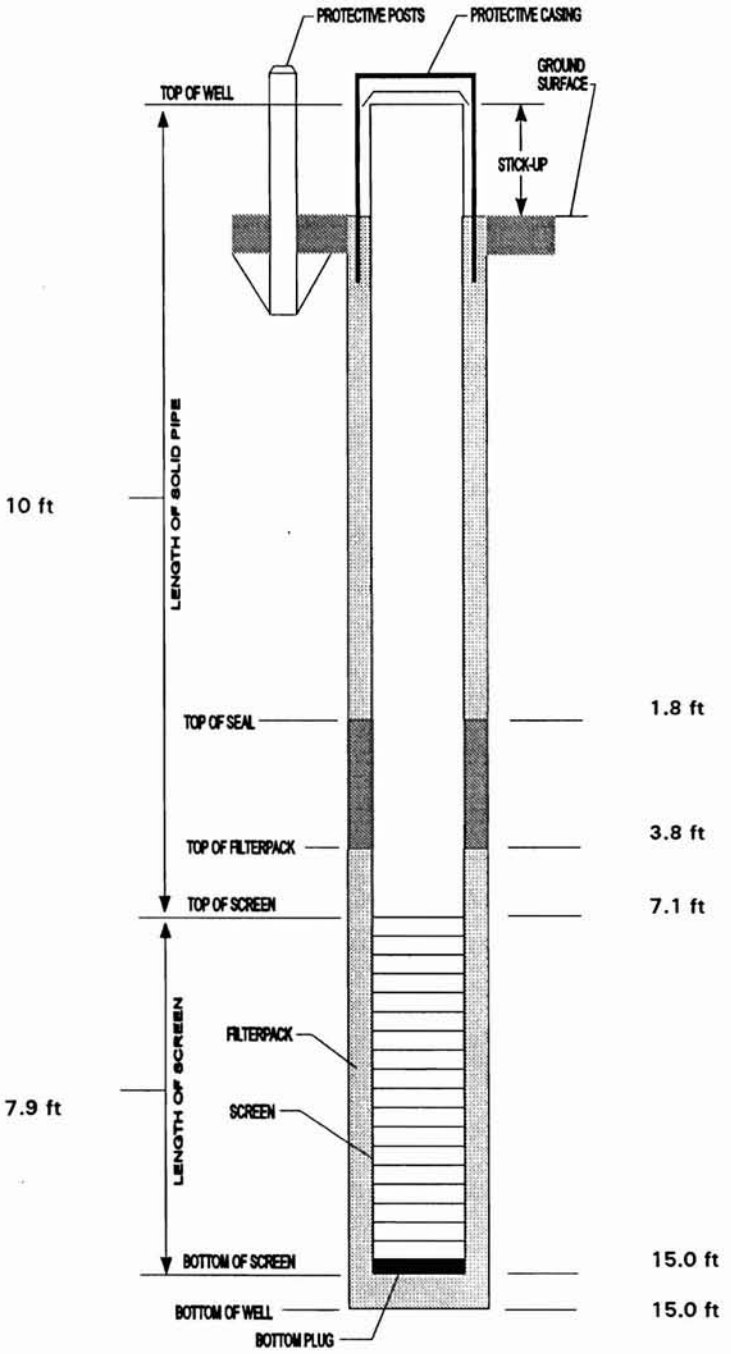
HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: NA			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 6-17-97	STARTED: 1645	COMPLETED: 1815	LOCATION (Coordinates or Station): Ammunition Box Chipper Disposal Area (not surveyed)
ELEVATION TOP OF HOLE: NA			SIGNATURE OF INSPECTOR: Kurt Kraske
TOTAL DEPTH OF HOLE: 15 ft.			HOLE No.: **6E**

(ALL MEASUREMENTS FROM GROUND SURFACE)

NOTE: TEMPORARY WELL FOR SAMPLING. ABANDONED AND GROUTED NOVEMBER 1997.



PROTECTIVE CASING: 6 in. Square		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	0.010	
SCHEDULE:	40	
MATERIAL:	PVC xxx	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Not applicable		
TIME SPENT DEVELOPING:		
VOLUME OF WATER REMOVED:		
VOLUME OF WATER ADDED:		
DESCRIPTION OF PREDEVELOPMENT WATER:		
DESCRIPTION OF POST DEVELOPMENT WATER:		

WATER LEVEL MEASUREMENTS:

DATE	TIME	DEPTH
DEPTH FROM TOC AFTER DEVELOPMENT:		

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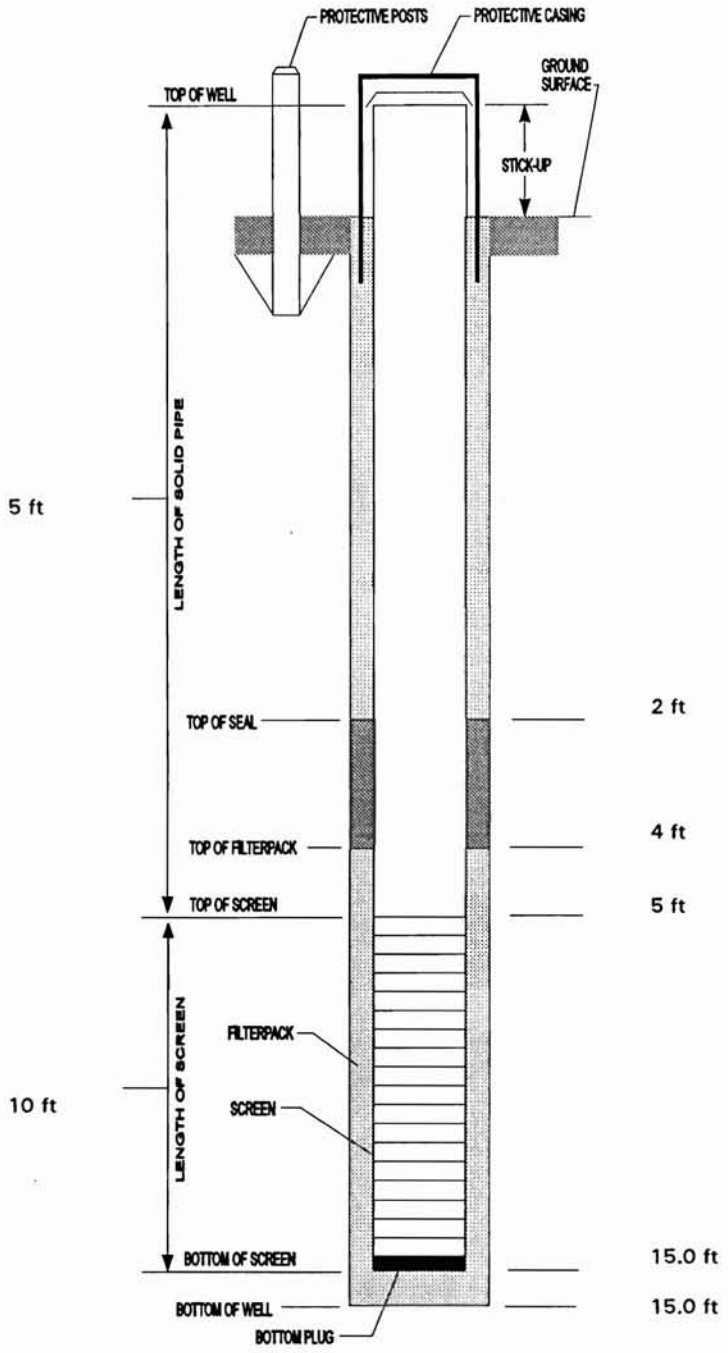
HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: NA			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 6-17-97	STARTED: 1019	COMPLETED: 1423	LOCATION (Coordinates or Station): Ammunition Box Chipper Disposal Area (not surveyed)
ELEVATION TOP OF HOLE: NA			SIGNATURE OF INSPECTOR: Kurt Kraske
TOTAL DEPTH OF HOLE: 15 ft.			HOLE No.: **6F**

(ALL MEASUREMENTS FROM GROUND SURFACE)

NOTE: TEMPORARY WELL FOR SAMPLING. ABANDONED AND GROUTED NOVEMBER 1997.



PROTECTIVE CASING: 6 in. Square		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	0.010	
SCHEDULE:	40	
MATERIAL:	PVC xxx	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Not applicable		
TIME SPENT DEVELOPING:		
VOLUME OF WATER REMOVED:		
VOLUME OF WATER ADDED:		
DESCRIPTION OF PREDEVELOPMENT WATER:		
DESCRIPTION OF POST DEVELOPMENT WATER:		

WATER LEVEL MEASUREMENTS:

DATE	TIME	DEPTH
DEPTH FROM TOC AFTER DEVELOPMENT:		

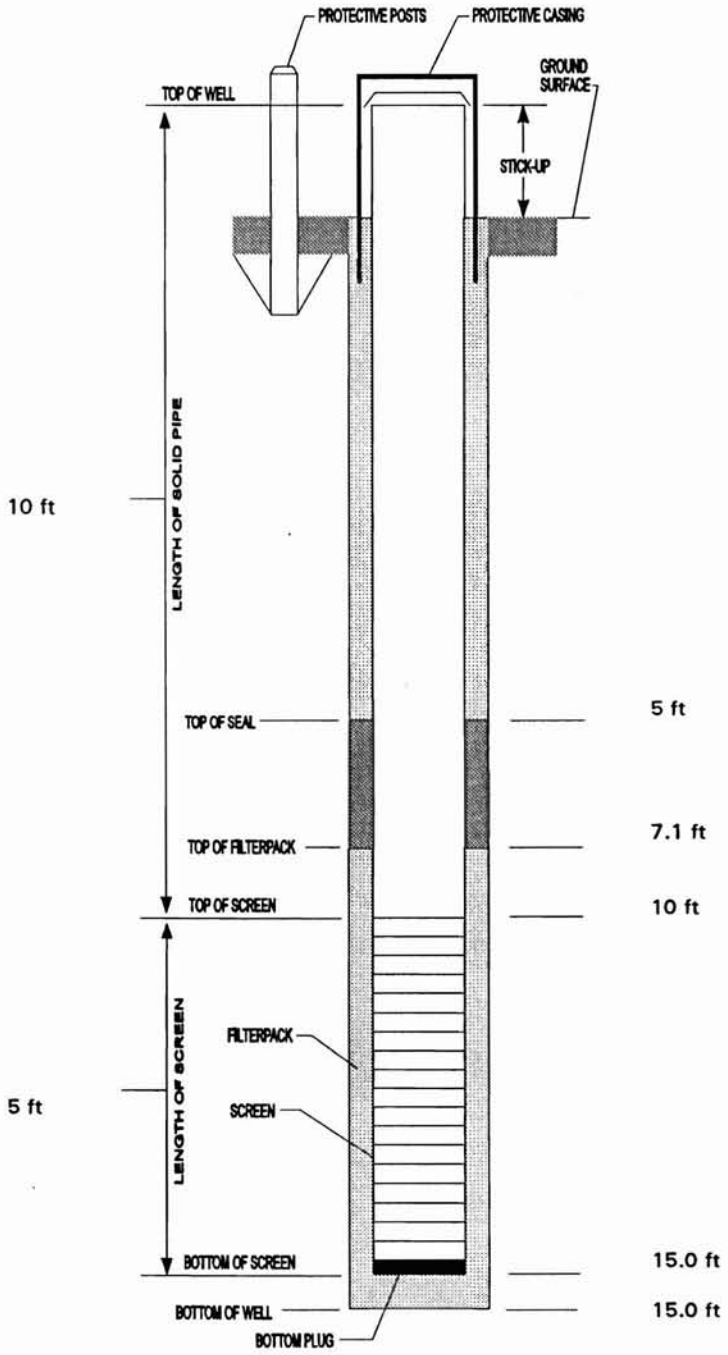
HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: NA			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 6-17-97	STARTED:	COMPLETED:	LOCATION (Coordinates or Station): Ammunition Box Chipper Disposal Area (not surveyed)
ELEVATION TOP OF HOLE: NA			SIGNATURE OF INSPECTOR: Kurt Kraske
TOTAL DEPTH OF HOLE: 15 ft.			HOLE No.: **6G**

(ALL MEASUREMENTS FROM GROUND SURFACE)

NOTE: TEMPORARY WELL FOR SAMPLING. ABANDONED AND GROUTED NOVEMBER 1997.



PROTECTIVE CASING: 6 in. Square		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	0.010	
SCHEDULE:	40	
MATERIAL:	PVC xxx	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Not applicable		
TIME SPENT DEVELOPING:		
VOLUME OF WATER REMOVED:		
VOLUME OF WATER ADDED:		
DESCRIPTION OF PREDEVELOPMENT WATER:		
DESCRIPTION OF POST DEVELOPMENT WATER:		

WATER LEVEL MEASUREMENTS:

DATE	TIME	DEPTH
DEPTH FROM TOC AFTER DEVELOPMENT:		

APPENDIX C
WELL CONSTRUCTION DRAWINGS

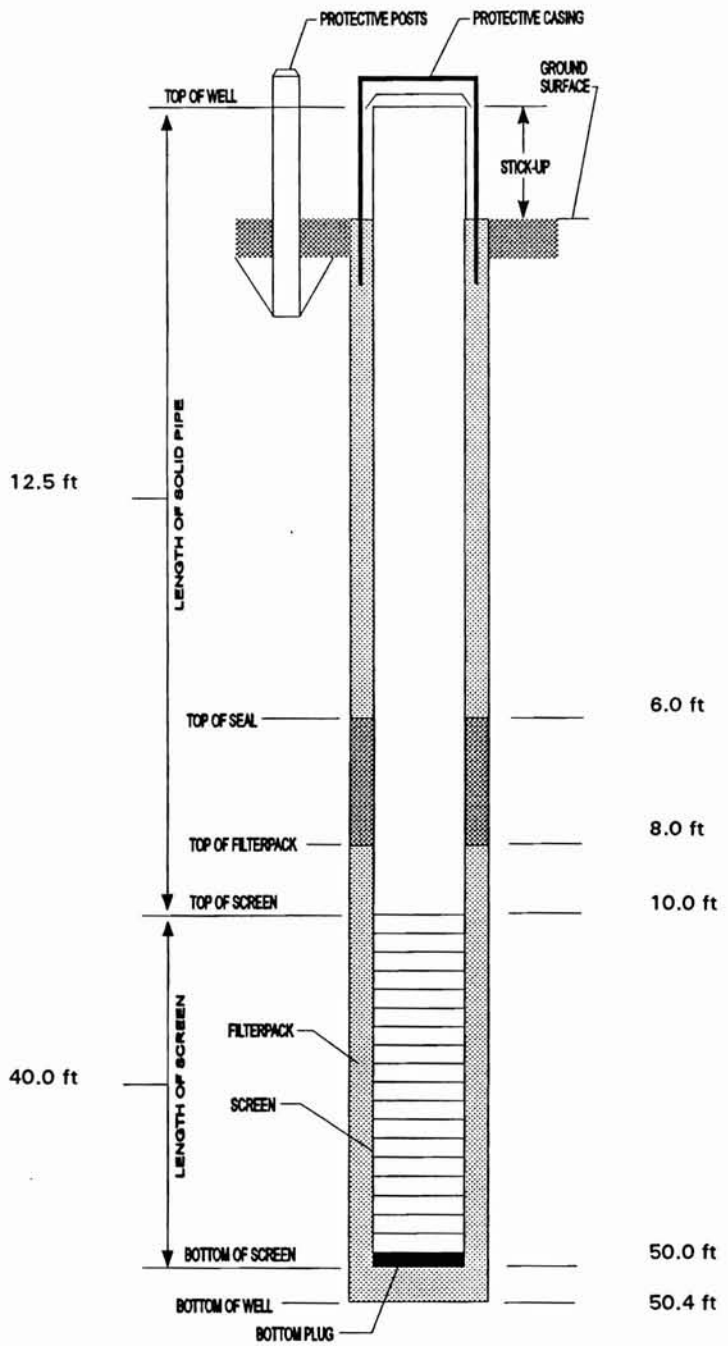
C-3 Task 10. Pumping Test, Line 2

HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: 631.25			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 5-5-97	STARTED: 5-5-97	COMPLETED: 5-5-97	LOCATION (Coordinates or Station): N. 298819 E. 2271165
ELEVATION TOP OF HOLE: 681.65			SIGNATURE OF INSPECTOR: Joe Marks
TOTAL DEPTH OF HOLE: 50.40 ft.			HOLE No.: **10A**

(ALL MEASUREMENTS FROM GROUND SURFACE)



PROTECTIVE CASING: 6 in. Square		
BLANK CASING		
DIAMETER:	4 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Threaded	
SCREEN INFORMATION:		
DIAMETER:	4 in.	
SLOT WIDTH:	10-Slot	
SCHEDULE:	40	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Pumped w/Well Wizard.		
TIME SPENT DEVELOPING:	2 hrs 40 min	
VOLUME OF WATER REMOVED:	140 gal (approx)	
VOLUME OF WATER ADDED:	None	
DESCRIPTION OF PREDEVELOPMENT WATER: Very turbid; silt laden		
DESCRIPTION OF POST DEVELOPMENT WATER: Mod-turbid; silt in water.		
WATER LEVEL MEASUREMENTS:		

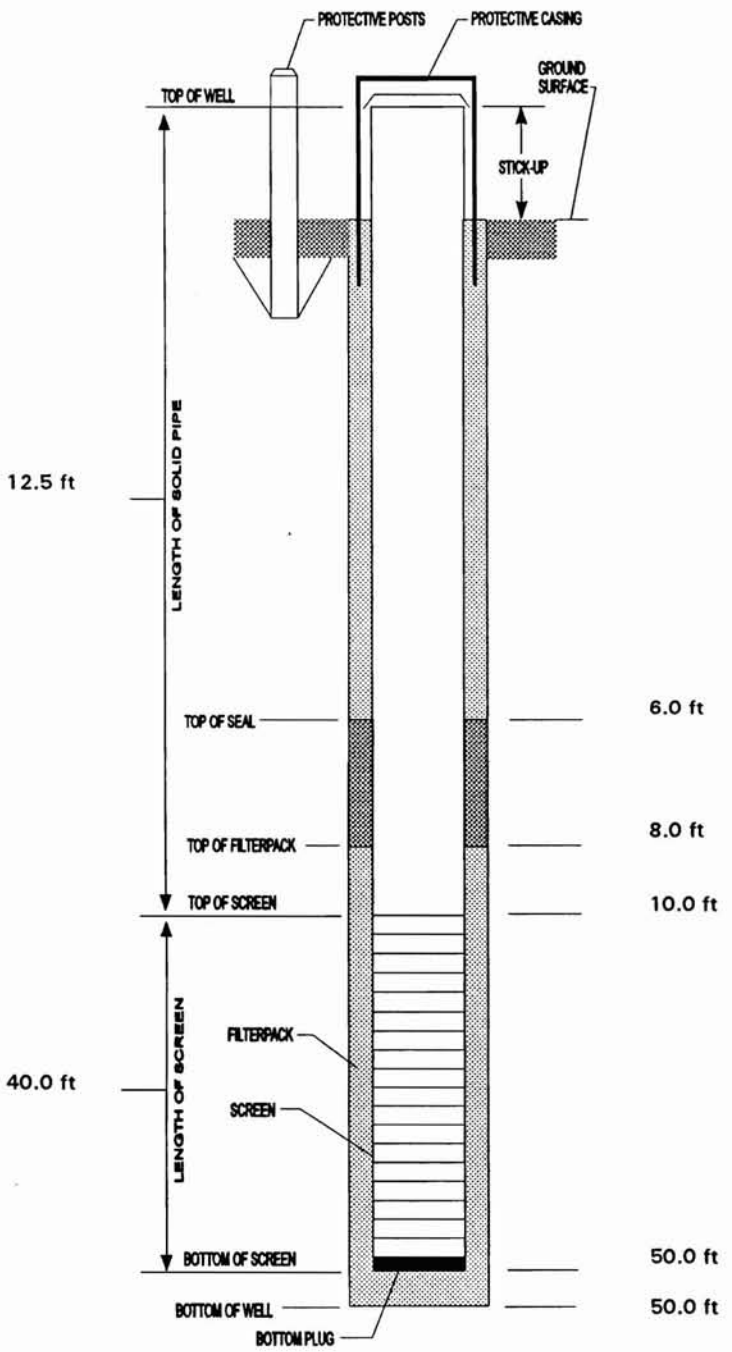
DATE	TIME	DEPTH
DEPTH FROM TOC AFTER DEVELOPMENT:		46.35 ft

HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: 631.25			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 5-1-97	STARTED: 5-1-97	COMPLETED: 5-5-97	LOCATION (Coordinates or Station): N. 298806 E. 2271151
ELEVATION TOP OF HOLE: 681.55			SIGNATURE OF INSPECTOR: Joe Marks
TOTAL DEPTH OF HOLE: 50.0 ft.			HOLE No.: **10B**

(ALL MEASUREMENTS FROM GROUND SURFACE)



PROTECTIVE CASING: 4 in. Square		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	10-Slot	
SCHEDULE:	40	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Bailed & then pumped w/Well Wizard.		
TIME SPENT DEVELOPING:	3.5 hrs 40 min	
VOLUME OF WATER REMOVED:	110 gal (approx)	
VOLUME OF WATER ADDED:	None	
DESCRIPTION OF PREDEVELOPMENT WATER: Very turbid; gray; silt laden		
DESCRIPTION OF POST DEVELOPMENT WATER: Mod-turbid; with silt.		
WATER LEVEL MEASUREMENTS:		

DATE	TIME	DEPTH

DEPTH FROM TOC AFTER DEVELOPMENT:	35.91 ft

APPENDIX C
WELL CONSTRUCTION DRAWINGS

C-4 Task 11. VOC Sampling (Temporary Wells)

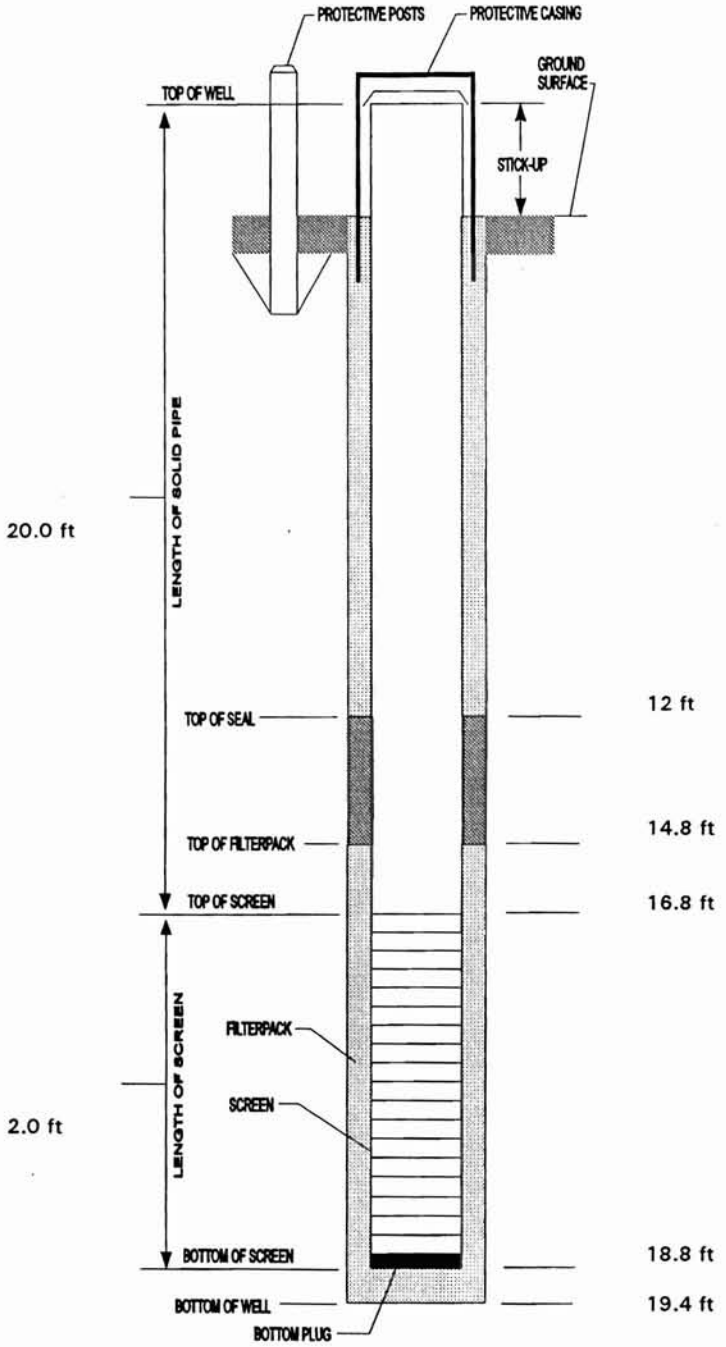
HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: NA			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 6-14-97	STARTED:	COMPLETED:	LOCATION (Coordinates or Station): Buildings 2-02/2-03
ELEVATION TOP OF HOLE: NA (Not surveyed)			SIGNATURE OF INSPECTOR: Roger Wilson
TOTAL DEPTH OF HOLE: 19.4 ft.			HOLE No.: **11C4**

(ALL MEASUREMENTS FROM GROUND SURFACE)

NOTE: TEMPORARY WELL FOR SAMPLING. ABANDONED AND GROUTED AFTER SAMPLING.



PROTECTIVE CASING: NA		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	10-Slot	
SCHEDULE:	40	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: NA		
TIME SPENT DEVELOPING:		
VOLUME OF WATER REMOVED:		
VOLUME OF WATER ADDED:		
DESCRIPTION OF PREDEVELOPMENT WATER:		
DESCRIPTION OF POST DEVELOPMENT WATER:		

WATER LEVEL MEASUREMENTS:

DATE	TIME	DEPTH
DEPTH FROM TOC AFTER DEVELOPMENT:		

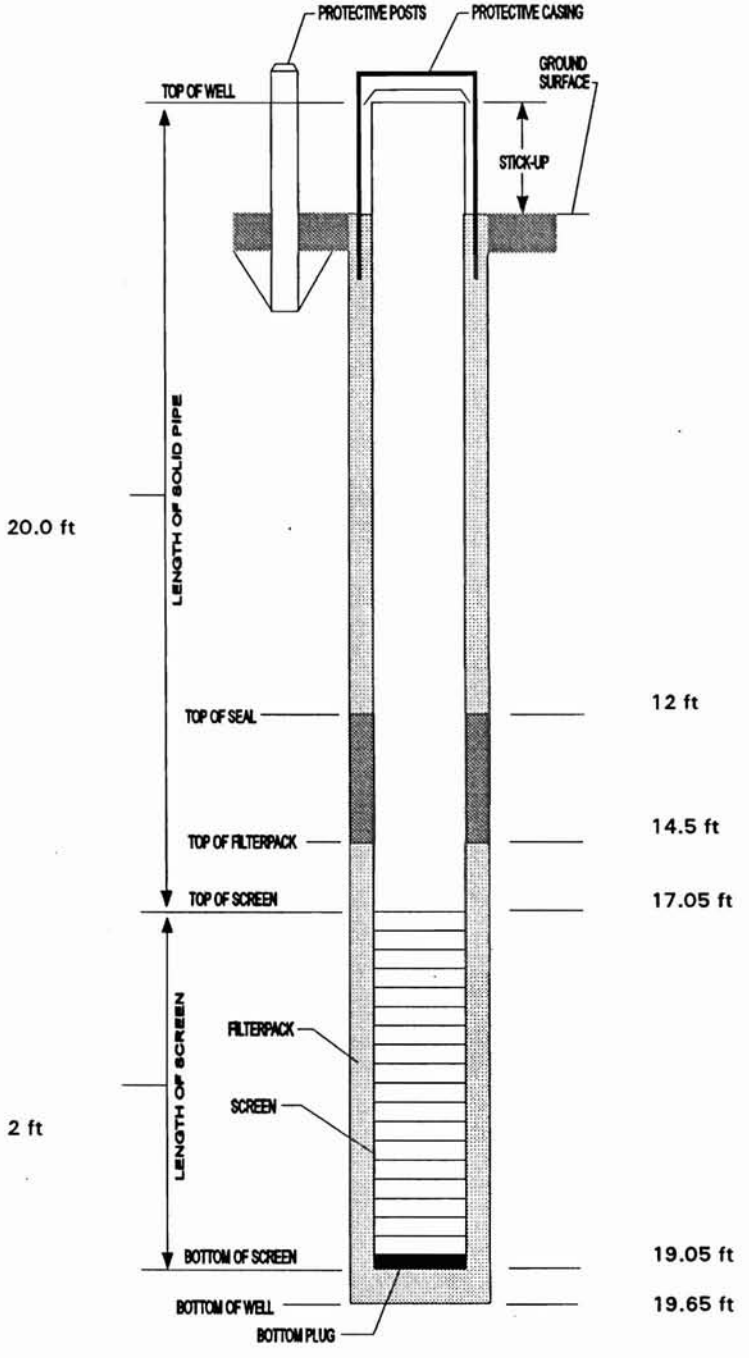
HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: NA			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 6-14-97	STARTED:	COMPLETED:	LOCATION (Coordinates or Station): Buildings 2-02/2-03
ELEVATION TOP OF HOLE: NA (Not surveyed)			SIGNATURE OF INSPECTOR: Roger Wilson
TOTAL DEPTH OF HOLE: 19.65 ft.			HOLE No.: **11C5**

(ALL MEASUREMENTS FROM GROUND SURFACE)

NOTE: TEMPORARY WELL FOR SAMPLING. ABANDONED AND GROUTED AFTER SAMPLING.



PROTECTIVE CASING: NA		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	10-Slot	
SCHEDULE:	40	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: NA		
TIME SPENT DEVELOPING:		
VOLUME OF WATER REMOVED:		
VOLUME OF WATER ADDED:		
DESCRIPTION OF PREDEVELOPMENT WATER:		
DESCRIPTION OF POST DEVELOPMENT WATER:		

WATER LEVEL MEASUREMENTS:

DATE	TIME	DEPTH
DEPTH FROM TOC AFTER DEVELOPMENT:		

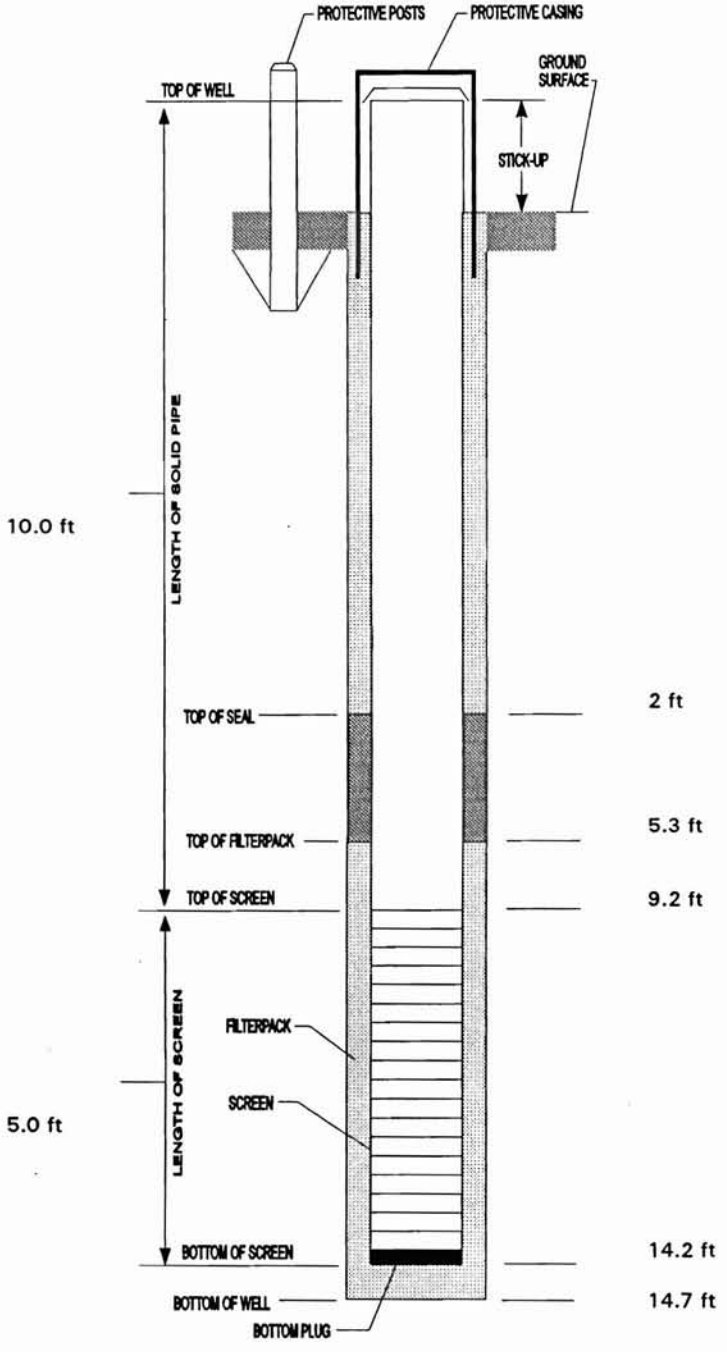
HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: NA			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 6-14-97	STARTED:	COMPLETED:	LOCATION (Coordinates or Station): Buildings 2-02/2-03
ELEVATION TOP OF HOLE: NA (Not surveyed)			SIGNATURE OF INSPECTOR: Roger Wilson
TOTAL DEPTH OF HOLE: 14.7 ft.			HOLE No.: **11C6**

(ALL MEASUREMENTS FROM GROUND SURFACE)

NOTE: TEMPORARY WELL FOR SAMPLING. ABANDONED AND GROUTED AFTER SAMPLING.



PROTECTIVE CASING: NA		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	10-Slot	
SCHEDULE:	40	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: NA		
TIME SPENT DEVELOPING:		
VOLUME OF WATER REMOVED:		
VOLUME OF WATER ADDED:		
DESCRIPTION OF PREDEVELOPMENT WATER:		
DESCRIPTION OF POST DEVELOPMENT WATER:		

WATER LEVEL MEASUREMENTS:

DATE	TIME	DEPTH
DEPTH FROM TOC AFTER DEVELOPMENT:		

APPENDIX C
WELL CONSTRUCTION DRAWINGS

C-5 Task 12. Additional Groundwater Data, Line 2

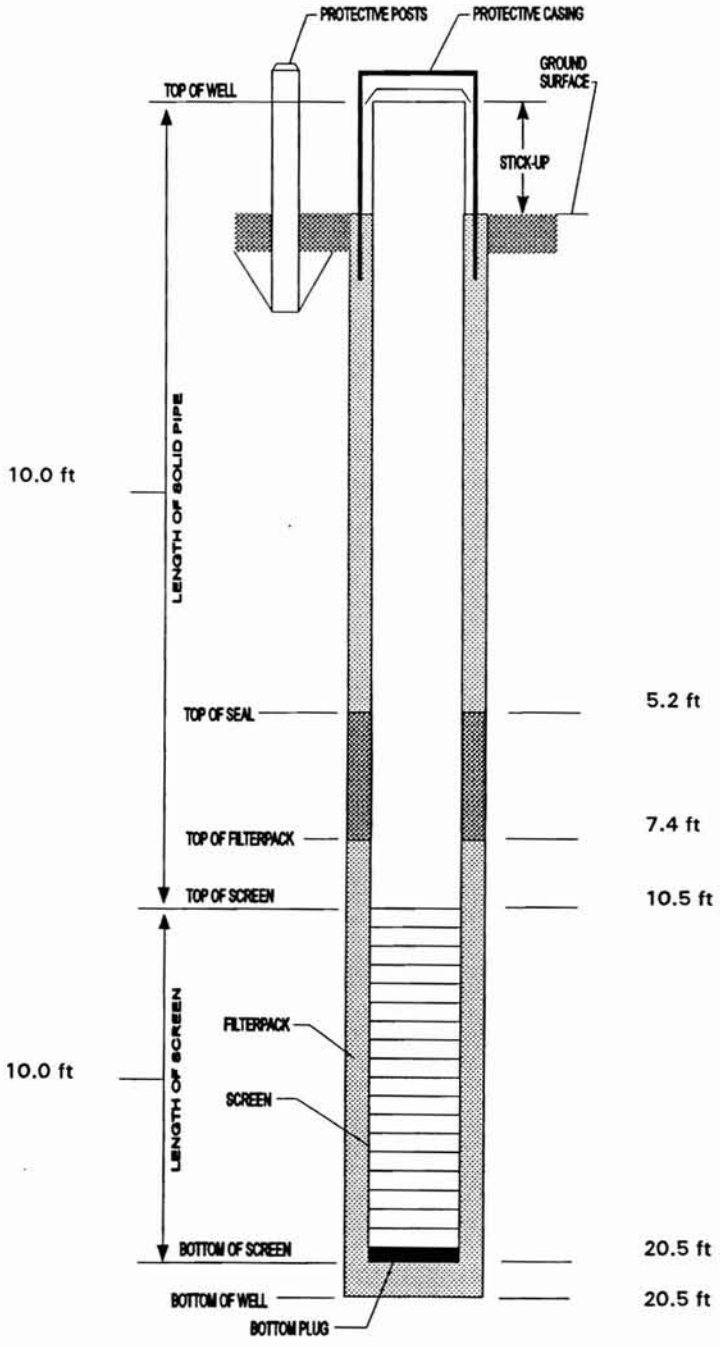
HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

475

ELEVATION GROUND WATER: 673.10			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 5-8-97	STARTED: 5-8-97	COMPLETED: 5-8-97	LOCATION (Coordinates or Station): N. 298785 E. 2270801
ELEVATION TOP OF HOLE: 679.14			SIGNATURE OF INSPECTOR: Roger Wilson
TOTAL DEPTH OF HOLE: 20.5 ft.			HOLE No.: **12A**

(ALL MEASUREMENTS FROM GROUND SURFACE)



PROTECTIVE CASING: 4 in. Square		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Flush Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	10-Slot	
SCHEDULE:	40	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O Silica Sand	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Bailed. Small yields. Bailed down.		
TIME SPENT DEVELOPING:	26 min	
VOLUME OF WATER REMOVED:	10 gal (approx)	
VOLUME OF WATER ADDED:	None	
DESCRIPTION OF PREDEVELOPMENT WATER: Very turbid; gray.		
DESCRIPTION OF POST DEVELOPMENT WATER: Very turbid; gray.		
WATER LEVEL MEASUREMENTS:		

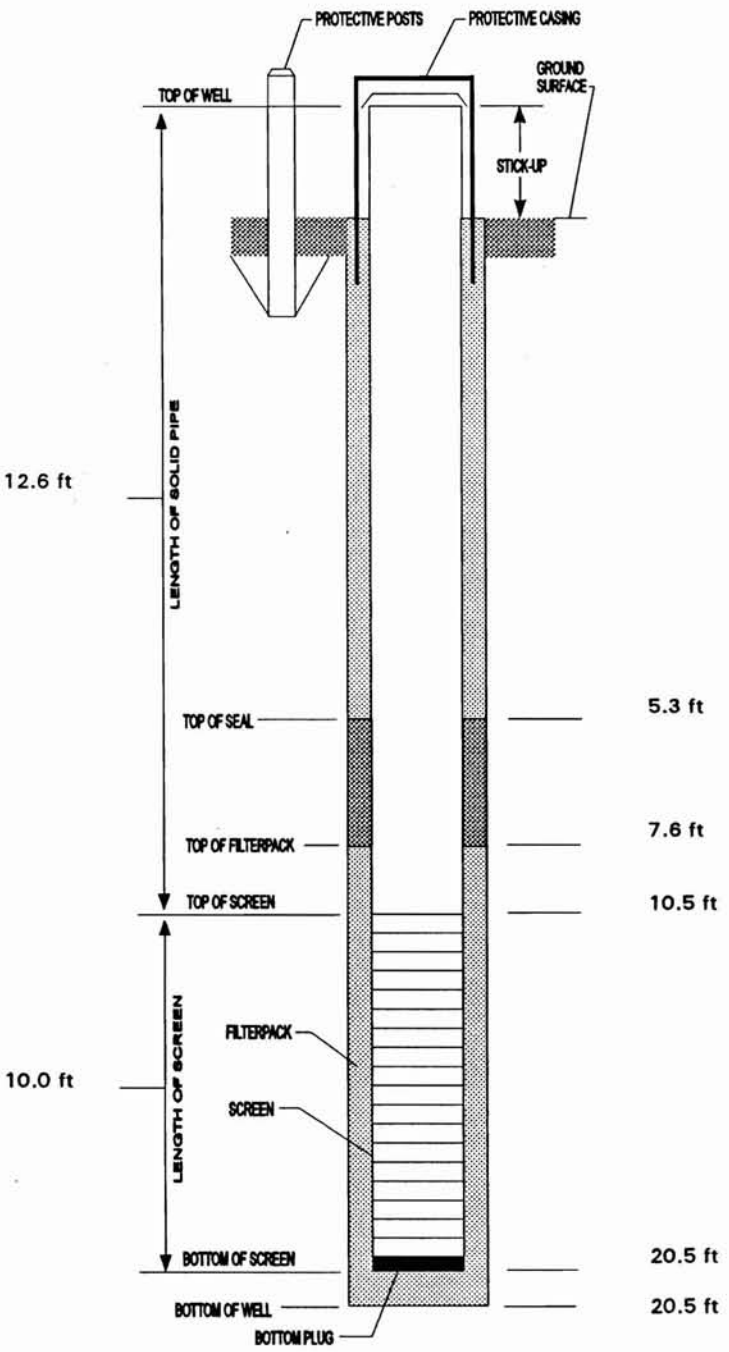
DATE	TIME	DEPTH
DEPTH FROM TOC AFTER DEVELOPMENT:		

HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: 684.35			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 5-10-97	STARTED: 5-10-97	COMPLETED: 5-10-97	LOCATION (Coordinates or Station): N. 297916 E. 2270847
ELEVATION TOP OF HOLE: 689.23 691.44 (TOC)			SIGNATURE OF INSPECTOR: Roger Wilson
TOTAL DEPTH OF HOLE: 20.5 ft.			HOLE No.: **12B**

(ALL MEASUREMENTS FROM GROUND SURFACE)



PROTECTIVE CASING: 4 in. Square		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Flush Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	10-Slot	
SCHEDULE:	40	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #0 Silica Sand	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Bailed and then pumped w/Well Wizard.		
TIME SPENT DEVELOPING:	2 hrs	
VOLUME OF WATER REMOVED:	65 gal (approx)	
VOLUME OF WATER ADDED:	None	
DESCRIPTION OF PREDEVELOPMENT WATER: Very turbid; light tan; silt laden.		
DESCRIPTION OF POST DEVELOPMENT WATER: Moderately turbid; cloudy.		
WATER LEVEL MEASUREMENTS:		
DATE	TIME	DEPTH
DEPTH FROM TOC AFTER DEVELOPMENT:		8.45 ft

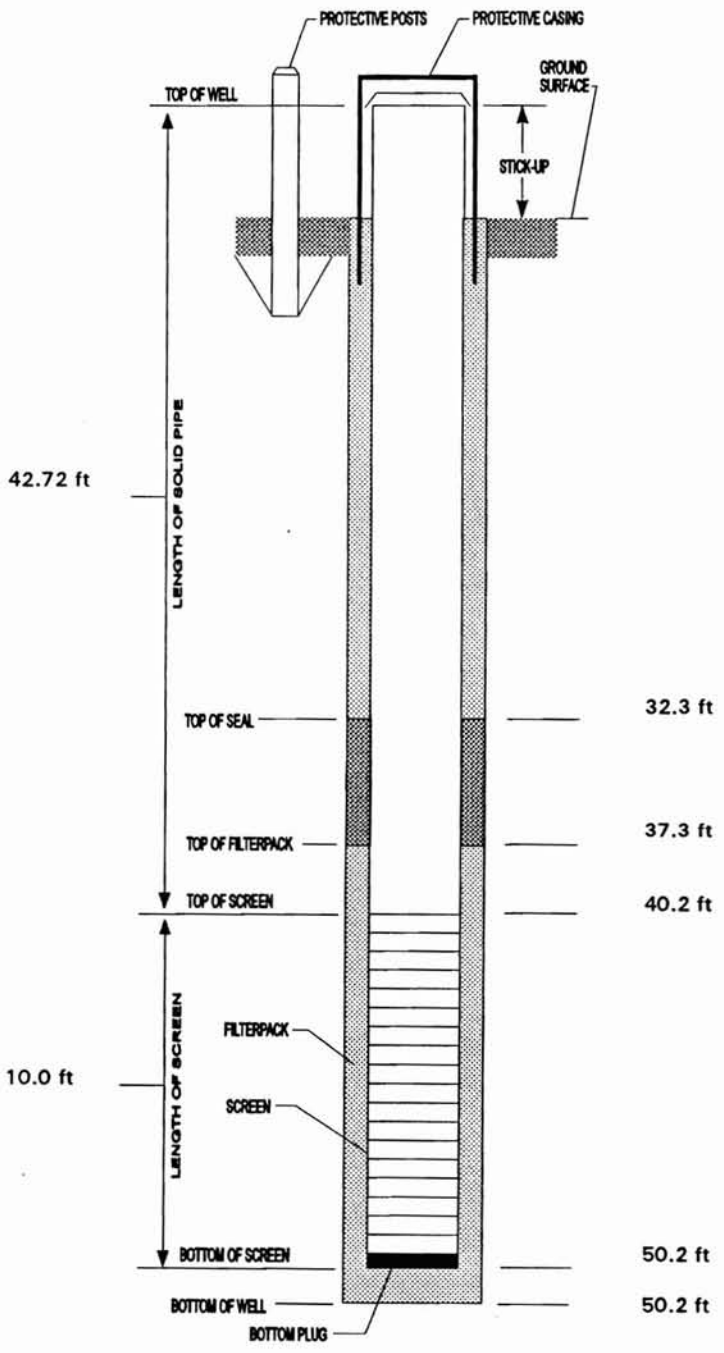
HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

477

ELEVATION GROUND WATER: 671.90			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 5-10-97	STARTED: 5-10-97	COMPLETED: 5-10-97	LOCATION (Coordinates or Station): N. 297922 E. 2270835
ELEVATION TOP OF HOLE: 689.18 691.66 (TOC)			SIGNATURE OF INSPECTOR: Roger Wilson
TOTAL DEPTH OF HOLE: 50.5 ft.			HOLE No.: **12C**

(ALL MEASUREMENTS FROM GROUND SURFACE)



PROTECTIVE CASING: 4 in. Square		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Flush Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	10-Slot	
SCHEDULE:	40	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O Silica Sand	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Bailed. Very slow recovery. Bailed down.		
TIME SPENT DEVELOPING:	38 min	
VOLUME OF WATER REMOVED:		
VOLUME OF WATER ADDED:	None	
DESCRIPTION OF PREDEVELOPMENT WATER: Very turbid; gray; silt laden.		
DESCRIPTION OF POST DEVELOPMENT WATER: Very turbid; gray; silt laden.		

WATER LEVEL MEASUREMENTS:

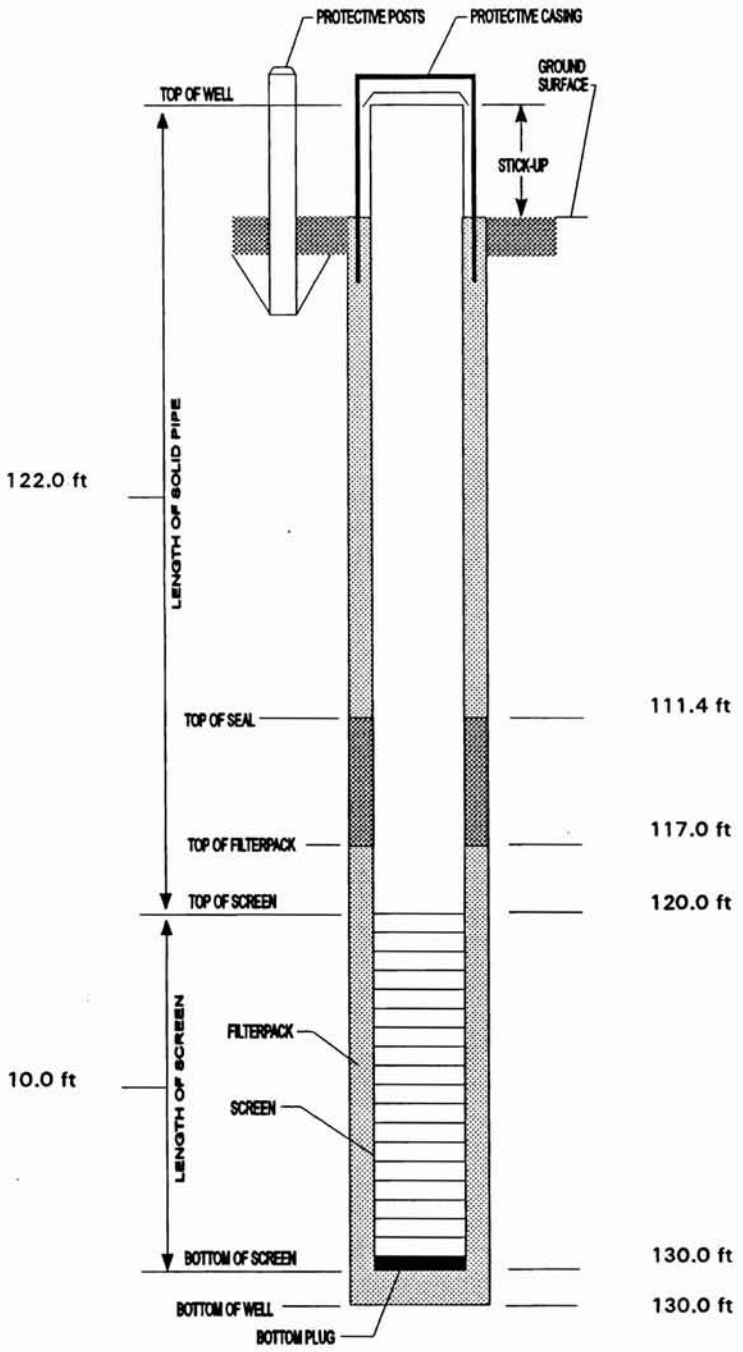
DATE	TIME	DEPTH
DEPTH FROM TOC AFTER DEVELOPMENT:		Dry

HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: 646.73			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 5-8-97	STARTED: 5-7-97	COMPLETED: 5-9-97	LOCATION (Coordinates or Station): N. 297913 E. 2270838
ELEVATION TOP OF HOLE: 689.28 691.26 (TOC)			SIGNATURE OF INSPECTOR: Joe Mark
TOTAL DEPTH OF HOLE: 130.0 ft.			HOLE No.: **12D**

(ALL MEASUREMENTS FROM GROUND SURFACE)



PROTECTIVE CASING: 4 in. Square		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Flush Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	10-Slot	
SCHEDULE:	40	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O Silica Sand	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Bailed. Very slow recovery.		
TIME SPENT DEVELOPING:	2 hrs	
VOLUME OF WATER REMOVED:	35 gal.	
VOLUME OF WATER ADDED:	None	
DESCRIPTION OF PREDEVELOPMENT WATER: Turbid; gray.		
DESCRIPTION OF POST DEVELOPMENT WATER: Turbid; gray.		
WATER LEVEL MEASUREMENTS:		
DATE	TIME	DEPTH
DEPTH FROM TOC AFTER DEVELOPMENT:		123.7 ft

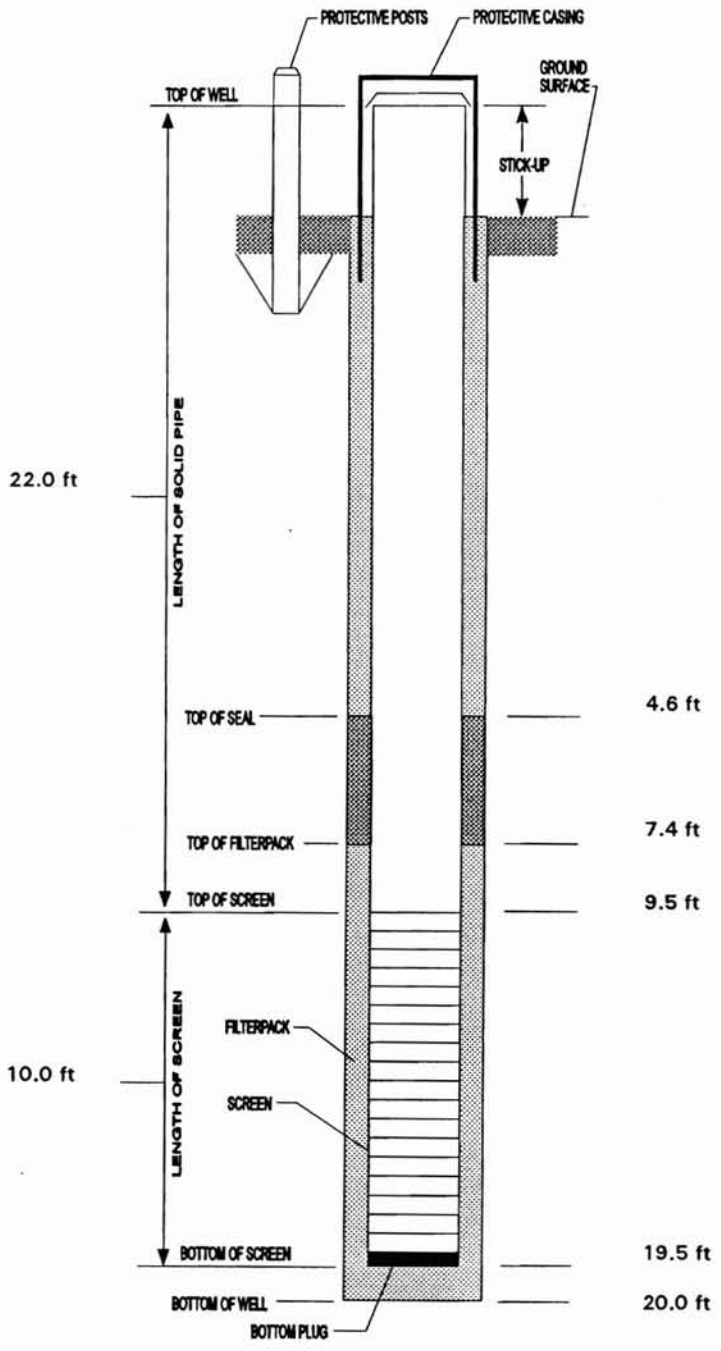
HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

479

ELEVATION GROUND WATER:			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 5-7-97	STARTED: 5-7-97	COMPLETED: 5-7-97	LOCATION (Coordinates or Station): N. E.
ELEVATION TOP OF HOLE:			SIGNATURE OF INSPECTOR: Joe Mark
TOTAL DEPTH OF HOLE: 20.0 ft.			HOLE No.: 12E

(ALL MEASUREMENTS FROM GROUND SURFACE)



PROTECTIVE CASING: 4 in. Square		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Flush Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	10-Slot	
SCHEDULE:	40	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #0 Silica Sand	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Bailed then pumped w/Well Wizard.		
TIME SPENT DEVELOPING:	3 hrs	
VOLUME OF WATER REMOVED:	57 gal.	
VOLUME OF WATER ADDED:	None	
DESCRIPTION OF PREDEVELOPMENT WATER: Very turbid; contained fine sand and silt.		
DESCRIPTION OF POST DEVELOPMENT WATER: Slightly turbid.		
WATER LEVEL MEASUREMENTS:		

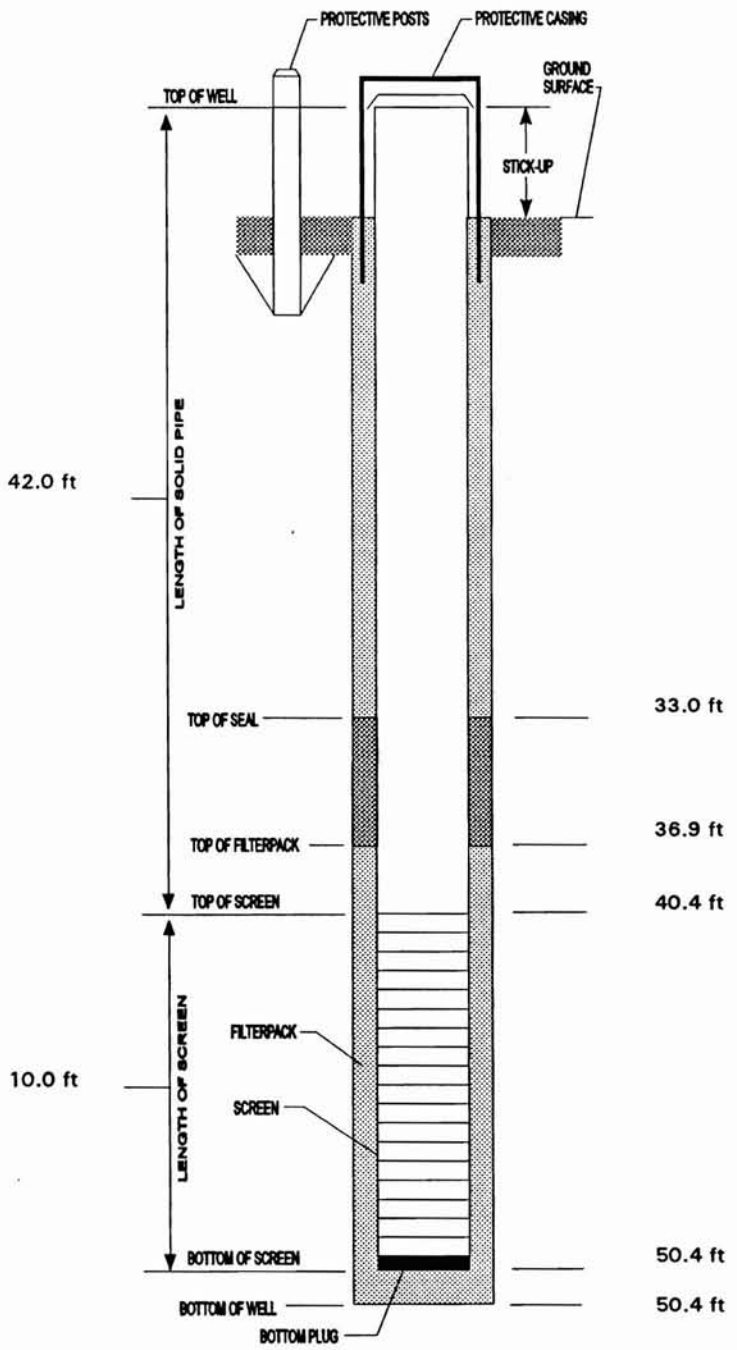
DATE	TIME	DEPTH
DEPTH FROM TOC AFTER DEVELOPMENT:		11.55 ft

HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: Dry (<637.86)			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 5-9-97	STARTED: 5-9-97	COMPLETED: 5-9-97	LOCATION (Coordinates or Station): N. 298193 E. 2271212
ELEVATION TOP OF HOLE: 688.26 690.54 (TOC)			SIGNATURE OF INSPECTOR: Roger Wilson
TOTAL DEPTH OF HOLE: 50.4 ft.			HOLE No.: 12F

(ALL MEASUREMENTS FROM GROUND SURFACE)



PROTECTIVE CASING: 4 in. Square		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Flush Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	10-Slot	
SCHEDULE:	40	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O Silica Sand	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Not developed. Well dry upon completion.		
TIME SPENT DEVELOPING:	NA	
VOLUME OF WATER REMOVED:	NA	
VOLUME OF WATER ADDED:	None	
DESCRIPTION OF PREDEVELOPMENT WATER: NA		
DESCRIPTION OF POST DEVELOPMENT WATER: NA		
WATER LEVEL MEASUREMENTS:		
DATE	TIME	DEPTH
DEPTH FROM TOC AFTER DEVELOPMENT:		Dry

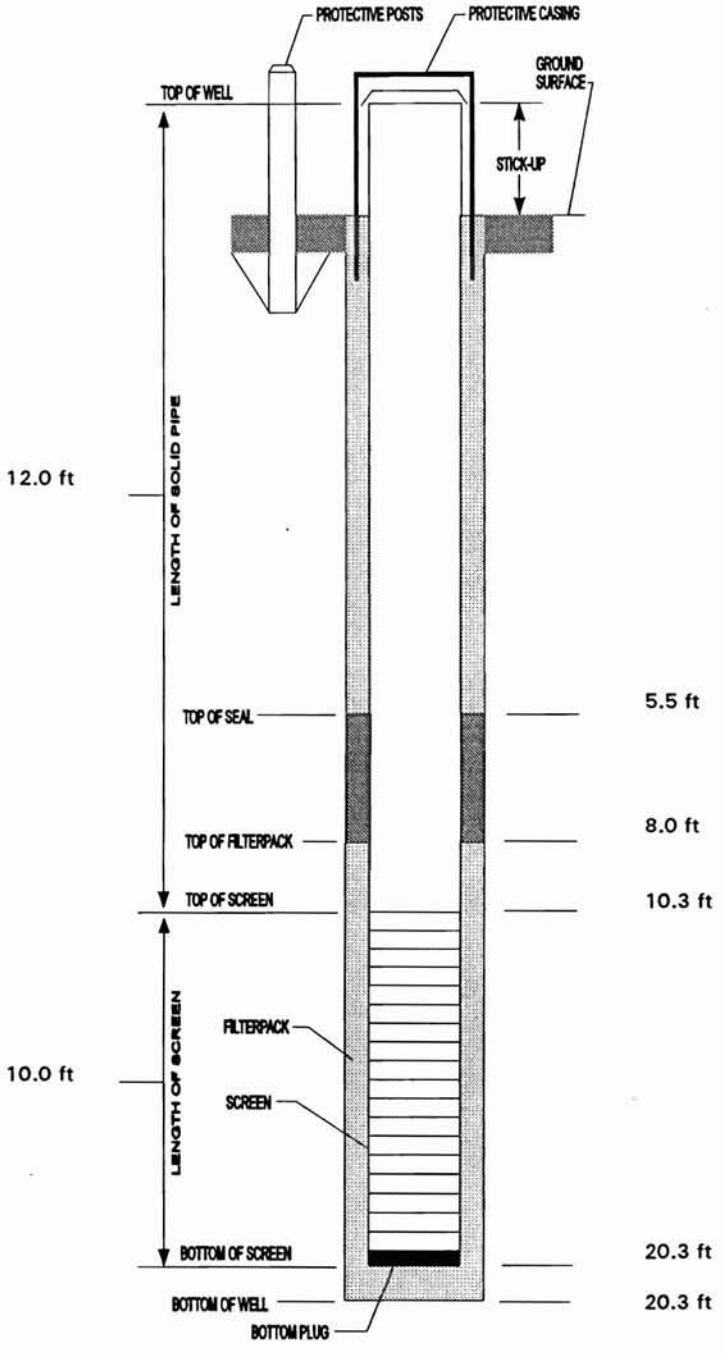
HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

481

ELEVATION GROUND WATER: 681.96			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 5-9-97	STARTED: 5-9-97	COMPLETED: 5-9-97	LOCATION (Coordinates or Station): Line 2 N. 298,035 E. 2,270,441
ELEVATION TOP OF HOLE: 687.97 690.00 (TOC)			SIGNATURE OF INSPECTOR: Roger Wilson
TOTAL DEPTH OF HOLE: 20.3 ft.			HOLE No.: **12G**

(ALL MEASUREMENTS FROM GROUND SURFACE)



PROTECTIVE CASING: 4 in. Square		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Flush Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	10-Slot	
SCHEDULE:	40	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #0 Silica Sand	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Bailed. Small recharge. Bailed down.		
TIME SPENT DEVELOPING:	36 min	
VOLUME OF WATER REMOVED:	10 gal.	
VOLUME OF WATER ADDED:	None	
DESCRIPTION OF PREDEVELOPMENT WATER: Very turbid; gray.		
DESCRIPTION OF POST DEVELOPMENT WATER: Very turbid; gray.		

WATER LEVEL MEASUREMENTS:

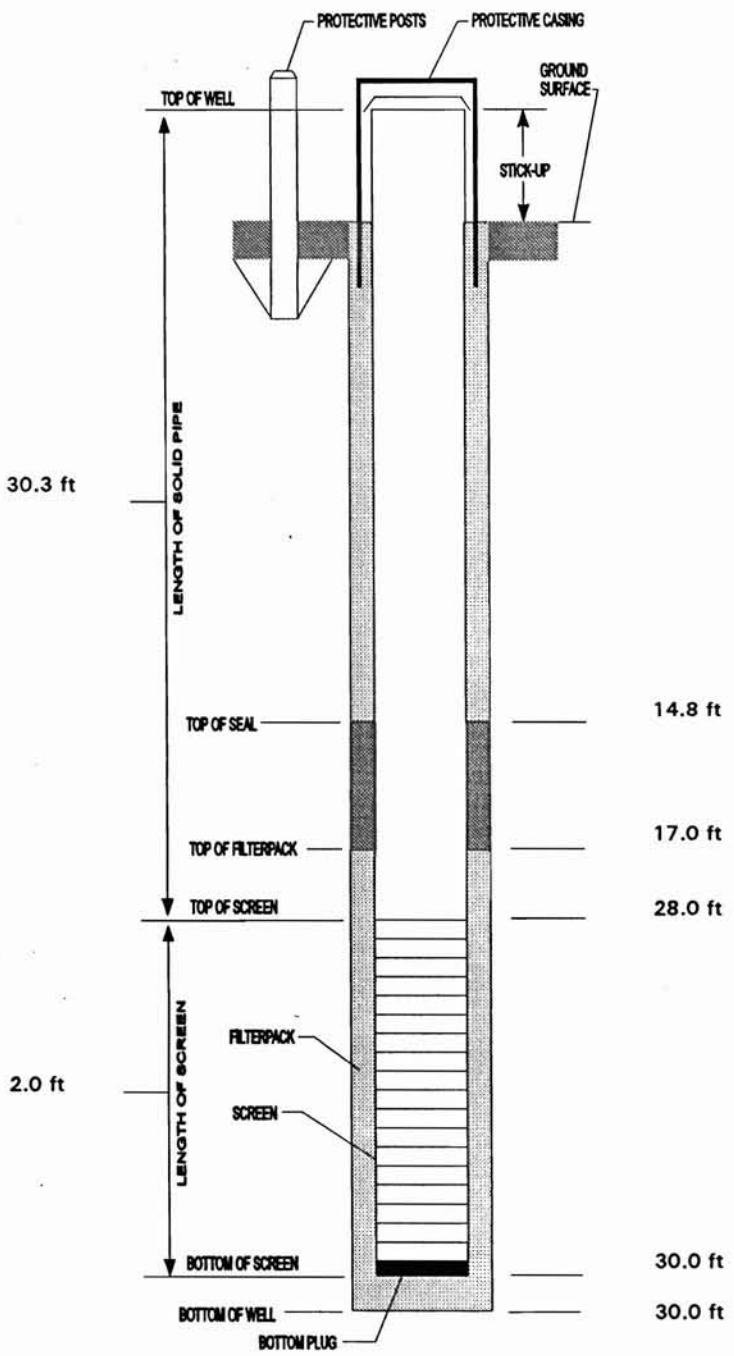
DATE	TIME	DEPTH
5-9-97	am	4.6 ft
DEPTH FROM TOC AFTER DEVELOPMENT:		11.55 ft

HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: 683.6			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 4-29-97	STARTED: 4-29-97	COMPLETED: 4-29-97	LOCATION (Coordinates or Station): Line 2/Line 3 N.: 298,714 E: 2,269,728
ELEVATION TOP OF HOLE: 688.13 689.60 (TOC)			SIGNATURE OF INSPECTOR: Joe Marks
TOTAL DEPTH OF HOLE: 30 ft.			HOLE No.: **12H**

(ALL MEASUREMENTS FROM GROUND SURFACE)



PROTECTIVE CASING: 4 in. Square		
BLANK CASING		
DIAMETER:	1 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Threaded	
SCREEN INFORMATION:		
DIAMETER:	1 in.	
SLOT WIDTH:	Porous Tip	
SCHEDULE:	40	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O	
BACKFILL METHOD:	Poured slowly from the top	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Piezometer; No development required.		
TIME SPENT DEVELOPING:	NA	
VOLUME OF WATER REMOVED:	NA	
VOLUME OF WATER ADDED:	NA	
DESCRIPTION OF PREDEVELOPMENT WATER: NA		
DESCRIPTION OF POST DEVELOPMENT WATER: NA		

WATER LEVEL MEASUREMENTS:

DATE	TIME	DEPTH
DEPTH FROM TOC AFTER DEVELOPMENT:		

APPENDIX C
WELL CONSTRUCTION DRAWINGS

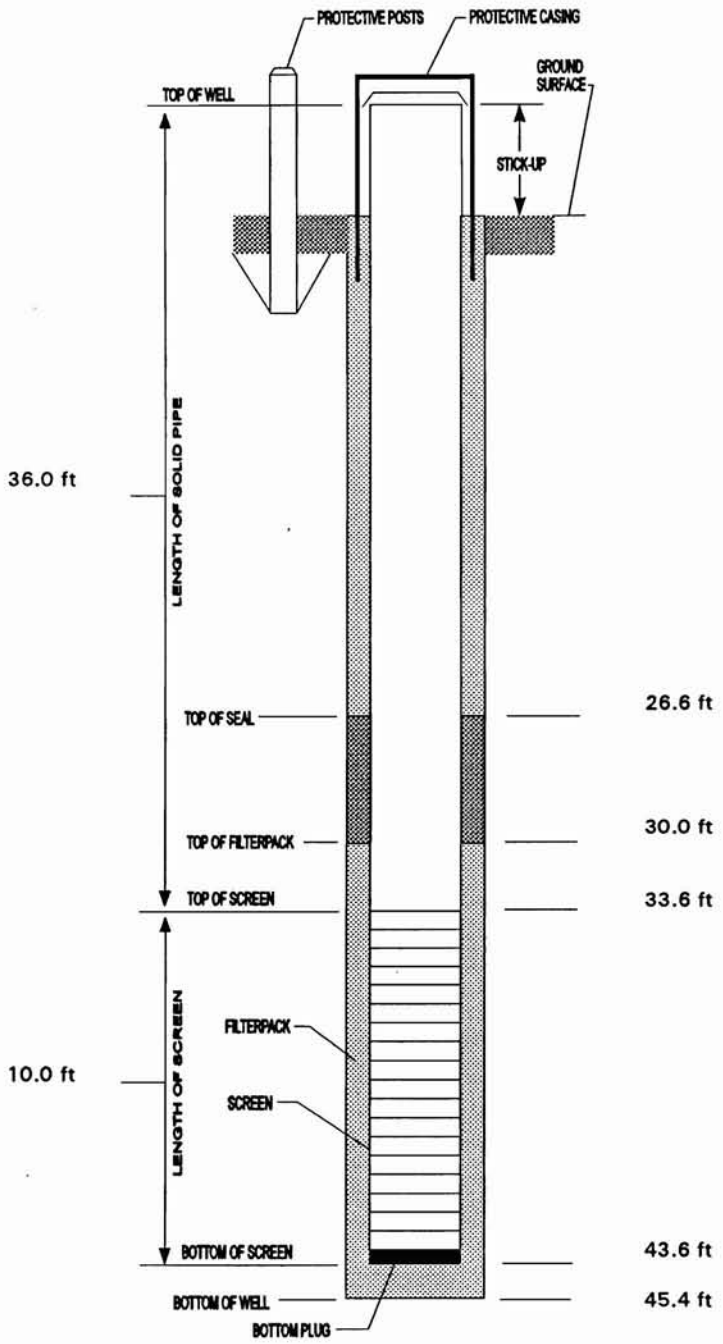
C-6 Task 13. Groundwater Data, Downstream Reach, Brush Creek

HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: 607.97			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 5-15-97	STARTED: 5-14-97	COMPLETED: 5-16-97	LOCATION (Coordinates or Station): N. 287766 E. 2277256
ELEVATION TOP OF HOLE: 629.59			SIGNATURE OF INSPECTOR: Joe Mark
TOTAL DEPTH OF HOLE: 45.4 ft.			HOLE No.: **13B**

(ALL MEASUREMENTS FROM GROUND SURFACE)



PROTECTIVE CASING: 4 in. Square		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Flush Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	10-Slot	
SCHEDULE:	40	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O Silica Sand	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Bailed then pumped w/Well Wizard.		
TIME SPENT DEVELOPING:	2 hrs 51 min	
VOLUME OF WATER REMOVED:	70 gal.	
VOLUME OF WATER ADDED:	None	
DESCRIPTION OF PREDEVELOPMENT WATER: Very turbid; light tan.		
DESCRIPTION OF POST DEVELOPMENT WATER: Milky.		

WATER LEVEL MEASUREMENTS:

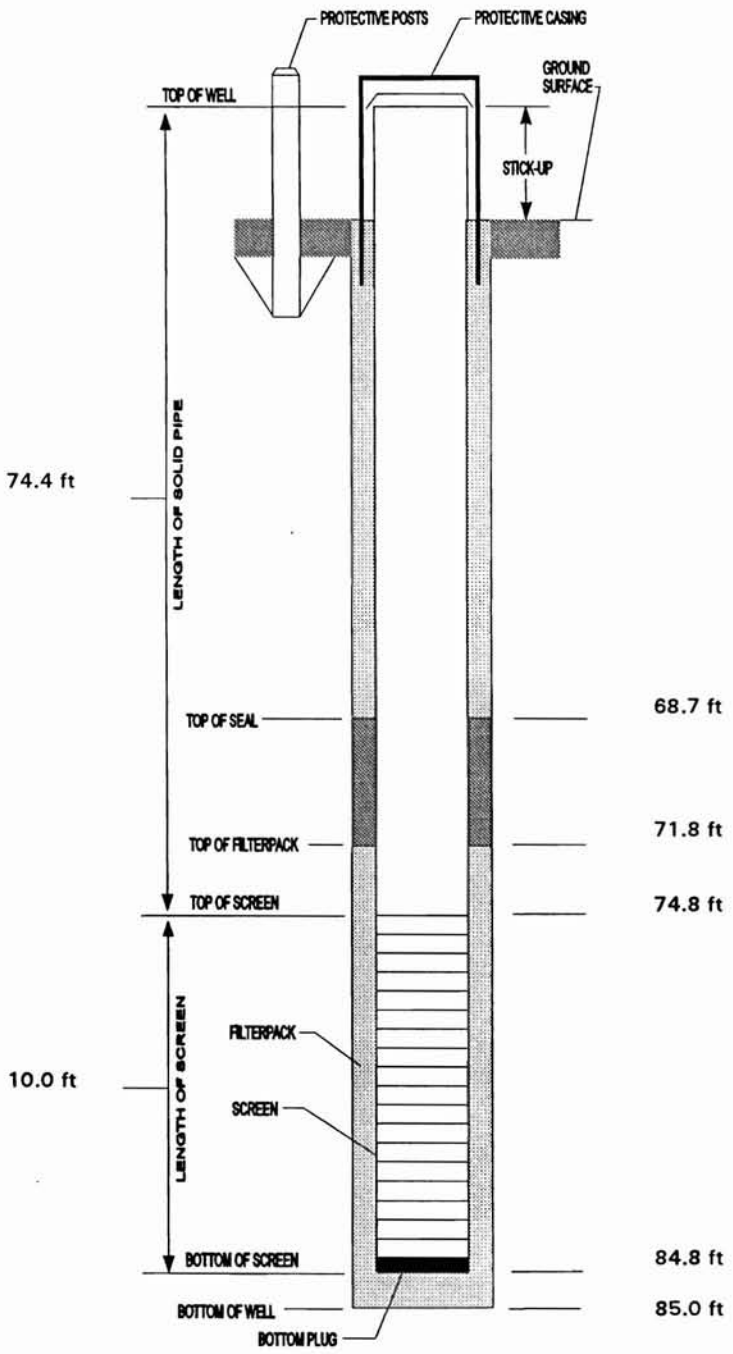
DATE	TIME	DEPTH
DEPTH FROM TOC AFTER DEVELOPMENT:		29.41 ft

HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: 617.29			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 5-16-97	STARTED: 5-16-97	COMPLETED: 5-17-97	LOCATION (Coordinates or Station): N. 288,128 E. 2,278,282
ELEVATION TOP OF HOLE: 652.84 654.59 (TOC)			SIGNATURE OF INSPECTOR: Roger Wilson
TOTAL DEPTH OF HOLE: 85.0 ft.			HOLE No.: **13D**

(ALL MEASUREMENTS FROM GROUND SURFACE)



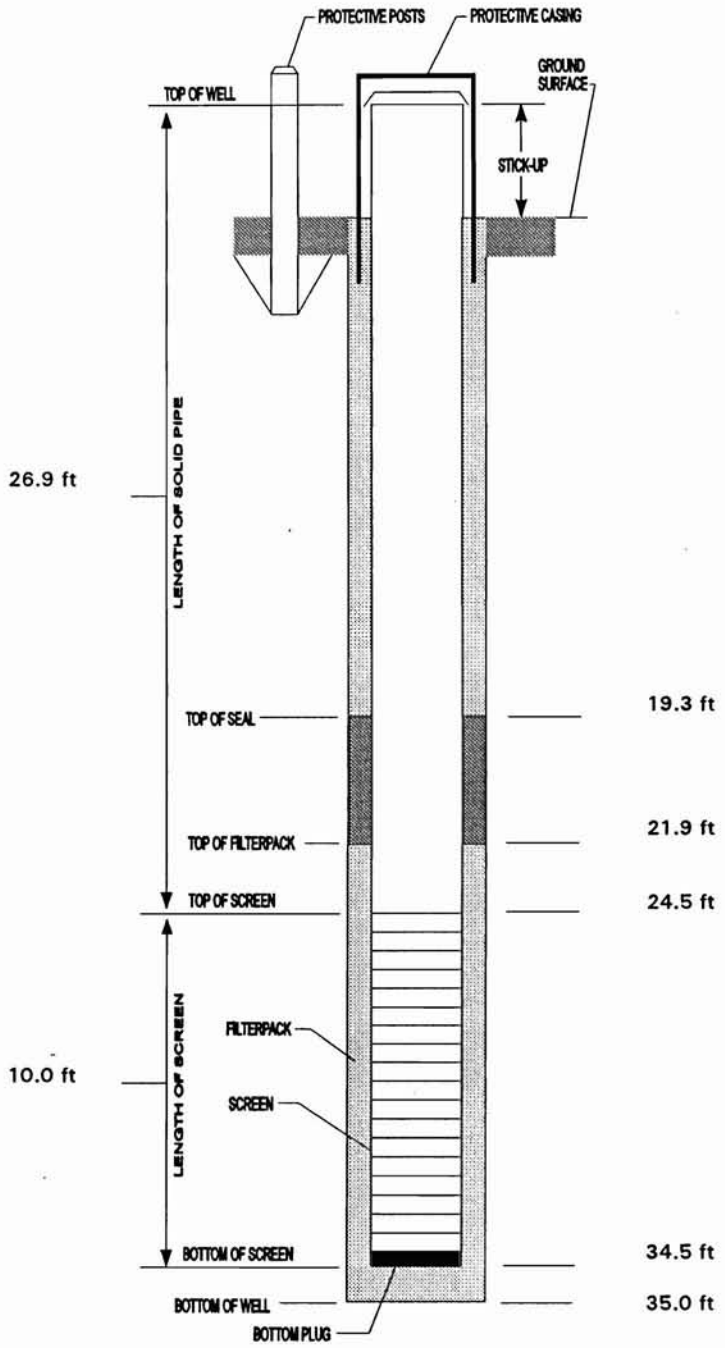
PROTECTIVE CASING: 4 in. Square		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Flush Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	10-Slot	
SCHEDULE:	40	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O Silica Sand	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Bailed. Slow recovery. Bailed dry.		
TIME SPENT DEVELOPING:	29 min	
VOLUME OF WATER REMOVED:	10 gal.	
VOLUME OF WATER ADDED:	None	
DESCRIPTION OF PREDEVELOPMENT WATER: Very turbid.		
DESCRIPTION OF POST DEVELOPMENT WATER: Very turbid.		
WATER LEVEL MEASUREMENTS:		
DATE	TIME	DEPTH
DEPTH FROM TOC AFTER DEVELOPMENT:		Dry

HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: 624.18			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 5-16-97	STARTED: 5-16-97	COMPLETED: 5-17-97	LOCATION (Coordinates or Station): N. 288,119 E. 2,278,285
ELEVATION TOP OF HOLE: 652.56 654.21 (TOC)			SIGNATURE OF INSPECTOR: Roger Wilson
TOTAL DEPTH OF HOLE: 35.0 ft.			HOLE No.: **13E**

(ALL MEASUREMENTS FROM GROUND SURFACE)



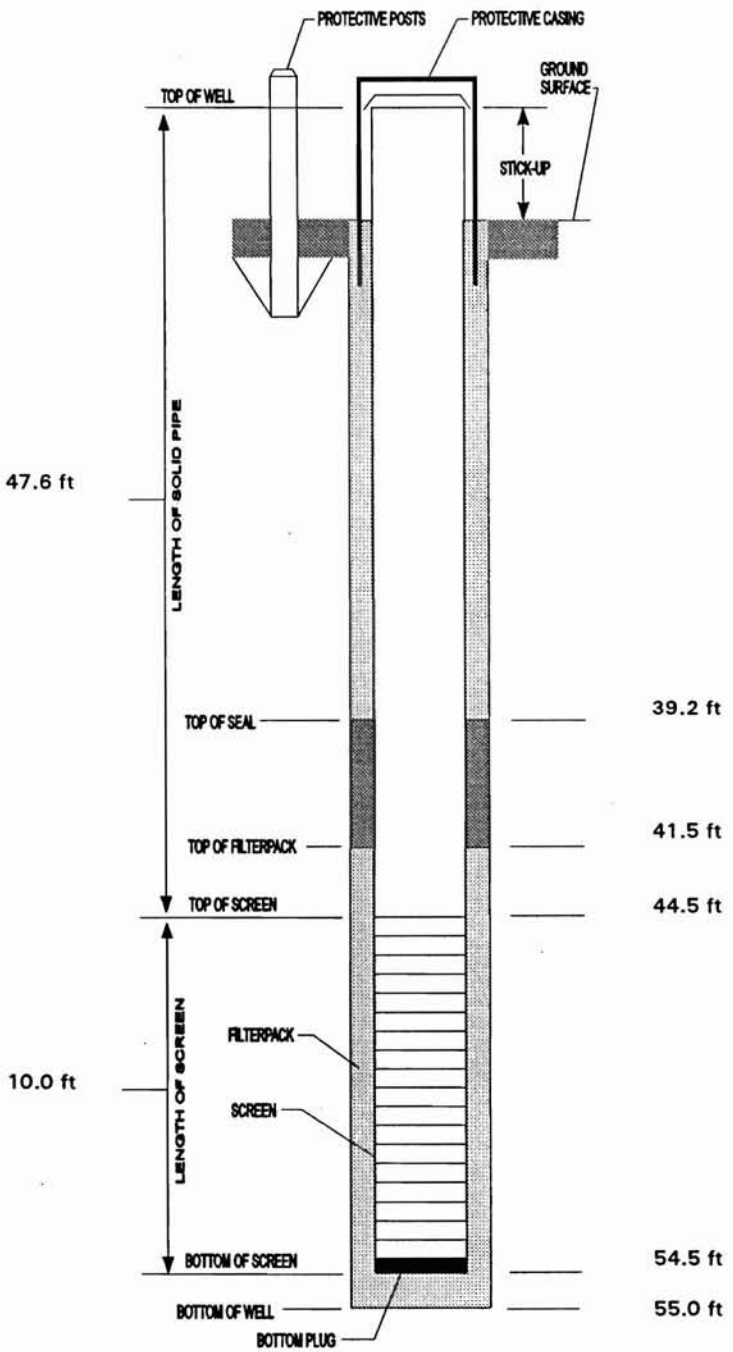
PROTECTIVE CASING: 4 in. Square		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Flush Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	10-Slot	
SCHEDULE:	40	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #0 Silica Sand	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Bailed dry.		
TIME SPENT DEVELOPING:	14 min	
VOLUME OF WATER REMOVED:	7 gal.	
VOLUME OF WATER ADDED:	None	
DESCRIPTION OF PREDEVELOPMENT WATER: Very turbid; light tan.		
DESCRIPTION OF POST DEVELOPMENT WATER: Very turbid; light tan.		
WATER LEVEL MEASUREMENTS:		
DATE	TIME	DEPTH
DEPTH FROM TOC AFTER DEVELOPMENT:		Dry

HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: 607.88			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 5-16-97	STARTED: 5-16-97	COMPLETED: 5-17-97	LOCATION (Coordinates or Station): N. 288,227 E. 2,278,612
ELEVATION TOP OF HOLE: 658.65 660.44 (TOC)			SIGNATURE OF INSPECTOR: Roger Wilson
TOTAL DEPTH OF HOLE: 55.0 ft.			HOLE No.: **13F**

(ALL MEASUREMENTS FROM GROUND SURFACE)



PROTECTIVE CASING: 4 in. Square		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Flush Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	10-Slot	
SCHEDULE:	40	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O Silica Sand	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Bailed dry.		
TIME SPENT DEVELOPING:	8 min	
VOLUME OF WATER REMOVED:	1 gal.	
VOLUME OF WATER ADDED:	None	
DESCRIPTION OF PREDEVELOPMENT WATER: Very turbid; gray.		
DESCRIPTION OF POST DEVELOPMENT WATER: Very turbid; gray.		
WATER LEVEL MEASUREMENTS:		
DATE	TIME	DEPTH
DEPTH FROM TOC AFTER DEVELOPMENT:		Dry

APPENDIX C
WELL CONSTRUCTION DRAWINGS

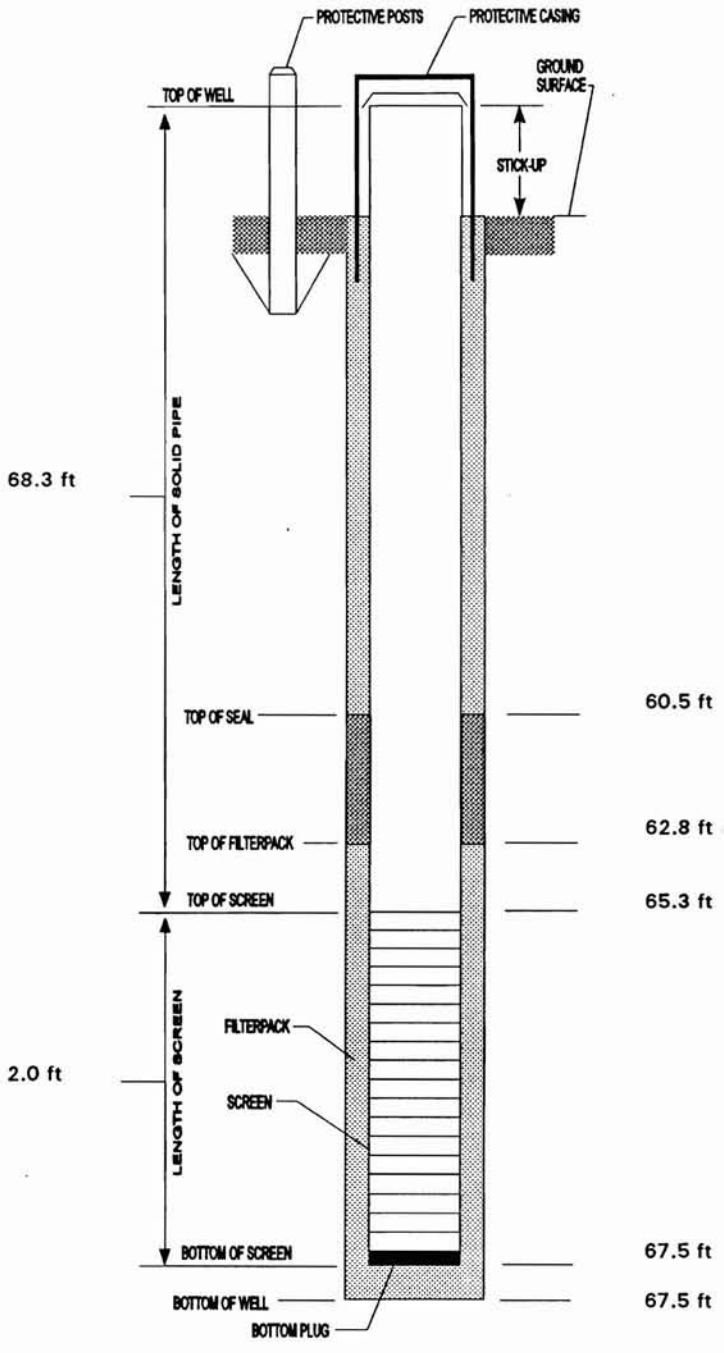
C-7 Task 14. Bedrock Surface/Piezometers

HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: 660.15			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 4-23-97	STARTED: 4-22-97	COMPLETED: 4-22-97	LOCATION (Coordinates or Station): N. 298163 E. 2275920
ELEVATION TOP OF HOLE: 691.57 693.83 (TOC)			SIGNATURE OF INSPECTOR: Janusz Pyrich
TOTAL DEPTH OF HOLE: 67.5 ft.			HOLE No.: **14A**

(ALL MEASUREMENTS FROM GROUND SURFACE)



PROTECTIVE CASING: 4 in. Square		
BLANK CASING		
DIAMETER:	1 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Flush Threaded w/O-rings	
SCREEN INFORMATION:		
DIAMETER:	1 in.	
SLOT WIDTH:	Porous Tip	
SCHEDULE:	NA	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O Silica Sand	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Piezometer. Not required.		
TIME SPENT DEVELOPING:	NA	
VOLUME OF WATER REMOVED:	NA	
VOLUME OF WATER ADDED:	None	
DESCRIPTION OF PREDEVELOPMENT WATER: NA		
DESCRIPTION OF POST DEVELOPMENT WATER: NA		

WATER LEVEL MEASUREMENTS:

DATE	TIME	DEPTH
4/23/97	1015	20.86 ft

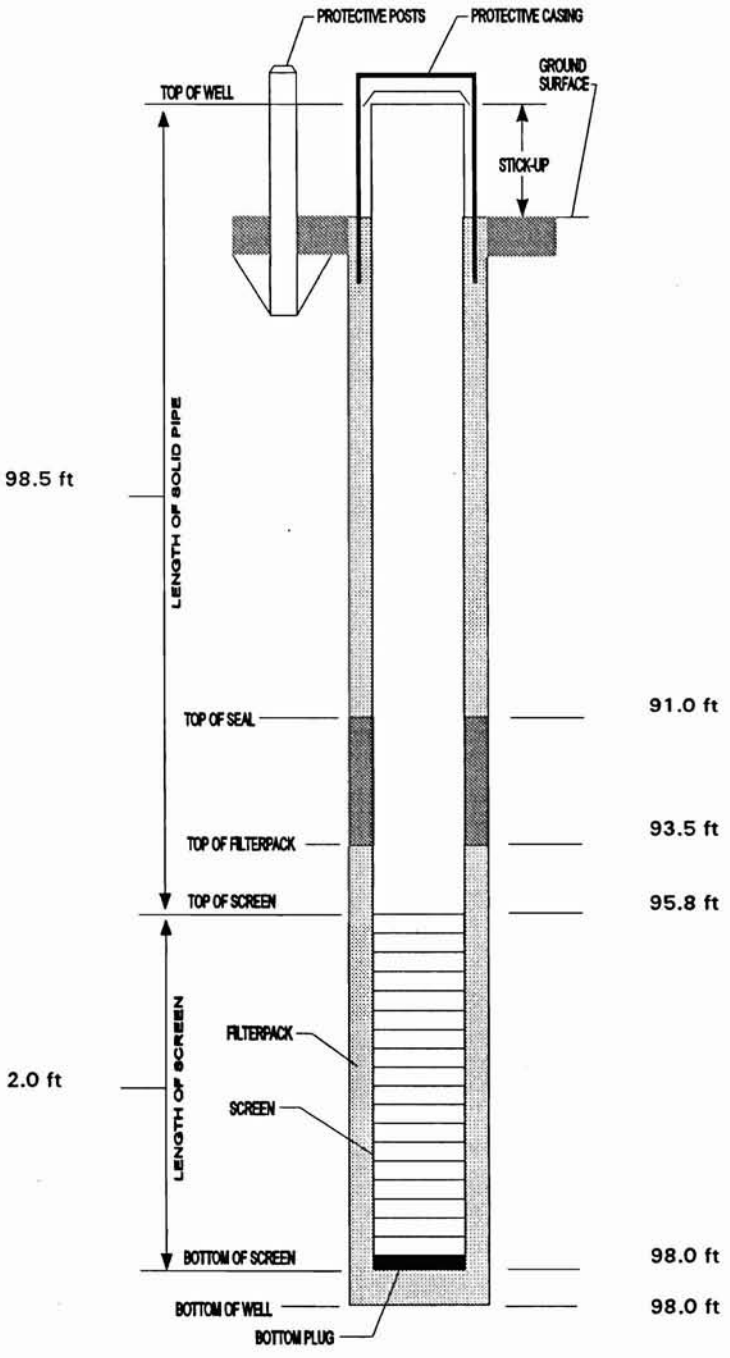
DEPTH FROM TOC AFTER DEVELOPMENT:	NA

HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: 631.10			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 4-24-97	STARTED: 4-23-97	COMPLETED: 4-24-97	LOCATION (Coordinates or Station): N. 292,255 E. 2,276,162
ELEVATION TOP OF HOLE: 678.28 680.84 (TOC)			SIGNATURE OF INSPECTOR: Janusz Pyrich
TOTAL DEPTH OF HOLE: 98.0 ft.			HOLE No.: **14B**

(ALL MEASUREMENTS FROM GROUND SURFACE)



PROTECTIVE CASING: 4 in. Square		
BLANK CASING		
DIAMETER:	1 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Flush Threaded w/O-rings	
SCREEN INFORMATION:		
DIAMETER:	1 in.	
SLOT WIDTH:	Porous Tip	
SCHEDULE:	NA	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O Silica Sand	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Piezometer. Not required.		
TIME SPENT DEVELOPING:	NA	
VOLUME OF WATER REMOVED:	NA	
VOLUME OF WATER ADDED:	None	
DESCRIPTION OF PREDEVELOPMENT WATER: NA		
DESCRIPTION OF POST DEVELOPMENT WATER: NA		
WATER LEVEL MEASUREMENTS:		

DATE	TIME	DEPTH
4/24/97	1430	16.0 ft

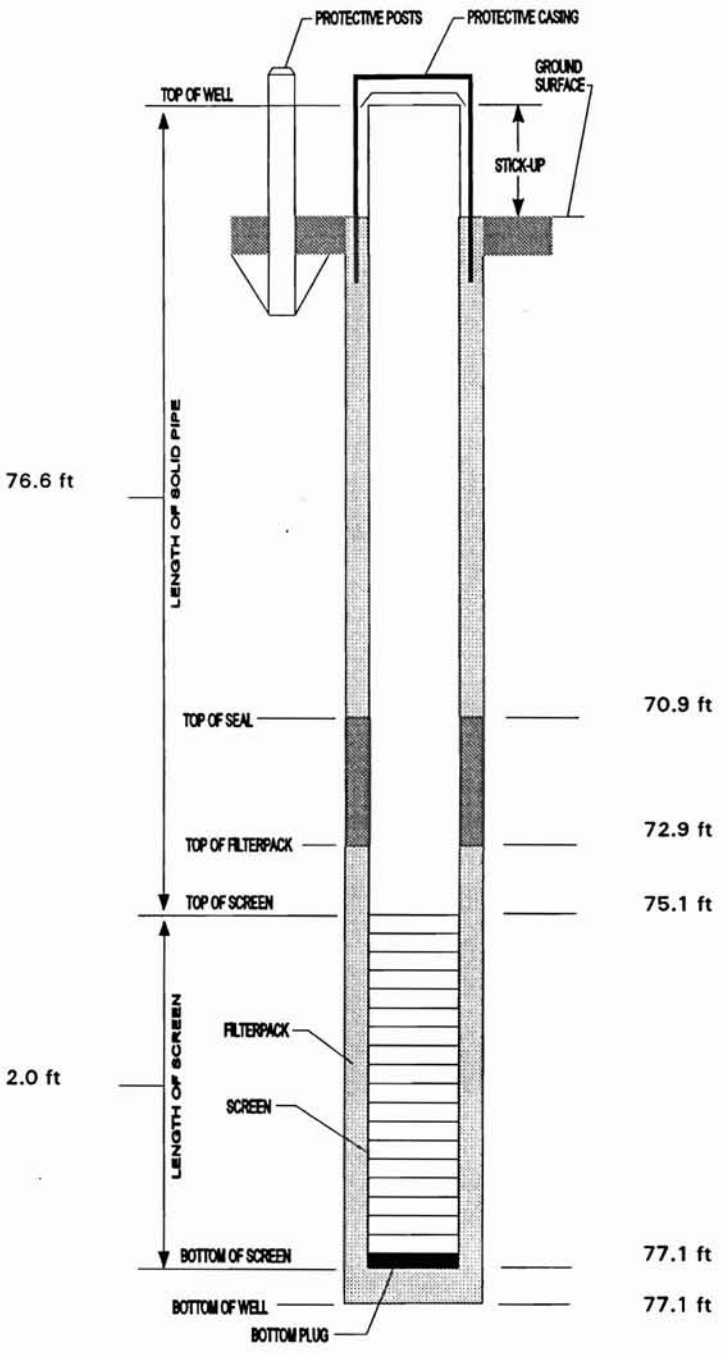
DEPTH FROM TOC AFTER DEVELOPMENT:	NA

HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: 646.02			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 4-18-97	STARTED: 4-17-97	COMPLETED: 4-21-97	LOCATION (Coordinates or Station): N. 290,753 E. 2,267,498
ELEVATION TOP OF HOLE: 684.35 686.24 (TOC)			SIGNATURE OF INSPECTOR: Janusz Pyrich
TOTAL DEPTH OF HOLE: 77.1 ft.			HOLE No.: **14C**

(ALL MEASUREMENTS FROM GROUND SURFACE)



PROTECTIVE CASING: 4 in. Square		
BLANK CASING		
DIAMETER:	1 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Flush Threaded w/O-rings	
SCREEN INFORMATION:		
DIAMETER:	1 in.	
SLOT WIDTH:	Porous Tip	
SCHEDULE:	NA	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O Silica Sand	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Piezometer. Not required.		
TIME SPENT DEVELOPING:	NA	
VOLUME OF WATER REMOVED:	NA	
VOLUME OF WATER ADDED:	None	
DESCRIPTION OF PREDEVELOPMENT WATER: NA		
DESCRIPTION OF POST DEVELOPMENT WATER: NA		

WATER LEVEL MEASUREMENTS:

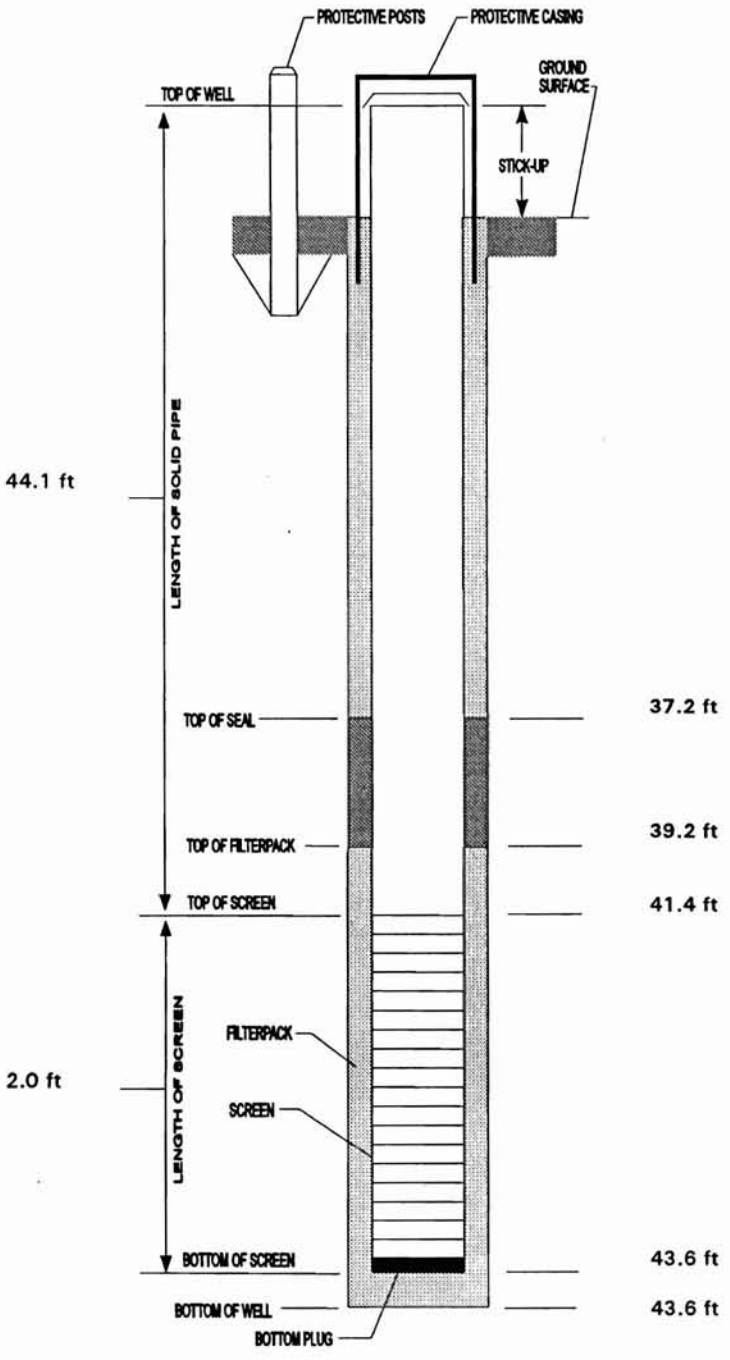
DATE	TIME	DEPTH
4/21/97	1000	37.36 ft
4/25/97	1400	40.60 ft
DEPTH FROM TOC AFTER DEVELOPMENT:		NA

HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: 666.72			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 4-22-97	STARTED: 4-21-97	COMPLETED: 4-22-97	LOCATION (Coordinates or Station): N. 287,167 E. 2,276,458
ELEVATION TOP OF HOLE: 676.81 679.05 (TOC)			SIGNATURE OF INSPECTOR: Janusz Pyrich
TOTAL DEPTH OF HOLE: 43.6 ft.			HOLE No.: **14D**

(ALL MEASUREMENTS FROM GROUND SURFACE)



PROTECTIVE CASING: 4 in. Square		
BLANK CASING		
DIAMETER:	1 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Flush Threaded w/O-rings	
SCREEN INFORMATION:		
DIAMETER:	1 in.	
SLOT WIDTH:	Porous Tip	
SCHEDULE:	NA	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O Silica Sand	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Piezometer. Not required.		
TIME SPENT DEVELOPING:	NA	
VOLUME OF WATER REMOVED:	NA	
VOLUME OF WATER ADDED:	None	
DESCRIPTION OF PREDEVELOPMENT WATER: NA		
DESCRIPTION OF POST DEVELOPMENT WATER: NA		

WATER LEVEL MEASUREMENTS:

DATE	TIME	DEPTH
4/22/97	1800	10.14 ft
4/25/97	1300	10.72 ft

DEPTH FROM TOC AFTER DEVELOPMENT:	NA

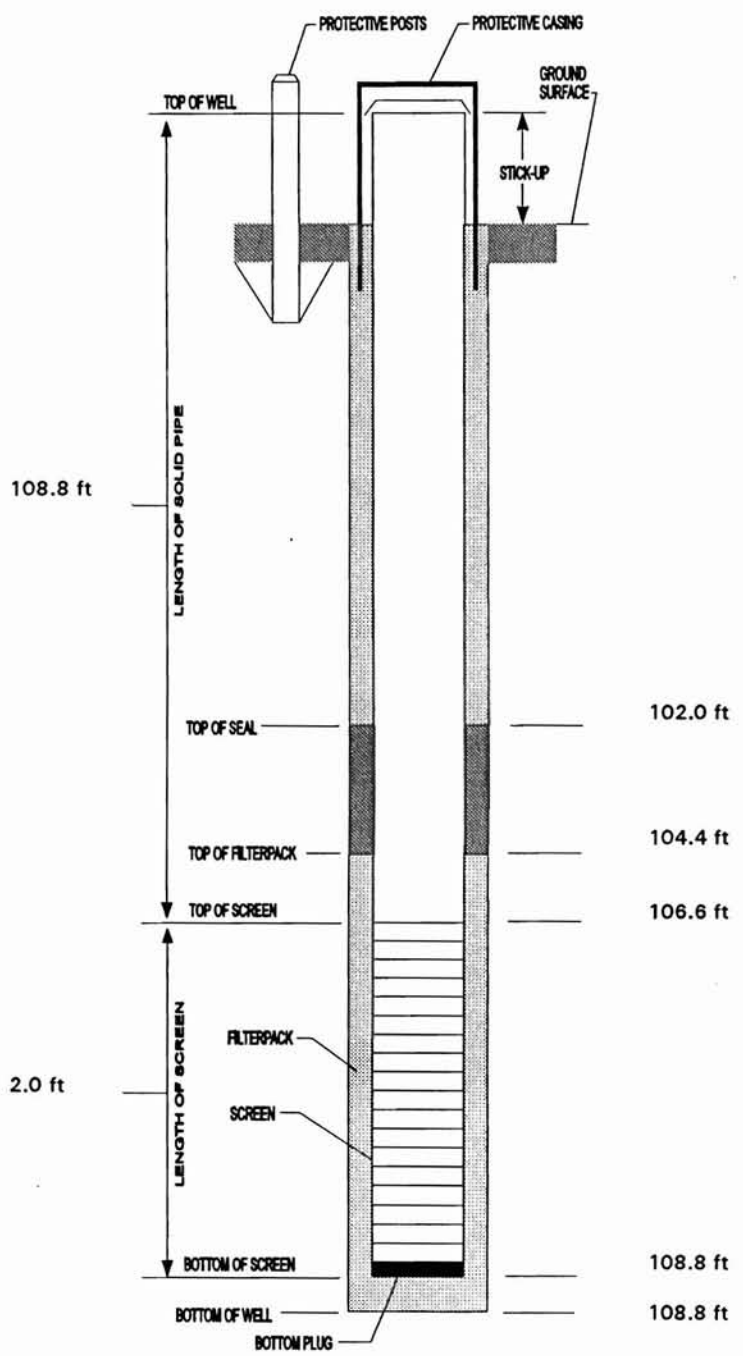
HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

493

ELEVATION GROUND WATER: 644.67			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 4-17-97	STARTED: 4-15-97	COMPLETED: 4-17-97	LOCATION (Coordinates or Station): N. 298,556 E. 2,262,676
ELEVATION TOP OF HOLE: 689.81 691.26 (TOC)			SIGNATURE OF INSPECTOR: Janusz Pyrich
TOTAL DEPTH OF HOLE: 108.8 ft.			HOLE No.: 14E

(ALL MEASUREMENTS FROM GROUND SURFACE)



PROTECTIVE CASING: 4 in. Square		
BLANK CASING		
DIAMETER:	1 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Flush Threaded w/O-rings	
SCREEN INFORMATION:		
DIAMETER:	1 in.	
SLOT WIDTH:	Porous Tip	
SCHEDULE:	NA	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O Silica Sand	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Piezometer. Not required.		
TIME SPENT DEVELOPING:	NA	
VOLUME OF WATER REMOVED:	NA	
VOLUME OF WATER ADDED:	None	
DESCRIPTION OF PREDEVELOPMENT WATER: NA		
DESCRIPTION OF POST DEVELOPMENT WATER: NA		
WATER LEVEL MEASUREMENTS:		

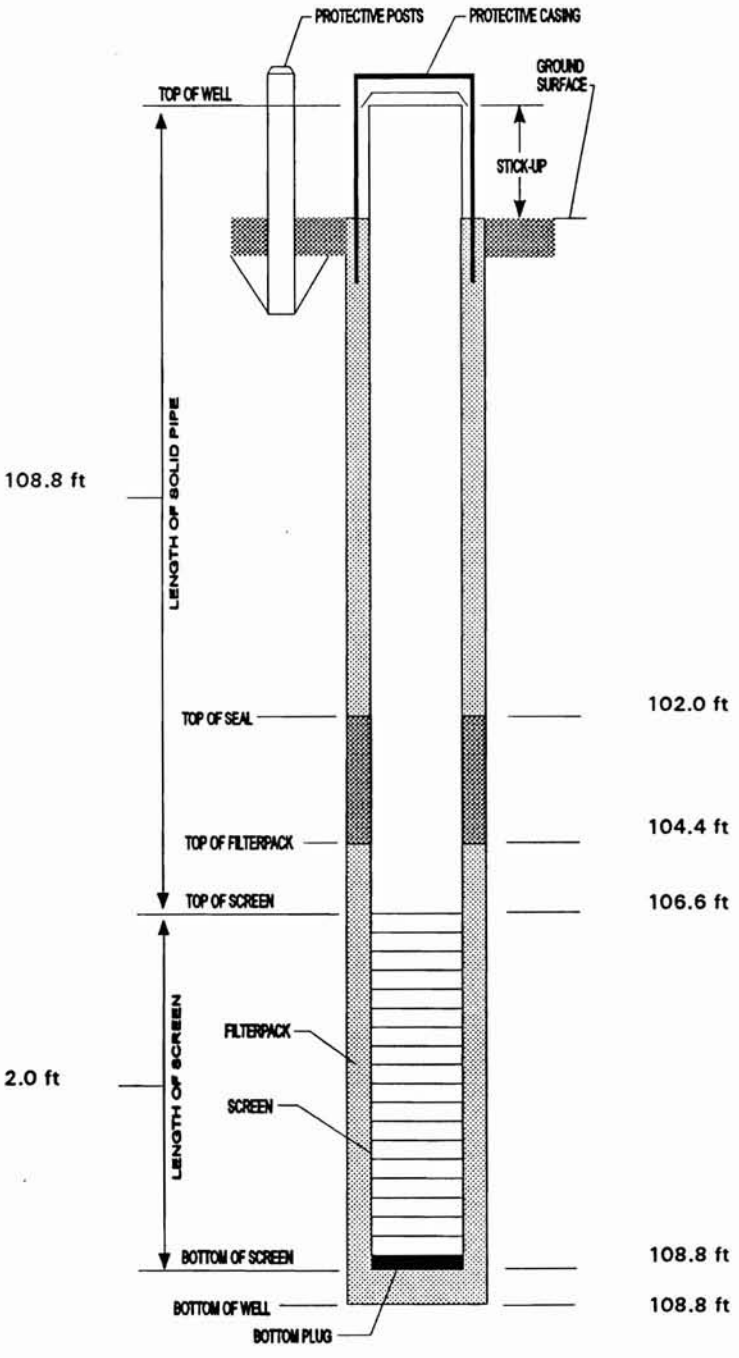
DATE	TIME	DEPTH
4/17/97	1600	43.51 ft
4/21/97	0830	41.48 ft
DEPTH FROM TOC AFTER DEVELOPMENT:		NA

HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER:			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 4-17-97	STARTED: 4-15-97	COMPLETED: 4-17-97	LOCATION (Coordinates or Station): N. E.
ELEVATION TOP OF HOLE:			SIGNATURE OF INSPECTOR: Janusz Pyrich
TOTAL DEPTH OF HOLE: 108.8 ft.			HOLE No.: **14E**

(ALL MEASUREMENTS FROM GROUND SURFACE)



PROTECTIVE CASING: 4 in. Square		
BLANK CASING		
DIAMETER:	1 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Flush Threaded w/O-rings	
SCREEN INFORMATION:		
DIAMETER:	1 in.	
SLOT WIDTH:	Porous Tip	
SCHEDULE:	NA	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O Silica Sand	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Piezometer. Not required.		
TIME SPENT DEVELOPING:	NA	
VOLUME OF WATER REMOVED:	NA	
VOLUME OF WATER ADDED:	None	
DESCRIPTION OF PREDEVELOPMENT WATER: NA		
DESCRIPTION OF POST DEVELOPMENT WATER: NA		
WATER LEVEL MEASUREMENTS:		

DATE	TIME	DEPTH
4/17/97	1600	43.51 ft
4/21/97	0830	41.48 ft
DEPTH FROM TOC AFTER DEVELOPMENT:		NA

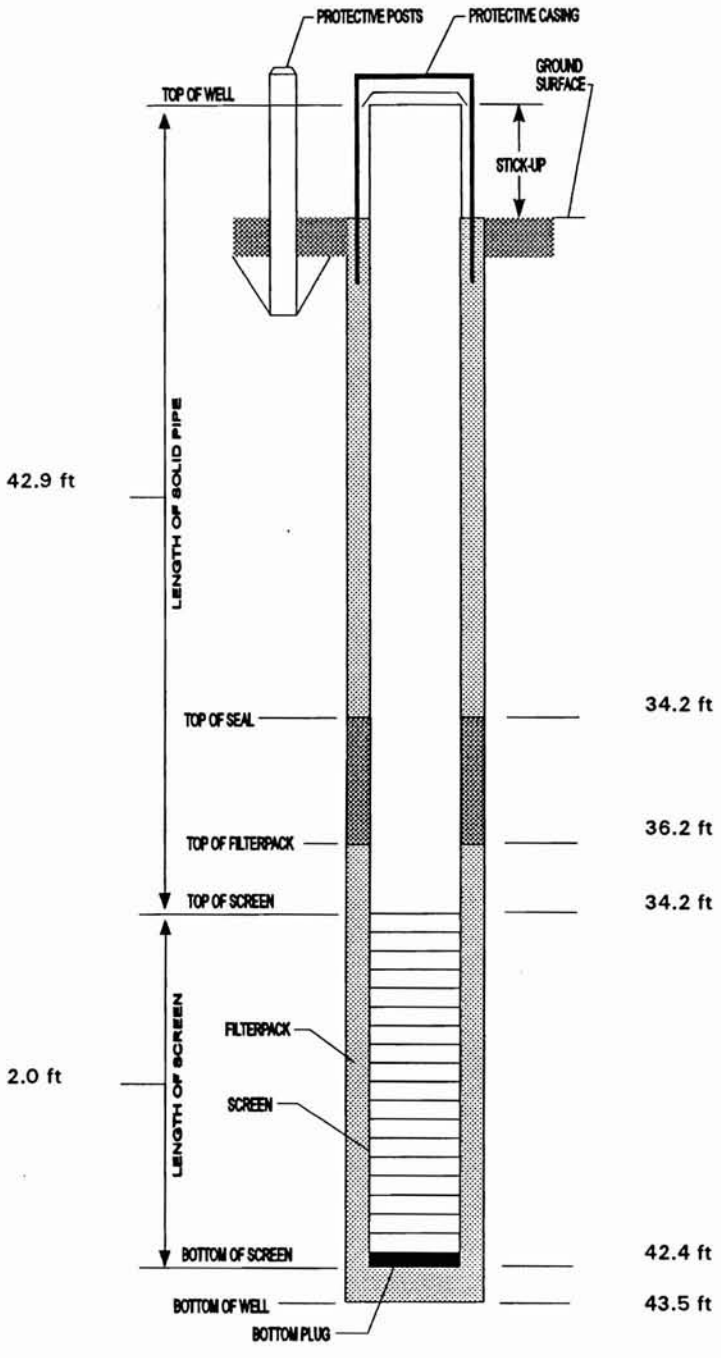
HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

495

ELEVATION GROUND WATER: 650.57			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 4-24-97	STARTED: 4-24-97	COMPLETED: 4-25-97	LOCATION (Coordinates or Station): N. 285499 E. 2260874
ELEVATION TOP OF HOLE: 675.16 677.20 (TOC)			SIGNATURE OF INSPECTOR: Janusz Pyrich
TOTAL DEPTH OF HOLE: 43.5 ft.			HOLE No.: **14F**

(ALL MEASUREMENTS FROM GROUND SURFACE)



PROTECTIVE CASING: 4 in. Square		
BLANK CASING		
DIAMETER:	1 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Flush Threaded w/O-rings	
SCREEN INFORMATION:		
DIAMETER:	1 in.	
SLOT WIDTH:	Porous Tip	
SCHEDULE:	NA	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O Silica Sand	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Piezometer. Not required.		
TIME SPENT DEVELOPING:	NA	
VOLUME OF WATER REMOVED:	NA	
VOLUME OF WATER ADDED:	None	
DESCRIPTION OF PREDEVELOPMENT WATER: NA		
DESCRIPTION OF POST DEVELOPMENT WATER: NA		

WATER LEVEL MEASUREMENTS:

DATE	TIME	DEPTH
4/24/97	1930	36.78 ft
4/25/97	1400	26.30 ft
DEPTH FROM TOC AFTER DEVELOPMENT:		NA

APPENDIX C
WELL CONSTRUCTION DRAWINGS

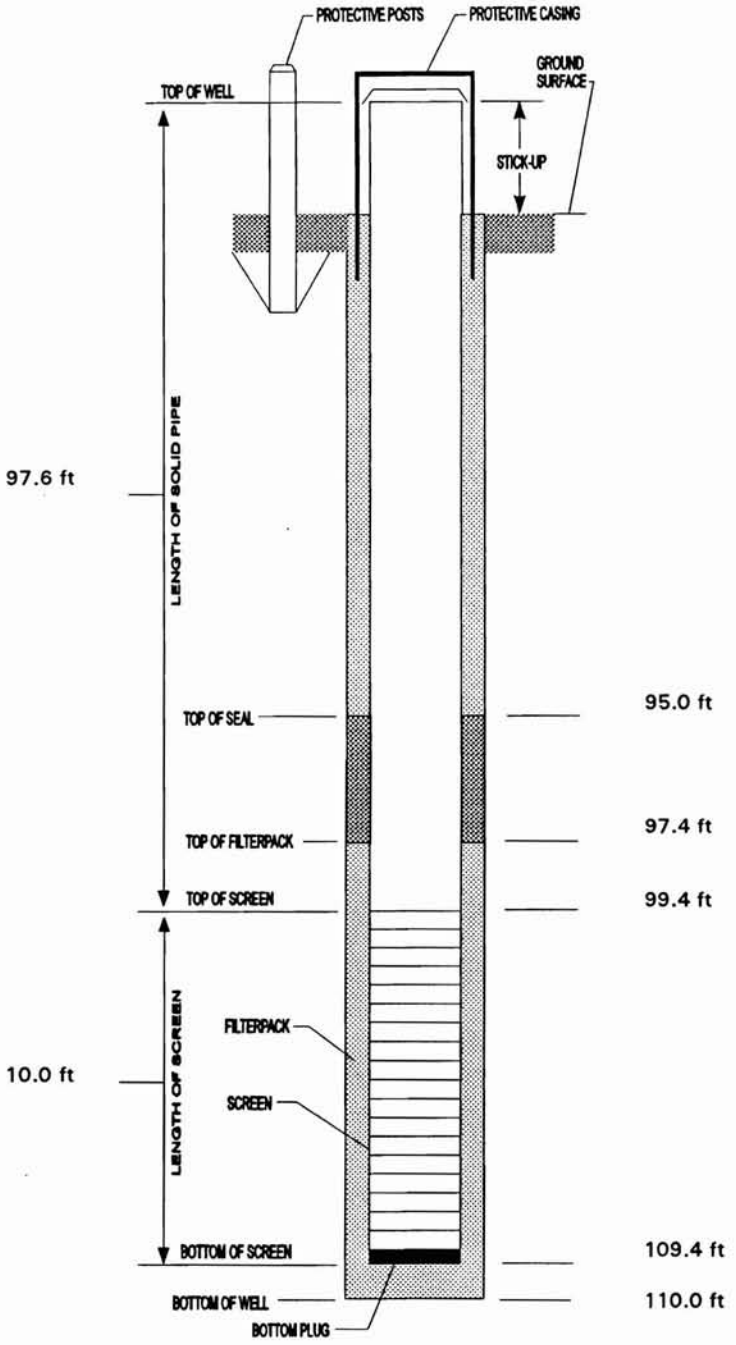
C-8 Task 16. Additional Groundwater Data, Line 3

HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: 678.88			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 5-13-97	STARTED: 5-13-97	COMPLETED: 5-14-97	LOCATION (Coordinates or Station): N. 299601 E. 2267991
ELEVATION TOP OF HOLE: 694.35 696.30 (TOC)			SIGNATURE OF INSPECTOR: Roger Wilson
TOTAL DEPTH OF HOLE: 110.0 ft.			HOLE No.: **16A**

(ALL MEASUREMENTS FROM GROUND SURFACE)



PROTECTIVE CASING: 4 in. Square		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Flush Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	10-Slot	
SCHEDULE:	40	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #0 Silica Sand	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Bailed, then pumped w/Well Wizard.		
TIME SPENT DEVELOPING:	4 hrs	
VOLUME OF WATER REMOVED:	125 gal.	
VOLUME OF WATER ADDED:	None	
DESCRIPTION OF PREDEVELOPMENT WATER: Very turbid; light tan.		
DESCRIPTION OF POST DEVELOPMENT WATER: Very turbid; light tan.		

WATER LEVEL MEASUREMENTS:

DATE	TIME	DEPTH

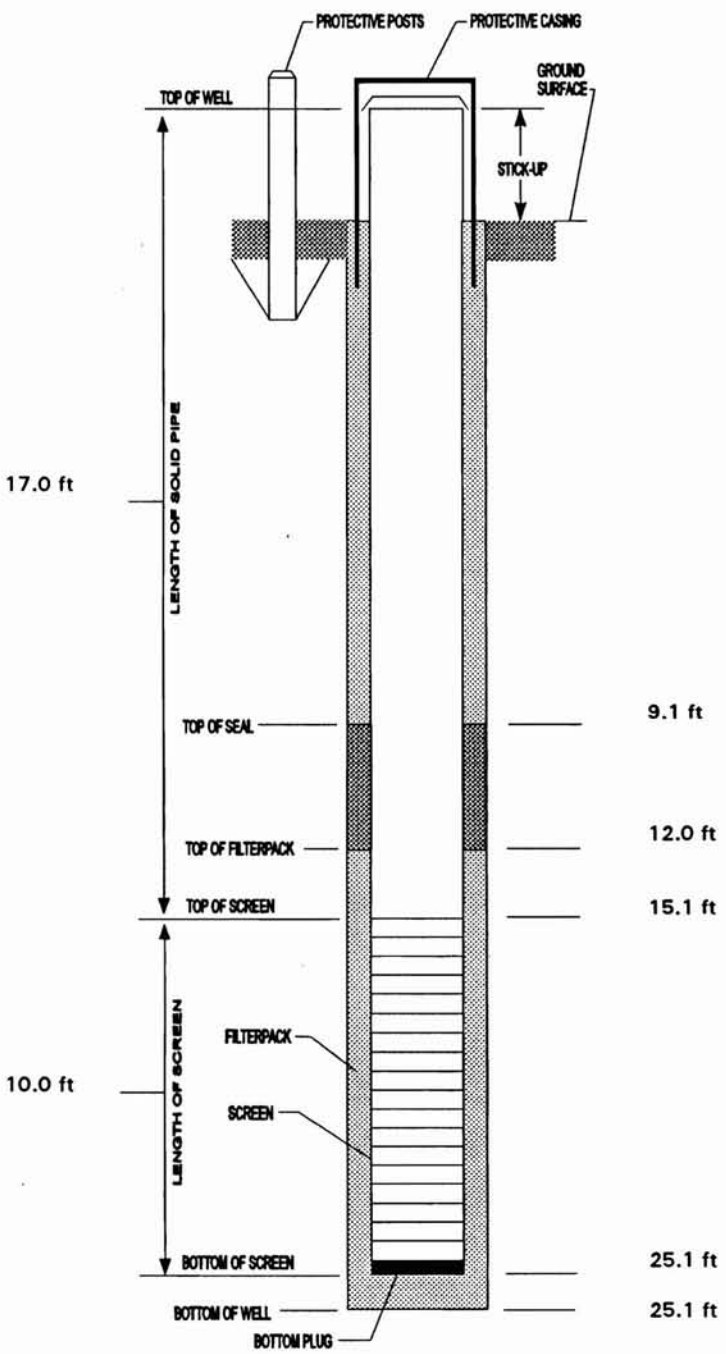
DEPTH FROM TOC AFTER DEVELOPMENT:	18.05 ft

HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: 697.39			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 5-14-97	STARTED: 5-14-97	COMPLETED: 4-15-97	LOCATION (Coordinates or Station): N. 300701 E. 2268410
ELEVATION TOP OF HOLE: 699.15 701.10 (TOC)			SIGNATURE OF INSPECTOR: Roger Wilson
TOTAL DEPTH OF HOLE: 25.1 ft.			HOLE No.: **16B**

(ALL MEASUREMENTS FROM GROUND SURFACE)



PROTECTIVE CASING: 4 in. Square		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Flush Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	10-Slot	
SCHEDULE:	40	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O Silica Sand	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Bailed dry.		
TIME SPENT DEVELOPING:	19 min	
VOLUME OF WATER REMOVED:	12 gal.	
VOLUME OF WATER ADDED:	None	
DESCRIPTION OF PREDEVELOPMENT WATER: Very turbid; light tan.		
DESCRIPTION OF POST DEVELOPMENT WATER: Very turbid; light tan.		
WATER LEVEL MEASUREMENTS:		

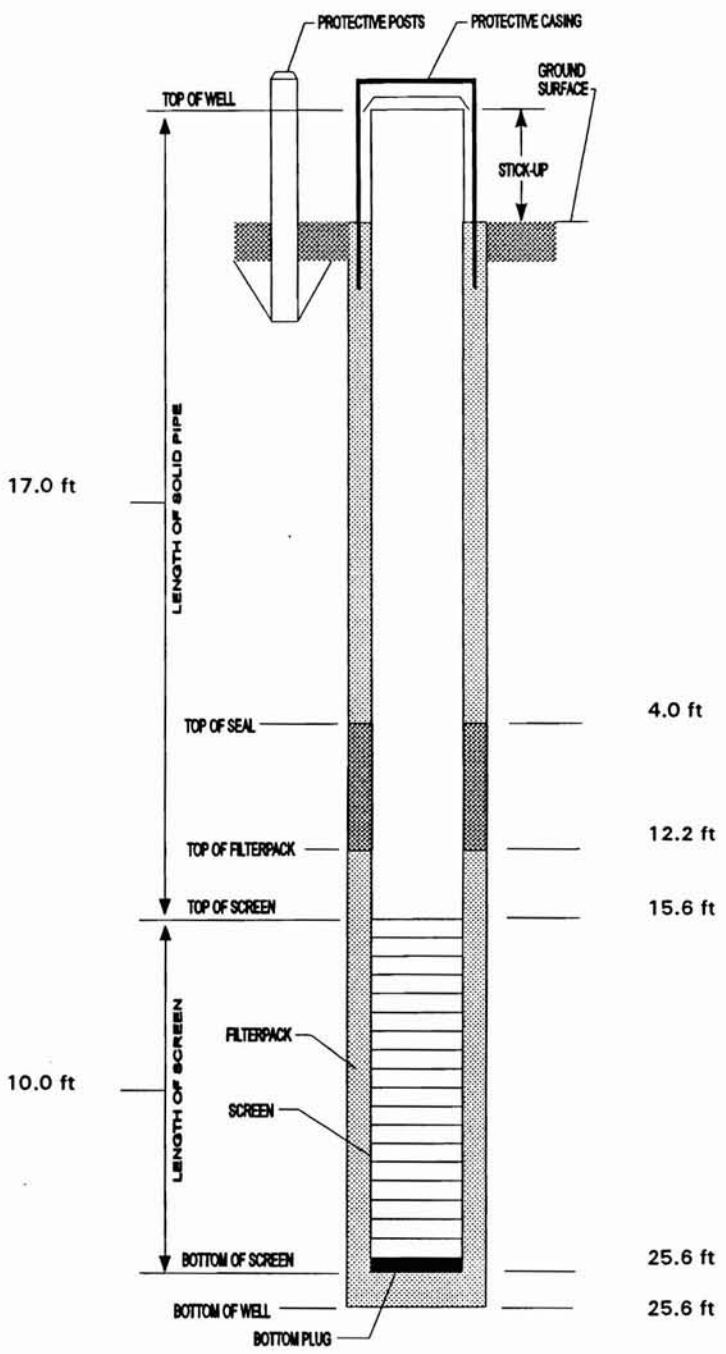
DATE	TIME	DEPTH
DEPTH FROM TOC AFTER DEVELOPMENT:		Dry

HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: 692.95			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 5-12-97	STARTED: 5-12-97	COMPLETED: 5-12-97	LOCATION (Coordinates or Station): N. 300002 E. 2268671
ELEVATION TOP OF HOLE: 695.66 697.69 (TOC)			SIGNATURE OF INSPECTOR: Roger Wilson
TOTAL DEPTH OF HOLE: 25.6 ft.			HOLE No.: **16C**

(ALL MEASUREMENTS FROM GROUND SURFACE)



PROTECTIVE CASING: 4 in. Square		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Flush Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	10-Slot	
SCHEDULE:	40	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #0 Silica Sand	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Bailed dry.		
TIME SPENT DEVELOPING:	25 min	
VOLUME OF WATER REMOVED:	10 gal.	
VOLUME OF WATER ADDED:	None	
DESCRIPTION OF PREDEVELOPMENT WATER: Very turbid; light brown.		
DESCRIPTION OF POST DEVELOPMENT WATER: Very turbid; light brown.		
WATER LEVEL MEASUREMENTS:		

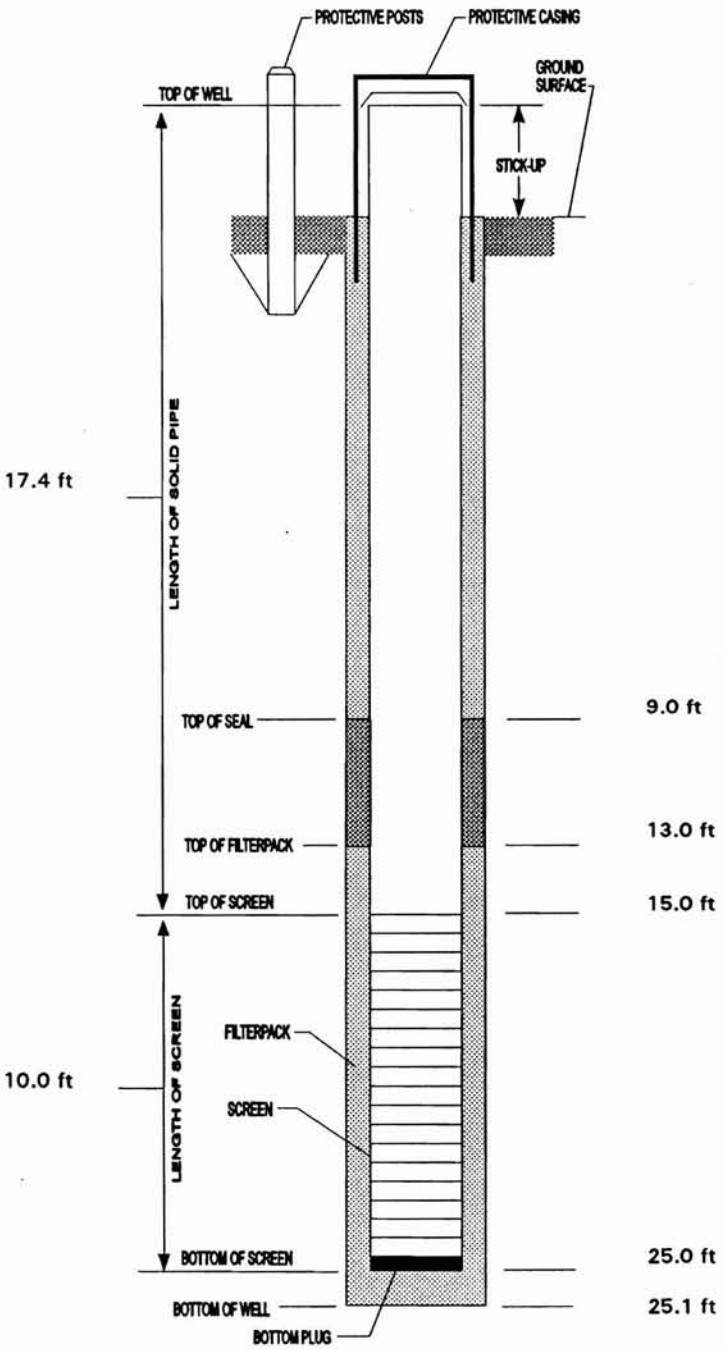
DATE	TIME	DEPTH
DEPTH FROM TOC AFTER DEVELOPMENT:		Dry

HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: 692.66			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 5-14-97	STARTED: 5-14-97	COMPLETED: 5-15-97	LOCATION (Coordinates or Station): N. 298983 E. 2268246
ELEVATION TOP OF HOLE: 695.77 697.66 (TOC)			SIGNATURE OF INSPECTOR: Roger Wilson
TOTAL DEPTH OF HOLE: 25.1 ft.			HOLE No.: **16D**

(ALL MEASUREMENTS FROM GROUND SURFACE)



PROTECTIVE CASING: 4 in. Square		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Flush Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	10-Slot	
SCHEDULE:	40	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O Silica Sand	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Bailed dry.		
TIME SPENT DEVELOPING:	10 min	
VOLUME OF WATER REMOVED:	10 gal.	
VOLUME OF WATER ADDED:	None	
DESCRIPTION OF PREDEVELOPMENT WATER: Very turbid; light tan.		
DESCRIPTION OF POST DEVELOPMENT WATER: Very turbid; light tan.		
WATER LEVEL MEASUREMENTS:		
DATE	TIME	DEPTH
DEPTH FROM TOC AFTER DEVELOPMENT:		Dry

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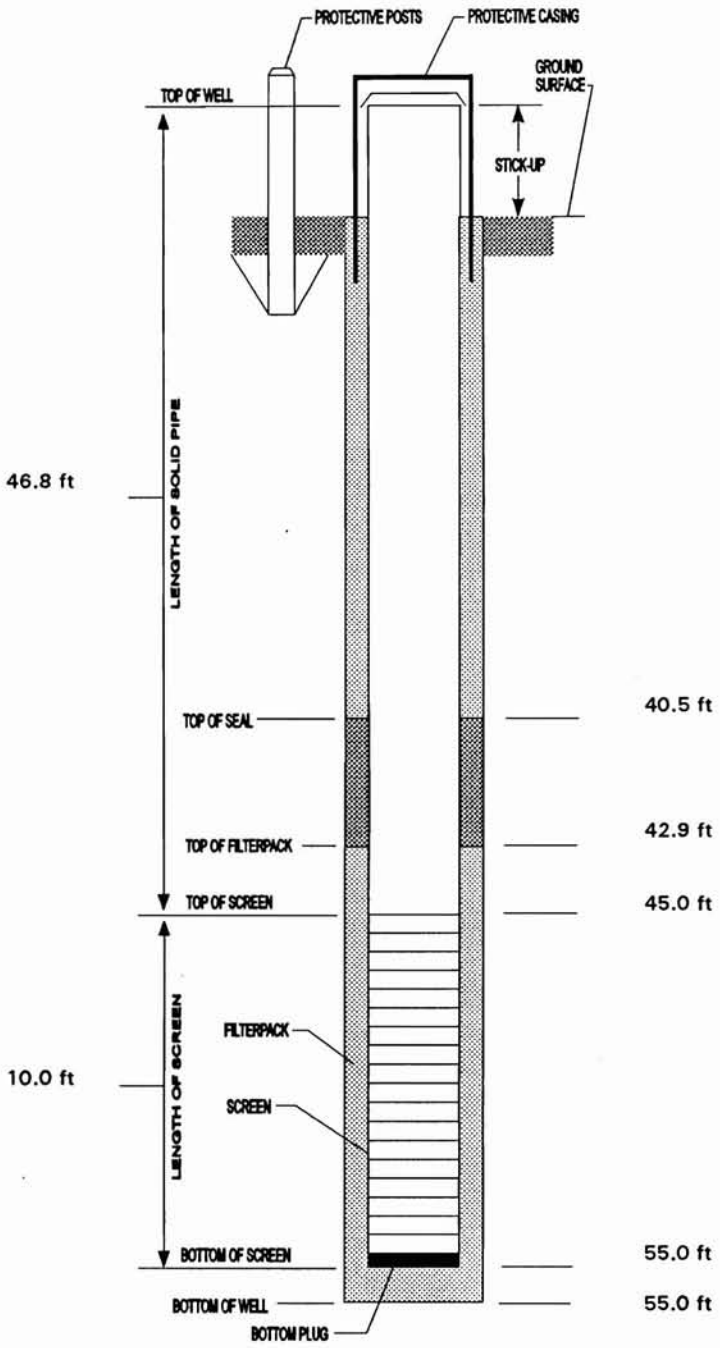
HARZA ENVIRONMENTAL SERVICES, INC.

MONITORING WELL CONSTRUCTION DIAGRAM

ELEVATION GROUND WATER: 684.65			PROJECT: IOWA ARMY AMMUNITION PLANT (5644V)
DATE INSTALLED: 5-14-97	STARTED: 5-14-97	COMPLETED: 5-15-97	LOCATION (Coordinates or Station): N. 298986 E. 2268236
ELEVATION TOP OF HOLE: 695.69 697.55 (TOC)			SIGNATURE OF INSPECTOR: Roger Wilson
TOTAL DEPTH OF HOLE: 55.0 ft.			HOLE No.: **16E**

(ALL MEASUREMENTS FROM GROUND SURFACE)



PROTECTIVE CASING: 4 in. Square		
BLANK CASING		
DIAMETER:	2 in.	
TYPE:	PVC	
TYPE OF PIPE JOINTS:	Flush Threaded	
SCREEN INFORMATION:		
DIAMETER:	2 in.	
SLOT WIDTH:	10-Slot	
SCHEDULE:	40	
MATERIAL:	PVC XXX	ST.ST.
	OTHER (Describe)	
FILTERPACK MATERIAL:		
TYPE:	GS #O Silica Sand	
BACKFILL METHOD:	Poured slowly from top of augers	
TYPE OF SEAL: Bentonite Pellets		
WELL DEVELOPMENT:		
METHOD: Bailed dry.		
TIME SPENT DEVELOPING:	16 min	
VOLUME OF WATER REMOVED:	13 gal.	
VOLUME OF WATER ADDED:	None	
DESCRIPTION OF PREDEVELOPMENT WATER: Very turbid; light tan.		
DESCRIPTION OF POST DEVELOPMENT WATER: Very turbid; light tan.		
WATER LEVEL MEASUREMENTS:		

DATE	TIME	DEPTH
DEPTH FROM TOC AFTER DEVELOPMENT:		Dry

APPENDIX D
WELL DEVELOPMENT FORMS

HARZA ENVIRONMENTAL SERVICES, INC.

WELL DEVELOPMENT FORM

WELL NUMBER:	**10A**
PROJECT NAME/LOCATION:	IOWA ARMY AMMUNITION PLANT, MIDDLETOWN, IOWA
PROJECT NUMBER:	5644V
TASK NAME:	PUMPING TESTS; LINE 2
TASK NUMBER:	10
METHOD OF DEVELOPMENT:	PUMPED WITH WELL WIZARD

WATER REMOVAL

YIELD (GPM):	TIME: FROM	TIME: TO	DATE:	REMARKS:
1 gpm (approx.)	1638	1818	5-12-97	Water milky, light gray.

TOTAL WATER REMOVED DURING DEVELOPMENT (GALLONS):	65 gallons (approx.)

DESCRIPTION OF TURBIDITY AT END OF DEVELOPMENT:	CLEAR	**SLIGHTLY CLOUDY**	MOD. TURBID	VERY MUDDY
ODOR OF WATER:	None			

WATER DISCHARGED TO:	GROUND SURFACE	STORM SEWER	**DRUMS**	TANK TRUCK	STORAGE TANK
	OTHER:				

FIELD MEASUREMENTS

pH (units)	TEMPERATURE (°F)	SPEC. COND. (mmhos/cm)	TURBIDITY (N-units)	DATE	TIME
Well going dry before comparative field measurements could be taken.					

DEPTH TO GROUNDWATER AFTER DEVELOPMENT:		FEET

FORM COMPLETED BY: Joe Marks DATE: 5-12-97

HARZA ENVIRONMENTAL SERVICES, INC.

WELL DEVELOPMENT FORM

WELL NUMBER:	**10B**
bPROJECT NAME/LOCATION:	IOWA ARMY AMMUNITION PLANT, MIDDLETOWN, IOWA
PROJECT NUMBER:	5644V
TASK NAME:	PUMPING TESTS; LINE 2
TASK NUMBER:	10
METHOD OF DEVELOPMENT:	BAILED AND THEN PUMPED WITH WELL WIZARD

WATER REMOVAL

YIELD (GPM):	TIME: FROM	TIME: TO	DATE:	REMARKS:
50 gal (total)	1105	1342	5-12-97	Water very turbid, silty, gray.
5 gal (total)	1407	1510	5-12-9	Water slightly turbid.

TOTAL WATER REMOVED DURING DEVELOPMENT (GALLONS):				55 gallons	
DESCRIPTION OF TURBIDITY AT END OF DEVELOPMENT:		CLEAR	**SLIGHTLY CLOUDY**	**MOD. TURBID**	VERY MUDDY
ODOR OF WATER:		None			
WATER DISCHARGED TO:	GROUND SURFACE	STORM SEWER	**DRUMS**	TANK TRUCK	STORAGE TANK
	OTHER:				

FIELD MEASUREMENTS

pH (units)	TEMPERATURE (°F)	SPEC. COND. (mmhos/cm)	TURBIDITY (N-units)	DATE	TIME
Well went dry before comparative field measurements could be taken.					
DEPTH TO GROUNDWATER AFTER DEVELOPMENT:					FEET

FORM COMPLETED BY: Joe Marks DATE: 5-12-97

HARZA ENVIRONMENTAL SERVICES, INC.

WELL DEVELOPMENT FORM

WELL NUMBER:	**12A**
PROJECT NAME/LOCATION:	IOWA ARMY AMMUNITION PLANT, MIDDLETOWN, IOWA
PROJECT NUMBER:	5644V
TASK NAME:	ADDITIONAL GROUNDWATER DATA, LINE 2
TASK NUMBER:	12
METHOD OF DEVELOPMENT:	BAILED.

WATER REMOVAL

YIELD (GPM):	TIME: FROM	TIME: TO	DATE:	REMARKS:
8 gal. (Total)	1138	1149	5-13-97	Well bailed dry.

TOTAL WATER REMOVED DURING DEVELOPMENT (GALLONS):				8 gallons (approx.)	
DESCRIPTION OF TURBIDITY AT END OF DEVELOPMENT:		CLEAR	SLIGHTLY CLOUDY	MOD. TURBID	**VERY MUDDY**
ODOR OF WATER:		None			
WATER DISCHARGED TO:	GROUND SURFACE	STORM SEWER	**DRUMS**	TANK TRUCK	STORAGE TANK
	OTHER:				

FIELD MEASUREMENTS

pH (units)	TEMPERATURE (°F)	SPEC. COND. (mmhos/cm)	TURBIDITY (N-units)	DATE	TIME
Well went dry before comparative field measurements could be taken.					
DEPTH TO GROUNDWATER AFTER DEVELOPMENT:					FEET

FORM COMPLETED BY: Joe Marks DATE: 5-13-97

HARZA ENVIRONMENTAL SERVICES, INC.

WELL DEVELOPMENT FORM

WELL NUMBER:	12B
PROJECT NAME/LOCATION:	IOWA ARMY AMMUNITION PLANT, MIDDLETOWN, IOWA
PROJECT NUMBER:	5644V
TASK NAME:	ADDITIONAL GROUNDWATER DATA, LINE 2
TASK NUMBER:	12
METHOD OF DEVELOPMENT:	BAILED, THEN PUMPED WITH WELL WIZARD.

WATER REMOVAL

YIELD (GPM):	TIME: FROM	TIME: TO	DATE:	REMARKS:
50 gal. (Total)	0850	1029	5-14-97	Very turbid, light tan at end.
0.43 gal (total)	1155	1230	5-14-97	Very turbid to start.

TOTAL WATER REMOVED DURING DEVELOPMENT (GALLONS):			65 gallons (approx.)	
DESCRIPTION OF TURBIDITY AT END OF DEVELOPMENT:	CLEAR	SLIGHTLY CLOUDY	**MOD. TURBID**	VERY MUDDY
ODOR OF WATER:	None			
WATER DISCHARGED TO:	GROUND SURFACE	STORM SEWER	**DRUMS**	TANK TRUCK	STORAGE TANK
	OTHER:			

FIELD MEASUREMENTS

pH (units)	TEMPERATURE (°F)	SPEC. COND. (mmhos/cm)	TURBIDITY (N-units)	DATE	TIME
6.86	57.2	476		5-14-97	1201
6.27	55.1	414		5-14-97	1207
5.95	54.1	416		5-14-97	1213
5.96	55.7	414		5-14-97	1219
6.07	54.6	414		5-14-97	1224
5.99	53.6	436		5-14-97	1230
DEPTH TO GROUNDWATER AFTER DEVELOPMENT:			8.45	FEET	

FORM COMPLETED BY: Joe Marks DATE: 5-14-97

HARZA ENVIRONMENTAL SERVICES, INC.

WELL DEVELOPMENT FORM

WELL NUMBER:	**12C**
PROJECT NAME/LOCATION:	IOWA ARMY AMMUNITION PLANT, MIDDLETOWN, IOWA
PROJECT NUMBER:	5644V
TASK NAME:	ADDITIONAL GROUNDWATER DATA, LINE 2
TASK NUMBER:	12
METHOD OF DEVELOPMENT:	BAILED.

WATER REMOVAL

YIELD (GPM):	TIME: FROM	TIME: TO	DATE:	REMARKS:
7 gal. (Total)	0757	0835	5-14-97	Very turbid; gray; silty water.

TOTAL WATER REMOVED DURING DEVELOPMENT (GALLONS):				7 gallons (approx.)	
DESCRIPTION OF TURBIDITY AT END OF DEVELOPMENT:		CLEAR	SLIGHTLY CLOUDY	MOD. TURBID	**VERY MUDDY**
ODOR OF WATER:		None			
WATER DISCHARGED TO:	GROUND SURFACE	STORM SEWER	**DRUMS**	TANK TRUCK	STORAGE TANK
	OTHER:				

FIELD MEASUREMENTS

pH (units)	TEMPERATURE (°F)	SPEC. COND. (mmhos/cm)	TURBIDITY (N-units)	DATE	TIME
Well went dry before comparative field measurements could be taken.					
DEPTH TO GROUNDWATER AFTER DEVELOPMENT:					FEET

FORM COMPLETED BY: Joe Marks DATE: 5-13-97

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL DEVELOPMENT FORM

WELL NUMBER:	12D
PROJECT NAME/LOCATION:	IOWA ARMY AMMUNITION PLANT, MIDDLETOWN, IOWA
PROJECT NUMBER:	5644V
TASK NAME:	ADDITIONAL GROUNDWATER DATA, LINE 2
TASK NUMBER:	12
METHOD OF DEVELOPMENT:	BAILED.

WATER REMOVAL

YIELD (GPM):	TIME: FROM	TIME: TO	DATE:	REMARKS:
35 gal. (Total)	1540	1745	5-13-97	Water slightly cloudy. Water level dropped rapidly.

TOTAL WATER REMOVED DURING DEVELOPMENT (GALLONS):			35 gallons (approx.)	
DESCRIPTION OF TURBIDITY AT END OF DEVELOPMENT:	CLEAR	**SLIGHTLY CLOUDY**	MOD. TURBID	VERY MUDDY
ODOR OF WATER:	None			
WATER DISCHARGED TO:	GROUND SURFACE	STORM SEWER	**DRUMS**	TANK TRUCK	STORAGE TANK
	OTHER:			

FIELD MEASUREMENTS

pH (units)	TEMPERATURE (°F)	SPEC. COND. (mmhos/cm)	TURBIDITY (N-units)	DATE	TIME
Well going dry before comparative field measurements could be taken.					
DEPTH TO GROUNDWATER AFTER DEVELOPMENT:			123.7	FEET	

FORM COMPLETED BY: Joe Marks DATE: 5-13-97

HARZAENVIRONMENTAL SERVICES, INC.

WELL DEVELOPMENT FORM

WELL NUMBER:	12E
PROJECT NAME/LOCATION:	IOWA ARMY AMMUNITION PLANT, MIDDLETOWN, IOWA
PROJECT NUMBER:	5644V
TASK NAME:	ADDITIONAL GROUNDWATER DATA, LINE 2
TASK NUMBER:	12
METHOD OF DEVELOPMENT:	BAILED 45 GALLONS, THEN PUMPED WITH WELL WIZARD.

WATER REMOVAL

YIELD (GPM):	TIME: FROM	TIME: TO	DATE:	REMARKS:
45 gal. (Total)	0755	1018	5-13-97	No observable improvemente in wtr.
0.3 gpm	1020	1100	5-13-97	Water improved to slightly cloudy.

TOTAL WATER REMOVED DURING DEVELOPMENT (GALLONS):				57 gallons (approx.)	
DESCRIPTION OF TURBIDITY AT END OF DEVELOPMENT:		CLEAR	**SLIGHTLY CLOUDY**	MOD. TURBID	VERY MUDDY
ODOR OF WATER:		None			
WATER DISCHARGED TO:	GROUND SURFACE	STORM SEWER	**DRUMS**	TANK TRUCK	STORAGE TANK
	OTHER:				

FIELD MEASUREMENTS

pH (units)	TEMPERATURE (°F)	SPEC. COND. (mmhos/cm)	TURBIDITY (N-units)	DATE	TIME
6.55	72.3	616	6.07	5-13-97	1029
6.58	61.9	470	6.07	5-13-97	1036
6.60	57.1	467	6.07	5-13-97	1040
6.59	56.1	479	6.07	5-13-97	1045
6.58	55.1	476	6.07	5-13-97	1053

DEPTH TO GROUNDWATER AFTER DEVELOPMENT:	11.55	FEET

FORM COMPLETED BY: Joe Marks DATE: 5-13-97

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL DEVELOPMENT FORM

WELL NUMBER:	12F
PROJECT NAME/LOCATION:	IOWA ARMY AMMUNITION PLANT, MIDDLETOWN, IOWA
PROJECT NUMBER:	5644V
TASK NAME:	ADDITIONAL GROUNDWATER DATA, LINE 2
TASK NUMBER:	12
METHOD OF DEVELOPMENT:	NA - WELL WAS DRY.

WATER REMOVAL

YIELD (GPM):	TIME: FROM	TIME: TO	DATE:	REMARKS:

TOTAL WATER REMOVED DURING DEVELOPMENT (GALLONS):				
DESCRIPTION OF TURBIDITY AT END OF DEVELOPMENT:	CLEAR	SLIGHTLY CLOUDY	MOD. TURBID	VERY MUDDY
ODOR OF WATER:	None			
WATER DISCHARGED TO:	GROUND SURFACE	STORM SEWER	DRUMS	TANK TRUCK	STORAGE TANK
	OTHER:			

FIELD MEASUREMENTS

pH (units)	TEMPERATURE (°F)	SPEC. COND. (mmhos/cm)	TURBIDITY (N-units)	DATE	TIME

DEPTH TO GROUNDWATER AFTER DEVELOPMENT:		FEET

FORM COMPLETED BY: Joe Marks DATE: 5-13-97

HARZA ENVIRONMENTAL SERVICES, INC.

WELL DEVELOPMENT FORM

WELL NUMBER:	**12G**
PROJECT NAME/LOCATION:	IOWA ARMY AMMUNITION PLANT, MIDDLETOWN, IOWA
PROJECT NUMBER:	5644V
TASK NAME:	ADDITIONAL GROUNDWATER DATA, LINE 2
TASK NUMBER:	12
METHOD OF DEVELOPMENT:	BAILED.

WATER REMOVAL

YIELD (GPM):	TIME: FROM	TIME: TO	DATE:	REMARKS:
7.5 gal. (Total)	1300	1314	5-13-97	Bailed dry.
1.5 gpm	1330	1336	5-13-97	Bailed dry.

TOTAL WATER REMOVED DURING DEVELOPMENT (GALLONS):				9 gallons (approx.)	
DESCRIPTION OF TURBIDITY AT END OF DEVELOPMENT:		CLEAR	SLIGHTLY CLOUDY	MOD. TURBID	**VERY MUDDY**
ODOR OF WATER:		None			
WATER DISCHARGED TO:	GROUND SURFACE	STORM SEWER	**DRUMS**	TANK TRUCK	STORAGE TANK
	OTHER:				

FIELD MEASUREMENTS

pH (units)	TEMPERATURE (°F)	SPEC. COND. (mmhos/cm)	TURBIDITY (N-units)	DATE	TIME
Well bailed dry before comparative field measurements could be taken.					

DEPTH TO GROUNDWATER AFTER DEVELOPMENT:	11.55	FEET

FORM COMPLETED BY: Joe Marks DATE: 5-13-97

HARZA ENVIRONMENTAL SERVICES, INC.

WELL DEVELOPMENT FORM

WELL NUMBER:	13B
PROJECT NAME/LOCATION:	IOWA ARMY AMMUNITION PLANT, MIDDLETOWN, IOWA
PROJECT NUMBER:	5644V
TASK NAME:	GROUNDWATER DATA, LOWER REACHES, BRUSH CREEK
TASK NUMBER:	13
METHOD OF DEVELOPMENT:	BAILED THEN PUMPED WITH WELL WIZARD.

WATER REMOVAL

YIELD (GPM):	TIME: FROM	TIME: TO	DATE:	REMARKS:
50 gal. (Total)	1157	1351	5-20-97	
20 gal (total)	1400	1448	5-20-97	Well wizard.

TOTAL WATER REMOVED DURING DEVELOPMENT (GALLONS):			70 gallons (approx.)	
DESCRIPTION OF TURBIDITY AT END OF DEVELOPMENT:	CLEAR	SLIGHTLY CLOUDY	MOD. TURBID	VERY MUDDY
ODOR OF WATER:	None			
WATER DISCHARGED TO:	GROUND SURFACE	STORM SEWER	**DRUMS**	TANK TRUCK	STORAGE TANK
	OTHER:			

FIELD MEASUREMENTS

pH (units)	TEMPERATURE (°F)	SPEC. COND. (mmhos/cm)	TURBIDITY (N-units)	DATE	TIME
7.36	65.8	442		5-20-97	1409
6.70	58.7	474		5-20-97	1419
6.64	57.3	472		5-20-97	1425
6.57	56.7	474		5-20-97	1437
6.63	56.1	483		5-20-97	1448

DEPTH TO GROUNDWATER AFTER DEVELOPMENT:	29.41	FEET

FORM COMPLETED BY: Joe Marks DATE: 5-20-97

HARZA ENVIRONMENTAL SERVICES, INC.

WELL DEVELOPMENT FORM

WELL NUMBER:	**13D**
PROJECT NAME/LOCATION:	IOWA ARMY AMMUNITION PLANT, MIDDLETOWN, IOWA
PROJECT NUMBER:	5644V
TASK NAME:	GROUNDWATER DATA, LOWER REACHES, BRUSH CREEK
TASK NUMBER:	13
METHOD OF DEVELOPMENT:	BAILED.

WATER REMOVAL

YIELD (GPM):	TIME: FROM	TIME: TO	DATE:	REMARKS:
10 gal. (Total)	1516	1545	5-20-97	Very turbid, light gray.
20 gal (total)	1400	1448	5-20-97	Well wizard.

TOTAL WATER REMOVED DURING DEVELOPMENT (GALLONS):				10 gallons (approx.)	
DESCRIPTION OF TURBIDITY AT END OF DEVELOPMENT:		CLEAR	SLIGHTLY CLOUDY	MOD. TURBID	**VERY MUDDY**
ODOR OF WATER:		None			
WATER DISCHARGED TO:	GROUND SURFACE	STORM SEWER	**DRUMS**	TANK TRUCK	STORAGE TANK
	OTHER:				

FIELD MEASUREMENTS

pH (units)	TEMPERATURE (°F)	SPEC. COND. (mmhos/cm)	TURBIDITY (N-units)	DATE	TIME
Well bailed dry before comparative field measurements could be taken.					
DEPTH TO GROUNDWATER AFTER DEVELOPMENT:					FEET

FORM COMPLETED BY: Joe Marks DATE: 5-20-97

HARZA ENVIRONMENTAL SERVICES, INC.

WELL DEVELOPMENT FORM

WELL NUMBER:	13E
PROJECT NAME/LOCATION:	IOWA ARMY AMMUNITION PLANT, MIDDLETOWN, IOWA
PROJECT NUMBER:	5644V
TASK NAME:	GROUNDWATER DATA, LOWER REACHES, BRUSH CREEK
TASK NUMBER:	13
METHOD OF DEVELOPMENT:	BAILED.

WATER REMOVAL

YIELD (GPM):	TIME: FROM	TIME: TO	DATE:	REMARKS:
7 gal. (Total)	1516	1530	5-20-97	Very turbid, light tan.

TOTAL WATER REMOVED DURING DEVELOPMENT (GALLONS):			7 gallons (approx.)	
DESCRIPTION OF TURBIDITY AT END OF DEVELOPMENT:	CLEAR	SLIGHTLY CLOUDY	MOD. TURBID	**VERY MUDDY**
ODOR OF WATER:	None			
WATER DISCHARGED TO:	GROUND SURFACE	STORM SEWER	**DRUMS**	TANK TRUCK	STORAGE TANK
	OTHER:			

FIELD MEASUREMENTS

pH (units)	TEMPERATURE (°F)	SPEC. COND. (mmhos/cm)	TURBIDITY (N-units)	DATE	TIME
Well bailed dry before comparative field measurements could be taken.					
DEPTH TO GROUNDWATER AFTER DEVELOPMENT:					FEET

FORM COMPLETED BY: Joe Marks DATE: 5-20-97

HARZA ENVIRONMENTAL SERVICES, INC.

WELL DEVELOPMENT FORM

WELL NUMBER:	**13F**
PROJECT NAME/LOCATION:	IOWA ARMY AMMUNITION PLANT, MIDDLETOWN, IOWA
PROJECT NUMBER:	5644V
TASK NAME:	GROUNDWATER DATA, LOWER REACHES, BRUSH CREEK
TASK NUMBER:	13
METHOD OF DEVELOPMENT:	BAILED.

WATER REMOVAL

YIELD (GPM):	TIME: FROM	TIME: TO	DATE:	REMARKS:
17 gal. (Total)	1552	1600	5-20-97	Very turbid, gray.

TOTAL WATER REMOVED DURING DEVELOPMENT (GALLONS):				1 gallons (approx.)	
DESCRIPTION OF TURBIDITY AT END OF DEVELOPMENT:		CLEAR	SLIGHTLY CLOUDY	MOD. TURBID	**VERY MUDDY**
ODOR OF WATER:		None			
WATER DISCHARGED TO:	**GROUND SURFACE**	STORM SEWER	DRUMS	TANK TRUCK	STORAGE TANK
	OTHER:				

FIELD MEASUREMENTS

pH (units)	TEMPERATURE (°F)	SPEC. COND. (mmhos/cm)	TURBIDITY (N-units)	DATE	TIME
Well bailed dry before comparative field measurements could be taken.					
DEPTH TO GROUNDWATER AFTER DEVELOPMENT:					FEET

FORM COMPLETED BY: Joe Marks DATE: 5-20-97

HARZA ENVIRONMENTAL SERVICES, INC.

WELL DEVELOPMENT FORM

WELL NUMBER:	16A
PROJECT NAME/LOCATION:	IOWA ARMY AMMUNITION PLANT, MIDDLETOWN, IOWA
PROJECT NUMBER:	5644V
TASK NAME:	GROUNDWATER DATA, LINE 3
TASK NUMBER:	16
METHOD OF DEVELOPMENT:	BAILED FOR 2 HOURS, THEN PUMPED WITH WELL WIZARD.

WATER REMOVAL

YIELD (GPM):	TIME: FROM	TIME: TO	DATE:	REMARKS:
65 gal. (Total)	0737	0936	5-20-97	Very turbid, light gray.
60 gal. (Total)	0940	1130	5-20-97	Turbid, light gray.

TOTAL WATER REMOVED DURING DEVELOPMENT (GALLONS):				125 gallons (approx.)	
DESCRIPTION OF TURBIDITY AT END OF DEVELOPMENT:		CLEAR	SLIGHTLY CLOUDY	MOD. TURBID	VERY MUDDY
ODOR OF WATER:		None			
WATER DISCHARGED TO:	GROUND SURFACE	STORM SEWER	DRUMS	TANK TRUCK	STORAGE TANK
	OTHER:				

FIELD MEASUREMENTS

pH (units)	TEMPERATURE (°F)	SPEC. COND. (mmhos/cm)	TURBIDITY (N-units)	DATE	TIME
7.35	57.3	795		5-20-97	1000
7.41	56.6	812		5-20-97	1030
7.42	57.3	768		5-20-97	1102
7.40	57.1	779		5-20-97	1130

DEPTH TO GROUNDWATER AFTER DEVELOPMENT:	18.05	FEET

FORM COMPLETED BY: Joe Marks DATE: 5-20-97

HARZA ENVIRONMENTAL SERVICES, INC.

WELL DEVELOPMENT FORM

WELL NUMBER:	**16B**
PROJECT NAME/LOCATION:	IOWA ARMY AMMUNITION PLANT, MIDDLETOWN, IOWA
PROJECT NUMBER:	5644V
TASK NAME:	GROUNDWATER DATA, LINE 3
TASK NUMBER:	16
METHOD OF DEVELOPMENT:	BAILED.

WATER REMOVAL

YIELD (GPM):	TIME: FROM	TIME: TO	DATE:	REMARKS:
12 gal. (Total)	1658	1717	5-19-97	Very turbid. Bailed dry. Lt. tan.

TOTAL WATER REMOVED DURING DEVELOPMENT (GALLONS):				12 gallons (approx.)	
DESCRIPTION OF TURBIDITY AT END OF DEVELOPMENT:		CLEAR	SLIGHTLY CLOUDY	MOD. TURBID	**VERY MUDDY**
ODOR OF WATER:		None			
WATER DISCHARGED TO:	GROUND SURFACE	STORM SEWER	**DRUMS**	TANK TRUCK	STORAGE TANK
	OTHER:				

FIELD MEASUREMENTS

pH (units)	TEMPERATURE (°F)	SPEC. COND. (mmhos/cm)	TURBIDITY (N-units)	DATE	TIME
Well bailed dry before comparative field measurements could be taken.					
DEPTH TO GROUNDWATER AFTER DEVELOPMENT:				18.05	FEET

FORM COMPLETED BY: Joe Marks DATE: 5-19-97

HARZA ENVIRONMENTAL SERVICES, INC.

WELL DEVELOPMENT FORM

WELL NUMBER:	16C
PROJECT NAME/LOCATION:	IOWA ARMY AMMUNITION PLANT, MIDDLETOWN, IOWA
PROJECT NUMBER:	5644V
TASK NAME:	GROUNDWATER DATA, LINE 3
TASK NUMBER:	16
METHOD OF DEVELOPMENT:	BAILED.

WATER REMOVAL

YIELD (GPM):	TIME: FROM	TIME: TO	DATE:	REMARKS:
10 gal. (Total)	1522	1547	5-19-97	Water light tan.

TOTAL WATER REMOVED DURING DEVELOPMENT (GALLONS):			10 gallons (approx.)	
DESCRIPTION OF TURBIDITY AT END OF DEVELOPMENT:	CLEAR	SLIGHTLY CLOUDY	MOD. TURBID	**VERY MUDDY**
ODOR OF WATER:	None			
WATER DISCHARGED TO:	GROUND SURFACE	STORM SEWER	**DRUMS**	TANK TRUCK	STORAGE TANK
	OTHER:			

FIELD MEASUREMENTS

pH (units)	TEMPERATURE (°F)	SPEC. COND. (mmhos/cm)	TURBIDITY (N-units)	DATE	TIME
Well bailed dry before comparative field measurements could be taken.					

DEPTH TO GROUNDWATER AFTER DEVELOPMENT:	18.05	FEET

FORM COMPLETED BY: Joe Marks DATE: 5-19-97

HARZA ENVIRONMENTAL SERVICES, INC.

WELL DEVELOPMENT FORM

WELL NUMBER:	**16D**
PROJECT NAME/LOCATION:	IOWA ARMY AMMUNITION PLANT, MIDDLETOWN, IOWA
PROJECT NUMBER:	5644V
TASK NAME:	GROUNDWATER DATA, LINE 3
TASK NUMBER:	16
METHOD OF DEVELOPMENT:	BAILED.

WATER REMOVAL

YIELD (GPM):	TIME: FROM	TIME: TO	DATE:	REMARKS:
10 gal. (Total)	1614	1624	5-19-97	Very turbid. Light tan.

TOTAL WATER REMOVED DURING DEVELOPMENT (GALLONS):				10 gallons (approx.)	
DESCRIPTION OF TURBIDITY AT END OF DEVELOPMENT:		CLEAR	SLIGHTLY CLOUDY	MOD. TURBID	**VERY MUDDY**
ODOR OF WATER:		None			
WATER DISCHARGED TO:	GROUND SURFACE	STORM SEWER	**DRUMS**	TANK TRUCK	STORAGE TANK
	OTHER:				

FIELD MEASUREMENTS

pH (units)	TEMPERATURE (°F)	SPEC. COND. (mmhos/cm)	TURBIDITY (N-units)	DATE	TIME
Well bailed dry before comparative field measurements could be taken.					
DEPTH TO GROUNDWATER AFTER DEVELOPMENT:				18.05	FEET

FORM COMPLETED BY: Joe Marks DATE: 5-19-97

I-20

HARZA ENVIRONMENTAL SERVICES, INC.

WELL DEVELOPMENT FORM

WELL NUMBER:	16E
PROJECT NAME/LOCATION:	IOWA ARMY AMMUNITION PLANT, MIDDLETOWN, IOWA
PROJECT NUMBER:	5644V
TASK NAME:	GROUNDWATER DATA, LINE 3
TASK NUMBER:	16
METHOD OF DEVELOPMENT:	BAILED.

WATER REMOVAL

YIELD (GPM):	TIME: FROM	TIME: TO	DATE:	REMARKS:
13 gal. (Total)	1614	1630	5-19-97	Very turbid. Light brown.

TOTAL WATER REMOVED DURING DEVELOPMENT (GALLONS):			10 gallons (approx.)	
DESCRIPTION OF TURBIDITY AT END OF DEVELOPMENT:	CLEAR	SLIGHTLY CLOUDY	MOD. TURBID	**VERY MUDDY**
ODOR OF WATER:	None			
WATER DISCHARGED TO:	GROUND SURFACE	STORM SEWER	**DRUMS**	TANK TRUCK	STORAGE TANK
	OTHER:			

FIELD MEASUREMENTS

pH (units)	TEMPERATURE (°F)	SPEC. COND. (mmhos/cm)	TURBIDITY (N-units)	DATE	TIME
Well bailed dry before comparative field measurements could be taken.					

DEPTH TO GROUNDWATER AFTER DEVELOPMENT:	18.05	FEET

FORM COMPLETED BY: Joe Marks DATE: 5-19-97

APPENDIX E
SAMPLE COLLECTION FIELD SHEETS

E-1 Task 6. Ammunition Box Chipper Disposal Area

E-2 Task 7. Surface Water & Sediment Sampling, Site Drainages

E-3 Task 10. Pumping Test, Line 2

E-4 Task 11. VOC Sampling

E-5 Task 12. Additional Groundwater Data, Line 2

E-6 Task 13. Groundwater Data, Downstream Reach, Brush Creek

E-7 Task 16. Additional Groundwater Data, Line 3

APPENDIX E
SAMPLE COLLECTION FIELD SHEETS

E-1 Task 6. Ammunition Box Chipper Disposal Area

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: 6-A
Project No: 5644V
SAMPLE NO: H-06-A-01-04-00
Sample Method: HYDRO PUNCH
Date: 6-17-97 **Time:** 0815
Sampling Personnel: K. KRASKE
Sample Split (circle one) Yes (No) **Split Sample No:**
Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1 L GLASS	1			✓			
1 L GLASS	1				X		

WELL PURGING

Date:
Time Started:
Time Completed:
HNu/OVA Measurements
Background:
Well Head:
Breathing Zone:

A. Well Depth (Ft ftom TOC):
B. Depth to Water (Ft from TOC):
C. Water Column Length (A-B)(Ft):
D. Casing Diameter (In.):
E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):
F. Minimum Casing Volumes to Purge:
G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Well No: 6-B

Project No: 5644V

SAMPLE NO: H-06-B-01-04-0

Sample Method: HYDROPUNCH

Date: 6-18-97 Time: 1800

Sampling Personnel: K. KRASKE

Sample Split (circle one) Yes No Split Sample No:

Field Duplicate (circle one) Yes No Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1-1 L GLASS	1			X			
1-1 L GLASS	1				X		

WELL PURGING

Date:

Time Started:

Time Completed:

HNu/OVA Measurements

Background:

Well Head:

Breathing Zone:

A. Well Depth (Ft ftom TOC):

B. Depth to Water (Ft from TOC):

C. Water Column Length (A-B)(Ft):

D. Casing Diameter (In.):

E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):

F. Minimum Casing Volumes to Purge:

G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP **Well No:** 6-C

Project No: 5644V **SAMPLE NO:** 4-06-C-01-04-06

Sample Method: HYDROPUNCH **Date:** 6-16-97 **Time:** 1230

Sampling Personnel: K. KRASKE

Sample Split (circle one) Yes (No) **Split Sample No:**

Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1- 1 L GLASS	1			X			
1- 1 L GLASS	1				X		

WELL PURGING

Date:

Time Started:

Time Completed:

HNu/OVA Measurements

Background:

Well Head:

Breathing Zone:

A. Well Depth (Ft ftom TOC):

B. Depth to Water (Ft from TOC):

C. Water Column Length (A-B)(Ft):

D. Casing Diameter (In.):

E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):

F. Minimum Casing Volumes to Purge:

G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: 6-D
Project No: 5644V
SAMPLE NO: H-06-D-01-04-0
Sample Method: HYDROPUNCH
Date: 6-18-97 Time: 1830
Sampling Personnel: K. KRASKE
Sample Split (circle one) Yes No Split Sample No:
Field Duplicate (circle one) Yes No Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1 L GLASS	1			X			
1 L GLASS	1				X		

WELL PURGING

Date:
Time Started:
Time Completed:
HNu/OVA Measurements
Background:
Well Head:
Breathing Zone:

A. Well Depth (Ft ftom TOC):
B. Depth to Water (Ft from TOC):
C. Water Column Length (A-B)(Ft):
D. Casing Diameter (In.):
E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):
F. Minimum Casing Volumes to Purge:
G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: 6-E
Project No: 5644V
SAMPLE NO: H-06-E-01-04-00
Sample Method: HYDROPUNCH
Date: 6-18-97 Time: 1845
Sampling Personnel: K. KRASKE
Sample Split (circle one) Yes No Split Sample No:
Field Duplicate (circle one) Yes No Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1 L GLASS	1			X			
1 L GLASS	1				X		

WELL PURGING

Date:
Time Started:
Time Completed:
HNu/OVA Measurements
Background:
Well Head:
Breathing Zone:

A. Well Depth (Ft ftom TOC):
B. Depth to Water (Ft from TOC):
C. Water Column Length (A-B)(Ft):
D. Casing Diameter (In.):
E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):
F. Minimum Casing Volumes to Purge:
G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP **Well No:** 6-F

Project No: 5644V **SAMPLE NO:** H-06-F-01-04-0

Sample Method: HYDROPUNCH **Date:** 6-18-97 **Time:** 1422

Sampling Personnel: K. KRASKE

Sample Split (circle one) Yes No **Split Sample No:** SAME LABEL TO MRDL

Field Duplicate (circle one) Yes No **Duplicate Sample No:** H-MRDL-DUP1-CHIP AND 2 EACH SETS FOR MRDL MS/MSDS

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1-L GLASS	1			X			
1 L GLASS	1				X		

WELL PURGING

Date: _____

Time Started: _____

Time Completed: _____

HNu/OVA Measurements

Background: _____

Well Head: _____

Breathing Zone: _____

A. Well Depth (Ft ftom TOC): _____

B. Depth to Water (Ft from TOC): _____

C. Water Column Length (A-B)(Ft): _____

D. Casing Diameter (In.): _____

E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.): _____

F. Minimum Casing Volumes to Purge: _____

G. Minimum Water Volume to Purge (E x F)(Gal.): _____

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP **Well No:** 6-G

Project No: 5644V **SAMPLE NO:** H-06-G-01-04-00

Sample Method: HYDROPUNCH **Date:** 6-18-97 **Time:** 1752

Sampling Personnel: K. KRASKE

Sample Split (circle one) Yes No **Split Sample No:**

Field Duplicate (circle one) Yes No **Duplicate Sample No:**

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1 L GLASS	1			X			
1 L GLASS	1				X		

WELL PURGING

Date:

Time Started:

Time Completed:

HNu/OVA Measurements

Background:

Well Head:

Breathing Zone:

A. Well Depth (Ft ftom TOC):

B. Depth to Water (Ft from TOC):

C. Water Coiumn Length (A-B)(Ft):

D. Casing Diameter (In.):

E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):

F. Minimum Casing Volumes to Purge:

G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: JAW 620
Project No: 5644V
SAMPLE NO: HG JAW 620 01 030
Sample Method: Well Wizard slow rate Sampling
Date: 6/26/97 Time: 920
Sampling Personnel: Hoss Natiar Pour, Pat Reed (Mason & Hanger Corp)
Sample Split (circle one) Yes (No) Split Sample No:
Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1l Amber glass	2	4°C		✓	✓		

WELL PURGING

Date: 6/26/97
Time Started: 815
Time Completed: 920
HNu/OVA Measurements
Background: 0/0
Well Head: 0/0
Breathing Zone: 0/0

A. Well Depth (Ft from TOC): 17'
B. Depth to Water (Ft from TOC): 7.39
C. Water Column Length (A-B)(Ft): 9.61
D. Casing Diameter (In.): 2"
E. Volume of Water in Well ([D÷24]² x 3.14 x C)(Gal.): 1.54 - 3al. one-vol! 4.6 3al. 3-
F. Minimum Casing Volumes to Purge: —
G. Minimum Water Volume to Purge (E x F)(Gal.): —

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color
815							
830	1	7.55	11.4	403	3.80	—	clear
845	2	7.50	11.4	392	2.82	—	"
855	2½	7.70	12.5	398	10.20	—	"
900	3	7.58	11.8	387	8.48	—	"
910	4½	7.50	12.1	386	2.30	—	"

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator	Solinst		
Conductivity Meter	YSI 3500	with std solution	
pH Meter	" "	Before:	After:
Nephalometer	Cole Parmer		

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP **Well No:** JAW 621

Project No: 5644V **SAMPLE NO:** H6JAW621010300

Sample Method: Well Wizard slow rate Sampling **Date:** [illegible] **Time:**

Sampling Personnel: Hoss Najjar Pour, Pat Reed (Mason + Hanger a.p.)

Sample Split (circle one) Yes (No) **Split Sample No:**

Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1l Amber glass	2	--		✓	✓		

WELL PURGING

Date: 6/26/97

Time Started: 10 15

Time Completed: 11 40

HNu/OVA Measurements

Background: 0/0

Well Head: 0/0

Breathing Zone: 0/0

A. Well Depth (Ft from TOC): 17'

B. Depth to Water (Ft from TOC): 5.55'

C. Water Column Length (A-B)(Ft): 11.45'

D. Casing Diameter (In.): 2"

E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.): 1.83 gal/one-vol.

F. Minimum Casing Volumes to Purge: 5.50 gal/3-vol

G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color
10:15							
10:20	1/4	7.30	13.0	283	14.40	-	Clear
11 05	2	7.34	11.6	283	6.50	-	"
11 20	4	7.27	11.5	273	1.70	-	"
11 30	5	7.19	11.9	296	1.68	-	"

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator	Solinst		
Conductivity Meter	YSI 3500	With Ref. Solution	
pH Meter	" "	Before:	After:
Nephalometer	Cole Parmer		

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: JAW 622
Project No: 5644V
SAMPLE NO: H6 JAW622 01 030
Sample Method: Well Wizard wt. slow rate Pump
Date: 6/26/97 Time: 1505
Sampling Personnel: Hoss NAJJAR Pour, Pat Reed from Mason & Hanger Cor.
Sample Split (circle one) Yes (No) Split Sample No:
Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1l Amber glass	2			✓	✓		

WELL PURGING

Date: 6/26/97
Time Started: 1345
Time Completed: 1505

HNu/OVA Measurements
Background: 0/0
Well Head: 0/0
Breathing Zone: 0/0

A. Well Depth (Ft ftom TOC): 17'
B. Depth to Water (Ft from TOC): 4.54'
C. Water Column Length (A-B)(Ft): 12.55'
D. Casing Diameter (In.): 2"
E. Volume of Water in Well ([D÷24]² x 3.14 x C)(Gal.): 2.01 gal, one-vol! 6.03 gal 3-
F. Minimum Casing Volumes to Purge: —
G. Minimum Water Volume to Purge (E x F)(Gal.): —

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color
1345							
1355	1	7.40	13.9	313	1.70	—	clear
1410	1½	6.93	14.9	317	1.59	—	"
1435	2	7.19	12.4	287	1.08	—	"
1500	7	7.06	10.8	285	6.91	—	Pale-clear

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator	Solinst		
Conductivity Meter	YSI 3500	with Ref. solution	
pH Meter	" "	Before:	After:
Nephalometer	Cole Parmer		

Comments:

APPENDIX E
SAMPLE COLLECTION FIELD SHEETS

E-2 Task 7. Surface Water & Sediment Sampling, Site Drainages

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Well No: 7A

Project No: 5644V

SAMPLE NO: H-07-A-01-06-00

Sample Method: Glass Digger

Date: 6-11-97 Time: 0900

Sampling Personnel: JM, KAK

Sample Split (circle one) Yes (No)

Split Sample No:

Field Duplicate (circle one) (Yes) (No)

Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	CN OTHER (List)
40 ML VIAL	3	HCL	X				
1 L Glass	1			X			
1 L Glass	1				X		
1 L Plastic	1	HNO3				X	
1 L Plastic	1	NAOH					X

WELL PURGING

Date:

Time Started:

Time Completed:

HNu/OVA Measurements

Background:

Well Head:

Breathing Zone:

A. Well Depth (Ft ftom TOC):

B. Depth to Water (Ft from TOC):

C. Water Column Length (A-B)(Ft):

D. Casing Diameter (In.):

E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):

F. Minimum Casing Volumes to Purge:

G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: 7A

Project No: 5644V

SAMPLE NO: H-07-A1-01-0[illegible]1

Sample Method: Stainless Spoon + Bowl

Date: 6-11-97

Sample Depth (ft.): 0-1 FT

Time: 0852

Sample/Media Type: Soil (surface) Soil (subsurface) (Sediment) Sludge Other (describe)

Sample Split (circle one) Yes (No)

Split Sample No:

Field Duplicate (circle one) (Yes) No

Duplicate Sample No: ARDL-DUP3-SOIL

Sampling Personnel: JM, KAK

(Analysis Metals + Explosive)

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4 oz		X				
1-8 oz			X			
1-8 oz				X		
1-8 oz					X	

SAMPLE DESCRIPTION

Depth:	Description:
0-1 FT	Fine to medium sand

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: 7B
Project No: 5644V
SAMPLE NO: H-07-B-01-06-00
Sample Method: Glass Digger
Date: 6-10-97 Time: 1700
Sampling Personnel: ~~RW~~, JM, KAK
Sample Split (circle one) Yes No Split Sample No:
Field Duplicate (circle one) Yes No Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	CN OTHER (List)
40 ML VIAL	3	HCL	X				
1 L Glass	1			X			
1 L Glass	1				X		
1 L Plastic	1	HNO3				X	
1 L Plastic	1	NAOH					X

WELL PURGING

Date:
Time Started:
Time Completed:
HNu/OVA Measurements
Background:
Well Head:
Breathing Zone:

A. Well Depth (Ft from TOC):
B. Depth to Water (Ft from TOC):
C. Water Column Length (A-B)(Ft):
D. Casing Diameter (In.):
E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):
F. Minimum Casing Volumes to Purge:
G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: 7B

Project No: 5644V

SAMPLE NO: H-07-B1-01-05

Sample Method: Stainless Spoon + Bowl

Date: 6-10-97

Sample Depth (ft.): 0-1 FT

Time: 1653

Sample/Media Type: Soil (surface) Soil (subsurface) (Sediment) Sludge Other (describe)

Sample Split (circle one) Yes (No) Split Sample No:

Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sampling Personnel: JM, KAK

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 - 4 oz		X				
1 - 8 oz			X			
1 - 8 oz				X		
1 - 8 oz					X	

SAMPLE DESCRIPTION

Depth:	Description:
0-1 FT	Fine to medium sand

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: 7B
Project No: 5644V
SAMPLE NO: H-07-B1-02-05-03
Sample Method: Driven PVC Pipe
Date: 6-10-97
Sample Depth (ft.): 3-4 FT
Time: 1703
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes ~~No~~
Split Sample No:
Field Duplicate (circle one) Yes ~~No~~
Duplicate Sample No:
Sampling Personnel: JM, KAK

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1- 8 oz				X		
1- 8 oz					X	

SAMPLE DESCRIPTION

Depth:	Description:
3-4 FT	Silty sand

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Well No: 7C

Project No: 5644V

SAMPLE NO: H-07-C-01-06-0

Sample Method: Glass Digger

Date: 6-10-97 Time: 1445

Sampling Personnel: RW, JM, KAK

Sample Split (circle one) Yes (No) Split Sample No:

Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	CN OTHER (List)
40 ML VIAL	3	HCL	X				
1 L Glass	1			X			
1 L Glass	1				X		
1 L Plastic	1	HNO3				X	
1 L Plastic	1	NAOH					X

WELL PURGING

Date:

Time Started:

Time Completed:

HNu/OVA Measurements

Background:

Well Head:

Breathing Zone:

A. Well Depth (Ft from TOC):

B. Depth to Water (Ft from TOC):

C. Water Column Length (A-B)(Ft):

D. Casing Diameter (In.):

E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):

F. Minimum Casing Volumes to Purge:

G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: 7C
Project No: 5644V
SAMPLE NO: H-07-C1-01-05-01
Sample Method: Stainless Spoon + Bowl
Date: 6-10-97
Sample Depth (ft.): 0-1 FT
Time: 1439
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes No
Split Sample No:
Field Duplicate (circle one) Yes No
Duplicate Sample No:
Sampling Personnel: RW, JM, KAK

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 - 4 oz		X				
1 - 8 oz			X			
1 - 8 oz				X		
1 - 8 oz					X	

SAMPLE DESCRIPTION

Depth:	Description:
0 - 1 FT	Medium to coarse sand

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: 7C

Project No: 5644V

SAMPLE NO: H-07-C1-02-05-

Sample Method: Driven PVC Pipe

Date: 6-10-97

Sample Depth (ft.): 3-4 FT

Time: 1450

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes No

Split Sample No:

Field Duplicate (circle one) Yes No

Duplicate Sample No:

Sampling Personnel: RW, JM, KAK

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1 - 8 oz				X		
1 - 8 oz					X	

SAMPLE DESCRIPTION

Depth:	Description:
3-4 FT	Coarse sand to fine gravel

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: 7C

Project No: 5644V

SAMPLE NO: H-07-C2-01-05-01

Sample Method: Stainless Spoon + Bowl

Date: 6-10-97

Sample Depth (ft.): 0-1 FT

Time: 1450

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes No

Split Sample No:

Field Duplicate (circle one) Yes No

Duplicate Sample No:

Sampling Personnel: RW, JM, KAK

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1-8 oz				X		
1-8 oz					X	

SAMPLE DESCRIPTION

Depth:	Description:
0-1 FT	Medium to coarse sand - trace fines

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP **Well No:** 7D

Project No: 5644V **SAMPLE NO:** HOT DUPLICATE

Sample Method: Dip and pour **Date:** 5/29/94 **Time:** 1600

Sampling Personnel: K. Krause, R. Wilson, H. Najjar, R. Nercessy

Sample Split (circle one) Yes (No) **Split Sample No:**

Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
40 ml glass	3	HCl	✓				
1 l amber glass	1	–		✓			
" "	1	–			✓		
1 l polyethylene	1	HNO_3				✓	
1 l plastic		N-OH					CN

WELL PURGING NA

Date:

Time Started:

Time Completed:

HNu/OVA Measurements

Background:

Well Head:

Breathing Zone:

A. Well Depth (Ft ftom TOC):

B. Depth to Water (Ft from TOC):

C. Water Column Length (A-B)(Ft):

D. Casing Diameter (In.):

E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):

F. Minimum Casing Volumes to Purge:

G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C) F	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	Odor	Color
1547		6.57	61.2	598	4.96		

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator			
Conductivity Meter	Aquacheck		
pH Meter	Aquacheck	Before:	After:
Nephalometer	Cole Parmer		

Comments:

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: 7D1

Project No: 5644V

SAMPLE NO: H-07-D1-01-05-1

Sample Method: Stainless Steel Spoon + Bowl

Date: 5-29-97

Sample Depth (ft.): 0 to 1 FT

Time: 1600

Sample/Media Type: Soil (surface) Soil (subsurface) (Sediment) Sludge Other (describe)

Sample Split (circle one) Yes (No) Split Sample No:

Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sampling Personnel: KAK, RW, HNP, RN

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	Cyanide OTHER (List)
2- 4OZ. Glass		X				
1- 8 OZ. Glass			X			
1- 8 OZ. Glass				X		
1- 8 OZ - Glass					X	X

SAMPLE DESCRIPTION

Depth:	Description:
0 to 1 FT	Bank deposit near water
	Silty, fine sand above a black,
	organic-rich layer

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Well No: 7E

Project No: 5644V

SAMPLE NO: H-07-E-01-06-0

Sample Method: Glass Digger

Date: 6-10-97 Time: 1130

Sampling Personnel: RW, JM, KAK

Sample Split (circle one) Yes (No) Split Sample No:

Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	CN OTHER (List)
40 ML VIAL	3	HCL	X				
1 L Glass	1			X			
1 L Glass	1				X		
1 L Plastic	1	HNO3				X	
1 L Plastic	1	NAOH					X

WELL PURGING

Date:

Time Started:

Time Completed:

HNu/OVA Measurements

Background:

Well Head:

Breathing Zone:

A. Well Depth (Ft from TOC):

B. Depth to Water (Ft from TOC):

C. Water Column Length (A-B)(Ft):

D. Casing Diameter (In.):

E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):

F. Minimum Casing Volumes to Purge:

G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments:

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: 7E
Project No: 5644V
SAMPLE NO: H-07-E1-01-05-01
Sample Method: Stainless Spoon + Bowl
Date: 6-10-97
Sample Depth (ft.): 0-1 FT
Time: 1129
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes No
Split Sample No:
Field Duplicate (circle one) Yes No
Duplicate Sample No:
Sampling Personnel: RW, JM, KAK

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 - 4 oz		X				
1 - 8 oz			X			
1 - 8 oz				X		
1 - 8 oz					X	

SAMPLE DESCRIPTION

Depth:	Description:
0-1 FT	fine / med sand

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: 7E

Project No: 5644V

SAMPLE NO: H-07-E1-02-0_3

Sample Method: Driven PVC Pipe

Date: 6-10-97

Sample Depth (ft.): 3-4 FT

Time: 1129

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes No

Split Sample No:

Field Duplicate (circle one) Yes No

Duplicate Sample No:

Sampling Personnel: RW, JM, KAK

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1 - 8 oz				X		
1 - 8 oz					X	

SAMPLE DESCRIPTION

Depth:	Description:
3-4 FT	Silty sand, some clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: 7E

Project No: 5644V

SAMPLE NO: H-07-E2-01-05-01

Sample Method: Stainless Spoon + Bowl

Date: 6-10-97

Sample Depth (ft.): 0-1 FT

Time: 1129

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes No

Split Sample No:

Field Duplicate (circle one) Yes No

Duplicate Sample No:

Sampling Personnel: RW, JM, KAK

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1 - 8 oz				X		
1 - 8 oz					X	

SAMPLE DESCRIPTION

Depth:	Description:
0-1 FT	Fine/med sand

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Well No: 7F

Project No: 5644V

SAMPLE NO: H-07-F-01-06

Sample Method: Glass Digger

Date: 6-10-97 Time: 0909

Sampling Personnel: RW, JM, KAK

Sample Split (circle one) Yes (No)

Split Sample No:

Field Duplicate (circle one) (Yes) No

Duplicate Sample No: ARDL-DUP2-SW

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	CN OTHER (List)
40 ML VIAL	3	HCL	X				
1 L Glass	1			X			
1 L Glass	1				X		
1 L Plastic	1	HNO3				X	
1 L Plastic	1	NAOH					X

WELL PURGING

Date:

Time Started:

Time Completed:

HNu/OVA Measurements

Background:

Well Head:

Breathing Zone:

A. Well Depth (Ft ftom TOC):

B. Depth to Water (Ft from TOC):

C. Water Column Length (A-B)(Ft):

D. Casing Diameter (In.):

E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):

F. Minimum Casing Volumes to Purge:

G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: 7F
Project No: 5644V
SAMPLE NO: H-07-F1-01-05-01
Sample Method: Stainless Spoon + Bowl
Date: 6-10-97
Sample Depth (ft.): 0 TO 1 FT
Time: 0910
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes No
Split Sample No:
Field Duplicate (circle one) Yes No
Duplicate Sample No: ARDL-DUP2-SO-F2
Sampling Personnel: RW, JM, KAK

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 - 4 oz		X				
1 - 8 oz			X			
1 - 8 oz				X		
1 - 8 oz					X	

SAMPLE DESCRIPTION

Depth:	Description:
0-1 FT	Fine/med sand

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: 7F

Project No: 5644V

SAMPLE NO: H-07-F2-01-05

Sample Method: Stainless Spoon + Bowl

Date: 6-10-97

Sample Depth (ft.): 0-1 FT

Time: 0910

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes No

Split Sample No:

Field Duplicate (circle one) Yes No

Duplicate Sample No:

Sampling Personnel:

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1-8 oz				X		
1-8 oz					X	

SAMPLE DESCRIPTION

Depth:	Description:
0-1 FT	Fine/med sand

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: 76
Project No: 5644V
SAMPLE NO: H-07-G1-01-05-01
Sample Method: Stainless Spoon + Bowl
Date: 6-10-97
Sample Depth (ft.): 0-1 FT
Time: 1045
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes No
Split Sample No:
Field Duplicate (circle one) Yes No
Duplicate Sample No:
Sampling Personnel: RW, JM, KAK

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 - 4 oz		X				
1 - 8 oz			X			
1 - 8 oz				X		
1 - 8 oz					X	

SAMPLE DESCRIPTION

Depth:	Description:
0-1 FT	Fine/med sand

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP **Well No:** 76

Project No: 5644V **SAMPLE NO:** H-07-G-01-06-0

Sample Method: Glass Dipper **Date:** 6-10-97 **Time:** 1040

Sampling Personnel: RW, JM, KAK

Sample Split (circle one) Yes (No) **Split Sample No:**

Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	CN OTHER (List)
40 ML VIAL	3	HCL	X				
1 L Glass	1			X			
1 L Glass	1				X		
1 L Plastic	1	HNO3				X	
1 L Plastic	1	NAOH					X

WELL PURGING

Date:

Time Started:

Time Completed:

HNu/OVA Measurements

Background:

Well Head:

Breathing Zone:

A. Well Depth (Ft ftom TOC):

B. Depth to Water (Ft from TOC):

C. Water Column Length (A-B)(Ft):

D. Casing Diameter (In.):

E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):

F. Minimum Casing Volumes to Purge:

G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: 76
Project No: 5644V
SAMPLE NO: H-07-62-01-05-01
Sample Method: Stainless Spoon + Bowl
Date: 6-16-97
Sample Depth (ft.): 0-1 FT
Time: 1045
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes No
Split Sample No:
Field Duplicate (circle one) Yes No
Duplicate Sample No:
Sampling Personnel: RW, JM, KAK

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1 - 8 oz				X		
1 - 8 oz					X	

SAMPLE DESCRIPTION

Depth:	Description:
0-1 FT	Coarse sand w/ Gravel

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP **Well No:** 7H

Project No: 5644V **SAMPLE NO:** H-07-H-01-06-2

Sample Method: Glass Dipper **Date:** 6-9-97 **Time:** 1415

Sampling Personnel: RW, JM, KAK

Sample Split (circle one) Yes (No) **Split Sample No:**

Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	CN OTHER (List)
40 ML VIAL	3	HCL	X				
1 L Glass	1			X			
1 L Glass	1				X		
1 L Plastic	1	HNO3				X	
1 L Plastic	1	NaOH					X

WELL PURGING

Date:

Time Started:

Time Completed:

HNu/OVA Measurements

Background:

Well Head:

Breathing Zone:

A. Well Depth (Ft ftom TOC):

B. Depth to Water (Ft from TOC):

C. Water Column Length (A-B)(Ft):

D. Casing Diameter (In.):

E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):

F. Minimum Casing Volumes to Purge:

G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: 7H

Project No: 5644V

SAMPLE NO: H-07-H1-01-05-01

Sample Method: Stainless Spoon + Bowl

Date: 6-9-97

Sample Depth (ft.): 0 - 1 FT

Time: 1410

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes No

Split Sample No:

Field Duplicate (circle one) Yes No

Duplicate Sample No:

Sampling Personnel: RW, JM, KAK

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
~~2 - 40 oz~~						
2 - 4 oz		X				
1 - 8 oz			X			
1 - 8 oz				X		
1 - 8 oz					X	

SAMPLE DESCRIPTION

Depth:	Description:
0 - 1 FT	Fine / medium sand

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: 7H

Project No: 5644V

SAMPLE NO: H-07-HL-02-0 3

Sample Method: Driven PVC Pipe

Date: 6-9-97

Sample Depth (ft.): 3-4 FT

Time: 1430

Sample/Media Type: Soil (surface) Soil (subsurface) ~~Sediment~~ Sludge Other (describe)

Sample Split (circle one) Yes (No) **Split Sample No:**

Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sampling Personnel: RW, JM, KAK

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1 - 8 oz				X		
1 - 8 oz					X	

SAMPLE DESCRIPTION

Depth:	Description:
3 - 4 FT	Silty sand, gray, some clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: 7H
Project No: 5644V
SAMPLE NO: H-07-H2-01-05-01
Sample Method: Stainless Spoon + Bowl
Date: 6-9-97
Sample Depth (ft.): 0-1 FT
Time: 1410
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes No
Split Sample No:
Field Duplicate (circle one) Yes No
Duplicate Sample No:
Sampling Personnel: RW, JM, KAK

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1 - 8 oz				X		
1 - 8 oz					X	

SAMPLE DESCRIPTION

Depth:	Description:
0 - 1 FT	Fine / Med Sand

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP **Well No:** 7I

Project No: 5644V **SAMPLE NO:** H-07-I-01-06-0

Sample Method: Glass Dipper **Date:** 6-9-97 **Time:** 1245

Sampling Personnel: RW, JM, KAK

Sample Split (circle one) Yes (No) **Split Sample No:**

Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	CN OTHER (List)
40 ML VIAL	3	HCL	X				
1 L GLASS	1			X			
1 L GLASS	1				X		
1 L P	1	HNO3				X	
1 L P	1	NaOH					X

WELL PURGING

Date:

Time Started:

Time Completed:

HNu/OVA Measurements

Background:

Well Head:

Breathing Zone:

A. Well Depth (Ft ftom TOC):

B. Depth to Water (Ft from TOC):

C. Water Column Length (A-B)(Ft):

D. Casing Diameter (In.):

E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):

F. Minimum Casing Volumes to Purge:

G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: 7I
Project No: 5644V
SAMPLE NO: H-07-I1-01-05-01
Sample Method: Stainless Spoon + Bowl
Date: 6-9-97
Sample Depth (ft.): 0-1 FT
Time: 1237
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes No
Split Sample No:
Field Duplicate (circle one) Yes No
Duplicate Sample No:
Sampling Personnel: RW, JM, KAK

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 - 4oz		X				
1 - 8 oz			X			
1 - 8 oz				X		
1 - 8 oz					X	

SAMPLE DESCRIPTION

Depth:	Description:
0-1 FT	Fine to medium sand - black / gray

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: 7I

Project No: 5644V

SAMPLE NO: H-07-I1-02-03

Sample Method: PVC Pipe Driven

Date: 6-9-97

Sample Depth (ft.): 1-2 FT

Time: 1250

Sample/Media Type: Soil (surface) Soil (subsurface) (Sediment) Sludge Other (describe)

Sample Split (circle one) Yes (No) Split Sample No:

Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sampling Personnel: RW, JM, KAK

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1 - 8 oz				X		
1 - 8 oz					X	

SAMPLE DESCRIPTION

Depth:	Description:
1-2 FT	Black / gray clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: 7I
Project No: 5644V
SAMPLE NO: H-07-JC-01-05-01
Sample Method: Stainless Steel Bowl
Date: 6-9-97
Sample Depth (ft.): 0-1 FT
Time: 1237
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes No
Split Sample No:
Field Duplicate (circle one) Yes No
Duplicate Sample No:
Sampling Personnel: RW, JM, KAK

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1 - 8 OZ				X		
1 - 8 OZ					X	

SAMPLE DESCRIPTION

Depth:	Description:
0-1 FT	fine to medium sand

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: 7J
Project No: 5644V
SAMPLE NO: H-07-J-01-06-
Sample Method: Glass Digger
Date: 6-9-97 Time: 0935
Sampling Personnel: R. Wilson, J. Mark, K. Kroske
Sample Split (circle one) Yes (No) Split Sample No:
Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	CN OTHER (List)
40 ML VIAL	3	HCL, 4°C	X				
1 L Glass	1			X			
1 L Glass	1				X		
1 L Plastic	1	HNO3				X	
1 L Plastic	1	NaOH					X

WELL PURGING

Date:
Time Started:
Time Completed:
HNu/OVA Measurements
Background:
Well Head:
Breathing Zone:

A. Well Depth (Ft ftom TOC):
B. Depth to Water (Ft from TOC):
C. Water Column Length (A-B)(Ft):
D. Casing Diameter (In.):
E. Volume of Water in Well ([D ÷ 24]^2 x 3.14 x C)(Gal.):
F. Minimum Casing Volumes to Purge:
G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: 7J

Project No: 5644V

SAMPLE NO: H-07-J1-01-05-01

Sample Method: Stainless Spoon + Bowl

Date: 6-9-97

Sample Depth (ft.): 0 TO 1 FT

Time: 0955

Sample/Media Type: Soil (surface) Soil (subsurface) (Sediment) Sludge Other (describe)

Sample Split (circle one) Yes (No)

Split Sample No:

Field Duplicate (circle one) Yes (No)

Duplicate Sample No:

Sampling Personnel: R. Wilson, J. Mark, K. Kraske

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2- 4 oz Glass		X				
1- 8 oz Glass			X			
1- 8 oz Glass				X		
1- 8 oz Glass					X	

SAMPLE DESCRIPTION

Depth:	Description:
0 TO 1 FT	Fine to medium sand

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: 7J

Project No: 5644V

SAMPLE NO: H-07-J1-02-05

Sample Method: Driven 2" PVC Pipe

Date: 6-9-97

Sample Depth (ft.): 2.75 TO 3.25 FT

Time: 1055

Sample/Media Type: Soil (surface) Soil (subsurface) (Sediment) Sludge Other (describe)

Sample Split (circle one) Yes (No) **Split Sample No:**

Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sampling Personnel: R. Wilson, J. Mark, K. Kraske

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
~~2 4 oz Glass~~		~~X~~				
~~1 8 oz~~			~~X~~			
1 - 8 oz				X		
1 - 8 oz					X	

SAMPLE DESCRIPTION

Depth:	Description:
2.75 to 3.25 FT	Black clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: 7J
Project No: 5644V
SAMPLE NO: H-07-02-01-05-01
Sample Method: Stainless Spoon + Bowl
Date: 6-9-97
Sample Depth (ft.): 0 TO 1 FT
Time: 0955
Sample/Media Type: Soil (surface) Soil (subsurface) (Sediment) Sludge Other (describe)
Sample Split (circle one) Yes (No) Split Sample No:
Field Duplicate (circle one) Yes (No) Duplicate Sample No:
Sampling Personnel: RW, JM, KAK

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
~~2 - 4 oz~~		~~X~~				
~~1 - 8 oz~~			~~X~~			
1 - 8 oz				X		
1 - 8 oz					X	

SAMPLE DESCRIPTION

Depth:	Description:
0 TO 1 FT	Fine to medium sand

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP **Well No:** 7K

Project No: 5644V **SAMPLE NO:** H-07-K-01-06-

Sample Method: Grab - Dig and Pour **Date:** 6-6-97 **Time:** 1124

Sampling Personnel: J. Mark, K. Kraske

Sample Split (circle one) Yes (No) **Split Sample No:**

Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List) Cyanide
40 ML VIAL	3	HCL, 4°C	X				
1 L Amber Glass	1	4°C		X			
1 L Amber Glass	1	4°C			X		
1 L Plastic	1	HNO3, 4°C				X	
1 L Plastic	1	NaOH, 4°C					X

WELL PURGING

Date:

Time Started:

Time Completed:

HNu/OVA Measurements

Background:

Well Head:

Breathing Zone:

A. Well Depth (Ft ftom TOC):

B. Depth to Water (Ft from TOC):

C. Water Column Length (A-B)(Ft):

D. Casing Diameter (In.):

E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):

F. Minimum Casing Volumes to Purge:

G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: 7K
Project No: 5644V
SAMPLE NO: H-07-K1-01-05-01
Sample Method: Stainless Steel Spoon + Bowl
Date: 6-6-97
Sample Depth (ft.): 0 to 1 FT
Time: 1139
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes No
Split Sample No:
Field Duplicate (circle one) Yes No
Duplicate Sample No:
Sampling Personnel: J. Mark, K. Kraske

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List) Cyanide
2-4 oz Glass	4°C	X				
1-8 oz Glass	4°C		X			
1-8 oz Glass	4°C			X		
1-8 oz Glass	4°C				X	X

SAMPLE DESCRIPTION

Depth:	Description:
0 to 1 FT	fine to medium sand

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: 7K

Project No: 5644V

SAMPLE NO: H-07-K1-02-0[illegible]3

Sample Method: PVC Driven Pipe

Date: 6-6-97

Sample Depth (ft.): 1.5 to 2.5 FT

Time: 1210

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes No

Split Sample No:

Field Duplicate (circle one) Yes No

Duplicate Sample No:

Sampling Personnel:

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	Cyanide OTHER (List)
1 - 8 oz Glass	4°C			X		
1 - 8 oz Glass	4°C				X	X

SAMPLE DESCRIPTION

Depth:	Description:
1.5 to 2.5	Clay and organics (black)

COMMENTS:

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: 7K
Project No: 5644V
SAMPLE NO: H-07-K2-01-05-01
Sample Method: Stainless Spoon + Bowl
Date: 6-6-97
Sample Depth (ft.): 0 to 1 FT
Time: 1139
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes No
Split Sample No:
Field Duplicate (circle one) Yes No
Duplicate Sample No:
Sampling Personnel: J. Mark, K. Kraske

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	Cyanide OTHER (List)
1- 8 oz Glass	4°C			X		
1- 8 oz Glass	4°C				X	X

SAMPLE DESCRIPTION

Depth:	Description:
0 to 1 FT	Fine to medium sand

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (~~GROUND~~ SURFACE WATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Well No: 7L

Project No: 5644V

SAMPLE NO: H-07-L-01-06-00

Sample Method: Grab – Dip + Pour

Date: 5-30-97 Time: 0852

Sampling Personnel: KAK, RW, HNP

Sample Split (circle one) Yes (No) Split Sample No:

Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List) cyanide
40 ML VIAL	3	HCL, 4°C	X				
1 L Amber Glass	1	4°C		X			
1 L Amber Glass	1	4°C			X		
1 L Plastic	1	HNO3, 4°C				X	
1 L Plastic	1	NaOH, 4°C					X

WELL PURGING

Date:

Time Started:

Time Completed:

HNu/OVA Measurements

Background:

Well Head:

Breathing Zone:

A. Well Depth (Ft ftom TOC):

B. Depth to Water (Ft from TOC):

C. Water Column Length (A-B)(Ft):

D. Casing Diameter (In.):

E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):

F. Minimum Casing Volumes to Purge:

G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C) F	S. Cond. (µM~~HOS~~S/cm)	Turbidity (Neph. units)	Odor	Color
0847		6.56	57.7	447	4.03		

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter	Aquacheck		
pH Meter	Aquacheck	Before:	After:
Nephalometer	Cole Parmer		

Comments:

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: 7L1
Project No: 5644V
SAMPLE NO: H-07-L1-01-05-1
Sample Method: Stainless Steel Spoon + Bowl
Date: 5-30-97
Sample Depth (ft.): 0 to 1 FT
Time: 0903
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes No
Split Sample No:
Field Duplicate (circle one) Yes No
Duplicate Sample No:
Sampling Personnel: KAK, RW, HNP

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	Cyanide OTHER (List)
2-4oz Glass	4°C	X				
1-8oz Glass	4°C		X			
1-8oz Glass	4°C			X		
1-8oz Glass	4°C				X	X

SAMPLE DESCRIPTION

Depth:	Description:
0 to 1 FT	Silt-Sand-Gravel

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: 7L2

Project No: 5644V

SAMPLE NO: H-07-L2-01-0

Sample Method: Stainless Steel Spoon + Bowl

Date: 5-30-97

Sample Depth (ft.): 0 to 1 FT

Time: 0925

Sample/Media Type: Soil (surface) Soil (subsurface) (Sediment) Sludge Other (describe)

Sample Split (circle one) Yes (No) Split Sample No:

Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sampling Personnel: KAK, RW, HNP

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	Cyanide OTHER (List)
~~2-4 OZ. GLASS~~	~~4°C~~					
~~1-8 OZ. GLASS~~	~~4°C~~					
1-8 OZ. GLASS	4°C			X		
1-8 OZ. GLASS	4°C				X	X

SAMPLE DESCRIPTION

Depth:	Description:
0 to 1 FT	Silt - Sand - Gravel

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: 7L2

Project No: 5644V PVC Pipe

SAMPLE NO: H-07-L2-02-05-2.

Sample Method: ~~Stainless Steel Spoon + Bowl~~

Date: 5-30-97

Sample Depth (ft.): 2.7 to 3.3 FT

Time: 1000

Sample/Media Type: Soil (surface) Soil (subsurface) (Sediment) Sludge Other (describe)

Sample Split (circle one) Yes (No)

Split Sample No:

Field Duplicate (circle one) Yes (No)

Duplicate Sample No:

Sampling Personnel: KAK, RW, HNP

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	Cyanide OTHER (List)
1- 8 OZ Glass	4°C			X		
1- 8 OZ Glass	4°C				X	X

SAMPLE DESCRIPTION

Depth:	Description:
2.7 to 3.3 FT	Silty sand

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (~~GROUND~~SURFACE WATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: 7M
Project No: 5644V
SAMPLE NO: HOTNCIGOC
Sample Method: Grab - dip and pour
Date: 5/29/17 **Time:** 1333
Sampling Personnel: H. Najjar, K. Hoke, R. Willey, A. Nerenberg
Sample Split (circle one) Yes (No) **Split Sample No:**
Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
40 ml glass	3	HCl pH<2	✓				
1 l, amber glass	1	—		✓			
1 l, amber glass	1	—			✓		
1 l polyethylene	1	HNO_3 pH<2				✓	
1 l plastic	1	NaOH pH>12					Cyanide

WELL PURGING — NA

Date:
Time Started:
Time Completed:
HNu/OVA Measurements
Background:
Well Head:
Breathing Zone:

A. Well Depth (Ft from TOC):
B. Depth to Water (Ft from TOC):
C. Water Column Length (A-B)(Ft):
D. Casing Diameter (In.):
E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):
F. Minimum Casing Volumes to Purge:
G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (~~°C~~ F)	S. Cond. (µ~~MHOS~~S/cm)	Turbidity (Neph. units)	Odor	Color
1342		6.58	59.9	449	6.11		

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator			
Conductivity Meter	Aquacheck		
pH Meter	Aquacheck	Before:	After:
Nephalometer	Cole Parmer		

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: 7M1
Project No: 5644V
SAMPLE NO: HO7M1G1SC1
Sample Method: Stainless Steel Spoon + Bowl
Date: 5/29/97
Sample Depth (ft.): 0'-1'
Time: 1400
Sample/Media Type: Soil (surface) Soil (subsurface) (Sediment) Sludge Other (describe)
Sample Split (circle one) Yes (No) **Split Sample No:**
Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**
Sampling Personnel: K. Krake, R. Wilson, H. Najjar, R. Nerenberg

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS/CN	OTHER (List)
2 - 40z glass VOA	—	✓				
1 - 8oz wm glass	—		✓			
1 - 8oz wm glass	—			✓		
1 - 8oz. wm glass	—				✓	

SAMPLE DESCRIPTION

Depth:	Description:
0'-1'	Coarse sand

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	**Boring/Well No:**	7M1
Project No:	5644V	**SAMPLE NO:**	HOTMU2050S1
Sample Method:	~~Stainless Steel Auger~~ PVC Pipe	**Date:**	5/21/91
Sample Depth (ft.):	~~K. Kraske, R. Wilson~~ 3'	**Time:**	1430
Sample/Media Type:	Soil (surface) Soil (subsurface) (Sediment)	Sludge Other (describe)	
Sample Split (circle one)	Yes (No)	**Split Sample No:**	
Field Duplicate (circle one)	Yes (No)	**Duplicate Sample No:**	
Sampling Personnel:	K. Kraske, R. Wilson		

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS/CN	OTHER (List)
1 - 8oz Wm Sters	—			✓		
1 - 8oz Wm Sters	—				✓	

SAMPLE DESCRIPTION

Depth:	Description:
3'	Coarse sand

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: 7M1

Project No: 5644V

SAMPLE NO: HC7M1GS054.5

Sample Method: Stainless Steel Auger

Date: 5/25/97

Sample Depth (ft.): 4.5'

Time: 1500

Sample/Media Type: Soil (surface) Soil (subsurface) (Sediment) Sludge Other (describe)

Sample Split (circle one) Yes (No) **Split Sample No:**

Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sampling Personnel: K. Krause, R. Wilson, H. Najjar, R. Neersey

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS/CN	OTHER (List)
1 - 8oz wm glass	—			✓		
1 - 8oz nm glass	—				✓	

SAMPLE DESCRIPTION

Depth: 4.5' **Description:** Coarse sand

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: 7M2

Project No: 5644V

SAMPLE NO: H-07-M2-01-0

Sample Method: Stainless Steel Spoon + Bowl

Date: 5-27-97

Sample Depth (ft.): 0 to 1 FT

Time: 1515

Sample/Media Type: Soil (surface) Soil (subsurface) (Sediment) Sludge Other (describe)

Sample Split (circle one) Yes (No)

Split Sample No:

Field Duplicate (circle one) Yes (No)

Duplicate Sample No:

Sampling Personnel: KAK, RW, HNP, RN

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	Cyanide OTHER (List)
1-8 oz Glass	4°C			X		
1-8 oz Glass	4°C				X	X

SAMPLE DESCRIPTION

Depth:	Description:
0 to 1 FT	Silty sand with large gravel, brown silt sand is coarse

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP **Well No:** 7N

Project No: 5644V **SAMPLE NO:** H-07-N-01-06-00

Sample Method: Direct Immersion **Date:** 6-6-97 **Time:** 1033

Sampling Personnel: J. Mark, K. Kraske

Sample Split (circle one) Yes (No) **Split Sample No:**

Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List) cyanide
40 ML VIAL	3	HCL, 4°C	X				
1 L Amber Glass	1	4°C		X			
1 L Amber Glass	1	4°C			X		
1 L Plastic	1	HNO3, 4°C				X	
1 L Plastic	1	NaOH, 4°C					X

WELL PURGING

Date:

Time Started:

Time Completed:

HNu/OVA Measurements

Background:

Well Head:

Breathing Zone:

A. Well Depth (Ft ftom TOC):

B. Depth to Water (Ft from TOC):

C. Water Column Length (A-B)(Ft):

D. Casing Diameter (In.):

E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):

F. Minimum Casing Volumes to Purge:

G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (µMHOS/cm)	Turbidity (Nech. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: 7N

Project No: 5644V.

SAMPLE NO: H-07-N1-01-02

Sample Method: Stainless Steel Spoon + Bowl

Date: 6-6-97

Sample Depth (ft.): 0 to 1 FT

Time: 1042

Sample/Media Type: Soil (surface) Soil (subsurface) (Sediment) Sludge Other (describe)

Sample Split (circle one) Yes (No) **Split Sample No:**

Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sampling Personnel: J. Mark, K. Kraske

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	Cyanide OTHER (List)
2- 4 oz. Glass	4°C	X				
1- 8 oz Glass	4°C		X			
1- 8 oz Glass	4°C			X		
1- 8 oz Glass	4°C				X	X

SAMPLE DESCRIPTION

Depth:	Description:
0 to 1 FT	Silty, clay-rich medium sand black

COMMENTS:

582

SAMPLE COLLECTION FIELD SHEET (~~GROUND~~SURFACE WATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: 701
Project No: 5644V
SAMPLE NO: H-07-01-01-06-00
Sample Method: Grab - Dig + Pour
Date: 5-30-97 Time: 1045
Sampling Personnel: KAK, RW, HNP
Sample Split (circle one) Yes No Split Sample No:
Field Duplicate (circle one) Yes No Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	CYANIDE OTHER (List)
40 ML VIAL	3	HCL, 4°C	X				
1L Amber Glass	1	4°C		X			
1L Amber Glass	1	4°C			X		
1L Plastic	1	HNO3, 4°C				X	
1L Plastic	1	NaOH, 4°C					X

WELL PURGING

Date:
Time Started:
Time Completed:
HNu/OVA Measurements
Background:
Well Head:
Breathing Zone:

A. Well Depth (Ft ftom TOC):
B. Depth to Water (Ft from TOC):
C. Water Column Length (A-B)(Ft):
D. Casing Diameter (In.):
E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):
F. Minimum Casing Volumes to Purge:
G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°~~C~~F)	S. Cond. (µ~~M~~MHOS/cm)	Turbidity (Neph. units)	Odor	Color
1042		6.56	61.5	417	4.63		

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator			
Conductivity Meter	Aquacheck		
pH Meter	Aquacheck	Before:	After:
Nephalometer	Cole Parmer		

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET ~~(SOIL~~/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	Boring/Well No:	701
Project No:	5644V	SAMPLE NO:	H-07-01-01-05-
Sample Method:	Stainless Steel Spoon + Bowl	Date:	5-30-97
Sample Depth (ft.):	0 to 1 FT	Time:	1045
Sample/Media Type:	Soil (surface) Soil (subsurface) (Sediment)	Sludge Other (describe)	
Sample Split (circle one)	Yes (No)	Split Sample No:	
Field Duplicate (circle one)	Yes (No)	Duplicate Sample No:	
Sampling Personnel:	K. Kraske, R. Wilson, H. Najjar-Pour		

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	Cyanide OTHER (List)
2-4oz Glass	~~NONE~~ 4°C	X				
1-8oz Glass	4°C		X			
1-8oz Glass	4°C			X		
1-8oz Glass	4°C				X	X

SAMPLE DESCRIPTION

Depth:	Description:
0 to 1 FT	Silty sand

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: 701

Project No: 5644V Auger

SAMPLE NO: H-07-01-02-05-03

Sample Method: Stainless ~~Spoon + Bowl~~

Date: 5-30-97

Sample Depth (ft.): 3 to 4 FT

Time: 1100

Sample/Media Type: Soil (surface) Soil (subsurface) (Sediment) Sludge Other (describe)

Sample Split (circle one) Yes (No)

Split Sample No:

Field Duplicate (circle one) Yes (No)

Duplicate Sample No:

Sampling Personnel: KAK, RW, HNP

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	Cyanide OTHER (List)
1-8OZ Glass	4°C			X		
1-8OZ Glass	4°C				X	X

SAMPLE DESCRIPTION

Depth:	Description:
3 to 4 FT	Sandy silt

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: 701

Project No: 5644V Auger

SAMPLE NO: H-07-01-03-05

Sample Method: Stainless Spoon + Bowl

Date: 5-30-97

Sample Depth (ft.): 4.5 to 5.5 FT

Time: 1125

Sample/Media Type: Soil (surface) Soil (subsurface) (Sediment) Sludge Other (describe)

Sample Split (circle one) Yes (No) Split Sample No:

Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sampling Personnel: KAK, RW, HNP

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	Cyanide OTHER (List)
1-8oz Glass	4°C			X		
1-8oz Glass	4°C				X	X

SAMPLE DESCRIPTION

Depth:	Description:
4.5 to 5.5 FT	Sandy Silt - taken at auger refusal depth

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (~~GROUND~~ SURFACE WATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP **Well No:** 7P

Project No: 5644V **SAMPLE NO:** H-07-P-01-06-00

Sample Method: Grab - Dig + Pour **Date:** 6-2-97 **Time:** 1230

Sampling Personnel: H. Najjar-Pour, K. Kraske

Sample Split (circle one) (Yes) No **Split Sample No:** H-07-P-01-06-00 (MRDL)

Field Duplicate (circle one) (Yes) No **Duplicate Sample No:** ARDL-DUP1-SW (QC)
H-07-P-01-06-00 (MSD)

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List) cyanide
40 ML VIAL	3	HCL, 4°C	X				
1 L Amber Glass	1	4°C		X			
1 L Amber Glass	1	4°C			X		
1 L Plastic	1	HNO3, 4°C				X	
1 L Plastic	1	NaOH, 4°C					X

WELL PURGING

Date: _____

Time Started: _____

Time Completed: _____

HNu/OVA Measurements

Background: _____

Well Head: _____

Breathing Zone: _____

A. Well Depth (Ft from TOC): _____

B. Depth to Water (Ft from TOC): _____

C. Water Column Length (A-B)(Ft): _____

D. Casing Diameter (In.): _____

E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.): _____

F. Minimum Casing Volumes to Purge: _____

G. Minimum Water Volume to Purge (E x F)(Gal.): _____

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C) F	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	Odor	Color
1230		6.57	61.8	608	1.73		

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator			
Conductivity Meter	Aquacheck		
pH Meter	Aquacheck	Before:	After:
Nephalometer	Cole Parmer		

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: 7P

Project No: 5644V

SAMPLE NO: H-07-P1-01-0[illegible]1

Sample Method: Stainless Steel Spoon + Bowl

Date: 6-2-97

Sample Depth (ft.): 0 to 1 FT

Time: 1400

Sample/Media Type: Soil (surface) Soil (subsurface) (Sediment) Sludge Other (describe)

Sample Split (circle one) (Yes) No

Split Sample No: H-07-P1-01-05-01 (MRDL

Field Duplicate (circle one) (Yes) No

Duplicate Sample No: ARDL-DUP1-SOIL

Sampling Personnel: H. Nafjar-Pow, K. Kraske

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	Cyanide OTHER (List)
2-4 OZ. Glass	4°C	X				
1-8 OZ. Glass	4°C		X			
1-8 OZ. Glass	4°C			X		
1-8 OZ. Glass	4°C				X	X

SAMPLE DESCRIPTION

Depth:	Description:
0 to 1 FT	Course sand

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (~~GROUND~~SURFACE WATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP **Well No:** 7G

Project No: 5644V **SAMPLE NO:** H-07-G-01-06-00

Sample Method: Dipper (glass) or Direct **Date:** 6-5-97 **Time:** 1630

Sampling Personnel: H. Nagyor-Pour, J. Mark, K. Kraske

Sample Split (circle one) Yes (No) **Split Sample No:**

Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	Cyanide OTHER (List)
40 ML VOA	3	HCL, 4°C	X				
1 L Amber-Glass	1	4°C		X			
1 L Amber-Glass	1	4°C			X		
1 L Plastic	1	HNO3, 4°C				X	
1 L Plastic	1	NaOH, 4°C					X

WELL PURGING

Date:

Time Started:

Time Completed:

HNu/OVA Measurements

Background:

Well Head:

Breathing Zone:

A. Well Depth (Ft ftom TOC):

B. Depth to Water (Ft from TOC):

C. Water Column Length (A-B)(Ft):

D. Casing Diameter (In.):

E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):

F. Minimum Casing Volumes to Purge:

G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°~~C~~F)	S. Cond. (µM~~HO~~S/cm)	Turbidity (Neph. units)	Odor	Color
1628		8.07	66.2	535	9.00		

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator			
Conductivity Meter	Aquacheck		
pH Meter	Aquacheck	Before:	After:
Nephalometer	Cole Parmer		

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: 7G

Project No: 5644V

SAMPLE NO: H-G7-G1-01-05

Sample Method: Stainless Steel Spoon + Bowl

Date: 6-5-97

Sample Depth (ft.): 0 to 1 FT

Time: 1620

Sample/Media Type: Soil (surface) Soil (subsurface) (Sediment) Sludge Other (describe)

Sample Split (circle one) Yes (No) **Split Sample No:**

Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sampling Personnel: H. Najjar-Pour, J. Mark, K. Kraske

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	Cyanide OTHER (List)
2-4oz Glass	4°C	X				
1-8oz Glass	4°C		X			
1-8oz Glass	4°C			X		
1-8-oz Glass	4°C				X	X

SAMPLE DESCRIPTION

Depth:	Description:
0 to 1 FT	Fine to medium sand - some small gravel

COMMENTS:

590

APPENDIX E
SAMPLE COLLECTION FIELD SHEETS

E-3 Task 10. Pumping Test, Line 2

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: 10-A
Project No: 5644V
SAMPLE NO: H10A01 0800
Sample Method: Bailing
Date: 6/12/97 Time: 1445
Sampling Personnel: Hoss Naylor Pour, Rob Nocenbers
Sample Split (circle one) Yes (No) Split Sample No:
Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1l Amber Glass	2			✓	✓		
40 ml Glass Vial	3	HCl 1:4	✓				
1l Polyethylene Jar	2	H NO3				✓	Filter & UnFiltered
1l Plastic Jar	2	NaOH					Cyanide Filtered & UnFiltered

WELL PURGING

Date: 6/11/97
Time Started: 952
Time Completed: 1923

HNu/OVA Measurements
Background: 0/0
Well Head: 0/0
Breathing Zone: 0/0

A. Well Depth (Ft from TOC): 52.82
B. Depth to Water (Ft from TOC): 4.60'
C. Water Column Length (A-B)(Ft): 48.22
D. Casing Diameter (In.): 4"
E. Volume of Water in Well ([D÷24]² x 3.14 x C)(Gal.): 31.34 Gal
F. Minimum Casing Volumes to Purge: 31.34 Gal
G. Minimum Water Volume to Purge (E x F)(Gal.): 94.00 Gal

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	~~Odor~~ O_2	Color
952							
1020	3	7.36	71.3	549	43.7	47	Pale Yellow
1050	5	7.33	72.4	509	30.2	44	Pale Yellow
1145	9	7.29	74.2	534	189 NTU	42	Faint Yellow
1700	22	–	65.8	595	6.4	42	Clear
1740	28	7.07	63.2	578	3.83	32	Clear
1802	34	7.01	58.5	572	3.10	30	Clear
1820	44	6.96	59.2	577	4.8	29	Clear
1850	64	6.99	54.5	600	40	33	Faint Yellow

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator	Solinst		
Conductivity Meter	Aqua Check	With Reference Solution	
pH Meter	Aqua Check	Before:	After:
Nephalometer	Cole Parr		

Comments: Due to rain stop Pump and restart with flow rate > 500 ml/Min

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: 10 B
Project No: 5644V
SAMPLE NO: H 10B 01 0300
Sample Method: Bailing and low rate Pumping
Date: 6/10/97 Time: 2145
Sampling Personnel: Hess Nyjlet Low, Rob Nordberg
Sample Split (circle one) Yes No Split Sample No:
Field Duplicate (circle one) Yes No Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1l amber glass	2			✓	✓		
1l polyethylene	2	HNO3				✓	Filtered unfiltered
40 ml glass vials	3	HCl	✓				
1l plastic Jar	2	NaOH					cyanide filtered unfiltered

WELL PURGING

Date: 6/10/97
Time Started: 2145
Time Completed: 2200

HNu/OVA Measurements
Background: 0/0
Well Head: 0/0
Breathing Zone: 0/0

A. Well Depth (Ft ftom TOC): 52.22
B. Depth to Water (Ft from TOC): 4.72
C. Water Column Length (A-B)(Ft): 47.45
D. Casing Diameter (In.): 2
E. Volume of Water in Well ([D ÷ 24]^2 x 3.14 x C)(Gal.):
F. Minimum Casing Volumes to Purge: 7.59 gal
G. Minimum Water Volume to Purge (E x F)(Gal.): 22.77 gal

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C) F	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	~~Odor~~ O_2	Color
1700							
1740	3	Fail	72.3	601	150	21 i	Pale yellow
1835	6 1/2	Fail	72	584	142	19	" "
1950	11	Fail	66.3	569	53	16	" "
2050	18	Fail	60.0	566	32	10	" "

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator	Solinist		
Conductivity Meter	Aqua Check	with Reference solution	
pH Meter	Aqua Check	Before:	After:
Nephalometer	Cole Parmer		

Comments: Aqua check pH did not work properly

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: JAW 70
Project No: 5644V
SAMPLE NO: H10JAW70010300
Sample Method: Well Wizard (w slow rate
Date: 6/25/97 **Time:** 1600
Sampling Personnel: Hoss NASJAP Power, Brian Stevenson from Mason + Hanger
Sample Split (circle one) Yes (No) **Split Sample No:**
Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1l Amber glass	2			✓	✓		
40 ml glass vial	3	HCl	✓				
1l Plastic Jar	2	HNO3				✓	Filt and unfilt
1l Plastic Jar	2	NaOH					cyanide filt. unfilt.

WELL PURGING

Date: 06-25-97
Time Started: 1430
Time Completed: 1600
HNu/OVA Measurements
Background: 0/0
Well Head: 0/0
Breathing Zone: 0/0

A. Well Depth (Ft from TOC): 35'
B. Depth to Water (Ft from TOC): 4.45'
C. Water Column Length (A-B)(Ft): 30.55
D. Casing Diameter (In.): 2"
E. Volume of Water in Well ([D÷24]² x 3.14 x C)(Gal.): 4.89 gal one-vol. 14.66 gallon 3-vol.
F. Minimum Casing Volumes to Purge:
G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	Odor	Color
1430							
1440	1	7.06	13.1	429	6.80	–	Clear – slight stain
1450	3	7.10	12.1	418	2.45	–	" " "
1510	7	7.16	11.8	416	0.886	–	" " "
1530	10	7.42	11.8	416	0.582	–	" " "
1540	12½	7.38	11.8	417	0.822	–	" " "
1555	15	7.33	11.7	416	0.648	–	Clear

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator	Solinst		
Conductivity Meter	YSI 3500	with Ref. Solution	
pH Meter	" "	Before:	After:
Nephalometer	Cole Parmer		

Comments:

APPENDIX E
SAMPLE COLLECTION FIELD SHEETS

E-4 Task 11. VOC Sampling

HARZA ENVIRONMENTAL SERVICES

RINSE BLANK

595

SAMPLE COLLECTION FIELD SHEET ~~(SOIL/SEDIMENT)~~

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No:

Project No: 5644V

SAMPLE NO:

Sample Method: 4

Date: 6-13-97

Sample Depth (ft.):

Time: 1517

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes No

Split Sample No:

Field Duplicate (circle one) Yes No

Duplicate Sample No:

Sampling Personnel: Roger Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
3 40 ml Glass	4°C/HCL	✓				

SAMPLE DESCRIPTION

Depth:	Description:

COMMENTS: A RINSE blank was collected to document the effectiveness of rinsing drilling and sampling equipment w/ a pressure washer followed by a Alconox rinse followed by a pressure wash rinse. This method was used in lieu of a steam cleaner because the USACE steam cleaner was not available.

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	Boring/Well No:	A1 TASK 11
Project No:	5644V	SAMPLE NO:	HHA1-01-01-0[illegible]
Sample Method:	Hand Auger	Date:	6-5-97
Sample Depth (ft.):	Surface	Time:	1200
Sample/Media Type:	(Soil surface) Soil (subsurface) Sediment	Sludge Other (describe)	
Sample Split (circle one)	Yes (No)	Split Sample No:	
Field Duplicate (circle one)	Yes (No)	Duplicate Sample No:	
Sampling Personnel:	Robin Wilson		

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4oz Glass	4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
Surface	Black to dark brown Silty Clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: Ai TASK 11
Project No: 5644V
SAMPLE NO: H-11-Ai-02-01-04
Sample Method: Hand Auger
Date: 6-5-97
Sample Depth (ft.): 4
Time: 1220
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes No
Split Sample No:
Field Duplicate (circle one) Yes No
Duplicate Sample No:
Sampling Personnel: Robin Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4oz Glass	4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
4	yellowish gray to dark yellowish orange silty clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	**Boring/Well No:**	A2 Trak 11
Project No:	5644V	**SAMPLE NO:**	H-11-A2-01-01
Sample Method:	Hand Auger	**Date:**	6-5-97
Sample Depth (ft.):	surface	**Time:**	1227

Sample/Media Type: (Soil (surface)) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes (No) Split Sample No:

Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sampling Personnel: Roger Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4oz Glass	4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
surface	Dark brown to black silty clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: A2 Task 11

Project No: 5644V

SAMPLE NO: H-11-A2-02-01-04

Sample Method: Hand Auger

Date: 6-5-97

Sample Depth (ft.): 4

Time: 1235

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes No

Split Sample No:

Field Duplicate (circle one) Yes No

Duplicate Sample No:

Sampling Personnel: Roger Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4oz Glass	4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
4	yellowish gray to dark yellowish orange silty clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: A3 TASK 11

Project No: 5644V

SAMPLE NO: H-11-AB-0.1-0.1-0

Sample Method: 4" O.D CME Split Spoon

Date: 6-5-97

Sample Depth (ft.): surface

Time: 0957

Sample/Media Type: (Soil (surface)) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes (No) **Split Sample No:**

Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sampling Personnel: Roger Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
24 oz Glass	4°C	Y				

SAMPLE DESCRIPTION

Depth:	Description:
4	Dark brown to black silty clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: A3 Task 11
Project No: 5644V
SAMPLE NO: H-11-A3-02-01-01
Sample Method: 4" O.D. CME split spoon
Date: 6-5-97
Sample Depth (ft.): 4
Time: 0957
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes No
Split Sample No:
Field Duplicate (circle one) Yes No
Duplicate Sample No:
Sampling Personnel: Roger Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4oz Glass	4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
4	yellowish grey to dark yellowish orange Silty Clay.

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: A3 TASK 11

Project No: 5644V

SAMPLE NO: H-11-A3-01-04-0

Sample Method: Hydropunch w/ bailer

Date: 6-5-97

Sample Depth (ft.): 7

Time: 1145

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe) Groundwater

Sample Split (circle one) Yes (NO)

Split Sample No:

Field Duplicate (circle one) Yes (NO)

Duplicate Sample No:

Sampling Personnel: ROGER WILSON

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
3-40 ml glass	4°C/HCL	X				

SAMPLE DESCRIPTION

Depth:	Description:
7	Groundwater

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: TANK 11 B1
Project No: 5644V
SAMPLE NO: H11-B1-01-01-00
Sample Method: HAND Auger
Date: 6-4-97
Sample Depth (ft.): surface
Time: 1627
Sample/Media Type: (Soil (surface)) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes (No) Split Sample No: —
Field Duplicate (circle one) Yes (No) Duplicate Sample No: —
Sampling Personnel: ROGER WILSON

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4oz Glass	4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
surface	dark brown to black silty clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	**Boring/Well No:**	B2 Task 11
Project No:	5644V	**SAMPLE NO:**	H-11-B2-01-01-
Sample Method:	Hand Auger	**Date:**	6-5-97
Sample Depth (ft.):	Surface	**Time:**	0855
Sample/Media Type:	Soil (surface) Soil (subsurface) Sediment	Sludge Other (describe)	
Sample Split (circle one)	Yes (No)	**Split Sample No:**	
Field Duplicate (circle one)	Yes (No)	**Duplicate Sample No:**	
Sampling Personnel:	Robin Wilson		

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 40z Glass	4° C	X				

SAMPLE DESCRIPTION

Depth:	Description:
Surface	Gravel + Silty clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: B2 Task 11
Project No: 5644V
SAMPLE NO: H-11-B2-02-01-04
Sample Method: Hand Auger
Date: 6-5-97
Sample Depth (ft.): 4
Time: 0907
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes No
Split Sample No:
Field Duplicate (circle one) Yes No
Duplicate Sample No:
Sampling Personnel: Roger Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4oz Glass	4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
4	Pale blue to dark yellowish orange Silty Clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	Boring/Well No:	B3 Trsk. 11
Project No:	5644V	SAMPLE NO:	H-11-B3-01-01-0
Sample Method:	Hand Auger	Date:	6-5-97
Sample Depth (ft.):		Time:	1310

Sample/Media Type: (Soil (surface)) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes (No) Split Sample No:

Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sampling Personnel: Roger Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4 oz. Glass	4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
surface	medium brown silty Clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: B3 Task 11

Project No: 5644V

SAMPLE NO: H-11-B3-02-01-04

Sample Method: Hand auger

Date: 6-5-97

Sample Depth (ft.): 4

Time: 1332

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes No

Split Sample No:

Field Duplicate (circle one) Yes No

Duplicate Sample No:

Sampling Personnel: Roger Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4oz Glass	4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
4	Clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: B4 Trsk11

Project No: 5644V

SAMPLE NO: H-11-B4-01-04

Sample Method: Hydropunch w/ bailer

Date: 6-5-97

Sample Depth (ft.):

Time: 0800

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe) Groundwater

Sample Split (circle one) Yes (No)

Split Sample No:

Field Duplicate (circle one) Yes (No)

Duplicate Sample No:

Sampling Personnel: Roger Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
3 40 ml Glass	4°C/HCL	X				

SAMPLE DESCRIPTION

Depth:	Description:
4	Groundwater

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: B4 Task 11
Project No: 5644V
SAMPLE NO: H-11-B4-02 01-10
Sample Method: 4" O.D CME Split spoon
Date: 6-5-97
Sample Depth (ft.): 10
Time: 0917
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes No
Split Sample No:
Field Duplicate (circle one) Yes No
Duplicate Sample No:
Sampling Personnel: Roger Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4oz Glass	4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
10	Clay w/silt mottled dark yellowish orange – light bluish grey – light olive grey.

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: B4

Project No: 5644V

SAMPLE NO: H-11-B4-01-01

Sample Method: 4" O.D CMG splitspoon

Date: 6-4-95

Sample Depth (ft.): surface

Time: 1507

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes No

Split Sample No:

Field Duplicate (circle one) Yes NO

Duplicate Sample No:

Sampling Personnel: Rogers-Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4oz GLASS	4°C	Y				

SAMPLE DESCRIPTION

Depth:	Description:
surface	dark brown to black silty clay / clayey silt

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Project No: 5644V

Sample Method: 4" O.D CMT Split Spoon

Sample Depth (ft.): 5

Sample/Media Type: Soil (surface) (Soil (subsurface)) Sediment Sludge Other (describe)

Sample Split (circle one) Yes (No)

Field Duplicate (circle one) Yes (No)

Sampling Personnel: ROGER WILSON

Boring/Well No: TANK 11 B4

SAMPLE NO: H-11-B4-02-01-05

Date: 6-4-97

Time: 1515

Split Sample No: —

Duplicate Sample No: —

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4 oz Glass	4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
5	BLACKISH RED Silty Clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: B5 TASK. 11

Project No: 5644V

SAMPLE NO: H-11-B5-01-01-

Sample Method: 4" O.D. CME SPLIT SPOON

Date: 6-13-97

Sample Depth (ft.): 3

Time: 1450

Sample/Media Type: Soil (surface) (Soil) (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes (No)

Split Sample No:

Field Duplicate (circle one) Yes (No)

Duplicate Sample No:

Sampling Personnel: Roger Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4oz Glass	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
3 to 5	Clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Project No: 5644V

Sample Method: 4" O.D CMG SPLIT SPOON

Sample Depth (ft.): 8

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes No

Field Duplicate (circle one) Yes No

Sampling Personnel:

Boring/Well No: B5 TASK 11

SAMPLE NO: H-11-B5-02-01-08

Date: 6-13-97

Time: 1501

Split Sample No:

Duplicate Sample No:

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4oz Glass	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
8 to 10	Clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	Boring/Well No:	B6 Task 11
Project No:	5644V	SAMPLE NO:	A-11-B6-01-01-0
Sample Method:	4" O.D. CMG split spoon	Date:	6-13-97
Sample Depth (ft.):	3	Time:	1410
Sample/Media Type:	Soil (surface) Soil (subsurface) Sediment	Sludge Other (describe)	
Sample Split (circle one)	Yes No	Split Sample No:	
Field Duplicate (circle one)	Yes No	Duplicate Sample No:	11-11-DUP-12-01
Sampling Personnel:	ROGER WILSON		

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4 ~~2~~ 4 oz Glass	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
3 to 5	Clay

COMMENTS:

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HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: B6 TASK 11

Project No: 5644V

SAMPLE NO: H-11-B6-02-01-00

Sample Method: 4" O.D CME split spoon

Date: 6-13-97

Sample Depth (ft.): 8

Time: 1420

Sample/Media Type: Soil (surface) (Soil) (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes (No)

Split Sample No:

Field Duplicate (circle one) Yes (No)

Duplicate Sample No:

Sampling Personnel: ROGER WILSON

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4oz GLASS	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
8 to 10	CLAY

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Project No: 5644V

Sample Method: 4" O.D. CME SPLIT SPOON

Sample Depth (ft.): 3

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes (No)

Field Duplicate (circle one) Yes (No)

Sampling Personnel: ROGER WILSON

Boring/Well No: B7 TASK 11

SAMPLE NO: H-11-B7-01-01

Date: 6-12-97

Time:

Split Sample No:

Duplicate Sample No:

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4oz Glass	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
3 to 5	Clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: B7 Task 11

Project No: 5644V

SAMPLE NO: H-11-B7-02-01-03

Sample Method:

Date: 6-12-97

Sample Depth (ft.):

Time:

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes (No)

Split Sample No:

Field Duplicate (circle one) Yes (No)

Duplicate Sample No:

Sampling Personnel: Roger Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4 oz Glass	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
0 to 10	Clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	Boring/Well No:	B8 Task 11
Project No:	5644V	SAMPLE NO:	H-11-B8-01-01-
Sample Method:	4" O.D CME SPLIT SPOON.	Date:	6-12-97
Sample Depth (ft.):	3	Time:	1815

Sample/Media Type: Soil (surface) (Soil) subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes (No) Split Sample No:

Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sampling Personnel: ROGER WILSON

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4oz Glass	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
3 to 5	CLAY, mottled yellowish orange to pale olive

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: B8 TASK 11

Project No: 5644V

SAMPLE NO: H-11-B8-02-01-00

Sample Method: 4" O.D CME SPLIT SPOON

Date: 6-12-97

Sample Depth (ft.): 8

Time: 1620

Sample/Media Type: Soil (surface) (Soil) (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes (No)

Split Sample No:

Field Duplicate (circle one) Yes (No)

Duplicate Sample No:

Sampling Personnel: ROGER WILSON

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4oz. Glass	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
8 to 10	Sandy silty Clay light grey to brown

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	Boring/Well No:	C-1
Project No:	5644V	SAMPLE NO:	H-11-C1-01-01
Sample Method:	CME Continuous Sampler	Date:	6-4-97
Sample Depth (ft.):	0'	Time:	12:59
Sample/Media Type:	(Soil (surface)) Soil (subsurface) Sediment	Sludge Other (describe)	—
Sample Split (circle one)	Yes (No)	Split Sample No:	—
Field Duplicate (circle one)	Yes (No)	Duplicate Sample No:	—
Sampling Personnel:	Joe Mark		

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4oz Glass	Ice	X				

SAMPLE DESCRIPTION

Depth:	Description:
0'	Rocked Gr valved - see log

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: C-1
Project No: 5644V
SAMPLE NO: H-11-C1-02-C1-10
Sample Method: CME Continuous Sampler
Date: 6-4-97
Sample Depth (ft.): 10'
Time: 13:06
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe) —
Sample Split (circle one) Yes No
Split Sample No: —
Field Duplicate (circle one) Yes No
Duplicate Sample No: Dup #4
Sampling Personnel: Joe Mark

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4oz Glass	Ice	X				

SAMPLE DESCRIPTION

Depth:	Description:
10'	Clay - See boring log.

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	Boring/Well No:	C-1
Project No:	5644V	SAMPLE NO:	H-11-C1-03-0
Sample Method:	CME Continuous Sampler	Date:	6-4-97
Sample Depth (ft.):	25'	Time:	14:30
Sample/Media Type:	Soil (surface) Soil (subsurface) Sediment	Sludge Other (describe)	—
Sample Split (circle one)	Yes (No)	Split Sample No:	—
Field Duplicate (circle one)	Yes (No)	Duplicate Sample No:	—
Sampling Personnel:	Joe Mark		

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4 oz Glass	ICE	X				

SAMPLE DESCRIPTION

Depth:	Description:
25'	Clay. See boring log

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: C-1
Project No: 5644V
SAMPLE NO: H-11-C1-04-01-33
Sample Method: CME Continuous Sampler
Date: 6-4-97
Sample Depth (ft.): 33'
Time: 15:55
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe) —
Sample Split (circle one) Yes No
Split Sample No: —
Field Duplicate (circle one) Yes No
Duplicate Sample No: —
Sampling Personnel: Jx

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4oz Glass	ICE	X				

SAMPLE DESCRIPTION

Depth:	Description:
33'	Clay - see boring log

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Project No: 5644V

Sample Method: Hydropunch

Sampling Personnel: Joe Mark

Well No: Hydropunch C-1 (Grab)

SAMPLE NO: H-11-C1-01-04-G

Date: 6-4-97 **Time:** 15:25

Sample Split (circle one) Yes (No) **Split Sample No:** –

Field Duplicate (circle one) Yes (No) **Duplicate Sample No:** –

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
40 ml Glass	2	HCl	X				

WELL PURGING

Date: –

Time Started: –

Time Completed: –

HNu/OVA Measurements

Background: –

Well Head: –

Breathing Zone: –

A. Well Depth (Ft ftom TOC): –

B. Depth to Water (Ft from TOC): –

C. Water Column Length (A-B)(Ft): –

D. Casing Diameter (In.): –

E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.): –

F. Minimum Casing Volumes to Purge: –

G. Minimum Water Volume to Purge (E x F)(Gal.): –

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHCS/cm)	Turbidity (Neph. units)	Odor	Color
NA							

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments: Collected from hydropunch

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HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Project No: 5644V

Sample Method: Hydropunch

Sampling Personnel: Joe Vrat

Well No: Hydropunch C-1 (35')

SAMPLE NO: IA-11-C1-GW-07-00

Date: 6-4-97 **Time:** 15:25

Sample Split (circle one) Yes (No) Split Sample No: —

Field Duplicate (circle one) Yes (No) Duplicate Sample No: —

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
40 ml Glass	2	HCL	X				

WELL PURGING

Date: —

Time Started: —

Time Completed: —

HNu/OVA Measurements

Background: —

Well Head: —

Breathing Zone: —

A. Well Depth (Ft ftom TOC): —

B. Depth to Water (Ft from TOC): —

C. Water Column Length (A-B)(Ft): —

D. Casing Diameter (In.): —

E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.): —

F. Minimum Casing Volumes to Purge: —

G. Minimum Water Volume to Purge (E x F)(Gal.): —

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	Odor	Color
NA							

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments: Collected from hydropunch

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	**Boring/Well No:**	C-2
Project No:	5644V	**SAMPLE NO:**	H-11-C2-01-01
Sample Method:	CME Continuous Sampler	**Date:**	6-5-97
Sample Depth (ft.):	00'	**Time:**	8:45
Sample/Media Type:	(Soil (surface)) Soil (subsurface) Sediment	Sludge Other (describe)	—
Sample Split (circle one)	Yes (No)	Split Sample No:	—
Field Duplicate (circle one)	Yes (No)	Duplicate Sample No:	—
Sampling Personnel:	Joe Mark		

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4/02 Glass	Ice	X				

SAMPLE DESCRIPTION

Depth:	Description:
0'	Railroad Bed - 7.4

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: C-2

Project No: 5644V

SAMPLE NO: H-11-C2-02-01-00

Sample Method: CME Continuous Sampler

Date: 6-5-97

Sample Depth (ft.): 4'

Time: 8:50

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe) —

Sample Split (circle one) Yes No

Split Sample No: —

Field Duplicate (circle one) Yes No

Duplicate Sample No: Dup #7

Sampling Personnel: Joe Mark

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4oz Glass	ICE	X				

SAMPLE DESCRIPTION

Depth:	Description:
4'	Clay - See Logs

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: C-2

Project No: 5644V

SAMPLE NO: H-11-C2-03-

Sample Method: CME Continuous Sampler

Date: 6-5-97

Sample Depth (ft.): 10'

Time: 1005

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe) —

Sample Split (circle one) Yes No

Split Sample No: —

Field Duplicate (circle one) Yes No

Duplicate Sample No: —

Sampling Personnel: Jay Imrik

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4 oz Glass	Ice	X				

SAMPLE DESCRIPTION

Depth:	Description:
10'	Clay- See log.

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: Temp Well C-2
Project No: 5644V
SAMPLE NO: 14-07-C2-01-01-00
Sample Method: HDPE Bailer
Date: 6-9-97 **Time:** 13:50
Sampling Personnel: Joe Nail
Sample Split (circle one) Yes (No) **Split Sample No:** —
Field Duplicate (circle one) Yes (No) **Duplicate Sample No:** —

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
40 ml Glass	3	HCl	X				

WELL PURGING

Date: NA
Time Started: NA
Time Completed: NA
HNu/OVA Measurements
Background: NA
Well Head: NA
Breathing Zone: NA

A. Well Depth (Ft ftom TOC): ~~10~~ 10.10
B. Depth to Water (Ft from TOC): 9.42
C. Water Column Length (A-B)(Ft): —
D. Casing Diameter (In.): —
E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.): —
F. Minimum Casing Volumes to Purge: —
G. Minimum Water Volume to Purge (E x F)(Gal.): —

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	Odor	Color
NA							

FIELD INSTRUMENTS/CALIBRATION NA

	Instrument/Model	Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments: Collected Sample on 6-9-97 It took ≈ 4 days for ≈ 0.6' of water to enter the well.

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP **Well No:** C-3

Project No: 5644V **SAMPLE NO:** H11C03 0300

Sample Method: Slow Bailing **Date:** 6/16/97 **Time:** 1100

Sampling Personnel: Hass Neyffer, Rob Nordenberg

Sample Split (circle one) Yes (No) **Split Sample No:**

Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
40 ml glass vial	3	HCl	✓				

WELL PURGING

Date: 6/16/97

Time Started: 10:10

Time Completed: 10:25

HNu/OVA Measurements

Background: 0/0

Well Head: 0/0

Breathing Zone: 0/0

A. Well Depth (Ft ftom TOC): 22.68

B. Depth to Water (Ft from TOC): 14.27

C. Water Column Length (A-B)(Ft): 8.41'

D. Casing Diameter (In.): 2"

E. Volume of Water in Well ([D ÷ 24]² x 3.14 x C)(Gal.): 25.23 3dl.

F. Minimum Casing Volumes to Purge: 4.04 3.

G. Minimum Water Volume to Purge (E x F)(Gal.): 3 [illegible]

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator	Solinst		
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments: Temp Well

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: C-4
Project No: 5644V
SAMPLE NO: H11C040306
Sample Method: Slow Bailing
Date: 6/16/92 **Time:** 10 45
Sampling Personnel: Hoss Vaughn from Rob Nerenberg
Sample Split (circle one) Yes (No) **Split Sample No:**
Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
3 40 ml glass Vial	3	HCl	✓				

WELL PURGING

Date: 6/16/92
Time Started: 930
Time Completed: 955

HNu/OVA Measurements
Background: 0/0
Well Head: 0/0
Breathing Zone: 0/0

A. Well Depth (Ft ftom TOC): 22.64
B. Depth to Water (Ft from TOC): 16.34
C. Water Column Length (A-B)(Ft): 6.3'
D. Casing Diameter (In.): 2"
E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.): 18.9 3 1/2 hrs
F. Minimum Casing Volumes to Purge: 3.024
G. Minimum Water Volume to Purge (E x F)(Gal.): 3.024

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator	SOLINST		
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments: Temp. Well

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Well No: C-6

Project No: 5644V

SAMPLE NO: H11C06 0300

Sample Method: Slow Bailing

Date: 6/16/97 Time: 1140

Sampling Personnel: Hoss Nuzzerian, Rob Nerenberg

Sample Split (circle one) Yes (No)

Split Sample No:

Field Duplicate (circle one) Yes (No)

Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)

WELL PURGING

Date: 6/16/97

Time Started: 1025

Time Completed: 1045

HNu/OVA Measurements

Background: 0/0

Well Head: 0/0

Breathing Zone: 0/0

A. Well Depth (Ft ftom TOC): 15.15

B. Depth to Water (Ft from TOC): 10.31

C. Water Column Length (A-B)(Ft): 4.84

D. Casing Diameter (In.): 2

E. Volume of Water in Well ([D ÷ 24]^2 x 3.14 x C)(Gal.): 4.84 Vol.

F. Minimum Casing Volumes to Purge: 3

G. Minimum Water Volume to Purge (E x F)(Gal.): 2.32 gal. for 3 volumes

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator	Solinst		
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments: Temp Well

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: C6 TASK 11
Project No: 5644V
SAMPLE NO: H-11-C6-01-01-05
Sample Method: 4" O.D CMT sampler
Date: 6-14-97
Sample Depth (ft.):
Time: 1420
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes No
Split Sample No:
Field Duplicate (circle one) Yes No
Duplicate Sample No:
Sampling Personnel: Rocke Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4 oz Glass	4°C					

SAMPLE DESCRIPTION

Depth:	Description:
5 to 7	Clay

COMMENTS: Contaminated. Look like tar.

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	Boring/Well No:	Task 11 D1
Project No:	5644V	SAMPLE NO:	D1-01-01-00
Sample Method:	CME Continuous Sampler	Date:	6.3.97
Sample Depth (ft.):	0'	Time:	14:17
Sample/Media Type:	Soil (surface) Soil (subsurface) Sediment	Sludge Other (describe)	–
Sample Split (circle one)	Yes (No)	Split Sample No:	–
Field Duplicate (circle one)	Yes (No)	Duplicate Sample No:	–
Sampling Personnel:	Joe Mark		

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4oz Glass	ICE	X				

SAMPLE DESCRIPTION

Depth:	Description:
0'	Railline Fill - See log

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: Task 11, D1
Project No: 5644V
SAMPLE NO: D1-02-01-05
Sample Method: CME Continuous
Date: 6-3-97
Sample Depth (ft.):
Time: 14:22
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes No
Split Sample No:
Field Duplicate (circle one) Yes No
Duplicate Sample No:
Sampling Personnel:

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4oz Glass	ICE	X				

SAMPLE DESCRIPTION

Depth:	Description:
5'	Clay - See Log

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	Boring/Well No:	Task 11 – D1
Project No:	5644V	SAMPLE NO:	D1-03--01
Sample Method:	CMC - Continuous Sampler	Date:	6-3-97
Sample Depth (ft.):	15'	Time:	16.10
Sample/Media Type:	Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)		—
Sample Split (circle one)	Yes No	Split Sample No:	—
Field Duplicate (circle one)	Yes No	Duplicate Sample No:	Dupe # 1
Sampling Personnel:			

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4 oz Glass	ICE	X				

SAMPLE DESCRIPTION

Depth:	Description:
15'	Clay - See boring Log

COMMENTS: Duplicate Sample collected here.

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	Boring/Well No:	E1
Project No:	5644V	SAMPLE NO:	H-11-E1-01-01-00
Sample Method:	CME - Continuous Sampler	Date:	6-4-97
Sample Depth (ft.):	0'	Time:	8 50
Sample/Media Type:	Soil (surface) Soil (subsurface) Sediment	Sludge Other (describe)	—
Sample Split (circle one)	Yes (No)	Split Sample No:	—
Field Duplicate (circle one)	Yes (No)	Duplicate Sample No:	—
Sampling Personnel:	Joe Mark		

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4oz Glass	Ice	X				

SAMPLE DESCRIPTION

Depth:	Description:
0'	Clean Railroad Bedding Fill - See Log

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	Boring/Well No:	E-1
Project No:	5644V	SAMPLE NO:	H-11-E1-02-01
Sample Method:	CME - Continuous Sample	Date:	6-4-97
Sample Depth (ft.):	5'	Time:	8:55
Sample/Media Type:	Soil (surface) Soil (subsurface) Sediment	Sludge Other (describe)	–
Sample Split (circle one)	Yes (No)	Split Sample No:	–
Field Duplicate (circle one)	Yes (No)	Duplicate Sample No:	–
Sampling Personnel:	Joe Mok		

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4 oz Glass	Ice	X				

SAMPLE DESCRIPTION

Depth:	Description:
5'	Clay - See Drilling Log

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: Hydropunch E1
Project No: 5644V
SAMPLE NO: H-11-E1-0-07-03
Sample Method: Hydropunch
Date: 6-4-97 **Time:** 9.55
Sampling Personnel: Joe Neal
Sample Split (circle one) Yes (No) **Split Sample No:** —
Field Duplicate (circle one) Yes (No) **Duplicate Sample No:** —

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
40 ml Glass	2	HCl	X				

WELL PURGING

Date: —
Time Started: —
Time Completed: —
HNu/OVA Measurements
Background: —
Well Head: —
Breathing Zone: —

A. Well Depth (Ft ftom TOC): —
B. Depth to Water (Ft from TOC): —
C. Water Column Length (A-B)(Ft): —
D. Casing Diameter (In.): —
E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.): —
F. Minimum Casing Volumes to Purge: —
G. Minimum Water Volume to Purge (E x F)(Gal.): —

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color
NO							

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments: Collected from hydropunch.

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	**Boring/Well No:**	E-1
Project No:	5644V	**SAMPLE NO:**	H-11-E1-03-01
Sample Method:	CME Continuous Sampler	**Date:**	6-4-97
Sample Depth (ft.):	10'	**Time:**	10 10
Sample/Media Type:	Soil (surface) Soil (subsurface) Sediment	Sludge Other (describe)	—
Sample Split (circle one)	Yes No	Split Sample No:	—
Field Duplicate (circle one)	Yes No	Duplicate Sample No:	Dupe #9
Sampling Personnel:	Joe Mark		

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4oz Glass	Ice	X				

SAMPLE DESCRIPTION

Depth:	Description:
10'	Clay See Log for description

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: E2 TASK 11
Project No: 5644V
SAMPLE NO: H-11-E2-01-01-00
Sample Method: Hand Auger
Date: 6-5-97
Sample Depth (ft.): surface
Time: 1514
Sample/Media Type: (Soil (surface)) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes No
Split Sample No:
Field Duplicate (circle one) (Yes) No
Duplicate Sample No: H-11-DUP02-01
Sampling Personnel: Roger

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4oz Glass	4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
surface	yellowish brown sandy gravel

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	Boring/Well No:	EZ Task 11
Project No:	5644V	SAMPLE NO:	H-11-EZ-02-07
Sample Method:	Hand Auger	Date:	6-5-97
Sample Depth (ft.):	4	Time:	1545
Sample/Media Type:	Soil (surface) Soil (subsurface) Sediment	Sludge Other (describe)	
Sample Split (circle one)	Yes No	Split Sample No:	
Field Duplicate (circle one)	Yes No	Duplicate Sample No:	
Sampling Personnel:	Roger Wilson		

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4oz Glass	4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
4	dark brown to dark gray Clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	Boring/Well No:	TASK 11 ~~F2~~ F1 RPM
Project No:	5644V	SAMPLE NO:	H-11-F1-02-01-G5
Sample Method:	4" O.D CME split spoon	Date:	6-3-97 ~~1200~~
Sample Depth (ft.):	5	Time:	1050
Sample/Media Type:	Soil (surface) Soil (subsurface) Sediment	Sludge Other (describe)	
Sample Split (circle one)	Yes (No)	Split Sample No:	
Field Duplicate (circle one)	Yes (No)	Duplicate Sample No:	
Sampling Personnel:	Roger Wilson		

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4 oz Glass	4°C	Y				

SAMPLE DESCRIPTION

Depth:	Description:
5	pale brown silty clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	**Boring/Well No:**	Trak 11 F1
Project No:	5644V	**SAMPLE NO:**	H-11-F1-01-01-01
Sample Method:	Hydropunch w/ bailer	**Date:**	6-3-97
Sample Depth (ft.):	6'	**Time:**	1215

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe) Groundwater

Sample Split (circle one) Yes No Split Sample No:

Field Duplicate (circle one) Yes No Duplicate Sample No:

Sampling Personnel:

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
3 40 ml glass	HCL/4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
6'	Groundwater

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	**Boring/Well No:**	Task 11 F1
Project No:	5644V	**SAMPLE NO:**	H-11-F1-05-01-13
Sample Method:	4" O.D CMG split spoon	**Date:**	6-3-97
Sample Depth (ft.):	13	**Time:**	1305
Sample/Media Type:	Soil (surface) Soil (subsurface) Sediment	Sludge Other (describe)	
Sample Split (circle one)	Yes No	Split Sample No:	–
Field Duplicate (circle one)	Yes No	Duplicate Sample No:	–
Sampling Personnel:	Robert Wilson		

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4oz Glass	4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
13	yellowish grey silty clay/clayey silt

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	Boring/Well No:	Task 11 F1
Project No:	5644V	SAMPLE NO:	~~H-11-01-01-23~~
Sample Method:	4" O.D CME Split spoon	Date:	6-3-97
Sample Depth (ft.):	23	Time:	1340
Sample/Media Type:	Soil (surface) Soil (subsurface) Sediment	Sludge Other (describe)	
Sample Split (circle one)	Yes No	Split Sample No:	
Field Duplicate (circle one)	Yes No	Duplicate Sample No:	
Sampling Personnel:	Roger Wilcox		

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4oz. Glass	4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
23	bluish gray silty clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: Task 11 F-2

Project No: 5644V

SAMPLE NO: H-11-F2-01-01-00

Sample Method: CME Continuous Sampler

Date: 6-2-97

Sample Depth (ft.): 0-1'

Time: 1215

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes No

Split Sample No: —

Field Duplicate (circle one) Yes No

Duplicate Sample No: —

Sampling Personnel: Jay Mark

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
~~2 8oz Glass~~	ICE	X				
2 40c Glass						

SAMPLE DESCRIPTION

Depth:	Description:
0-1'	Topsoil - See Drilling Log

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: Task 11 F-2

Project No: 5644V

SAMPLE NO: H-11-F2-03-[illegible]

Sample Method: CME Continuous Sampler

Date: 6-2-97

Sample Depth (ft.): 5'

Time: 12:37

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes No

Split Sample No: —

Field Duplicate (circle one) Yes No

Duplicate Sample No: —

Sampling Personnel: Joe Mark

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4 oz Glass	ICE	X				

SAMPLE DESCRIPTION

Depth:	Description:
5'	Clay - See drilling log

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: Task 11, F2

Project No: 5644V

SAMPLE NO: H-11-F2-03-01-13

Sample Method: CME Continuous Sampler

Date: 6-2-97

Sample Depth (ft.): 13'

Time: 1046

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe) —

Sample Split (circle one) Yes (No) Split Sample No: —

Field Duplicate (circle one) Yes (No) Duplicate Sample No: —

Sampling Personnel: Joe Mock

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4 oz Glass	ICE	X				

SAMPLE DESCRIPTION

Depth:	Description:
13'	Clay - See drilling log

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	**Boring/Well No:**	Task 11, F2
Project No:	5644V	**SAMPLE NO:**	H-11-F2-C4-3
Sample Method:	CME Continuous Sampler	**Date:**	6-2-97
Sample Depth (ft.):	23'	**Time:**	13.00
Sample/Media Type:	Soil (surface) Soil (subsurface) Sediment	Sludge Other (describe)	—
Sample Split (circle one)	Yes No	Split Sample No:	—
Field Duplicate (circle one)	Yes No	Duplicate Sample No:	—
Sampling Personnel:	Joe Mark		

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4 oz Glass	ICE	✓				

SAMPLE DESCRIPTION

Depth:	Description:
23'	Clay - See drilling log

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: Task 11, F2

Project No: 5644V

SAMPLE NO: 11-11-F2-05-0'-33

Sample Method: CME - Continuous Sampler

Date: 6-2-97

Sample Depth (ft.): 33'

Time: 13.45

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe) —

Sample Split (circle one) Yes No Split Sample No: —

Field Duplicate (circle one) Yes No Duplicate Sample No:

Sampling Personnel:

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4 oz Glass	ICE	X				

SAMPLE DESCRIPTION

Depth:	Description:
33'	Clay - See the Drilling Logs

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	**Boring/Well No:**	Track 11
Project No:	5644V	**SAMPLE NO:**	H-11-F1-05-0.-33
Sample Method:	4" O.D. CME split spoon	**Date:**	6-3-97
Sample Depth (ft.):	33	**Time:**	1355
Sample/Media Type:	Soil (surface) Soil (subsurface) Sediment	Sludge Other (describe)	
Sample Split (circle one)	Yes No	Split Sample No:	
Field Duplicate (circle one)	Yes No	Duplicate Sample No:	
Sampling Personnel:	Roger Wilson		

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4oz Glass	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
33	Dark yellowish brown silty clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: ~~E-3~~ F3

Project No: 5644V

SAMPLE NO: H-11-F3-01-01-00

Sample Method: CME continuous split spoon

Date: 6-2-97

Sample Depth (ft.): 00'

Time: 10:05

Sample/Media Type: (Soil) (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes (No) Split Sample No: —

Field Duplicate (circle one) Yes (No) Duplicate Sample No: —

Sampling Personnel: Robin Wilson (HARZA) Carolyn Schwafel (USACE)

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4oz Glass	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
00 to 01	Silty clay, medium stiff, damp dark brown to black

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	Boring/Well No:	~~E-3~~ F3
Project No:	5644V	SAMPLE NO:	H-11-F3-02-05
Sample Method:	4" O.D. CME split spoon	Date:	6-2-97
Sample Depth (ft.):	05'	Time:	1011
Sample/Media Type:	Soil (surface) Soil (subsurface) Sediment	Sludge Other (describe)	
Sample Split (circle one)	Yes No	Split Sample No:	—
Field Duplicate (circle one)	Yes No	Duplicate Sample No:	—
Sampling Personnel:	Roger Wilson (HARZA) Carolyn Schwatel (USACE)		

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4oz. Glass	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
~~05~~ 05' to 07'	Silty clay, soft, moist, greenish grey to yellowish brown

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: ~~E3~~ F3
Project No: 5644V
SAMPLE NO: H-11-F3-03-01-13
Sample Method: 4" O.D CME ~~Split~~ split spoon
Date: 6-2-97
Sample Depth (ft.): 13
Time: 1016
Sample/Media Type: Soil (surface) (Soil (subsurface)) Sediment Sludge Other (describe)
Sample Split (circle one) Yes (No) Split Sample No: —
Field Duplicate (circle one) Yes (No) Duplicate Sample No: —
Sampling Personnel: Roger Wilson (Harza)

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4oz	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
13 to 15	Sandy clayey silt, soft, moist to wet, light blinish grey to brown

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	Boring/Well No:	F3
Project No:	5644V	SAMPLE NO:	H-11-F3-04-03
Sample Method:	4" O.D CMG split spoon	Date:	6-2-97
Sample Depth (ft.):	23	Time:	1055

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes No Split Sample No: —

Field Duplicate (circle one) Yes No Duplicate Sample No: —

Sampling Personnel: Roger Wilson (HARZA), Carolyn Schwartel (USACE)

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4oz GLASS	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
23' to 25'	Silty clay, medium stiff, moist, medium brown w/ some black and yellowish brown mottling

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: F3
Project No: 5644V
SAMPLE NO: H-11-F3-05-01-32
Sample Method: 4" O.D. CMG Split spoon
Date: 6-2-97
Sample Depth (ft.): 32
Time: 1124
Sample/Media Type: Soil (surface) (Soil) subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes (No)
Split Sample No:
Field Duplicate (circle one) (Yes) No
Duplicate Sample No: H-11-~~F3~~-Dup-10-04
Sampling Personnel:

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
~~4~~ 2-4oz Glass	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
32 to ~~33~~ 33	Sand, loose, moist, yellowish brown

COMMENTS: Contaminated.

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	**Boring/Well No:**	F3
Project No:	5644V	**SAMPLE NO:**	H-11-F3-06-0 6
Sample Method:	4" O.D. CME Split spoon	**Date:**	6-2-97
Sample Depth (ft.):	36	**Time:**	

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes (No) **Split Sample No:** —

Field Duplicate (circle one) Yes (No) **Duplicate Sample No:** —

Sampling Personnel: Roger Wilson (HARZA) Carolyn Sedawafel

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4oz Glass	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
36 to 37	Sandy silt in clay, medium stiff, moist yellowish brown to tan.

COMMENTS: Contaminated

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: F5
Project No: 5644V
SAMPLE NO: H-11-F5-01-01-00
Sample Method: 4" O.D CME Continuous Split Spoon
Date: 6-2-97
Sample Depth (ft.): 00
Time: 1600
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes No
Split Sample No: —
Field Duplicate (circle one) Yes No
Duplicate Sample No: —
Sampling Personnel:

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4oz Glass	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
~~00 to 02~~	
00' to 01'	Silty clay soft, moist, dark brown to black

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: F5

Project No: 5644V

SAMPLE NO: H-11-F5-02-01-

Sample Method: 4" O.D CMT Continuous split spoon

Date: 6-2-97

Sample Depth (ft.):

Time: 1615

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe) —

Sample Split (circle one) Yes No

Split Sample No: —

Field Duplicate (circle one) Yes No

Duplicate Sample No: —

Sampling Personnel:

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4oz glass	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
05' to 07'	Silty Clay, soft, moist to wet mottled yellowish brown to light gray.

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: TASK 11 F4
Project No: 5644V
SAMPLE NO: H-11-F4-01-04-06
Sample Method: Hydropunch w/ bailer
Date: 6-4-97
Sample Depth (ft.): 6'
Time: 0740
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe) Groundwater
Sample Split (circle one) Yes No
Split Sample No:
Field Duplicate (circle one) Yes No
Duplicate Sample No: H-11-DUP-01-04
Sampling Personnel: Roone Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
3 40 ml Glass	HCL/4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
6'	Groundwater

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: Task 11 F4

Project No: 5644V

SAMPLE NO: H-11-F4-03-01-13

Sample Method: 4" OD Cme split spoon

Date: 6-4-97

Sample Depth (ft.): 13

Time: 0820

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes No

Split Sample No:

Field Duplicate (circle one) Yes No

Duplicate Sample No:

Sampling Personnel: Roger Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4oz Glass	4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
13	Sandy silty clay / clayey silt yellowish grey to dark yellowish orange.

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: Task 11 F4
Project No: 5644V
SAMPLE NO: H-11-F4-04-01-15
Sample Method: 4" O.D. CME Split spoon
Date: 6-4-97
Sample Depth (ft.): 15
Time: 0835
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes No
Split Sample No:
Field Duplicate (circle one) Yes (No)
Duplicate Sample No: H-11-Dup 08-01
Sampling Personnel: Roger Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4oz Glass	4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
15	Clayey sand dark yellowish orange

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: Tack 11 F4

Project No: 5644V

SAMPLE NO: H-11-F4-04-01-

Sample Method: 4" O.D. CME Split Spoon

Date: 6-4-97

Sample Depth (ft.): 23

Time: 0845

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes No

Split Sample No:

Field Duplicate (circle one) Yes No

Duplicate Sample No:

Sampling Personnel: Roger Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4oz Glass	~~HC~~ 4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
23	Silty clay olive grey to dark yellowish orange

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Project No: 5644V
Sample Method:
Sample Depth (ft.):
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes No
Field Duplicate (circle one) Yes No
Sampling Personnel: Robin Wilson

Boring/Well No: Tack II F4
SAMPLE NO: H-II-F4-0[illegible]33
Date: 6-4-97
Time: 0815
Split Sample No:
Duplicate Sample No:

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4oz Glass	4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
33	Sandy clayey silt/silty clay dark yellowish orange to light olive grey

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	**Boring/Well No:**	Task 11 F4
Project No:	5644V	**SAMPLE NO:**	H-11-F4-01-01-0
Sample Method:	4" O.D CME split spoon	**Date:**	6-3-97
Sample Depth (ft.):	surface	**Time:**	1527
Sample/Media Type:	Soil (surface) Soil (subsurface) Sediment	Sludge Other (describe)	
Sample Split (circle one)	Yes No	**Split Sample No:**	
Field Duplicate (circle one)	Yes No	**Duplicate Sample No:**	
Sampling Personnel:	Roger Wilson		

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4 oz Glass	4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
surface	Brown to black silty clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: Trk. 11

Project No: 5644V

SAMPLE NO: H-11-F4-02-01-05

Sample Method: 4" O.D. CME Splitspoon

Date: 6-3-97

Sample Depth (ft.):

Time: 1535

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes No

Split Sample No:

Field Duplicate (circle one) Yes No

Duplicate Sample No:

Sampling Personnel: Roger Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4 2-4oz Glass	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
5	Very pale green clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: Task 11 F5

Project No: 5644V

SAMPLE NO: H-11-F5-01-04-

Sample Method: Hydro punch

Date: 6-3-97

Sample Depth (ft.): 08'

Time: 0800

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe) Groundwater

Sample Split (circle one) Yes No

Split Sample No: H-11-F5-01-04-00 to MRL-D

Field Duplicate (circle one) Yes No

Duplicate Sample No:

Sampling Personnel: Roger Wilson and USACE drill crew

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
3-40mL GLASS	HCL/4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
8 to 10 feet	Groundwater

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: Task11 F5

Project No: 5644V

SAMPLE NO: H-11-F5-03-01-13

Sample Method: 4" O.D CME ~~Gen~~ split spoon

Date: 6-3-97

Sample Depth (ft.): 13

Time: 0840

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes No

Split Sample No:

Field Duplicate (circle one) Yes No

Duplicate Sample No: ~~H-11-F5-03~~ H-11-DUP-05

Sampling Personnel: Roger Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-40z Glass	4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
13	Sandy clayey silt / Sandy silty Clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	Boring/Well No:	TASK 11 FS
Project No:	5644V	SAMPLE NO:	H-11-FS-01-01
Sample Method:	4" O.D CME Split Spoon	Date:	6-3-97
Sample Depth (ft.):	23	Time:	0900
Sample/Media Type:	Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)		
Sample Split (circle one)	Yes No	Split Sample No:	
Field Duplicate (circle one)	Yes No	Duplicate Sample No:	
Sampling Personnel:	ROGER WILSON		

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4oz Glass	4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
23	Olive brown silty Clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: TASK11 FS
Project No: 5644V
SAMPLE NO: H-11-FS-05-01-33
Sample Method: 4" O.D. CME split spoon
Date: 6-3-97
Sample Depth (ft.): 33
Time: 0933
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes No
Split Sample No: —
Field Duplicate (circle one) Yes No
Duplicate Sample No: —
Sampling Personnel: ROGGE WILSON

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4 oz Glass	4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
33	Dark yellowish orange to light brown sandy clayey silt

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: Task11 FS

Project No: 5644V

SAMPLE NO: H-11-F1-01-01-

Sample Method: 4" O.D. CME split spoon

Date: 6-3-97

Sample Depth (ft.): 0

Time: 1039

Sample/Media Type: (Soil (surface)) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes (No) **Split Sample No:**

Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sampling Personnel: Roger Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4oz Glass	4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
00	~~Sa~~ Dark brown to black silty clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: TASK 11 F6
Project No: 5644V
SAMPLE NO: H-11-F6-01-01-00
Sample Method: HAND AUGER
Date: 6-4-97
Sample Depth (ft.): Surface
Time: 1125
Sample/Media Type: (Soil (surface)) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes (No) Split Sample No:
Field Duplicate (circle one) Yes (No) Duplicate Sample No:
Sampling Personnel: ROGER WILSON

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4OZ GLASS	4° C	X				

SAMPLE DESCRIPTION

Depth:	Description:
Surface	BLACK to dark brown silty clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Project No: 5644V

Sample Method: HAND Auger

Sample Depth (ft.): 4'

Sample/Media Type: Soil (surface) (Soil (subsurface)) Sediment Sludge Other (describe)

Sample Split (circle one) Yes (No)

Field Duplicate (circle one) (Yes) No

Sampling Personnel: ROGER WILSON

Boring/Well No: TASK 11 F6

SAMPLE NO: H-11-F6-02-01-0

Date: 6-4-97

Time: 1210

Split Sample No:

Duplicate Sample No: H-11-DUP-03-01

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4oz GLASS	4°C	X				

SAMPLE DESCRIPTION

Depth:	Description:
4	~~Grey~~ mottled grey to dark yellowish orange silty clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: Tsk 11 F-7

Project No: 5644V

SAMPLE NO: H-11-F7-01-01-00

Sample Method: CME Continuous Sampler

Date: 5-3-97

Sample Depth (ft.): 0-1'

Time: 8 00

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe) —

Sample Split (circle one) Yes No

Split Sample No: —

Field Duplicate (circle one) Yes No

Duplicate Sample No: —

Sampling Personnel: Joe Mark

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4 oz Glass Jar	ICE	X				

SAMPLE DESCRIPTION

Depth:	Description:
0-1'	Clay/fgsil - See Log

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: Bkl 11 F7

Project No: 5644V

SAMPLE NO: H-11-F7-02-0

Sample Method: CME Continuous Sampler

Date: 6 3 97

Sample Depth (ft.): 3-5'

Time: 8.05

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe) —

Sample Split (circle one) Yes No

Split Sample No: —

Field Duplicate (circle one) Yes No

Duplicate Sample No: —

Sampling Personnel:

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4oz Glass Jar	TCE	X				

SAMPLE DESCRIPTION

Depth:	Description:
5'	Clay - see boring Log.

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: Task 11 F-7

Project No: 5644V

SAMPLE NO: H-11-57-03-01-13

Sample Method: CME Continuous Sampler

Date: 6-3-97

Sample Depth (ft.): 13'

Time: 1023

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe) —

Sample Split (circle one) Yes No

Split Sample No: —

Field Duplicate (circle one) Yes No

Duplicate Sample No: —

Sampling Personnel: Jae Mok

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4 oz Glass	ICE	X				

SAMPLE DESCRIPTION

Depth:	Description:
13'	Clay - See log

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: Task 11 F-7

Project No: 5644V

SAMPLE NO: H-11-F7-04-01

Sample Method: CME Continuous Sampler

Date: 6-3-97

Sample Depth (ft.): 21'

Time: 10:45

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe) —

Sample Split (circle one) Yes No

Split Sample No:

Field Duplicate (circle one) Yes No

Duplicate Sample No: MRDL -

Sampling Personnel: Joe Mark

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4 oz Glass	ICE	X				

SAMPLE DESCRIPTION

Depth:	Description:
20'	Clay - See Log

COMMENTS: Collected Split Sample for MRDL @ this depth

Moved sampling depth from 23' to 20' due to high PID readings @ 20'

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	**Boring/Well No:**	Test 11 F7
Project No:	5644V	**SAMPLE NO:**	H-11-F7-05-33
Sample Method:	CME Continuous Sampler	**Date:**	6-3-97
Sample Depth (ft.):	33'	**Time:**	11.10
Sample/Media Type:	Soil (surface) Soil (subsurface) Sediment	Sludge Other (describe)	—
Sample Split (circle one)	Yes No	Split Sample No:	—
Field Duplicate (circle one)	Yes No	Duplicate Sample No:	—
Sampling Personnel:	Joe Mark		

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4 oz Glass	ICE	X				

SAMPLE DESCRIPTION

Depth:	Description:
33	Clay - See log

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: F7 TASK 11

Project No: 5644V

SAMPLE NO: H-11-F7-01-04-

Sample Method: Bailer

Date: ~~6-5-97~~ 6-5-97

Sample Depth (ft.): 17

Time: 0615

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe) Groundwater

Sample Split (circle one) Yes (No)

Split Sample No:

Field Duplicate (circle one) (Yes) ~~No~~

Duplicate Sample No: H-11-DUP02-04

Sampling Personnel: Robin Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
3 40 ml Glass	4°C/HCL	X				

SAMPLE DESCRIPTION

Depth:	Description:
17	Groundwater

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: Task 11 F8
Project No: 5644V
SAMPLE NO: H-11-F8-01-01-02
Sample Method: CME Continuous Sample
Date: 6-2-97
Sample Depth (ft.): 0'
Time: 1517
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe) —
Sample Split (circle one) Yes No
Split Sample No: —
Field Duplicate (circle one) Yes No
Duplicate Sample No: —
Sampling Personnel: Joe Mark

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4 oz Glass	Ice	X				

SAMPLE DESCRIPTION

Depth:	Description:
0'	Topsoil - See log

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	**Boring/Well No:**	Tank 11- F8
Project No:	5644V	**SAMPLE NO:**	14-11-F8-03-01
Sample Method:	CME Continuous Sampler	**Date:**	6-2-97
Sample Depth (ft.):	5'	**Time:**	15:26
Sample/Media Type:	Soil (surface) Soil (subsurface) Sediment	Sludge Other (describe)	—
Sample Split (circle one)	Yes (No)	Split Sample No:	—
Field Duplicate (circle one)	Yes (No)	Duplicate Sample No:	—
Sampling Personnel:			

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4 oz Glass	Ice	x				

SAMPLE DESCRIPTION

Depth:	Description:
5'	Clay - See drilling Logs

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: Task 11, FE

Project No: 5644V

SAMPLE NO: H-11-FE-03-01-13

Sample Method: CME Continuous Sampler

Date: 6-2-97

Sample Depth (ft.): 13'

Time: 16:10

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe) —

Sample Split (circle one) Yes No

Split Sample No: —

Field Duplicate (circle one) Yes No

Duplicate Sample No: —

Sampling Personnel:

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4oz Glass	ICE	Y				

SAMPLE DESCRIPTION

Depth:	Description:
13'	Clay - see Drilling Log

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	Boring/Well No:	~~Line 1~~, Task 11 F8
Project No:	5644V	SAMPLE NO:	A-11-F8-C4-23
Sample Method:	CME Continuous Sample	Date:	6-2-97
Sample Depth (ft.):	23'	Time:	16:45
Sample/Media Type:	Soil (surface) Soil (subsurface) Sediment	Sludge Other (describe)	—
Sample Split (circle one)	Yes (No)	Split Sample No:	—
Field Duplicate (circle one)	Yes (No)	Duplicate Sample No:	—
Sampling Personnel:			

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4 oz Glass	ICE	X				

SAMPLE DESCRIPTION

Depth:	Description:
23'	Clay - See boring log

COMMENTS: Sample was collected from the inside of the soil core.

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: Task 11, F8

Project No: 5644V

SAMPLE NO: A-11-F8-05-01-33

Sample Method: CME Continuous Sampler

Date: 6-2-97

Sample Depth (ft.): 33'

Time: 17:20

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe) —

Sample Split (circle one) Yes No

Split Sample No: —

Field Duplicate (circle one) Yes No

Duplicate Sample No: —

Sampling Personnel:

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
4 oz Glass	Ice	X				

SAMPLE DESCRIPTION

Depth:	Description:
33'	Clay - See boring Log

COMMENTS: Sample was collected from the inside of the core

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Well No: F9

Project No: 5644V

SAMPLE NO: H-11-F9-01-04-05

Sample Method: Hydropunch

Date: 6-11-97 Time: 0800

Sampling Personnel: Roger Wilson

Sample Split (circle one) Yes (No)

Split Sample No:

Field Duplicate (circle one) Yes (No)

Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
3 40 ml VOA	3	4°C/ HCL	✓				

WELL PURGING

Date:

Time Started:

Time Completed:

HNu/OVA Measurements

Background:

Well Head:

Breathing Zone:

A. Well Depth (Ft ftom TOC):

B. Depth to Water (Ft from TOC):

C. Water Column Length (A-B)(Ft):

D. Casing Diameter (In.):

E. Volume of Water in Well ([D ÷ 24]^2 x 3.14 x C)(Gal.):

F. Minimum Casing Volumes to Purge:

G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	**Boring/Well No:**	F9
Project No:	5644V	**SAMPLE NO:**	H-H-F9-01-01-03
Sample Method:	4" O.D CME split spoon	**Date:**	6-10-97
Sample Depth (ft.):	3	**Time:**	1620

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes No **Split Sample No:**

Field Duplicate (circle one) Yes No **Duplicate Sample No:**

Sampling Personnel: Robie Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4 oz Glass	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
3	Clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: F9 TASK-1

Project No: 5644V

SAMPLE NO: H-11-F9-02-01-

Sample Method: 4" O.D CMG SPLIT SPOON

Date: 6-11-97

Sample Depth (ft.): 13

Time: 1050

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes No

Split Sample No:

Field Duplicate (circle one) Yes No

Duplicate Sample No:

Sampling Personnel: ROGER WILSON

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4OZ Glass	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
13	Silty Clay mottled dark yellowish orange to pale olive

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: F10
Project No: 5644V
SAMPLE NO: H-11-F10-01-04-05
Sample Method: Hydropunch
Date: 6-11-97
Time: 0753
Sampling Personnel: Roger Wilson
Sample Split (circle one) Yes (No)
Split Sample No:
Field Duplicate (circle one) Yes (No)
Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
40 ml VOA	3	4°C/HCL	V				

WELL PURGING

Date:
Time Started:
Time Completed:
HNu/OVA Measurements
Background:
Well Head:
Breathing Zone:

A. Well Depth (Ft ftom TOC):
B. Depth to Water (Ft from TOC):
C. Water Column Length (A-B)(Ft):
D. Casing Diameter (In.):
E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):
F. Minimum Casing Volumes to Purge:
G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	Boring/Well No:	F10 Task 1
Project No:	5644V	SAMPLE NO:	H-11-F10-01-01-C
Sample Method:	4" O.D CMG split spoon	Date:	6-10-97
Sample Depth (ft.):	3	Time:	1705
Sample/Media Type:	Soil (surface) Soil (subsurface) Sediment	Sludge Other (describe)	
Sample Split (circle one)	Yes No	Split Sample No:	
Field Duplicate (circle one)	Yes No	Duplicate Sample No:	
Sampling Personnel:	Roger Wilson		

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
#2-4 oz Glass	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
3	Clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: FID TASK 11

Project No: 5644V

SAMPLE NO: H-11-FID-02-0.-13

Sample Method: 4" O.D Cme split spoon

Date: 6-11-97

Sample Depth (ft.): 13

Time: 0930

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes No

Split Sample No:

Field Duplicate (circle one) Yes No

Duplicate Sample No:

Sampling Personnel:

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4 oz Glass	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
13'	silty clay mottled dark yellowish orange to yellowish green

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: F11 TASK 11

Project No: 5644V

SAMPLE NO: H-11-F11-01-01-C

Sample Method: 4" O.D CME

Date: 6-11-97

Sample Depth (ft.): ± 3

Time: 10:10

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes No

Split Sample No:

Field Duplicate (circle one) Yes No

Duplicate Sample No:

Sampling Personnel: Roger Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4oz Glass	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
3	Clay mottled dark yellowish orange to pale olive

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: F11
Project No: 5644V
SAMPLE NO: H-11-FH-02-01-15
Sample Method: 4" O.D CMG Split spoon
Date: 6-11-97
Sample Depth (ft.): 15
Time: 1655
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes No
Split Sample No:
Field Duplicate (circle one) Yes No
Duplicate Sample No: H-11-Dup-11-01
Sampling Personnel: ROGER WILSON

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2						
4 4oz Glass	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
15	Silty Clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Well No: F12

Project No: 5644V

SAMPLE NO: H-11-F12-01-04-06

Sample Method: Hydropunch

Date: 6-11-97 Time: 1355

Sampling Personnel: Roger Wilson

Sample Split (circle one) Yes (No) Split Sample No:

Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
40 ml VOA	3	4°C/HCl	✓				

WELL PURGING

Date:

Time Started:

Time Completed:

HNu/OVA Measurements

Background:

Well Head:

Breathing Zone:

A. Well Depth (Ft ftom TOC):

B. Depth to Water (Ft from TOC):

C. Water Column Length (A-B)(Ft):

D. Casing Diameter (In.):

E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):

F. Minimum Casing Volumes to Purge:

G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No: F12 TASC11

Project No: 5644V

SAMPLE NO: H-11-F12-02-01-13

Sample Method: 4" O.D. CME Split spoon

Date: 6-11-97

Sample Depth (ft.): 13

Time: 1355

Sample/Media Type: Soil (surface) (Soil) (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes (No) Split Sample No:

Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sampling Personnel: Roger Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4oz Glass	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
13	silty clay, mottled ~~greenish~~ greyish green to dark yellowish orange.

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	Boring/Well No:	F12 TASK 12
Project No:	5644V	SAMPLE NO:	H-11-F12-02-01
Sample Method:	4" O.D CME SPLIT SPOON	Date:	6-11-97
Sample Depth (ft.):	13	Time:	1430
Sample/Media Type:	Soil (surface) Soil (subsurface) Sediment	Sludge Other (describe)	
Sample Split (circle one)	Yes No	Split Sample No:	
Field Duplicate (circle one)	Yes No	Duplicate Sample No:	
Sampling Personnel:	ROGER WILSON		

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4oz Glass	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
13	Silty Clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: F13 TASK 11
Project No: 5644V
SAMPLE NO: H-11-F13-01-04-07
Sample Method: Hydropunch
Date: 6-12-97 Time: 1415
Sampling Personnel: Robert Wilson
Sample Split (circle one) Yes (No) Split Sample No:
Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
40 ml VOA	3	4°C/HCl	V				

WELL PURGING

Date:
Time Started:
Time Completed:
HNu/OVA Measurements
Background:
Well Head:
Breathing Zone:

A. Well Depth (Ft ftom TOC):
B. Depth to Water (Ft from TOC):
C. Water Column Length (A-B)(Ft):
D. Casing Diameter (In.):
E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):
F. Minimum Casing Volumes to Purge:
G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Well No: F14 TASK11

Project No: 5644V

SAMPLE NO: H11-F14-01-04-0

Sample Method: Hydropunch

Date: 6/2/97 Time: 0755

Sampling Personnel: ROGGE WILSON

Sample Split (circle one) Yes (No)

Split Sample No:

Field Duplicate (circle one) Yes (No)

Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
40ml VOA	3	4°C/HCL	✓				

WELL PURGING

Date:

Time Started:

Time Completed:

HNu/OVA Measurements

Background:

Well Head:

Breathing Zone:

A. Well Depth (Ft ftom TOC):

B. Depth to Water (Ft from TOC):

C. Water Column Length (A-B)(Ft):

D. Casing Diameter (In.):

E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):

F. Minimum Casing Volumes to Purge:

G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Project No: 5644V

Sample Method: 4" O.D. CME Split Spoon

Sample Depth (ft.):

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes No

Field Duplicate (circle one) Yes No

Sampling Personnel: Robert Wilson

Boring/Well No: F13 TRK. 11

SAMPLE NO: H-11-F13-01-01-03

Date: 6-11-97

Time: 1505

Split Sample No:

Duplicate Sample No:

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2-4oz Glass	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
3	Clay light olive gray

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	Boring/Well No:	F13 TASK 1
Project No:	5644V	SAMPLE NO:	H-11-F13-02-01
Sample Method:	4" O.D. CMB SPLIT SPOON	Date:	6-12-97
Sample Depth (ft.):	13	Time:	1450
Sample/Media Type:	Soil (surface) Soil (subsurface) Sediment	Sludge Other (describe)	
Sample Split (circle one)	Yes No	Split Sample No:	
Field Duplicate (circle one)	Yes No	Duplicate Sample No:	
Sampling Personnel:	ROGER WILSON		

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4 oz GLASS	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
13 to 15	Clay, dark yellowish orange to pale olive

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	Boring/Well No:	F14
Project No:	5644V	SAMPLE NO:	H-11-F14-01-0.1-03
Sample Method:	4" O.D CME SPLITSPOON	Date:	6-11-97
Sample Depth (ft.):	3	Time:	1729

Sample/Media Type: Soil (surface) (Soil) subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes (No) Split Sample No:

Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sampling Personnel: Roger Wilson

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4oz Glass	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
3	Clay

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Boring/Well No: F14 TASK 11
Project No: 5644V
SAMPLE NO: H-11-F14-02-01-1
Sample Method: 4" O.D CME SPLIT SPOON
Date: 6-12-97
Sample Depth (ft.): 13
Time: 1355
Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)
Sample Split (circle one) Yes No
Split Sample No:
Field Duplicate (circle one) Yes No
Duplicate Sample No:
Sampling Personnel: ROGER WILSON

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
2 4oz GLASS	4°C	✓				

SAMPLE DESCRIPTION

Depth:	Description:
13 to 15	Clay, dark yellowish orange to pale olive.

COMMENTS:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (SOIL/SEDIMENT)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Boring/Well No:

Project No: 5644V

SAMPLE NO:

Sample Method: CME Continuous Sampler

Date:

Sample Depth (ft.):

Time:

Sample/Media Type: Soil (surface) Soil (subsurface) Sediment Sludge Other (describe)

Sample Split (circle one) Yes No Split Sample No:

Field Duplicate (circle one) Yes No Duplicate Sample No:

Sampling Personnel:

Sample Container	Preservative	Analysis Requested				
		VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)

SAMPLE DESCRIPTION

Depth:	Description:

COMMENTS:

APPENDIX E
SAMPLE COLLECTION FIELD SHEETS

E-5 Task 12. Additional Groundwater Data, Line 2

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: 12A
Project No: 5644V
SAMPLE NO: H12A010300/~~#~~
Sample Method: BAILING AND LOW RATE PUMP
Date: 6/5/97 Time: 1330
Sampling Personnel: JOHN PURICH, HOSS NAJJAR POUR
Sample Split (circle one) Yes (No) Split Sample No:
Field Duplicate (circle one) (Yes) No Duplicate Sample No: H12A0102

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1 amber glass	2			X	X		
40 ml glass vials	3	HCl	X				
1 l polyethylene jar	2	HNO_3				X	1 filtr. 1 non filtr.
1 l plastic jar	2	NaOH					Cyanide 1 filtr. 1 non filtr
1 l plastic jar	1						TDS, pH, TSS, Alk, Sulfate, Cl
8 oz glass jar	1	H_2SO_4					TOC, Nitrate/Nitrite
1 l plastic jar	1	NaOH + Zinc Acetate					Sulfide

WELL PURGING

Date: 6/5/97
Time Started: 1110
Time Completed: 1210

HNu/OVA Measurements
Background: 0.0
Well Head: 0.0
Breathing Zone: 0.0

A. Well Depth (Ft ftom TOC): ~~132.8~~ 22.6 (TP)
B. Depth to Water (Ft from TOC): ~~19.2~~ 7.4
C. Water Column Length (A-B)(Ft): ~~113.7~~ 15.6
D. Casing Diameter (In.): 2
E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.): 2.54
F. Minimum Casing Volumes to Purge: well dry
G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. ~~°C~~ °F	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	O_2 % ~~Odor~~	Color
1110							
1120	2	7.44	65.3	482	61	43	cloudy
1130	3	7.22	61.5	478	190	43	cloudy
1200	4	7.07	63.5	498	over 200	36	cloudy

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator	SOLINIST		
Conductivity Meter	AQUA CHECK	WITH REFERENCE SOLUTION	
pH Meter	AQUA CHECK	Before:	After:
Nephalometer	COLE PARMER		

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	Well No:	12B
Project No:	5644V	SAMPLE NO:	H12B010300
Sample Method:	LOW RATE PUMPING	Date: 6/3/97	Time: 1150
Sampling Personnel:	JOHN PYRICH, HOSS NAJJAR - POUR		
Sample Split (circle one)	Yes (No)	Split Sample No:	
Field Duplicate (circle one)	Yes (No)	Duplicate Sample No:	

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1L AMBER GLASS	2	4°C		X	X		
40 mL GLASS VIALS	3	HCL	X				
1L POLYETHYLENE JAR	2	HNO_3				X	1 FILT, 1 NONFILT
1L PLASTIC JAR	2	NaOH					CYANIDE 1F, 1NF
1L PLASTIC JAR	1	~~NaOH + ZINC ACETATE~~					TDS, pH, TSS, Alk, SULF, CHLOR
8 oz GLASS JAR	1	H_2SO_4					TOC, NITRATE/NITRITE
1L PLASTIC JAR	1	NaOH + ZINC ACETATE					SULFIDE

WELL PURGING

Date:	6/3/97	A. Well Depth (Ft ftom TOC):	22.6
Time Started:	1100	B. Depth to Water (Ft from TOC):	7.68
Time Completed:	1150	C. Water Column Length (A-B)(Ft):	14.92
HNu/OVA Measurements		D. Casing Diameter (In.):	2
Background:	0.0	E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):	2.4
Well Head:	0.0	F. Minimum Casing Volumes to Purge:	LOW RATE
Breathing Zone:	0.0	G. Minimum Water Volume to Purge (E x F)(Gal.):	

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. ~~(°C)~~ °F	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	O_2 % ~~Odor~~	Color
1100	—						
1110	2	6.57	60.8	459	76	21	CLOUDY
1120	3	6.57	61.8	438	51.8	14	CLOUDY
1130	4	6.57	63.1	416	18.1	13	CLOUDY
1140	6	6.57	64.0	405	8	13	CLEAR
1150	8	6.57	64.7	404	5.1	13	CLEAR

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator	SOLINIST		
Conductivity Meter	AQUA CHECK	WITH REFERENCE SOLUTION	
pH Meter	AQUA CHECK	Before:	After:
Nephalometer	COLE PARMER		

Comments:

HARZA ENVIRONMENTAL SERVICES) SAMPLE NOT TAKEN) 707

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: 12C
Project No: 5644V
SAMPLE NO: H12C010300
Sample Method: BAILING, LOW RATE PUMPING
Date: 6/6/97 Time: 1400
Sampling Personnel: JOHN PYRICH, ROBERT N
Sample Split (circle one) Yes No Split Sample No:
Field Duplicate (circle one) Yes No Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1l amber jar	2			X	X		
40 ml glass vials	3	HCl	X				
1l polyethylene jar	2	HNO_3				X	Fltr. / unfltr
1l plastic jar	2	NaOH					Cyanide / fltr. / unfltr
1l plastic jar	1						TDS, pH, TSS, Alk, Sulfate, Cl
8oz glass jar	1	H_2SO_4					TOC, Nitrate/Nitrite
1l plastic jar	1	NaOH+Zinc Acetate					Sulfide

WELL PURGING

Date: 6/6/97
Time Started: 1020
Time Completed: 1215

HNu/OVA Measurements
Background: 0.0
Well Head: 0.0
Breathing Zone: 0.0

A. Well Depth (Ft from TOC): 52.7
B. Depth to Water (Ft from TOC): 24.96
C. Water Column Length (A-B)(Ft): 27.74
D. Casing Diameter (In.): 2
E. Volume of Water in Well ([D÷24]² x 3.14 x C)(Gal.): 4.52
F. Minimum Casing Volumes to Purge: 4 well cay
G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. ~~°C~~ °F	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	~~Odor~~ O_2 %	Color
1020		INSTR					
1040	2	FAILED	65.7	761	182.2	33	cloudy
1110	4		68.6	775	over 200	15	↓
1135	6		66.2	770	↓	10	↓
1205	8		66.2	780	↓	12	↓
1245	9		68.1	782	↓	13	↓

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator	SOLINIST		
Conductivity Meter	AQUA CHECK	WITH REFERENCE SOLUTION	
pH Meter	AQUA CHECK	Before:	After:
Nephalometer	COLE PARMER		

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Well No: 12 C

Project No: 5644V

SAMPLE NO: H12C010300

Sample Method: Bailing

Date: 6/11/92 Time: 1450

Sampling Personnel:

Sample Split (circle one) Yes (No)

Split Sample No:

Field Duplicate (circle one) Yes (No)

Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1 l amber glass	2			✓	✓		
40 ml glass vials	3		✓				
1 l Polyethylene Jar	2	HNO_3				✓	one Filter lone water field
1 l plastic Jar	2	NaOH					1 gunite Filter water
1 l plastic Jar	1						TDS, PH, TSS, Alk
8 oz glass Jar	1	H_2SO_4					TOC, Nitrate/Nitrite
1 l plastic Jar	1	NaOH + Zinc Acetate					Sulfide

WELL PURGING

Date: 6/11/92

Time Started: 1450

Time Completed: 1550

HNu/OVA Measurements

Background: 0/0

Well Head: 0/0

Breathing Zone: 0/0

A. Well Depth (Ft ftom TOC):

B. Depth to Water (Ft from TOC):

C. Water Column Length (A-B)(Ft):

D. Casing Diameter (In.):

E. Volume of Water in Well ([D ÷ 24]^2 x 3.14 x C)(Gal.):

F. Minimum Casing Volumes to Purge:

G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	O_2 % ~~Odor~~	Color
1450	–	not working	63	783	12	17%	Clear

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator	Solinist		
Conductivity Meter	Aqua check	With Reference solution	
pH Meter	"	Before:	After:
Nephalometer	Cole Parmer		

Comments: Well Pumped to Dry on arrival

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: 12D
Project No: 5644V
SAMPLE NO: H12D010300
Sample Method: BAILING, LOW RATE PUMP
Date: 6/3/97 Time: 1900
Sampling Personnel: JOHN PYRICH, HOSS NAJAR POUR
Sample Split (circle one) Yes (No) Split Sample No:
Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1 amber glass	2			X	X		
40 ml glass vials	3	HCl	X				
1 l polyethylene jar	2	HNO_3				X	1 filtr. 1 non filtr.
1 l plastic jar	2	NaOH					Cyanide 1 filtr, 1 non filtr.
1 l plastic jar	1						TDS, pH, TSS, Alk, Sulfate, Cl
8 oz glass jar	1	H_2SO_4					TOC, Nitrate/Nitrite
1 l plastic jar	1	NaOH+Zinc Acetate					Sulfide

WELL PURGING

Date: 6/3/97
Time Started: 1400
Time Completed: 1845

A. Well Depth (Ft from TOC): 132.8
B. Depth to Water (Ft from TOC): 19.7
C. Water Column Length (A-B)(Ft): 113.1
D. Casing Diameter (In.): 2
E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.): 18.4
F. Minimum Casing Volumes to Purge: well dry
G. Minimum Water Volume to Purge (E x F)(Gal.):

HNu/OVA Measurements
Background: 0.0
Well Head: 0.0
Breathing Zone: 0.0

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. ~~(°C)~~ °F	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	~~Odor~~ % O_2	Color
1400							
1420	2	6.57	69.8	724	127	45	cloudy
1440	4	6.57	60.7	730	69	39	cloudy
1500	6	6.57	60.6	713	28.8	33	cloudy
1520	8	6.57	60.3	741	13.1	3	clear
1540	10	6.57	60.9	717	10.03	0	clear
1600	12	6.57	61.4	734	12	4	clear
1620	15	6.57	61.9	737	8.60	8	clear
1630	17	6.57	63.5	737	11.2	7	clear
1645	19	6.57	64.4	734			

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator	SOLINST		
Conductivity Meter	AQUA CHECK	WITH REFERENCE SOLUTION	
pH Meter	AQUA CHECK	Before:	After:
Nephalometer	COLE PARMER		

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Well No: 12E

Project No: 5644V

SAMPLE NO: #12E010300

Sample Method: Low Rate Pump and Bailing

Date: 6/9/97 Time: 1610

Sampling Personnel: Hossi Najjar Pour / Rob Nerenberg

Sample Split (circle one) Yes (No) Split Sample No:

Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1 l Amber Jar/glass	2			✓	✓		
40 ml glass Vials	3	HCl / 4°C	✓				3 TOCs blanks
1 l Polyethylene Jar	2	HNO_3				✓	
1 l Plastic Jar	2	NaOH					Cyanide, filtered / unfiltered
1 l Plastic Jar	1						TDS, pH, TSS, Alk, Sulfate
8 oz Glass Jar	1	H_2SO_4					TOC, Nitrate / Nitrite
1 l Plastic Jar	1	NaOH + Zinc Acetate					Sulfide

WELL PURGING

Date: 6/9/97

Time Started: 1430

Time Completed: 1630

HNu/OVA Measurements

Background: 0/0

Well Head: 0/0

Breathing Zone: 0/0

A. Well Depth (Ft ftom TOC): 21.3

B. Depth to Water (Ft from TOC): 8.68

C. Water Column Length (A-B)(Ft):

D. Casing Diameter (In.): 2

E. Volume of Water in Well ([D ÷ 24]² x 3.14 x C)(Gal.): 2.019

F. Minimum Casing Volumes to Purge: 3

G. Minimum Water Volume to Purge (E x F)(Gal.): 6.05 gal

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	O_2 % ~~Odor~~	Color
14:50							
15:00	1	Fail	68.8	515	30	75	clear
15:25	3	Fail	66	509	15.8	23	clear
15:40	5	Fail	68.7	507	6.1	22	clear
16:00	8	Fail	67.3	504	2.25	21	clear

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator	Solinist		
Conductivity Meter	Aqua Check	With reference solution	
pH Meter	Aqua Check	Before:	After:
Nephalometer	Cole Parmer		

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: 12G
Project No: 5644V
SAMPLE NO: H12G01 0300
Sample Method: Bailing ~~[illegible]~~
Date: 6/10/97 Time: 14 45
Sampling Personnel: Hess Dryer Fowl, Rod Nordenberg
Sample Split (circle one) Yes (No) Split Sample No:
Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1 Amber glass	2			X	X		
40 ml glass vials	3	HCl	3				
1 l polyethylene Jug	2	HNO_3				X	1 Filtered + 1 unfiltered
1 l plastic Jug	2	NaOH					cyanide Filtered/unfiltered
8 oz glass Jug	1	H_2SO_4					Tot. N. Nitrate / N. Nitrite
1 l plastic Jug	1						TDS, pH, TSS, Alk. Sulfate
1 l plastic Jug	1	NaOH + Zinc Acetate					Sulfide

WELL PURGING

Date: 6/10/97
Time Started: 1445
Time Completed: 1545

HNu/OVA Measurements
Background: 0/0
Well Head: 0/0
Breathing Zone: 0/0

A. Well Depth (Ft from TOC): 22.55
B. Depth to Water (Ft from TOC): 8.99
C. Water Column Length (A-B)(Ft): 13.56'
D. Casing Diameter (In.): 2"
E. Volume of Water in Well ([D ÷ 24]² x 3.14 x C)(Gal.): 2.16 Gal
F. Minimum Casing Volumes to Purge: 6.51 Gal
G. Minimum Water Volume to Purge (E x F)(Gal.): 6.51 Gal

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. ~~(°C)~~ F	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	~~Odor~~ O_2	Color
1020							
1030	1/2 gal	Fail	78.4	662	40	Clear 70	Clear
1105		Fail	77.9	669	8.95	44	Clear
1125		Fail	79.6	662	36	48	Clear

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments: Well Pump to dirty in the morning and Sample in afternoon
Aquaflow Chem pH did not work properly

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP **Well No:** JAW 71

Project No: 5644V **SAMPLE NO:** H12 JAW 71 0103

Sample Method: well wizard slow rate pumping **Date:** 6/25/97 **Time:** 815

Sampling Personnel: Hoss NAJJAR Power, Brian Stevenson (Malcolm & Hanger)

Sample Split (circle one) Yes (No) **Split Sample No:**

Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1l Amber Glass	2			✓	✓		
40 ml glass vials	3	HCl	✓				
8 oz glass Jar	1	H_2SO_4					TOC, NO_2, NO_3
1l plastic Jar	2	HNO_3				✓	Filt/unfilt.
1l plastic Jar	2	NaOH					cyanide Filt. unfilt.
1l plastic Jar	1	NaOH + $ZnCO_2CH_3$					sulfide
1l " "	1						TDS, TSS, Ph, Alk. sulfate chloride

WELL PURGING

Date:	6/24/97	A. Well Depth (Ft from TOC):	25.00
Time Started:	1530	B. Depth to Water (Ft from TOC):	22.90
Time Completed:	1645	C. Water Column Length (A-B)(Ft):	19.10
HNu/OVA Measurements		D. Casing Diameter (In.):	3.06
Background:	0/0	E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):	2"
Well Head:	0/0	F. Minimum Casing Volumes to Purge:	3.06 gal 6.12 gal
Breathing Zone:	0/0	G. Minimum Water Volume to Purge (E x F)(Gal.):	9.16 gal 3 vol.

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	Odor	Color
1530							
1535	1/2	7.24	12.7	555	8.90	Clear None	Clear
1552	2	7.47	13.3	552	6.33	None	Clear
1622	5 1/2						
1625	6	7.50	11.7	559	14.15	—	Clear
1640	7	7.45	13.3	558	28.0	—	Pale Yellow

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator	Solinst	with ref. solution	
Conductivity Meter	YSI 3500		
pH Meter	" "	Before:	After:
Nephalometer	Cole Parmer		

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: JAW 72
Project No: 5644V
SAMPLE NO: H12JAW72 0103 00
Sample Method: Well Wizard slow rate pump
Date: 6/25/97 **Time:** 1355
Sampling Personnel: Hoss NAJJAR Paul Brain Stevenson from Nelson & Hange
Sample Split (circle one) Yes (No) **Split Sample No:**
Field Duplicate (circle one) (Yes) No **Duplicate Sample No:** H12I010300

Sample Container Type	No.	Preservative	Analysis Requested: VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1l Amber glass	2			✓	✓		
40 ml glass vials	3		✓				
8 oz glass Jar	1	H_2SO_4					TOC, NO_2, NO_3
1l Plastic Jar	2	HNO_3				✓	Filt + unfilt
1l Plastic Jar	2	NaOH					Cyanide filt. unfilt
1l Polyethylene Jar	1						TDS, TSS, sulfate, Alk, chloride, fluoride
1l Plastic Jar	1	Na OH + ZnAcetate					sulfide

WELL PURGING

Date: 6/25/97
Time Started: 1258
Time Completed: 1355
HNu/OVA Measurements
Background: 0/0
Well Head: 0/0
Breathing Zone: 0/0

A. Well Depth (Ft from TOC): 25
B. Depth to Water (Ft from TOC): 5.85
C. Water Column Length (A-B)(Ft): 19.15
D. Casing Diameter (In.): 2 4
E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.): 3.06 one vol 9.19 3-vol
F. Minimum Casing Volumes to Purge:
G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color
1258							
1305	1½	7.38	11.4	420	2.90	—	Clear
1325	5	7.37	11.2	472	1.67	—	"
1340	8	7.33	11.2	444	2.48	—	" slight brown
1345	9½	7.38	11.2	490	1.52	—	" "

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator	solinst	with std. solution	
Conductivity Meter	YSI 3500	" " "	
pH Meter	" "	Before:	After:
Nephalometer	Cole Parmer		

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP **Well No:** JAW 73

Project No: 5644V **SAMPLE NO:** H12 JAW73010

Sample Method: Well Wizard & slow rate pump **Date:** 6/25 **Time:** 1230

Sampling Personnel: Hoss Najjar Pour, Brian Stevenson Carson & Harza

Sample Split (circle one) Yes (No) **Split Sample No:**

Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1l Amber Glass	2	–		✓	✓		
40 ml glass vials	3	HCl	✓				
1l Plastic Jar	2	HNO3				✓	Filt & unfilt.
1l " "	2	NaOH					Cyanide Filt & unfilt
1l Polyethylene Jar	1						TDS, TSS, Alkalinity, Sulfate, Chloride
1l Plastic Jar	1	NaOH Zn Acetate					Sulfide
8 oz Glass Jar	1	H2SO4					TOC, NO2, NO3

WELL PURGING

Date: 6/25/97

Time Started: 8 45

Time Completed: 10 45

HNu/OVA Measurements

Background: 0/0

Well Head: 0/0

Breathing Zone: 0/0

A. Well Depth (Ft from TOC): 25

B. Depth to Water (Ft from TOC): 6.7'

C. Water Column Length (A-B)(Ft): 18.3

D. Casing Diameter (In.): 2"

E. Volume of Water in Well ([D÷24]² x 3.14 x C)(Gal.): 2.93 gallon one vol; 8.57 gallon 3 vol

F. Minimum Casing Volumes to Purge:

G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	Odor	Color
845							
855	1	7.50	11.3	560	3.0	–	clear
905	2	7.45	11.8	557	2.45	–	"
915	4	7.62	11.2	537	2.70	–	"
945	5	7.54	12.5	563	2.31	–	"
1025	7	7.56	12.0	562	2.23	–	"
1035	8½	7.49	13.1	563	4.45	–	"
1045	9						

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator	Solinst	with Ref. Solution	
Conductivity Meter	YSI 3500	" " "	
pH Meter	" "	Before:	After:
Nephalometer	Cole Parmer		

Comments: Stop @ 9 gallon and waited 1½ Hours for recharging

APPENDIX E
SAMPLE COLLECTION FIELD SHEETS

E-6 Task 13. Groundwater Data, Downstream Reach, Brush Creek

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: 13-B
Project No: 5644V
SAMPLE NO: H13B010300
Sample Method: Slow Rate Pump + Bailing
Date: 6/13/97 Time: 13:05
Sampling Personnel:
Sample Split (circle one) Yes (No) Split Sample No:
Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1l amber glass	2			✓	✓		
40 ml glass vials	3	HCl	✓				
1l Polyethylene Jar	2	HNO3				✓	Filtered and unfiltered
1l Plastic Jar	2	NaOH					Cyanide, filtered and unfiltered
1l Plastic Jar	1						TDS, Ph, TSS, alkalinity, Sulfate
8 oz Glass Jar	1	H2SO4					TOC, nitrate/Nitrite
1l Plastic Jar	1	NaOH + Zinc Acetate					Sulfide

WELL PURGING

Date: 6/13/97
Time Started: 1050
Time Completed: 1330

HNu/OVA Measurements
Background: 0/0
Well Head: 0/0
Breathing Zone: 0/0

A. Well Depth (Ft from TOC): 44.45
B. Depth to Water (Ft from TOC): 21.20
C. Water Column Length (A-B)(Ft): 23.25
D. Casing Diameter (In.): 2"
E. Volume of Water in Well ([D ÷ 24]² x 3.14 x C)(Gal.): 3.72
F. Minimum Casing Volumes to Purge: 3 volume 11.16
G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	~~Odor~~ O2	Color
1050							
1105	1 1/2	7.54	58.4	465	385	232 ??	faint yellow
1115	3	7.39	60.1	443	5220	229	lite yellow
1210	9	7.48	66.2	349	5.35	177	clear
1236	11	7.41	74.2	351	5.46	160	clear
1302	13 1/2	7.48	72.3	335	5.52	164	clear

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator	Solinist		
Conductivity Meter	Aqua Check	With reference solution	
pH Meter	" "	Before:	After:
Nephalometer	Cole Parmer		

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: 13D
Project No: 5644V
SAMPLE NO: H13D010300
Sample Method: Slow Bailing
Date: 6/20/97 Time: 830
Sampling Personnel:
Sample Split (circle one) Yes (No) Split Sample No:
Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1l Amber Glass	1				✓		
1l Polyethylene	2	HNO3				✓	Filt & unfilt.
1l Plastic Jar	2	NaOH					cyanide filt/unfilt
1l Plastic Jar	1						TDS, pH, TSS, Alk, sulfate
8 oz Glass Jar	1	H2SO4					TOC, NO2, NO3
1l Plastic Jar	1	NaOH + zinc acetate					Sulfide

WELL PURGING

Date: 6/18/97
Time Started: 1630
Time Completed: 1900

HNu/OVA Measurements
Background: 0/0
Well Head: 0/0
Breathing Zone: 0/0

A. Well Depth (Ft ftom TOC): 88.65'
B. Depth to Water (Ft from TOC): 31.75
C. Water Column Length (A-B)(Ft): 56.9'
D. Casing Diameter (In.): 2"
E. Volume of Water in Well ([D ÷ 24]² x 3.14 x C)(Gal.): one vol. = 9.1 gal. 3 vol. = 28
F. Minimum Casing Volumes to Purge:
G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. ~~(°C)~~ °F	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	~~Odor~~ O2 %	Color
1630							
1640	1	7.24	64.3	705	107.9	18.1	cloudy/tan
1707	2	7.58	67.5	625	29.8	17.8	cloudy
1745	5	7.66	66.7	625	32.2	13.5	off clear
1845	10	7.67	69.2	646	194	13.0	

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator	Solinst	with ref solution	
Conductivity Meter	Aqua check	" " "	
pH Meter	" "	Before:	After:
Nephalometer	Cole		

Comments: well called Dry after 10 1/4 gallon of purged water

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: 13E
Project No: 5644V
SAMPLE NO: H13E010300
Sample Method: slow bailing
Date: 6/20/97 Time: 8:00
Sampling Personnel:
Sample Split (circle one) Yes (No) Split Sample No:
Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested: VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1l Amber glass	1			~~✓~~	~~✓~~ ✓		only for explosive
40 ml glass vials	6	HCl	✓				
1l polyethylene	2	HNO_3				✓	filt & unfilt.
1l Plastic Jar	2	NaOH					cyanide filt & unfilt.
1l Plastic Jar	1						TDS, pH, TSS, Alkalinity, sulfate
8 oz glass Jar	1	H_2SO_4					TOC, NO_2, NO_3
1l Plastic Jar	1	NaOH + zinc Acetate					Sulfide

WELL PURGING

Date: 6/18/97
Time Started: 1445
Time Completed: 1545

HNu/OVA Measurements
Background: 0%
Well Head: 0%
Breathing Zone: 0%

A. Well Depth (Ft ftom TOC): 36.91
B. Depth to Water (Ft from TOC): 12.54
C. Water Column Length (A-B)(Ft): 24.37
D. Casing Diameter (In.): 2"
E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.): one volume 3.9 gal/1 / 3 volumes 11.7 gal/1
F. Minimum Casing Volumes to Purge:
G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. ~~per~~ F	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	~~Odor~~ % O_2	Color
1445							
1510	2	6.77	68	1119	2.15	90	clear
1520	3½	6.78	67.6	1142	2.31	88	clear
1540	4	6.75	77.3	1122	4	78	clear

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator	Solinst	with std. solution	
Conductivity Meter	Aquacheck	" " "	
pH Meter	" "	Before:	After:
Nephalometer	COLE PARMER		

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Well No: 13-F

Project No: 5644V

SAMPLE NO: H-13-F-01-03-

Sample Method: Disposable Bailer

Date: 6-24-97 Time: 1245

Sampling Personnel: K. KRASKE

Sample Split (circle one) Yes No Split Sample No:

Field Duplicate (circle one) Yes No Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1 L GLASS	1	4°C			X		
1 L PLASTIC	1	4°C					WATER QUAL 1
8 OZ GLASS	1	H2SO4					WATER QUAL. 2
1 L PLASTIC	2	HNO3				X	FILTER/UNFILTER
1 L PLASTIC	2	NAOH					CYANIDE (FILTER UNFI
1 L PLASTIC	1	NAOH + ZNCO2CH3					SULFIDE

WELL PURGING

Date:

Time Started:

Time Completed:

HNu/OVA Measurements

Background:

Well Head:

Breathing Zone:

A. Well Depth (Ft ftom TOC):

B. Depth to Water (Ft from TOC):

C. Water Column Length (A-B)(Ft):

D. Casing Diameter (In.):

E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):

F. Minimum Casing Volumes to Purge:

G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: G-54
Project No: 5644V
SAMPLE NO: H-13-G54-01-03-00
Sample Method: Disposable Bailer
Date: 6-25-97 **Time:** 0800
Sampling Personnel: K. KRASKE
Sample Split (circle one) Yes No **Split Sample No:** SAME (EXPLOSIVE ONLY)
Field Duplicate (circle one) Yes No **Duplicate Sample No:** H-13-I-01-03-00
ARDL MS/MSD SAMPLE (2 SETS)

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1 L Glass	1	4°C			X		
1 L Plastic	1	4°C					WATER QUAL 1
8 OZ Glass	1	H2SO4					WATER QUAL 2
1 L Plastic	2	HNO3				X	FILT / UNFILT
1 L Plastic	2	NAOH				Cyanide	FILT / UNFILT
1 L Plastic	1	NAOH + ZNCO2CH3					SULFIDE

WELL PURGING

Date:	6-25-97	A. Well Depth (Ft ftom TOC):	66.8 FT
Time Started:	1040	B. Depth to Water (Ft from TOC):	8.25 FT
Time Completed:	2159	C. Water Column Length (A-B)(Ft):	58.55 FT
HNu/OVA Measurements		D. Casing Diameter (In.):	4 IN
Background:		E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):	38 GAL
Well Head:		F. Minimum Casing Volumes to Purge:	3
Breathing Zone:		G. Minimum Water Volume to Purge (E x F)(Gal.):	114 GAL

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (~~°C~~)°F	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	~~Odor~~ D.O. %	Color
SEE	IAAP	LOGBOOK	P.	88	TO	108	
1100	2.5	7.21	66.6	690	2.33	173	
1132	5	7.14	67.0	763	0.97	172	
1201	7.5	7.08	64.8	782	0.69	177	
1300	20	7.04	65.3	800	0.58	176	
1350	25	7.05	67.0	789	0.48	>250	* recalibrated
1441	30	7.02	65.9	792	0.47	240	
2159	85						

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator	SOLINST	YES 0720	
Conductivity Meter	AQUICHECK (RENTAL)		
pH Meter	AQUICHECK (RENTAL)	Before:	After:
Nephalometer	COLE PARMER		

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP **Well No:** G-55

Project No: 5644V **SAMPLE NO:** H-13-G55-01-0

Sample Method: Disposable Bailer **Date:** 6-24-97 **Time:** 1600

Sampling Personnel: K. KRASKE

Sample Split (circle one) Yes (No) **Split Sample No:**

Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1 L Glass	1	4°C			X		
1 L Plastic	1	4°C					WATER QUAL 1
8 OZ Glass	1	H2SO4					WATER QUAL 2
1 L Plastic	2	HNO3				X	FILT / UNFILT
1 L Plastic	2	NAOH				Cyanide	FILT / UNFILT
1 L Plastic	1	NAOH + ZNCO2CH3					SULFIDE

WELL PURGING

Date:

Time Started:

Time Completed:

HNu/OVA Measurements

Background:

Well Head:

Breathing Zone:

A. Well Depth (Ft from TOC):

B. Depth to Water (Ft from TOC):

C. Water Column Length (A-B)(Ft):

D. Casing Diameter (In.):

E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.):

F. Minimum Casing Volumes to Purge:

G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	Odor	Color

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator			
Conductivity Meter			
pH Meter		Before:	After:
Nephalometer			

Comments:

APPENDIX E
SAMPLE COLLECTION FIELD SHEETS

E-7 Task 16. Additional Groundwater Data, Line 3

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Project No: 5644V
Sample Method: Slow Pumping/Bailing
Sampling Personnel:
Well No: 16A
SAMPLE NO: H16A010306
Date: 6/19/97 **Time:** 1650
Sample Split (circle one) Yes No **Split Sample No:**
Field Duplicate (circle one) (Yes) No **Duplicate Sample No:** H16I010300

Sample Container Type	No.	Preservative	Analysis Requested: VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1l Amber Glass	10			✓	✓		
40 ml glass Vials	15	HCl	✓				
1l Polyethylene Jar	10	HNO3				✓	Fil 5/Unfil 5
1l Plastic Jar	10	NaOH					Cyanide Filt., Unfil. Chloride
1l Plastic Jar	5						TDS, pH, TSS, Alk.
8 oz glass	5	H2SO4					TOC, NO2, NO3
1l Plastic Jar	5	NaOH + Zinc Acetate					Sulfide

WELL PURGING

Date: 6/19/97
Time Started: 830
Time Completed: 1650

HNu/OVA Measurements
Background: 0/0
Well Head: 0/0
Breathing Zone: 0/0

A. Well Depth (Ft from TOC): 112.4
B. Depth to Water (Ft from TOC): 17.00
C. Water Column Length (A-B)(Ft): 95.4'
D. Casing Diameter (In.): 2"
E. Volume of Water in Well ([D÷24]² x 3.14 x C)(Gal.): one vol. 15.26 gal. 3 vol. 45.83 l.
F. Minimum Casing Volumes to Purge: –
G. Minimum Water Volume to Purge (E x F)(Gal.): –

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	~~Odor~~ O2 %	Color
830							
10 30	10	7.28	75.4	748	17	103	Pale Yellow
11 15	12½	7.26	75.4	739	25.4	103	" "
12 15	17½	7.23	69.8	616	33.2	111	" "
13 30	25½	7.21	69.8	621	6.4	111	Clear
14 10	29	7.27	67.5	588	6.0	92	"
15 15	35½	7.19	66.1	588	6.0	116	"
15 45	38	7.26	67.7	599	4.6	114	"

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator	Solinst		
Conductivity Meter	Aqua Check	With Ref. Solution	
pH Meter	" "	Before:	After:
Nephalometer	Hach Ratio		

Comments: Sampled for ARDL MS/MSD, ARDL Duplicate
" " MRDL

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name:	SITE GROUNDWATER INVESTIGATION IAAAP	Well No:	16 B
Project No:	5644V	SAMPLE NO:	H16B01030
Sample Method:	Slow rate Pump / Bailing	Date: 6/16/97	Time: 1730
Sampling Personnel:	Hass Naylor Pour, Rob Nordberg		
Sample Split (circle one)	Yes (No)	Split Sample No:	
Field Duplicate (circle one)	Yes (No)	Duplicate Sample No:	

Sample Container Type	No.	Preservative	Analysis Requested: VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1l Amber glass	2			✓	✓		
40 ml Glass vial	3	HCl	✓				
1l Polyethylene Jar	2	HNO3				✓	Filtered and unfiltered
1l Plastic Jar	2	NaOH					cyanide filtered & unfiltered
1l Plastic Jar	1						TDS, Phos, Alk, Sulfate
8 oz Glass Jar	1	H2SO4					TOC, Nitrate/Nitrite
1l Plastic Jar	1	NaOH + Zinc Acetate					Sulfide

WELL PURGING

Date:	6/16/97	A. Well Depth (Ft ftom TOC):	26.99
Time Started:	1415	B. Depth to Water (Ft from TOC):	3.43
Time Completed:	1730	C. Water Column Length (A-B)(Ft):	11.31
HNu/OVA Measurements		D. Casing Diameter (In.):	2
Background:	0/0	E. Volume of Water in Well ([D ÷ 24]² x 3.14 x C)(Gal.):	1.81 gal/ft
Well Head:	0/0	F. Minimum Casing Volumes to Purge:	3
Breathing Zone:	0/0	G. Minimum Water Volume to Purge (E x F)(Gal.):	5.43 gal/ft

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	~~Odor~~ O_2	Color
1415							
1430	1/2	7.38	75.7	460	40	160	Pale yellow
1510	1	7.32	63.7	452	23.2	184	Pale/clear
1545	3	6.9	72.8	469	22.5	164	slm. clear
1635	5	7.25	72.9	447	16.7	164	clear
1720	10.5	6.72	57.1	396	30.	199	slm clear

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator	Solinist		
Conductivity Meter	Aqua check		
pH Meter	4	Before:	After:
Nephalometer	Cole Parmer		

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: 16C
Project No: 5644V
SAMPLE NO: 16C010300
Sample Method: Slow Pump / Bailing
Date: 6/17/97 Time: 1225
Sampling Personnel: Hoss Neiger Pour
Sample Split (circle one) Yes (No) Split Sample No:
Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1l Amber Glass	2			✓	✓		
40 ml glass Vials	3	HCl	3				
1l Polyethylene	2	HNO3				✓	Filt./unfilt.
1l Plastic Jar	1						TDS/PH/TSS/Alk/Sulfate
1l Plastic Jar	2	NaOH					cyanide Filt/unfi
8 oz glass Jar	1	H2SO4					TOC/NO2/NO3
1l Plastic Jar	1	NaOH + Zinc Acetate					Sulfide

WELL PURGING

Date: 6/17/97
Time Started: 10.15
Time Completed: 12.25
HNu/OVA Measurements
Background: 0/0
Well Head: 0/0
Breathing Zone: 0/0

A. Well Depth (Ft from TOC): 27.60
B. Depth to Water (Ft from TOC): 4.5
C. Water Column Length (A-B)(Ft): 23.1
D. Casing Diameter (In.): 2"
E. Volume of Water in Well ([D ÷ 24]² x 3.14 x C)(Gal.): 3.7 gal/one value; 11.09 gals value
F. Minimum Casing Volumes to Purge:
G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	~~Odor~~ O2	Color
1030	1/2	7.28	57.5	370	17.5	Clear 197	Clear
1040	2 1/2	7.15	63.4	360	7.21	184	Clear
1125	6	7.01	62.9	293	5.8	185	Clear
1210	11 1/2	7.21	67.4	280	34.0	140	Pale yellow

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator	Solinst		
Conductivity Meter	Aqua Check	with reference solution	
pH Meter	" "	Before:	After:
Nephalometer	Cole Parmer		

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP

Well No: 16 D

Project No: 5644V

SAMPLE NO: H16D0103

Sample Method: Slow Pump / Bailing

Date: 6/17/97 Time: 17 15

Sampling Personnel: Hoss Neighbors

Sample Split (circle one) Yes (No)

Split Sample No:

Field Duplicate (circle one) Yes (No)

Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1l Amber Glass	2			✓	✓		
40 ml Vial	3	HCl	3				
1l Polyethylene	2	NO3H				✓	Alk. / unfil. H.
1l Plastic Jar	2	NaOH					Cyanide fil. / unfil.
1l Plastic Jar	1						TDS/pH/TSS/Alk
8 oz Glass Jar	1	H2SO4					TOC/NO2/NO3
1l Plastic Jar	1	NaOH + Zinc Acetate					Sulfide

WELL PURGING

Date: 6/17/97

Time Started: 1450

Time Completed: 1715

HNu/OVA Measurements

Background: 0/0

Well Head: 0/0

Breathing Zone: 0/0

A. Well Depth (Ft from TOC): 27.38

B. Depth to Water (Ft from TOC): 4.50

C. Water Column Length (A-B)(Ft): 22.88

D. Casing Diameter (In.): 2"

E. Volume of Water in Well ([D ÷ 24]² x 3.14 x C)(Gal.): 3.66

F. Minimum Casing Volumes to Purge: 10.98

G. Minimum Water Volume to Purge (E x F)(Gal.): 9.4/3-volume

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	~~Color~~ O_2	Color
1440	1450 N.N						
1510	1 1/2	7.22	62.1	339	13.5	150	Pale Yellow
1520	2 1/2	6.96	60.6	315	5.37	191	Clear
1540	3 1/2	6.95	61.9	313	6.71	150	clear
1600	5	7.06	59.8	308	3.60	154	Clear
1620	7	6.92	61.2	307	4.81	151	clear
1650	11	7.12	60.2	298	3.48	154	Clear

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator	Solinst		
Conductivity Meter	Aqua Check	with Reference Solution	
pH Meter	" "	Before:	After:
Nephalometer	Cole Parmer		

Comments:

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: 16 E
Project No: 5644V
SAMPLE NO: H16E01 0300
Sample Method: Slow Bailing
Date: 6/19/97 Time: 14 45
Sampling Personnel: Hoss Najjar Paul, Kurt Kraske
Sample Split (circle one) Yes (No) Split Sample No:
Field Duplicate (circle one) Yes (No) Duplicate Sample No:

Sample Container Type	No.	Preservative	Analysis Requested: VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1l Amber glass	2			✓	✓		
40 ml glass Jar	3	HCl	✓				
1l Polyethylene Jar	2	HNO_3				✓	Filt. and unfilt.
1l Plastic Jar	2	NaOH					Cyanides Filt. and unfilt.
1l Plastic Jar	1						TDS, pH, TSS, Alkalinity
8 oz glass Jar	1	H_2SO_4					TOC, NO_2, NO_3
1l Plastic Jar	1	NaOH + Zinc Acetate					Sulfide

WELL PURGING

Date: 6/18/97
Time Started: 9 20
Time Completed: 12 20
HNu/OVA Measurements
Background: 0/0
Well Head: 0/0
Breathing Zone: 0/0

A. Well Depth (Ft from TOC): 57 33
B. Depth to Water (Ft from TOC): 7.60
C. Water Column Length (A-B)(Ft): 49.73
D. Casing Diameter (In.): 2"
E. Volume of Water in Well ($[D-24]^2 \times 3.14 \times C$)(Gal.): One vol. change 7.96. 3-vol change 23.87.
F. Minimum Casing Volumes to Purge:
G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	~~Odor~~ O_2	Color
920							
1000	2	7.11	62.8	582	9.3	186	Clear
1030	4	7.11	68.0	564	9.47	139	Clear
1045	6						
1100							
1125	8	7.11	75.7	613	43.1	155	Pale Yellow
1145	9 1/2	7.09	77.3	611	101.2	153	" "

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator	Solinst		
Conductivity Meter	Acorn Check	with std. solution	
pH Meter	4 7	Before:	After:
Nephalometer	Cole Parmer		

Comments: This well called Dry after purging it up to 12 gal at 1220

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: JAW 53
Project No: 5644V
SAMPLE NO: HJAW53010
Sample Method: Well Wizard System
Date: 6/24 **Time:** 10 10
Sampling Personnel: Hoss Nassler Four / Brian Stevenson of Mason & Hanger
Sample Split (circle one) Yes (No) **Split Sample No:**
Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sample Container Type	No.	Preservative	Analysis Requested: VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1l Amber glass	2			✓	✓		
40 ml glass vials	3	HCl	✓				
1l Polyethylene	2	HNO3				✓	Filt / unFilt
1l Plastic Jar	2	NaOH					Cyanide Filt. / unFilt.
1l Plastic Jar	1						TDS, Rh, TSS, Alk. Sulfate
8 oz glass	1	H2SO4					TOC, NO2, NO3
1l plastic Jar	1	NaOH + zinc acetate					Sulfide

WELL PURGING

Date:	6/24/97	A. Well Depth (Ft from TOC):	19
Time Started:	925	B. Depth to Water (Ft from TOC):	4.1
Time Completed:	10 10	C. Water Column Length (A-B)(Ft):	2"
HNu/OVA Measurements		D. Casing Diameter (In.):	One Vol. 2.39 gal
Background:	0/0	E. Volume of Water in Well ([D÷24]² x 3.14 x C)(Gal.):	3 vol. 7
Well Head:	0/0	F. Minimum Casing Volumes to Purge:	
Breathing Zone:	0/0	G. Minimum Water Volume to Purge (E x F)(Gal.):	

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	Odor	Color
925							
930	1/2 gal	7.49	11.9	505	3.7	None	Clear
940	2 1/2	7.37	12.2	508	1.54	—	"
950	4 1/2	7.31	12.1	509	1.98	—	"
1000	6	7.50	12.0	504	2.0	—	"

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator	solinst	with ref. solution	
Conductivity Meter	YSI 3500	" " "	
pH Meter	" "	Before:	After:
Nephalometer	Cole		

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: JAW 54
Project No: 5644V
SAMPLE NO: HJAW54010300
Sample Method: well wizard system
Date: 6/24/97 **Time:** 1155
Sampling Personnel: Hoss Noffsinger Fox / Brian Stevenson from Mason & Hanger
Sample Split (circle one) Yes (No) **Split Sample No:**
Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sample Container Type	No.	Preservative	Analysis Requested: VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1l Amber glass	2			✓	✓		
40 ml glass vials	3	HCl	✓				
1l Polyethylene	2	HNO_3				✓	Filt/unfilt.
1l Plastic Jar	2	NaOH					Cyanide Filt/unfilt.
1l Plastic Jar	1						TDS, pH, TSS, Alkal
8 oz glass	1	H_2SO_4					TOC, Nor, NO3
1l plastic Jar	1	NaOH + zinc Acetate					Sulfide

WELL PURGING

Date: 6/24/97
Time Started: 10 45
Time Completed: 11 55

HNu/OVA Measurements
Background: 0/0
Well Head: 0/0
Breathing Zone: 0/0

A. Well Depth (Ft from TOC): 25
B. Depth to Water (Ft from TOC): 3.9
C. Water Column Length (A-B)(Ft): 21.1
D. Casing Diameter (In.): 2"
E. Volume of Water in Well ($[D \div 24]^2 \times 3.14 \times C$)(Gal.): one-vol 3.38 3 vol 10.45
F. Minimum Casing Volumes to Purge:
G. Minimum Water Volume to Purge (E x F)(Gal.):

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (μMHOS/cm)	Turbidity (Neph. units)	Odor	Color
10 45							
10 50	1/2	7.23	13.5	560	1.12	—	clear
11 10	3	7.32	13.2	482	2.34	—	"
11 25	6	7.48	11.7	486	1.43	—	"
11 40	8	7.41	11.6	489	1.58	—	"
11 50	10 1/2	7.25	11.3	486	1.50	—	"

FIELD INSTRUMENTS/CALIBRATION

Instrument/Model		Calibration	
Water Level Indicator	Solinst	with refs solution	
Conductivity Meter	YSI 3500	" " "	
pH Meter	" "	Before:	After:
Nephalometer	Cole		

Comments:

HARZA ENVIRONMENTAL SERVICES

SAMPLE COLLECTION FIELD SHEET (GROUNDWATER)

Project Name: SITE GROUNDWATER INVESTIGATION IAAAP
Well No: JAW 35
Project No: 5644V
SAMPLE NO: HJAW5501030
Sample Method: Well Wizard System
Date: 6/24/97 **Time:** 1445
Sampling Personnel: Hoss Noffsinger / Brian Stevenson (Chasson + Hanger)
Sample Split (circle one) Yes (No) **Split Sample No:**
Field Duplicate (circle one) Yes (No) **Duplicate Sample No:**

Sample Container Type	No.	Preservative	Analysis Requested				
			VOC	S-VOC	EXPLOSIVES	METALS	OTHER (List)
1l Amber Glass	2			✓	✓		
40 ml Glass Vials	3	HCl	✓				
1l Plastic Jar	2	HNO3				✓	Filt/unfilt
1l Plastic Jar	2	NaOH					cyanide Filt/unfilt.
1l Plastic Jar	1						TDS, pH, TDS, Alka, sulfate
8 oz Glass	1	H2SO4					TOC-NO2, NO3
1l Plastic Jar	1	NaOH + Zinc Acetate					Sulfide

WELL PURGING

Date:	6/24/97	A. Well Depth (Ft from TOC):	25
Time Started:	1335	B. Depth to Water (Ft from TOC):	4.8
Time Completed:	1445	C. Water Column Length (A-B)(Ft):	20.2
HNu/OVA Measurements		D. Casing Diameter (In.):	2
Background:	0/0	E. Volume of Water in Well ([D ÷ 24]² x 3.14 x C)(Gal.):	one vol. 3.23 / 3 vol. 9.68
Well Head:	0/0	F. Minimum Casing Volumes to Purge:	
Breathing Zone:	0/0	G. Minimum Water Volume to Purge (E x F)(Gal.):	

Field Measurements/Observations

Time	Gallons Purged	pH (units)	Temp. (°C)	S. Cond. (µMHOS/cm)	Turbidity (Neph. units)	Odor	Color
1335							
1340	1	7.26	12.6	539	11.9	—	clear
1352	2½	7.08	12.1	535	8.50	—	"
1416	7.00	7.28	11.9	536	4.20	—	"
1440	9½ 9½	7.16	11.7	521	2.78	—	"

FIELD INSTRUMENTS/CALIBRATION

	Instrument/Model	Calibration	
Water Level Indicator	Solinst	with ref. Solution	
Conductivity Meter	YSI 3500	" " "	
pH Meter	" "	Before:	After:
Nephalometer	Cole		

Comments:

APPENDIX F
FIELD PERMEABILITY ('SLUG') TESTS
DATA PRINTOUTS

WELL 12A FALLING HEAD SLUG TEST

SLUG TEST ANALYSIS: HVORSLEV STRAIGHT LINE METHOD
SOFTWARE: AQUITEST

RESULT: AQUIFER HORIZONTAL CONDUCTIVITY
= 1.520 FT/DAY = 5.362E-04 CM/SEC

AQUITEST PARAMETER VALUES
DISTANCE FROM AQUIFER TOP TO WELL BASE = 0.5 FT
DISTANCE FROM AQUIFER TOP (STATIC WATER LEVEL) TO SCREEN TOP = 2.35 FT
EFFECTIVE SCREEN RADIUS = 0.08 FT
EFFECTIVE BOREHOLE RADIUS = 0.18 FT
AQUIFER THICKNESS = 12.35 FT
RATIO VERTICAL TO HORIZONTAL CONDUCTIVITY = 0.1

HERMIT FIELD DATA USED IN CALCULATION

SE1000C
Environmental Logger
06/06 12:03

Unit# 00617 Test 2

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 00000

Reference 100.000
Linearity 0.040
Scale factor 19.880
Offset 0.010
Delay mSEC 50.000

Step 0 06/06 10:06:12

Elapsed Time	INPUT 1
0.0000	98.430
1.0000	98.669
2.0000	98.864
3.0000	99.027
4.0000	99.146
5.0000	99.240

6.0000	99.328
7.0000	99.403
8.0000	99.485
9.0000	99.523
10.0000	99.579
11.0000	99.629
12.0000	99.667
13.0000	99.698
14.0000	99.730
15.0000	99.761
16.0000	99.786
17.0000	99.811
18.0000	99.836
19.0000	99.855
20.0000	99.874
21.0000	99.893
22.0000	99.912
23.0000	99.924
24.0000	99.943
25.0000	99.956
26.0000	99.968
27.0000	99.981
28.0000	99.987

WELL 12B FALLING HEAD SLUG TEST

SLUG TEST ANALYSIS: HVORSLEV STRAIGHT LINE METHOD
SOFTWARE: AQUITEST

RESULT: AQUIFER HORIZONTAL CONDUCTIVITY
= 1.788 FT/DAY = 6.307E-04 CM/SEC

AQUITEST PARAMETER VALUES
DISTANCE FROM AQUIFER TOP TO WELL BASE = 0.5 FT
DISTANCE FROM AQUIFER TOP (STATIC WATER LEVEL) TO SCREEN TOP = 3.41 FT
EFFECTIVE SCREEN RADIUS = 0.08 FT
EFFECTIVE BOREHOLE RADIUS = 0.18 FT
AQUIFER THICKNESS = 13.41 FT
RATIO VERTICAL TO HORIZONTAL CONDUCTIVITY = 0.1

HERMIT FIELD DATA USED IN CALCULATION
SE1000C
Environmental Logger
06/18 07:43

Unit# 00617 Test 6

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 00000

Reference 100.000
Linearity 0.040
Scale factor 19.880
Offset 0.010
Delay mSEC 50.000

Step 0 06/17 17:40:52

Elapsed Time INPUT 1
--- ---
0.0000 98.267
1.0000 99.579
2.0000 99.843
3.0000 99.931
4.0000 99.956
5.0000 99.968

6.0000	99.974
7.0000	99.981
8.0000	99.987
9.0000	99.987
10.0000	99.987
11.0000	99.993
12.0000	99.993
13.0000	99.993
14.0000	99.993
15.0000	99.993
16.0000	99.993
17.0000	99.993
18.0000	99.993

WELL 12C FALLING HEAD SLUG TEST

SLUG TEST ANALYSIS: HVORSLEV STRAIGHT LINE METHOD
SOFTWARE: AQUITEST

RESULT: AQUIFER HORIZONTAL CONDUCTIVITY
= 3.949E-02 FT/DAY = 1.393E-05 CM/SEC

AQUITEST PARAMETER VALUES
DISTANCE FROM AQUIFER TOP TO WELL BASE = 0.5 FT
DISTANCE FROM AQUIFER TOP (STATIC WATER LEVEL) TO SCREEN TOP = 20.44 FT
EFFECTIVE SCREEN RADIUS = 0.08 FT
EFFECTIVE BOREHOLE RADIUS = 0.18 FT
AQUIFER THICKNESS = 30.44 FT
RATIO VERTICAL TO HORIZONTAL CONDUCTIVITY = 0.1

HERMIT FIELD DATA USED IN CALCULATION
SE1000C
Environmental Logger
06/20 13:17

Unit# 00617 Test 8

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 00000

Reference 100.000
Linearity 0.040
Scale factor 19.880
Offset 0.010
Delay mSEC 50.000

Step 0 06/19 10:32:10

Elapsed Time	INPUT 1
0.0000	98.166
1.0000	98.418
2.0000	98.505
3.0000	98.575
4.0000	98.631
5.0000	98.687

6.0000	98.731
7.0000	98.788
8.0000	98.826
9.0000	98.870
10.0000	98.901
11.0000	98.932
12.0000	98.964
13.0000	98.995
14.0000	99.020
15.0000	99.052
16.0000	99.077
17.0000	99.108
18.0000	99.158
19.0000	99.202
20.0000	99.234
21.0000	99.253
22.0000	99.271
23.0000	99.284
24.0000	99.303
25.0000	99.322
26.0000	99.340
27.0000	99.353
28.0000	99.372
29.0000	99.384
30.0000	99.403
31.0000	99.416
32.0000	99.428
33.0000	99.441
34.0000	99.453
35.0000	99.466
36.0000	99.479
37.0000	99.491
38.0000	99.504
39.0000	99.516
40.0000	99.522
41.0000	99.541
42.0000	99.548
43.0000	99.560
44.0000	99.573
45.0000	99.579
46.0000	99.585
47.0000	99.598
48.0000	99.610
49.0000	99.617
50.0000	99.623

51.0000	99.629
52.0000	99.642
53.0000	99.648
54.0000	99.654
55.0000	99.667
56.0000	99.673
57.0000	99.686
58.0000	99.686
59.0000	99.698
60.0000	99.705
61.0000	99.711
62.0000	99.717
63.0000	99.723
64.0000	99.730
65.0000	99.736
66.0000	99.742
67.0000	99.748
68.0000	99.755
69.0000	99.761
70.0000	99.767
71.0000	99.780
72.0000	99.780
73.0000	99.786
74.0000	99.792
75.0000	99.792
76.0000	99.799
77.0000	99.805
78.0000	99.811
79.0000	99.817
80.0000	99.817
81.0000	99.824
82.0000	99.836
83.0000	99.836
84.0000	99.843
85.0000	99.849
86.0000	99.855
87.0000	99.855
88.0000	99.861
89.0000	99.861
90.0000	99.861
91.0000	99.868
92.0000	99.868
93.0000	99.874
94.0000	99.874
95.0000	99.880

96.0000	99.887
97.0000	99.893
98.0000	99.899
99.0000	99.899
100.000	99.905
101.000	99.905
102.000	99.905
103.000	99.912
104.000	99.912
105.000	99.912
106.000	99.918
107.000	99.924
108.000	99.924
109.000	99.931
110.000	99.931
111.000	99.937
112.000	99.937
113.000	99.937
114.000	99.943
115.000	99.949
116.000	99.943
117.000	99.949
118.000	99.949
119.000	99.956
120.000	99.962
121.000	99.962
122.000	99.968
123.000	99.968
124.000	99.968
125.000	99.974
126.000	99.974
127.000	99.974
128.000	99.981
129.000	99.981
130.000	99.981
131.000	99.987
132.000	99.987
133.000	99.981
134.000	99.987
135.000	99.987
136.000	99.987
137.000	99.993
138.000	99.993
139.000	99.993

WELL 12D RISING HEAD SLUG TEST

SLUG TEST ANALYSIS: HVORSLEV STRAIGHT LINE METHOD
SOFTWARE: AQUITEST

RESULT: AQUIFER HORIZONTAL CONDUCTIVITY
= 2.846E-03 FT/DAY = 1.004E-06 CM/SEC

AQUITEST PARAMETER VALUES
DISTANCE FROM AQUIFER TOP TO WELL BASE = 0.5 FT
DISTANCE FROM AQUIFER TOP (STATIC WATER LEVEL) TO SCREEN TOP = 65.47 FT
EFFECTIVE SCREEN RADIUS = 0.08 FT
EFFECTIVE BOREHOLE RADIUS = 0.18 FT
AQUIFER THICKNESS = 75.47 FT
RATIO VERTICAL TO HORIZONTAL CONDUCTIVITY = 0.1

HERMIT FIELD DATA USED IN CALCULATION
SE1000C
Environmental Logger
06/06 08:42

Unit# 00617 Test 1

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 00000

Reference 100.000
Linearity 0.040
Scale factor 19.880
Offset 0.010
Delay mSEC 50.000

Step 0 06/05 09:08:47

Elapsed Time	INPUT 1
0.0000	102.889
1.0000	102.851
2.0000	102.838
3.0000	102.807
4.0000	102.794
5.0000	102.769

6.0000	102.750
7.0000	102.744
8.0000	102.719
9.0000	102.694
10.0000	102.681
11.0000	102.663
12.0000	102.656
13.0000	102.644
14.0000	102.631
15.0000	102.612
16.0000	102.600
17.0000	102.587
18.0000	102.575
19.0000	102.562
20.0000	102.543
21.0000	102.531
22.0000	102.518
23.0000	102.506
24.0000	102.493
25.0000	102.480
26.0000	102.468
27.0000	102.449
28.0000	102.437
29.0000	102.430
30.0000	102.411
31.0000	102.399
32.0000	102.386
33.0000	102.380
34.0000	102.361
35.0000	102.349
36.0000	102.336
37.0000	102.324
38.0000	102.324
39.0000	102.311
40.0000	102.298
41.0000	102.273
42.0000	102.261
43.0000	102.254
44.0000	102.248
45.0000	102.242
46.0000	102.229
47.0000	102.217
48.0000	102.204
49.0000	102.198
50.0000	102.185

51.0000	102.173
52.0000	102.167
53.0000	102.154
54.0000	102.135
55.0000	102.129
56.0000	102.116
57.0000	102.104
58.0000	102.085
59.0000	102.085
60.0000	102.079
61.0000	102.060
62.0000	102.060
63.0000	102.047
64.0000	102.035
65.0000	102.022
66.0000	102.010
67.0000	102.010
68.0000	102.003
69.0000	101.984
70.0000	101.972
71.0000	101.966
72.0000	101.959
73.0000	101.947
74.0000	101.940
75.0000	101.928
76.0000	101.922
77.0000	101.915
78.0000	101.903
79.0000	101.890
80.0000	101.884
81.0000	101.871
82.0000	101.865
83.0000	101.859
84.0000	101.846
85.0000	101.840
86.0000	101.827
87.0000	101.815
88.0000	101.815
89.0000	101.802
90.0000	101.796
91.0000	101.790
92.0000	101.784
93.0000	101.765
94.0000	101.758
95.0000	101.752

96.0000	101.746
97.0000	101.740
98.0000	101.727
99.0000	101.714
100.000	101.708
101.000	101.696
102.000	101.689
103.000	101.683
104.000	101.677
105.000	101.664
106.000	101.664
107.000	101.658
108.000	101.652
109.000	101.645
110.000	101.633
111.000	101.626
112.000	101.620
113.000	101.614
114.000	101.601
115.000	101.589
116.000	101.583
117.000	101.576
118.000	101.570
119.000	101.570
120.000	101.557
121.000	101.545
122.000	101.539
123.000	101.532
124.000	101.526
125.000	101.520
126.000	101.513
127.000	101.507
128.000	101.501
129.000	101.495
130.000	101.488
131.000	101.476
132.000	101.470
133.000	101.457
134.000	101.463
135.000	101.444
136.000	101.438
137.000	101.432
138.000	101.426
139.000	101.419
140.000	101.413

141.000	101.413
142.000	101.413
143.000	101.400
144.000	101.394
145.000	101.388
146.000	101.382
147.000	101.363
148.000	101.363
149.000	101.350
150.000	101.350
151.000	101.338
152.000	101.331
153.000	101.325
154.000	101.331
155.000	101.325
156.000	101.325
157.000	101.313
158.000	101.306
159.000	101.300
160.000	101.294
161.000	101.281
162.000	101.281
163.000	101.275
164.000	101.269
165.000	101.256
166.000	101.256
167.000	101.250
168.000	101.243
169.000	101.243
170.000	101.237
171.000	101.231
172.000	101.231
173.000	101.218
174.000	101.212
175.000	101.206
176.000	101.199
177.000	101.193
178.000	101.193
179.000	101.187
180.000	101.174
181.000	101.174
182.000	101.168
183.000	101.162
184.000	101.156
185.000	101.149

186.000	101.143
187.000	101.143
188.000	101.137
189.000	101.130
190.000	101.124
191.000	101.118
192.000	101.118
193.000	101.105
194.000	101.099
195.000	101.099
196.000	101.093
197.000	101.080
198.000	101.080
199.000	101.074

WELL 12G FALLING HEAD SLUG TEST

SLUG TEST ANALYSIS: HVORSLEV STRAIGHT LINE METHOD
SOFTWARE: AQUITEST

RESULT: AQUIFER HORIZONTAL CONDUCTIVITY
= 6.504E-02 FT/DAY = 2.294E-05 CM/SEC

AQUITEST PARAMETER VALUES
DISTANCE FROM AQUIFER TOP TO WELL BASE = 0.5 FT
DISTANCE FROM AQUIFER TOP (STATIC WATER LEVEL) TO SCREEN TOP = 2.26 FT
EFFECTIVE SCREEN RADIUS = 0.08 FT
EFFECTIVE BOREHOLE RADIUS = 0.18 FT
AQUIFER THICKNESS = 12.26 FT
RATIO VERTICAL TO HORIZONTAL CONDUCTIVITY = 0.1

HERMIT FIELD DATA USED IN CALCULATION
SE1000C
Environmental Logger
06/18 07:39

Unit# 00617 Test 4

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 00000

Reference 100.000
Linearity 0.040
Scale factor 19.880
Offset 0.010
Delay mSEC 50.000

Step 0 06/16 15:32:27

Elapsed Time	INPUT 1
0.0000	97.094
1.0000	97.263
2.0000	97.351
3.0000	97.420
4.0000	97.483
5.0000	97.540

6.0000	97.590
7.0000	97.646
8.0000	97.684
9.0000	97.722
10.0000	97.766
11.0000	97.822
12.0000	97.853
13.0000	97.891
14.0000	97.904
15.0000	97.954
16.0000	97.985
17.0000	98.004
18.0000	98.035
19.0000	98.060
20.0000	98.086
21.0000	98.111
22.0000	98.129
23.0000	98.142
24.0000	98.167
25.0000	98.186
26.0000	98.199
27.0000	98.224
28.0000	98.236
29.0000	98.255
30.0000	98.268
31.0000	98.286
32.0000	98.299
33.0000	98.305
34.0000	98.324
35.0000	98.337
36.0000	98.349
37.0000	98.343
38.0000	98.374
39.0000	98.381
40.0000	98.393
41.0000	98.393
42.0000	98.406
43.0000	98.418
44.0000	98.424
45.0000	98.431
46.0000	98.437
47.0000	98.450
48.0000	98.450
49.0000	98.462
50.0000	98.468

51.0000	98.475
52.0000	98.481
53.0000	98.481
54.0000	98.494
55.0000	98.500
56.0000	98.506
57.0000	98.512
58.0000	98.519
59.0000	98.519
60.0000	98.525
61.0000	98.531
62.0000	98.531
63.0000	98.537
64.0000	98.537
65.0000	98.550
66.0000	98.550
67.0000	98.556
68.0000	98.556
69.0000	98.563
70.0000	98.569
71.0000	98.569
72.0000	98.569
73.0000	98.581
74.0000	98.581
75.0000	98.581
76.0000	98.581
77.0000	98.588
78.0000	98.588
79.0000	98.594
80.0000	98.594
81.0000	98.594
82.0000	98.600
83.0000	98.606
84.0000	98.606
85.0000	98.606
86.0000	98.606
87.0000	98.613
88.0000	98.606
89.0000	98.619
90.0000	98.619
91.0000	98.619
92.0000	98.625
93.0000	98.625
94.0000	98.625
95.0000	98.625

96.0000	98.625
97.0000	98.625
98.0000	98.632
99.0000	98.632
100.000	98.632
101.000	98.638
102.000	98.613
103.000	98.613
104.000	98.613
105.000	98.613
106.000	98.613
107.000	98.613
108.000	98.619
109.000	98.613
110.000	98.613
111.000	98.619

WELL 13B FALLING HEAD SLUG TEST

SLUG TEST ANALYSIS: HVORSLEV STRAIGHT LINE METHOD
SOFTWARE: AQUITEST

RESULT: AQUIFER HORIZONTAL CONDUCTIVITY
= 34.88 FT/DAY = 1.230E-02 CM/SEC

AQUITEST PARAMETER VALUES
DISTANCE FROM AQUIFER TOP TO WELL BASE = 0.5 FT
DISTANCE FROM AQUIFER TOP (STATIC WATER LEVEL) TO SCREEN TOP = 11.98 FT
EFFECTIVE SCREEN RADIUS = 0.08 FT
EFFECTIVE BOREHOLE RADIUS = 0.18 FT
AQUIFER THICKNESS = 21.98 FT
RATIO VERTICAL TO HORIZONTAL CONDUCTIVITY = 0.1

HERMIT FIELD DATA USED IN CALCULATION

```
     SE1000C
 Environmental Logger
    06/25 13:31

 Unit# 00617  Test 13

Setups:     INPUT  1
------------ ---------
Type        Level (F)
Mode         TOC
I.D.        00000

Reference     100.000
Linearity       0.040
Scale factor   19.880
Offset          0.010
Delay mSEC     50.000

Step 0  06/24 11:22:02

Elapsed Time  INPUT  1
------------ ---------
  0.0000      99.993
  0.1666      97.665
  0.3333      97.903
  0.5000      98.085
  0.6666      98.230
  0.8333      98.349
```

1.0000	98.456
1.1666	98.556
1.3333	98.644
1.5000	98.726
1.6666	98.801
1.8333	98.864
2.0000	98.926
2.1666	98.989
2.3333	99.039
2.5000	99.096
2.6666	99.146
2.8333	99.190
3.0000	99.234
3.1666	99.272
3.3333	99.309
3.5000	99.347
3.6666	99.378
3.8333	99.410
4.0000	99.435
4.1666	99.466
4.3333	99.491
4.5000	99.516
4.6666	99.541
4.8333	99.560
5.0000	99.585
5.1666	99.604
5.3333	99.617
5.5000	99.642
5.6666	99.654
5.8333	99.667
6.0000	99.686
6.1666	99.698
6.3333	99.711
6.5000	99.730
6.6666	99.736
6.8333	99.749
7.0000	99.761
7.1666	99.774
7.3333	99.780
7.5000	99.792
7.6666	99.805
7.8333	99.811
8.0000	99.818
8.1666	99.824
8.3333	99.830

8.5000	99.836
8.6666	99.849
8.8333	99.855
9.0000	99.855
9.1666	99.862
9.3333	99.874
9.5000	99.874
9.6666	99.880
9.8333	99.887
10.0000	99.887
10.1667	99.893
10.3333	99.899
10.5000	99.899
10.6667	99.905
10.8333	99.912
11.0000	99.912
11.1667	99.918
11.3333	99.918
11.5000	99.924
11.6667	99.924
11.8333	99.924
12.0000	99.931
12.1667	99.931
12.3333	99.931
12.5000	99.937
12.6667	99.937
12.8333	99.943
13.0000	99.943
13.1667	99.949
13.3333	99.949
13.5000	99.949
13.6667	99.949
13.8333	99.956
14.0000	99.956
14.1667	99.956
14.3333	99.956
14.5000	99.956
14.6667	99.962
14.8333	99.962
15.0000	99.962
15.1667	99.962
15.3333	99.962
15.5000	99.962
15.6667	99.968
15.8333	99.968

16.0000	99.968
16.1667	99.968
16.3333	99.974
16.5000	99.974
16.6667	99.974
16.8333	99.974
17.0000	99.974
17.1667	99.974
17.3333	99.974
17.5000	99.974
17.6667	99.974
17.8333	99.974
18.0000	99.974
18.1667	99.981
18.3333	99.981
18.5000	99.981
18.6667	99.981
18.8333	99.981
19.0000	99.981
19.1667	99.981
19.3333	99.981
19.5000	99.987
19.6667	99.981
19.8333	99.987
20.0000	99.987
20.1667	99.987
20.3333	99.987
20.5000	99.987
20.6667	99.987
20.8333	99.987
21.0000	99.987
21.1667	99.987
21.3333	99.987
21.5000	99.987
21.6667	99.987
21.8333	99.987
22.0000	99.987
22.1667	99.987
22.3333	99.987
22.5000	99.993
22.6667	99.993
22.8333	99.993
23.0000	99.993
23.1667	99.993
23.3333	99.993

23.5000	99.993
23.6667	99.993
23.8333	99.993
24.0000	99.993
24.1667	99.993
24.3333	99.993
24.5000	99.993
24.6667	99.993
24.8333	99.993
25.0000	99.993
25.1667	99.993
25.3333	99.993
25.5000	99.993
25.6667	99.993
25.8333	99.993
26.0000	99.993
26.1667	99.993
26.3333	99.993
26.5000	99.993
26.6667	99.993
26.8333	99.993
27.0000	99.993
27.1667	99.993
27.3333	99.993
27.5000	99.993
27.6667	99.993
27.8333	99.993
28.0000	99.993
28.1667	99.993
28.3333	99.993
28.5000	99.993
28.6667	99.993
28.8333	99.993
29.0000	100.000
29.1667	99.993
29.3333	99.993
29.5000	100.000
29.6667	99.993
29.8333	99.993

WELL 13D FALLING HEAD SLUG TEST

SLUG TEST ANALYSIS: HVORSLEV STRAIGHT LINE METHOD
SOFTWARE: AQUITEST

RESULT: AQUIFER HORIZONTAL CONDUCTIVITY
= 4.024E-03 FT/DAY = 1.419E-06 CM/SEC

AQUITEST PARAMETER VALUES
DISTANCE FROM AQUIFER TOP TO WELL BASE = 0.5 FT
DISTANCE FROM AQUIFER TOP (STATIC WATER LEVEL) TO SCREEN TOP = 37.5 FT
EFFECTIVE SCREEN RADIUS = 0.08 FT
EFFECTIVE BOREHOLE RADIUS = 0.18 FT
AQUIFER THICKNESS = 47.5 FT
RATIO VERTICAL TO HORIZONTAL CONDUCTIVITY = 0.1

HERMIT FIELD DATA USED IN CALCULATION
SE1000C
Environmental Logger
06/25 13:42

Unit# 00617 Test 14

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 00000

Reference 100.000
Linearity 0.040
Scale factor 19.880
Offset 0.010
Delay mSEC 50.000

Step 0 06/24 14:22:26

Elapsed Time	INPUT 1
0.0000	97.489
1.0000	97.508
2.0000	97.514
3.0000	97.533
4.0000	97.546
5.0000	97.577

6.0000	97.596
7.0000	97.609
8.0000	97.621
9.0000	97.634
10.0000	97.640
11.0000	97.659
12.0000	97.671
13.0000	97.684
14.0000	97.690
15.0000	97.703
16.0000	97.715
17.0000	97.728
18.0000	97.740
19.0000	97.747
20.0000	97.759
21.0000	97.778
22.0000	97.759
23.0000	97.791
24.0000	97.803
25.0000	97.816
26.0000	97.822
27.0000	97.835
28.0000	97.847
29.0000	97.853
30.0000	97.866
31.0000	97.878
32.0000	97.885
33.0000	97.897
34.0000	97.904
35.0000	97.916
36.0000	97.922
37.0000	97.935
38.0000	97.941
39.0000	97.954
40.0000	97.960
41.0000	97.973
42.0000	97.979
43.0000	97.991
44.0000	97.998
45.0000	98.010
46.0000	98.017
47.0000	98.023
48.0000	98.035
49.0000	98.042
50.0000	98.054

51.0000	98.060
52.0000	98.067
53.0000	98.073
54.0000	98.086
55.0000	98.092
56.0000	98.098
57.0000	98.111
58.0000	98.117
59.0000	98.123
60.0000	98.129
61.0000	98.142
62.0000	98.148
63.0000	98.155
64.0000	98.167
65.0000	98.173
66.0000	98.180
67.0000	98.186
68.0000	98.199
69.0000	98.205
70.0000	98.211
71.0000	98.217
72.0000	98.224
73.0000	98.236
74.0000	98.242
75.0000	98.249
76.0000	98.255
77.0000	98.261
78.0000	98.274
79.0000	98.274
80.0000	98.286
81.0000	98.293
82.0000	98.299
83.0000	98.305
84.0000	98.311
85.0000	98.318
86.0000	98.330
87.0000	98.330
88.0000	98.343
89.0000	98.349
90.0000	98.355
91.0000	98.362
92.0000	98.374
93.0000	98.381
94.0000	98.387
95.0000	98.387

96.0000	98.399
97.0000	98.406
98.0000	98.412
99.0000	98.418
100.000	98.418
101.000	98.431
102.000	98.437
103.000	98.437
104.000	98.443
105.000	98.456
106.000	98.462
107.000	98.462
108.000	98.468
109.000	98.481
110.000	98.481
111.000	98.493
112.000	98.493
113.000	98.506
114.000	98.506
115.000	98.512
116.000	98.519
117.000	98.525
118.000	98.531
119.000	98.537
120.000	98.550
121.000	98.550
122.000	98.556
123.000	98.563
124.000	98.569
125.000	98.575
126.000	98.581
127.000	98.588
128.000	98.594
129.000	98.600
130.000	98.606
131.000	98.613
132.000	98.619
133.000	98.619
134.000	98.625
135.000	98.632
136.000	98.638
137.000	98.638
138.000	98.644
139.000	98.650
140.000	98.657

141.000	98.663
142.000	98.669
143.000	98.675
144.000	98.682
145.000	98.688
146.000	98.688
147.000	98.694
148.000	98.701
149.000	98.713
150.000	98.707
151.000	98.713
152.000	98.719
153.000	98.726
154.000	98.732
155.000	98.732
156.000	98.738
157.000	98.744
158.000	98.751
159.000	98.757
160.000	98.757
161.000	98.763
162.000	98.770
163.000	98.776
164.000	98.782
165.000	98.782
166.000	98.788
167.000	98.788
168.000	98.801
169.000	98.807
170.000	98.807
171.000	98.814
172.000	98.820
173.000	98.820
174.000	98.826
175.000	98.832
176.000	98.832
177.000	98.839
178.000	98.845
179.000	98.851
180.000	98.851
181.000	98.857
182.000	98.864
183.000	98.870
184.000	98.876
185.000	98.876

186.000	98.876
187.000	98.883
188.000	98.889
189.000	98.895
190.000	98.895
191.000	98.901
192.000	98.908
193.000	98.908
194.000	98.914
195.000	98.920
196.000	98.920
197.000	98.926
198.000	98.926
199.000	98.939

WELL 13E FALLING HEAD SLUG TEST

SLUG TEST ANALYSIS: AQUITEST COULD NOT PERFORM CALCULATION
SOFTWARE: AQUITEST

RESULT: AQUIFER HORIZONTAL CONDUCTIVITY
= FT/DAY = CM/SEC

AQUITEST PARAMETER VALUES
DISTANCE FROM AQUIFER TOP TO WELL BASE = 0.5 FT
DISTANCE FROM AQUIFER TOP (STATIC WATER LEVEL) TO SCREEN TOP = 3.47 FT
EFFECTIVE SCREEN RADIUS = 0.08 FT
EFFECTIVE BOREHOLE RADIUS = 0.18 FT
AQUIFER THICKNESS = 13.47 FT
RATIO VERTICAL TO HORIZONTAL CONDUCTIVITY = 0.1

HERMIT FIELD DATA USED IN CALCULATION
SE1000C
Environmental Logger
06/25 13:52

Unit# 00617 Test 15

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 00000

Reference 100.000
Linearity 0.040
Scale factor 19.880
Offset 0.010
Delay mSEC 50.000

Step 0 06/24 20:38:27

Elapsed Time	INPUT 1
0.0000	98.600
1.0000	98.726
2.0000	98.757
3.0000	98.776
4.0000	98.788
5.0000	98.807

6.0000	98.814
7.0000	98.820
8.0000	98.826
9.0000	98.826
10.0000	98.826
11.0000	98.832
12.0000	98.832
13.0000	98.839
14.0000	98.839
15.0000	98.839
16.0000	98.839
17.0000	98.845
18.0000	98.845
19.0000	98.845
20.0000	98.851
21.0000	98.851
22.0000	98.851
23.0000	98.851
24.0000	98.851
25.0000	98.851
26.0000	98.858
27.0000	98.858
28.0000	98.858
29.0000	98.858
30.0000	98.864
31.0000	98.864
32.0000	98.864
33.0000	98.864
34.0000	98.864
35.0000	98.864
36.0000	98.870
37.0000	98.870
38.0000	98.870
39.0000	98.870
40.0000	98.876
41.0000	98.876
42.0000	98.876
43.0000	98.876
44.0000	98.876
45.0000	98.876
46.0000	98.883
47.0000	98.883
48.0000	98.883
49.0000	98.883
50.0000	98.883

51.0000	98.883
52.0000	98.883
53.0000	98.889
54.0000	98.889
55.0000	98.889
56.0000	98.889
57.0000	98.889
58.0000	98.889
59.0000	98.889
60.0000	98.889
61.0000	98.895
62.0000	98.895
63.0000	98.895
64.0000	98.895
65.0000	98.895
66.0000	98.895
67.0000	98.901
68.0000	98.901
69.0000	98.901
70.0000	98.901
71.0000	98.901
72.0000	98.901
73.0000	98.901
74.0000	98.901
75.0000	98.901
76.0000	98.908
77.0000	98.908
78.0000	98.908
79.0000	98.908
80.0000	98.908
81.0000	98.908
82.0000	98.908
83.0000	98.908
84.0000	98.908
85.0000	98.914
86.0000	98.914
87.0000	98.914
88.0000	98.914
89.0000	98.914
90.0000	98.914
91.0000	98.914
92.0000	98.920
93.0000	98.920
94.0000	98.920
95.0000	98.920

96.0000	98.920
97.0000	98.920
98.0000	98.920
99.0000	98.920
100.000	98.927
101.000	98.927
102.000	98.927
103.000	98.927
104.000	98.927
105.000	98.927
106.000	98.927
107.000	98.927
108.000	98.927
109.000	98.933
110.000	98.927
111.000	98.933
112.000	98.933
113.000	98.933
114.000	98.933
115.000	98.933
116.000	98.933
117.000	98.933
118.000	98.933
119.000	98.933
120.000	98.933
121.000	98.933
122.000	98.939
123.000	98.939
124.000	98.939
125.000	98.939
126.000	98.939
127.000	98.939
128.000	98.939
129.000	98.939
130.000	98.939
131.000	98.945
132.000	98.945
133.000	98.945
134.000	98.945
135.000	98.945
136.000	98.945
137.000	98.945
138.000	98.945
139.000	98.945
140.000	98.945

141.000	98.945
142.000	98.945
143.000	98.945
144.000	98.952
145.000	98.952
146.000	98.952
147.000	98.952
148.000	98.952
149.000	98.952
150.000	98.952
151.000	98.952
152.000	98.952
153.000	98.952
154.000	98.952
155.000	98.952
156.000	98.952
157.000	98.952
158.000	98.952
159.000	98.952
160.000	98.958
161.000	98.958
162.000	98.958
163.000	98.958
164.000	98.958
165.000	98.958
166.000	98.958
167.000	98.958
168.000	98.958
169.000	98.958
170.000	98.958
171.000	98.958
172.000	98.958
173.000	98.958
174.000	98.958
175.000	98.958
176.000	98.964
177.000	98.964
178.000	98.964
179.000	98.964
180.000	98.964
181.000	98.964
182.000	98.964
183.000	98.964
184.000	98.964
185.000	98.964

186.000	98.964
187.000	98.964
188.000	98.964
189.000	98.964
190.000	98.964
191.000	98.964
192.000	98.964
193.000	98.964
194.000	98.964
195.000	98.964
196.000	98.964
197.000	98.964
198.000	98.964
199.000	98.964

WELL 16A RISING HEAD SLUG TEST

SLUG TEST ANALYSIS: INSTANTANEOUS RECOVERY
NO ANALYSIS PERFORMED
SOFTWARE: AQUITEST

RESULT: AQUIFER HORIZONTAL CONDUCTIVITY
= FT/DAY = CM/SEC

AQUITEST PARAMETER VALUES
DISTANCE FROM AQUIFER TOP TO WELL BASE = 0.5 FT
DISTANCE FROM AQUIFER TOP (STATIC WATER LEVEL) TO SCREEN TOP = 81.98 FT
EFFECTIVE SCREEN RADIUS = 0.08 FT
EFFECTIVE BOREHOLE RADIUS = 0.18 FT
AQUIFER THICKNESS = 91.98 FT
RATIO VERTICAL TO HORIZONTAL CONDUCTIVITY = 0.1

HERMIT FIELD DATA USED IN CALCULATION
SE1000C
Environmental Logger
06/25 13:19

Unit# 00617 Test 12

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 00000

Reference 100.000
Linearity 0.040
Scale factor 19.880
Offset 0.010
Delay mSEC 50.000

Step 0 06/24 09:05:06

Elapsed Time	INPUT 1
0.0000	100.019
0.0833	100.019
0.1666	100.019

WELL 16B FALLING HEAD SLUG TEST

SLUG TEST ANALYSIS: HVORSLEV STRAIGHT LINE METHOD
SOFTWARE: AQUITEST

RESULT: AQUIFER HORIZONTAL CONDUCTIVITY
= 1.831E-03 FT/DAY = 6.459E-07 CM/SEC

AQUITEST PARAMETER VALUES
DISTANCE FROM AQUIFER TOP TO WELL BASE = 0.5 FT
DISTANCE FROM AQUIFER TOP (STATIC WATER LEVEL) TO SCREEN TOP = 11.39 FT
EFFECTIVE SCREEN RADIUS = 0.08 FT
EFFECTIVE BOREHOLE RADIUS = 0.18 FT
AQUIFER THICKNESS = 21.39 FT
RATIO VERTICAL TO HORIZONTAL CONDUCTIVITY = 0.1

HERMIT FIELD DATA USED IN CALCULATION
SE1000C
Environmental Logger
06/18 07:23

Unit# 00617 Test 5

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 00000

Reference 100.000
Linearity 0.040
Scale factor 19.880
Offset 0.010
Delay mSEC 50.000

Step 0 06/17 12:03:19

Elapsed Time	INPUT 1
0.0000	90.247
1.0000	90.273
2.0000	90.593
3.0000	90.863
4.0000	91.077
5.0000	91.240

6.0000	91.366
7.0000	91.466
8.0000	91.529
9.0000	91.586
10.0000	91.629
11.0000	91.673
12.0000	91.705
13.0000	91.724
14.0000	91.749
15.0000	91.774
16.0000	91.793
17.0000	91.818
18.0000	91.831
19.0000	91.849
20.0000	91.856
21.0000	91.874
22.0000	91.881
23.0000	91.893
24.0000	91.906
25.0000	91.912
26.0000	91.918
27.0000	91.931
28.0000	91.931
29.0000	91.944
30.0000	91.950
31.0000	91.950
32.0000	91.950
33.0000	91.956
34.0000	91.962
35.0000	91.969
36.0000	91.962
37.0000	91.962
38.0000	91.962
39.0000	91.962
40.0000	91.962
41.0000	91.956
42.0000	91.956
43.0000	91.956
44.0000	91.950
45.0000	91.956
46.0000	91.956
47.0000	91.950
48.0000	91.950
49.0000	91.950
50.0000	91.950

51.0000	91.950
52.0000	91.950
53.0000	91.950
54.0000	91.950
55.0000	91.950
56.0000	91.950
57.0000	91.956
58.0000	91.950
59.0000	91.950
60.0000	91.956
61.0000	91.956
62.0000	91.950
63.0000	91.956
64.0000	91.950
65.0000	91.950
66.0000	91.950
67.0000	91.956
68.0000	91.950
69.0000	91.950
70.0000	91.950
71.0000	91.950
72.0000	91.950
73.0000	91.956
74.0000	91.956
75.0000	91.956
76.0000	91.956
77.0000	91.956
78.0000	91.950
79.0000	91.950
80.0000	91.956
81.0000	91.956
82.0000	91.956
83.0000	91.956
84.0000	91.956
85.0000	91.956
86.0000	91.956
87.0000	91.950
88.0000	91.950
89.0000	91.956
90.0000	91.956
91.0000	91.956
92.0000	91.962
93.0000	91.956
94.0000	91.962
95.0000	91.962

96.0000	91.962
97.0000	91.962
98.0000	91.962
99.0000	91.956
100.000	91.962
101.000	91.962
102.000	91.962
103.000	91.956
104.000	91.962
105.000	91.956
106.000	91.962
107.000	91.962
108.000	91.962
109.000	91.962
110.000	91.962
111.000	91.956
112.000	91.962
113.000	91.969
114.000	91.969
115.000	91.969
116.000	91.962
117.000	91.969
118.000	91.969
119.000	91.969
120.000	91.969
121.000	91.962
122.000	91.969
123.000	91.962
124.000	91.969
125.000	91.969
126.000	91.969
127.000	91.969
128.000	91.969
129.000	91.969
130.000	91.969
131.000	91.969
132.000	91.969
133.000	91.969
134.000	91.969
135.000	91.969
136.000	91.975
137.000	91.969
138.000	91.975
139.000	91.969
140.000	91.969

141.000	91.975
142.000	91.969
143.000	91.975
144.000	91.969
145.000	91.975
146.000	91.975
147.000	91.975
148.000	91.975
149.000	91.975
150.000	91.975
151.000	91.975
152.000	91.975
153.000	91.975
154.000	91.975
155.000	91.975
156.000	91.975
157.000	91.975
158.000	91.975
159.000	91.975
160.000	91.975
161.000	91.975
162.000	91.975
163.000	91.981
164.000	91.981
165.000	91.975
166.000	91.975
167.000	91.981
168.000	91.981
169.000	91.981
170.000	91.981
171.000	91.981
172.000	91.981
173.000	91.981
174.000	91.975
175.000	91.981
176.000	91.981
177.000	91.981
178.000	91.987
179.000	91.987
180.000	91.981
181.000	91.981
182.000	91.987
183.000	91.981
184.000	91.981

WELL 16C FALLING HEAD SLUG TEST

SLUG TEST ANALYSIS: HVORSLEV STRAIGHT LINE METHOD
SOFTWARE: AQUITEST

RESULT: AQUIFER HORIZONTAL CONDUCTIVITY
= 6.846E-02 FT/DAY = 2.415E-05 CM/SEC

AQUITEST PARAMETER VALUES
DISTANCE FROM AQUIFER TOP TO WELL BASE = 0.5 FT
DISTANCE FROM AQUIFER TOP (STATIC WATER LEVEL) TO SCREEN TOP = 10.86 FT
EFFECTIVE SCREEN RADIUS = 0.08 FT
EFFECTIVE BOREHOLE RADIUS = 0.18 FT
AQUIFER THICKNESS = 20.86 FT
RATIO VERTICAL TO HORIZONTAL CONDUCTIVITY = 0.1

HERMIT FIELD DATA USED IN CALCULATION
SE1000C
Environmental Logger
06/25 12:05

Unit# 00617 Test 8

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 00000

Reference 100.000
Linearity 0.040
Scale factor 19.880
Offset 0.010
Delay mSEC 50.000

Step 0 06/19 10:32:10

Elapsed Time INPUT 1
--- ---
0.0000 98.166
1.0000 98.418
2.0000 98.505
3.0000 98.575
4.0000 98.631
5.0000 98.687

6.0000	98.731
7.0000	98.788
8.0000	98.826
9.0000	98.870
10.0000	98.901
11.0000	98.932
12.0000	98.964
13.0000	98.995
14.0000	99.020
15.0000	99.052
16.0000	99.077
17.0000	99.108
18.0000	99.158
19.0000	99.202
20.0000	99.234
21.0000	99.253
22.0000	99.271
23.0000	99.284
24.0000	99.303
25.0000	99.322
26.0000	99.340
27.0000	99.353
28.0000	99.372
29.0000	99.384
30.0000	99.403
31.0000	99.416
32.0000	99.428
33.0000	99.441
34.0000	99.453
35.0000	99.466
36.0000	99.479
37.0000	99.491
38.0000	99.504
39.0000	99.516
40.0000	99.522
41.0000	99.541
42.0000	99.548
43.0000	99.560
44.0000	99.573
45.0000	99.579
46.0000	99.585
47.0000	99.598
48.0000	99.610
49.0000	99.617
50.0000	99.623

51.0000	99.629
52.0000	99.642
53.0000	99.648
54.0000	99.654
55.0000	99.667
56.0000	99.673
57.0000	99.686
58.0000	99.686
59.0000	99.698
60.0000	99.705
61.0000	99.711
62.0000	99.717
63.0000	99.723
64.0000	99.730
65.0000	99.736
66.0000	99.742
67.0000	99.748
68.0000	99.755
69.0000	99.761
70.0000	99.767
71.0000	99.780
72.0000	99.780
73.0000	99.786
74.0000	99.792
75.0000	99.792
76.0000	99.799
77.0000	99.805
78.0000	99.811
79.0000	99.817
80.0000	99.817
81.0000	99.824
82.0000	99.836
83.0000	99.836
84.0000	99.843
85.0000	99.849
86.0000	99.855
87.0000	99.855
88.0000	99.861
89.0000	99.861
90.0000	99.861
91.0000	99.868
92.0000	99.868
93.0000	99.874
94.0000	99.874
95.0000	99.880

96.0000	99.887
97.0000	99.893
98.0000	99.899
99.0000	99.899
100.000	99.905
101.000	99.905
102.000	99.905
103.000	99.912
104.000	99.912
105.000	99.912
106.000	99.918
107.000	99.924
108.000	99.924
109.000	99.931
110.000	99.931
111.000	99.937
112.000	99.937
113.000	99.937
114.000	99.943
115.000	99.949
116.000	99.943
117.000	99.949
118.000	99.949
119.000	99.956
120.000	99.962
121.000	99.962
122.000	99.968
123.000	99.968
124.000	99.968
125.000	99.974
126.000	99.974
127.000	99.974
128.000	99.981
129.000	99.981
130.000	99.981
131.000	99.987
132.000	99.987
133.000	99.981
134.000	99.987
135.000	99.987
136.000	99.987
137.000	99.993
138.000	99.993
139.000	99.993

WELL 16D FALLING HEAD SLUG TEST

SLUG TEST ANALYSIS: HVORSLEV STRAIGHT LINE METHOD
SOFTWARE: AQUITEST

RESULT: AQUIFER HORIZONTAL CONDUCTIVITY
= 68.57 FT/DAY = 2.418E-02 CM/SEC

AQUITEST PARAMETER VALUES
DISTANCE FROM AQUIFER TOP TO WELL BASE = 0.5 FT
DISTANCE FROM AQUIFER TOP (STATIC WATER LEVEL) TO SCREEN TOP = 10 FT
EFFECTIVE SCREEN RADIUS = 0.08 FT
EFFECTIVE BOREHOLE RADIUS = 0.18 FT
AQUIFER THICKNESS = 20 FT
RATIO VERTICAL TO HORIZONTAL CONDUCTIVITY = 0.1

HERMIT FIELD DATA USED IN CALCULATION
SE1000C
Environmental Logger
06/20 13:23

Unit# 00617 Test 9

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 00000

Reference 100.000
Linearity 0.040
Scale factor 19.880
Offset 0.010
Delay mSEC 50.000

Step 0 06/19 16:07:32

Elapsed Time	INPUT 1
0.0000	98.072
1.0000	98.355
2.0000	98.644
3.0000	98.895
4.0000	99.071
5.0000	99.253

6.0000	99.391
7.0000	99.510
8.0000	99.610
9.0000	99.698
10.0000	99.774
11.0000	99.836
12.0000	99.887
13.0000	99.931
14.0000	99.968

WELL 16E FALLING HEAD SLUG TEST

SLUG TEST ANALYSIS: HVORSLEV STRAIGHT LINE METHOD
SOFTWARE: AQUITEST

RESULT: AQUIFER HORIZONTAL CONDUCTIVITY
= 3.778E-03 FT/DAY = 1.332E-06 CM/SEC

AQUITEST PARAMETER VALUES
DISTANCE FROM AQUIFER TOP TO WELL BASE = 0.5 FT
DISTANCE FROM AQUIFER TOP (STATIC WATER LEVEL) TO SCREEN TOP = 32.1 FT
EFFECTIVE SCREEN RADIUS = 0.08 FT
EFFECTIVE BOREHOLE RADIUS = 0.18 FT
AQUIFER THICKNESS = 42.1 FT
RATIO VERTICAL TO HORIZONTAL CONDUCTIVITY = 0.1

HERMIT FIELD DATA USED IN CALCULATION
SE1000C
Environmental Logger
06/25 12:32

Unit# 00617 Test 10

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 00000

Reference 100.000
Linearity 0.040
Scale factor 19.880
Offset 0.010
Delay mSEC 50.000

Step 0 06/23 12:10:01

Elapsed Time	INPUT 1
0.0000	97.483
1.0000	97.602
2.0000	97.627
3.0000	97.634
4.0000	97.665
5.0000	97.684

6.0000	97.696
7.0000	97.696
8.0000	97.709
9.0000	97.721
10.0000	97.734
11.0000	97.753
12.0000	97.772
13.0000	97.778
14.0000	97.790
15.0000	97.803
16.0000	97.809
17.0000	97.816
18.0000	97.828
19.0000	97.834
20.0000	97.847
21.0000	97.853
22.0000	97.866
23.0000	97.878
24.0000	97.891
25.0000	97.897
26.0000	97.910
27.0000	97.916
28.0000	97.922
29.0000	97.929
30.0000	97.941
31.0000	97.947
32.0000	97.960
33.0000	97.960
34.0000	97.966
35.0000	97.979
36.0000	97.985
37.0000	97.991
38.0000	97.991
39.0000	98.004
40.0000	98.016
41.0000	98.029
42.0000	98.035
43.0000	98.042
44.0000	98.035
45.0000	98.042
46.0000	98.054
47.0000	98.067
48.0000	98.073
49.0000	98.079
50.0000	98.073

51.0000	98.092
52.0000	98.092
53.0000	98.111
54.0000	98.111
55.0000	98.123
56.0000	98.117
57.0000	98.129
58.0000	98.142
59.0000	98.148
60.0000	98.148
61.0000	98.161
62.0000	98.155
63.0000	98.167
64.0000	98.173
65.0000	98.180
66.0000	98.186
67.0000	98.192
68.0000	98.198
69.0000	98.205
70.0000	98.211
71.0000	98.211
72.0000	98.224
73.0000	98.224
74.0000	98.224
75.0000	98.236
76.0000	98.242
77.0000	98.242
78.0000	98.255
79.0000	98.261
80.0000	98.255
81.0000	98.261
82.0000	98.267
83.0000	98.267
84.0000	98.274
85.0000	98.280
86.0000	98.299
87.0000	98.305
88.0000	98.311
89.0000	98.311
90.0000	98.311
91.0000	98.318
92.0000	98.324
93.0000	98.330
94.0000	98.336
95.0000	98.336

96.0000	98.349
97.0000	98.349
98.0000	98.355
99.0000	98.362
100.000	98.362
101.000	98.368
102.000	98.368
103.000	98.374
104.000	98.380
105.000	98.380
106.000	98.387
107.000	98.393
108.000	98.399
109.000	98.399
110.000	98.412
111.000	98.418
112.000	98.418
113.000	98.412
114.000	98.424
115.000	98.431
116.000	98.437
117.000	98.443
118.000	98.443
119.000	98.443
120.000	98.449
121.000	98.456
122.000	98.462
123.000	98.449
124.000	98.456
125.000	98.462
126.000	98.468
127.000	98.475
128.000	98.487
129.000	98.481
130.000	98.487
131.000	98.493
132.000	98.506
133.000	98.500
134.000	98.506
135.000	98.506
136.000	98.512
137.000	98.518
138.000	98.518
139.000	98.531
140.000	98.531

141.000	98.537
142.000	98.537
143.000	98.537
144.000	98.537
145.000	98.550
146.000	98.550
147.000	98.556
148.000	98.556
149.000	98.556
150.000	98.562
151.000	98.575
152.000	98.575
153.000	98.575
154.000	98.569
155.000	98.562
156.000	98.581
157.000	98.581
158.000	98.594
159.000	98.594
160.000	98.594
161.000	98.594
162.000	98.600
163.000	98.619
164.000	98.613
165.000	98.625
166.000	98.631
167.000	98.631
168.000	98.631
169.000	98.638
170.000	98.638
171.000	98.638
172.000	98.644
173.000	98.644
174.000	98.644
175.000	98.650
176.000	98.657
177.000	98.657
178.000	98.663
179.000	98.657
180.000	98.669
181.000	98.675
182.000	98.675
183.000	98.669
184.000	98.682
185.000	98.682

186.000	98.682
187.000	98.688
188.000	98.694
189.000	98.694
190.000	98.694
191.000	98.694
192.000	98.700
193.000	98.700
194.000	98.707
195.000	98.713
196.000	98.707
197.000	98.719
198.000	98.726
199.000	98.726

APPENDIX G
FIELD WELL INTEGRITY TESTS
DATA PRINTOUTS

WELL FL-1 HYDRAULIC INTEGRITY TEST

RESULT: COMPETENT WELL WITH GOOD WATER LEVEL RESPONSE

HERMIT FIELD DATA

SE1000C
Environmental Logger
06/26 13:52

Unit# 00617 Test 17

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 00000

Reference 100.000
Linearity 0.040
Scale factor 19.880
Offset 0.010
Delay mSEC 50.000

Step 0 06/25 17:06:15

Elapsed Time	INPUT 1
0.0000	99.359
1.0000	99.403
2.0000	99.429
3.0000	99.447
4.0000	99.485
5.0000	99.504
6.0000	99.523
7.0000	99.535
8.0000	99.554
9.0000	99.567
10.0000	99.579
11.0000	99.592
12.0000	99.604
13.0000	99.617
14.0000	99.629
15.0000	99.636
16.0000	99.648
17.0000	99.661

18.0000	99.673
19.0000	99.680
20.0000	99.686
21.0000	99.698
22.0000	99.705
23.0000	99.717
24.0000	99.723
25.0000	99.730
26.0000	99.736
27.0000	99.749
28.0000	99.749
29.0000	99.761
30.0000	99.755
31.0000	99.755
32.0000	99.761
33.0000	99.767
34.0000	99.774
35.0000	99.780

WELL FL-3 HYDRAULIC INTEGRITY TEST

RESULT: COMPETENT WELL WITH GOOD WATER LEVEL REPONSE

HERMIT FIELD DATA

SE1000C
Environmental Logger
06/26 13:49

Unit# 00617 Test 16

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 00000

Reference 100.000
Linearity 0.040
Scale factor 19.880
Offset 0.010
Delay mSEC 50.000

Step 0 06/25 16:09:33

Elapsed Time	INPUT 1
0.0000	99.454
1.0000	99.554
2.0000	99.629
3.0000	99.680
4.0000	99.723
5.0000	99.774
6.0000	99.805
7.0000	99.830
8.0000	99.849
9.0000	99.868
10.0000	99.887
11.0000	99.899
12.0000	99.912
13.0000	99.924
14.0000	99.931
15.0000	99.931
16.0000	99.931

WELL FL-6 HYDRAULIC INTEGRITY TEST

RESULT: COMPETENT WELL WITH SLOW, STEADY WATER LEVEL RESPONSE

HERMIT FIELD DATA

SE1000C
Environmental Logger
06/26 13:55

Unit# 00617 Test 18

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 00000

Reference 100.000
Linearity 0.040
Scale factor 19.880
Offset 0.010
Delay mSEC 50.000

Step 0 06/26 09:23:20

Elapsed Time	INPUT 1
0.0000	99.391
1.0000	99.403
2.0000	99.416
3.0000	99.422
4.0000	99.428
5.0000	99.453
6.0000	99.460
7.0000	99.466
8.0000	99.472
9.0000	99.479
10.0000	99.485
11.0000	99.491
12.0000	99.497
13.0000	99.504
14.0000	99.510
15.0000	99.516
16.0000	99.523

17.0000	99.529
18.0000	99.535
19.0000	99.541
20.0000	99.548
21.0000	99.548
22.0000	99.554
23.0000	99.560
24.0000	99.567
25.0000	99.573
26.0000	99.579
27.0000	99.585
28.0000	99.592
29.0000	99.598
30.0000	99.604
31.0000	99.604
32.0000	99.610
33.0000	99.610
34.0000	99.623
35.0000	99.623
36.0000	99.629
37.0000	99.635
38.0000	99.635
39.0000	99.642
40.0000	99.648
41.0000	99.654
42.0000	99.661
43.0000	99.661
44.0000	99.673
45.0000	99.673
46.0000	99.679
47.0000	99.679
48.0000	99.686
49.0000	99.692
50.0000	99.692
51.0000	99.705

WELL FL-9 HYDRAULIC INTEGRITY TEST

RESULT: COMPETENT WELL WITH GOOD WATER LEVEL RESPONSE

HERMIT FIELD DATA

SE1000C
Environmental Logger
06/26 14:01

Unit# 00617 Test 19

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 00000

Reference 100.000
Linearity 0.040
Scale factor 19.880
Offset 0.010
Delay mSEC 50.000

Step 0 06/26 10:38:18

Elapsed Time	INPUT 1
0.0000	99.397
1.0000	99.428
2.0000	99.454
3.0000	99.485
4.0000	99.535
5.0000	99.554
6.0000	99.579
7.0000	99.604
8.0000	99.623
9.0000	99.642
10.0000	99.661
11.0000	99.680
12.0000	99.692
13.0000	99.711
14.0000	99.723
15.0000	99.736
16.0000	99.748
17.0000	99.761

18.0000	99.774
19.0000	99.786
20.0000	99.799
21.0000	99.811
22.0000	99.818
23.0000	99.830
24.0000	99.836
25.0000	99.843
26.0000	99.855
27.0000	99.861
28.0000	99.868
29.0000	99.874
30.0000	99.887
31.0000	99.887
32.0000	99.893
33.0000	99.899
34.0000	99.905
35.0000	99.912
36.0000	99.918
37.0000	99.924
38.0000	99.931
39.0000	99.931
40.0000	99.937
41.0000	99.943
42.0000	99.924

WELL G-17 HYDRAULIC INTEGRITY TEST

RESULT: COMPETENT WELL WITH GOOD WATER LEVEL RESPONSE

HERMIT FIELD DATA

SE1000C
Environmental Logger
07/01 10:36

Unit# 00617 Test 11

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	00000

Reference	100.000
Linearity	0.040
Scale factor	19.880
Offset	0.010
Delay mSEC	50.000

Step 0 06/30 19:21:15

Elapsed Time	INPUT 1
0.0000	99.372
1.0000	99.428
2.0000	99.479
3.0000	99.529
4.0000	99.585
5.0000	99.604
6.0000	99.654
7.0000	99.692
8.0000	99.717
9.0000	99.742
10.0000	99.761
11.0000	99.786
12.0000	99.805
13.0000	99.818
14.0000	99.836
15.0000	99.849
16.0000	99.862
17.0000	99.868

18.0000	99.874
19.0000	99.868
20.0000	99.893

WELL G-18 HYDRAULIC INTEGRITY TEST

RESULT: COMPETENT WELL WITH GOOD WATER LEVEL RESPONSE

HERMIT FIELD DATA

SE1000C
Environmental Logger
07/01 10:35

Unit# 00617 Test 10

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 00000

Reference 100.000
Linearity 0.040
Scale factor 19.880
Offset 0.010
Delay mSEC 50.000

Step 0 06/30 18:39:26

Elapsed Time	INPUT 1
0.0000	99.497
1.0000	99.523
2.0000	99.541
3.0000	99.585
4.0000	99.604
5.0000	99.623
6.0000	99.636
7.0000	99.654
8.0000	99.667
9.0000	99.679
10.0000	99.698
11.0000	99.711
12.0000	99.723
13.0000	99.730
14.0000	99.742
15.0000	99.755
16.0000	99.767
17.0000	99.774

18.0000	99.767
19.0000	99.774
20.0000	99.780
21.0000	99.792
22.0000	99.799
23.0000	99.811
24.0000	99.836
25.0000	99.843
26.0000	99.830

WELL G-54 HYDRAULIC INTEGRITY TEST

RESULT: COMPETENT WELL WITH GOOD WATER LEVEL RESPONSE

HERMIT FIELD DATA

SE1000C
Environmental Logger
07/01 10:31

Unit# 00617 Test 7

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 00000

Reference 100.000
Linearity 0.040
Scale factor 19.880
Offset 0.010
Delay mSEC 50.000

Step 0 06/27 12:03:08

Elapsed Time	INPUT 1
0.0000	99.472
1.0000	99.504
2.0000	99.554
3.0000	99.579
4.0000	99.598
5.0000	99.598
6.0000	99.617
7.0000	99.642
8.0000	99.679
9.0000	99.698
10.0000	99.717
11.0000	99.730
12.0000	99.742
13.0000	99.761
14.0000	99.774
15.0000	99.761
16.0000	99.799
17.0000	99.811

18.0000	99.824
19.0000	99.830
20.0000	99.843
21.0000	99.849
22.0000	99.861
23.0000	99.868
24.0000	99.874
25.0000	99.887
26.0000	99.893
27.0000	99.899
28.0000	99.905
29.0000	99.912
30.0000	99.918
31.0000	99.924
32.0000	99.930
33.0000	99.937
34.0000	99.943
35.0000	99.949
36.0000	99.949
37.0000	99.956
38.0000	99.962
39.0000	99.962
40.0000	99.968
41.0000	99.968
42.0000	99.949

WELL G-55 HYDRAULIC INTEGRITY TEST

RESULT: COMPETENT WELL WITH SLOW, STEADY WATER LEVEL RESPONSE

HERMIT FIELD DATA

SE1000C
Environmental Logger
07/01 10:30

Unit# 00617 Test 6

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 00000

Reference 100.000
Linearity 0.040
Scale factor 19.880
Offset 0.010
Delay mSEC 50.000

Step 0 06/27 11:23:22

Elapsed Time	INPUT 1
0.0000	99.717
1.0000	99.724
2.0000	99.755
3.0000	99.761
4.0000	99.736
5.0000	99.742
6.0000	99.767
7.0000	99.774
8.0000	99.774
9.0000	99.780
10.0000	99.780
11.0000	99.786
12.0000	99.786
13.0000	99.793
14.0000	99.799
15.0000	99.799
16.0000	99.799

17.0000	99.805
18.0000	99.805
19.0000	99.799
20.0000	99.805
21.0000	99.811
22.0000	99.811
23.0000	99.818
24.0000	99.818
25.0000	99.818
26.0000	99.793
27.0000	99.786
28.0000	99.793
29.0000	99.793
30.0000	99.793

WELL JAW-38 HYDRAULIC INTEGRITY TEST

RESULT: COMPETENT WELL WITH VERY SLOW WATER LEVEL RESPONSE

HERMIT FIELD DATA

SE1000C
Environmental Logger
07/01 09:41

Unit# 00617 Test 1

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 00000

Reference 100.000
Linearity 0.040
Scale factor 19.880
Offset 0.010
Delay mSEC 50.000

Step 0 06/26 14:45:09

Elapsed Time	INPUT 1
0.0000	97.847
1.0000	97.885
2.0000	97.910
3.0000	97.935
4.0000	97.954
5.0000	97.985
6.0000	98.004
7.0000	98.016
8.0000	98.029
9.0000	98.042
10.0000	98.054
11.0000	98.067
12.0000	98.079
13.0000	98.092
14.0000	98.104
15.0000	98.117
16.0000	98.123
17.0000	98.136

18.0000	98.148
19.0000	98.161
20.0000	98.167
21.0000	98.180
22.0000	98.192
23.0000	98.186
24.0000	98.192
25.0000	98.217
26.0000	98.230
27.0000	98.236
28.0000	98.242
29.0000	98.255
30.0000	98.261
31.0000	98.274
32.0000	98.280
33.0000	98.286
34.0000	98.299
35.0000	98.305
36.0000	98.311
37.0000	98.324
38.0000	98.330
39.0000	98.337
40.0000	98.343
41.0000	98.349
42.0000	98.362
43.0000	98.368
44.0000	98.374
45.0000	98.380
46.0000	98.387
47.0000	98.399
48.0000	98.406
49.0000	98.412
50.0000	98.418
51.0000	98.424
52.0000	98.431
53.0000	98.437
54.0000	98.443
55.0000	98.431

WELL JAW-41 HYDRAULIC INTEGRITY TEST

RESULT: COMPETENT WELL WITH VERY SLOW WATER LEVEL RESPONSE

HERMIT FIELD DATA

SE1000C
Environmental Logger
07/01 09:47

Unit# 00617 Test 2

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 00000

Reference 100.000
Linearity 0.040
Scale factor 19.880
Offset 0.010
Delay mSEC 50.000

Step 0 06/26 16:08:08

Elapsed Time	INPUT 1
0.0000	97.928
1.0000	98.023
2.0000	98.060
3.0000	98.092
4.0000	98.117
5.0000	98.167
6.0000	98.198
7.0000	98.217
8.0000	98.242
9.0000	98.267
10.0000	98.292
11.0000	98.311
12.0000	98.330
13.0000	98.355
14.0000	98.368
15.0000	98.393
16.0000	98.412
17.0000	98.437

18.0000	98.456
19.0000	98.474
20.0000	98.487
21.0000	98.512
22.0000	98.531
23.0000	98.550
24.0000	98.569
25.0000	98.587
26.0000	98.606
27.0000	98.613
28.0000	98.625
29.0000	98.644
30.0000	98.663
31.0000	98.675
32.0000	98.700
33.0000	98.713
34.0000	98.732
35.0000	98.744
36.0000	98.757
37.0000	98.776
38.0000	98.788
39.0000	98.801
40.0000	98.813
41.0000	98.826
42.0000	98.845
43.0000	98.857
44.0000	98.870
45.0000	98.882
46.0000	98.895
47.0000	98.889

WELL JAZ-629 HYDRAULIC INTEGRITY TEST

RESULT: COMPETENT WELL WITH GOOD WATER LEVEL RESPONSE

HERMIT FIELD DATA

SE1000C
Environmental Logger
07/01 10:29

Unit# 00617 Test 5

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 00000

Reference 100.000
Linearity 0.040
Scale factor 19.880
Offset 0.010
Delay mSEC 50.000

Step 0 06/27 10:09:37

Elapsed Time	INPUT 1
0.0000	99.924
1.0000	99.912
2.0000	99.931
3.0000	99.912
4.0000	99.912
5.0000	99.943
6.0000	99.949
7.0000	99.956
8.0000	99.962
9.0000	99.962
10.0000	99.974
11.0000	99.974
12.0000	99.981
13.0000	99.987
14.0000	99.993

WELL GZ-1 HYDRAULIC INTEGRITY TEST

RESULT: COMPETENT WELL WITH VERY SLOW WATER LEVEL RESPONSE

HERMIT FIELD DATA

SE1000C
Environmental Logger
07/01 10:27

Unit# 00617 Test 4

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	00000

Reference	100.000
Linearity	0.040
Scale factor	19.880
Offset	0.010
Delay mSEC	50.000

Step 0 06/27 07:58:55

Elapsed Time	INPUT 1
0.0000	99.359
1.0000	99.359
2.0000	99.366
3.0000	99.366
4.0000	99.359
5.0000	99.359
6.0000	99.372
7.0000	99.366
8.0000	99.372
9.0000	99.372
10.0000	99.372
11.0000	99.372
12.0000	99.372
13.0000	99.372
14.0000	99.372
15.0000	99.372
16.0000	99.372
17.0000	99.372

18.0000	99.372
19.0000	99.372
20.0000	99.378
21.0000	99.378
22.0000	99.378
23.0000	99.378
24.0000	99.378
25.0000	99.378
26.0000	99.378
27.0000	99.378
28.0000	99.378
29.0000	99.378
30.0000	99.378
31.0000	99.378
32.0000	99.378
33.0000	99.378
34.0000	99.384
35.0000	99.384
36.0000	99.384
37.0000	99.384
38.0000	99.384
39.0000	99.384
40.0000	99.384
41.0000	99.384
42.0000	99.384
43.0000	99.384
44.0000	99.384
45.0000	99.384
46.0000	99.384
47.0000	99.384
48.0000	99.384
49.0000	99.391
50.0000	99.391
51.0000	99.391
52.0000	99.391
53.0000	99.391
54.0000	99.391
55.0000	99.391
56.0000	99.391
57.0000	99.391
58.0000	99.391
59.0000	99.391
60.0000	99.391
61.0000	99.391
62.0000	99.391

63.0000	99.391
64.0000	99.391
65.0000	99.397
66.0000	99.397
67.0000	99.397
68.0000	99.397
69.0000	99.397
70.0000	99.397
71.0000	99.397
72.0000	99.397
73.0000	99.397
74.0000	99.397
75.0000	99.397
76.0000	99.397
77.0000	99.397

WELL GZ-2A HYDRAULIC INTEGRITY TEST

RESULT: COMPETENT WELL WITH EXTREMELY SLOW WATER LEVEL RESPONSE

HERMIT FIELD DATA

SE1000C
Environmental Logger
07/01 09:48

Unit# 00617 Test 3

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 00000

Reference 100.000
Linearity 0.040
Scale factor 19.880
Offset 0.010
Delay mSEC 50.000

Step 0 06/26 18:32:28

Elapsed Time	INPUT 1
0.0000	99.705
1.0000	99.717
2.0000	99.755
3.0000	99.736
4.0000	99.736
5.0000	99.742
6.0000	99.742
7.0000	99.768
8.0000	99.774
9.0000	99.780
10.0000	99.780
11.0000	99.786
12.0000	99.786
13.0000	99.786
14.0000	99.786
15.0000	99.793
16.0000	99.793

17.0000	99.793
18.0000	99.799
19.0000	99.799
20.0000	99.799
21.0000	99.799
22.0000	99.805
23.0000	99.799
24.0000	99.805
25.0000	99.811
26.0000	99.811
27.0000	99.811
28.0000	99.811
29.0000	99.811
30.0000	99.818
31.0000	99.818
32.0000	99.818
33.0000	99.818
34.0000	99.818
35.0000	99.824
36.0000	99.824
37.0000	99.824
38.0000	99.824
39.0000	99.830
40.0000	99.830
41.0000	99.830
42.0000	99.830
43.0000	99.830
44.0000	99.836
45.0000	99.836
46.0000	99.836
47.0000	99.836
48.0000	99.843
49.0000	99.843
50.0000	99.843
51.0000	99.843
52.0000	99.843
53.0000	99.849
54.0000	99.849
55.0000	99.849
56.0000	99.849
57.0000	99.849
58.0000	99.849
59.0000	99.855
60.0000	99.855
61.0000	99.855

62.0000	99.855
63.0000	99.855
64.0000	99.855
65.0000	99.855
66.0000	99.862
67.0000	99.862
68.0000	99.862
69.0000	99.862
70.0000	99.862
71.0000	99.862
72.0000	99.868
73.0000	99.868
74.0000	99.868
75.0000	99.868
76.0000	99.868
77.0000	99.868
78.0000	99.868
79.0000	99.868
80.0000	99.874
81.0000	99.874
82.0000	99.874
83.0000	99.874
84.0000	99.874
85.0000	99.874
86.0000	99.874
87.0000	99.880
88.0000	99.880
89.0000	99.880
90.0000	99.880
91.0000	99.880
92.0000	99.880
93.0000	99.880
94.0000	99.887
95.0000	99.887
96.0000	99.887
97.0000	99.887
98.0000	99.887
99.0000	99.887
100.000	99.887
101.000	99.887
102.000	99.893
103.000	99.893
104.000	99.893
105.000	99.893
106.000	99.893

107.000	99.893
108.000	99.893
109.000	99.893
110.000	99.899
111.000	99.899
112.000	99.899
113.000	99.899
114.000	99.899
115.000	99.899
116.000	99.899
117.000	99.899
118.000	99.899
119.000	99.899
120.000	99.905
121.000	99.905
122.000	99.905
123.000	99.905
124.000	99.905
125.000	99.905
126.000	99.905
127.000	99.905
128.000	99.912
129.000	99.912
130.000	99.912
131.000	99.912
132.000	99.912
133.000	99.912
134.000	99.912
135.000	99.912
136.000	99.912
137.000	99.912
138.000	99.912
139.000	99.918
140.000	99.918
141.000	99.918
142.000	99.918
143.000	99.918
144.000	99.918
145.000	99.918
146.000	99.918
147.000	99.918
148.000	99.918
149.000	99.918
150.000	99.924
151.000	99.924

152.000	99.924
153.000	99.924
154.000	99.924
155.000	99.924
156.000	99.924
157.000	99.924
158.000	99.924
159.000	99.924
160.000	99.924
161.000	99.931
162.000	99.931
163.000	99.931
164.000	99.931
165.000	99.931
166.000	99.931
167.000	99.931
168.000	99.931
169.000	99.931
170.000	99.931
171.000	99.931
172.000	99.937
173.000	99.937
174.000	99.937
175.000	99.937
176.000	99.937
177.000	99.937
178.000	99.937
179.000	99.937
180.000	99.937
181.000	99.937
182.000	99.937
183.000	99.943
184.000	99.943
185.000	99.943
186.000	99.943
187.000	99.943
188.000	99.943
189.000	99.943
190.000	99.943
191.000	99.943
192.000	99.943
193.000	99.943
194.000	99.943
195.000	99.949
196.000	99.949

197.000	99.949
198.000	99.949
199.000	99.949

WELL GZ3-1 HYDRAULIC INTEGRITY TEST

RESULT: COMPETENT WELL WITH VERY GOOD WATER LEVEL RESPONSE

HERMIT FIELD DATA

SE1000C
Environmental Logger
07/01 10:33

Unit# 00617 Test 8

Setups: INPUT 1
--- ---
Type Level (F)
Mode TOC
I.D. 00000

Reference 100.000
Linearity 0.040
Scale factor 19.880
Offset 0.010
Delay mSEC 50.000

Step 0 06/30 14:35:08

Elapsed Time	INPUT 1
0.0000	99.648
1.0000	99.711
2.0000	99.755
3.0000	99.811
4.0000	99.849
5.0000	99.849
6.0000	99.868
7.0000	99.905
8.0000	99.924
9.0000	99.918
10.0000	99.924
11.0000	99.937
12.0000	99.943
13.0000	99.974
14.0000	99.956
15.0000	99.962

PCDR \ PCDR3 \IOWA AAP \
091307 \ IWA070213

SUPPLEMENTAL GROUNDWATER REMEDIAL INVESTIGATION REPORT (1997)

IOWA ARMY AMMUNITION PLANT (IAAAP)
Middletown, Iowa

Volume II
APPENDICES H-N

REVISED DRAFT-FINAL

Prepared for:

U.S. ARMY CORPS OF ENGINEERS
Omaha District

Prepared by:

MWH
MONTGOMERY WATSON HARZA

August 2001

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Draft-Final

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SURVEY REPORT AND FIELD NOTES

(Provided by ASC American Surveying Consultants, P.C.)

4

GPS Positioning of Monitor Wells, Piezometers and Borings for Iowa Army Ammunition Plant in Des Moines County, Iowa, July, 1997

By

ASC AMERICAN SURVEYING CONSULTANTS, P.C.

1637 Plock Road
Dixon, Illinois 61021

September 1997

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REFERENCES

ATTACHMENTS

Location Drawing 97219A.DWG
Copy of Field Book 1 ..... Pages 1 ~ 77
Copy of Field Book 2 ..... Pages 1 ~ 40
Copy of Field Book 3 ..... Pages 1 ~ 52
Electronic copy of:
(Harza3.wk4/Harza4.wk4/97219A.DWG) ..... Harza.Zip

CHAPTER 1

SUMMARY

Purpose

This report describes the effort of ASC American Surveying Consultants, P.C. to determine the horizontal and vertical positions of Monitor Wells, Piezometers, and Borings using Global Positioning System (GPS) technique for Iowa Army Ammunition Plant in Des Moines County, Iowa.

Accuracy Standards

The GPS survey was performed to FGCS accuracy standard Order C 2-I as outlined in "Geometric Geodetic Accuracy Standards and Specifications for Using GPS Relative Positioning Techniques" Version 5.0 dated May 11, 1988, reprinted with corrections August 1, 1989. This accuracy standard allows for a base error (e) of 2.0 cm and a line-length dependent error of 20 ppm (i.e., 1:50,000) at 95% confidence level.

The accutally achieved survey accuracy is about 1 cm horizontally, and 1 to 2 cm vertically.

Point of Contact

For questions regarding the survey campaign, please contact:

Coventine Fidis, PLS, President/CEO
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CHAPTER 2

GPS SURVEY DESIGN AND FILED SURVEY

Surveying Design

In order to survey the Monitor Wells, Piezometers, and Borings which are spread all over the project area, a network of control points has been designed first to provide survey control for Monitor Wells, Piezometers, and Borings. Field reconnaissance was performed in the project area to select ideal locations of control points. Furthermore, a thorough search was also performed for all the existing NGS horizontal and vertical control stations in the project area. One horizontal and two vertical NGS control stations were recovered in good condition and were tied into the GPS network.

Monumentation

Iron pins were used to set all the survey control stations.

Instrumentation, Mission Planning and Field Survey

TRIMBLE 4000SSI dual frequency geodetic receivers with L1/L2 geodetic antennas were used. Due to the full coverage of the existing GPS system, little effort was needed for GPS mission planning, especially for a project of local extent such as the present one. The Trimble software, GPSurvey v2.20 was used, however, to plan the survey to avoid making measurements during high PDOP periods.

The Fast-Static GPS baseline measuring technique was used to survey the project control network first. Then the Real Time Kinematic (RTK) survey technique was used to survey Monitor Wells, Piezometers, and Borings adopting the control points as base stations.

CHAPTER 3

DATA REDUCTION AND NETWORK ADJUSTMENT

Baseline Processing and Error analysis

GPS data processing in the office started with reducing the collected raw observation data to three dimensional baseline vectors in the Geodetic Cartesian coordinate system. The processing of GPS baselines for the Fast-Static survey was done using the Trimble software GPSurvey v2.20. Broadcast ephemerides were used. For each observation session, only the non-trivial baselines were processed. Then the Real Time Kinematic Survey is combined with the Fast-Static survey to form a complete network.

Pre-adjustment network analysis procedures were, then, followed to screen for any potential errors of large magnitude, that is, gross errors or blunders, which might exist in the obtained baseline vectors in order to produce reliable and consistent network results. These include the loop closure analysis and analysis of the repeat baseline differences, which indicated no gross errors.

Least Squares Network Adjustment

After all GPS raw data were reduced and pre-adjustment network analysis performed, the surveyed network may be considered as being cleared of any gross observation errors or blunders. That is, the obtained baseline vectors can be considered as being basically reliable and consistent. Observational errors of small or marginal magnitude may, however, still exist. Least Squares network adjustment can then be used to detect those errors and minimize their effects on the network positioning. This was done using the Trimble software TRIMNETP which is imbedded in software GPSurvey Version 2.20. In order to evaluate the internal and external consistency of the GPS network, two different adjustment procedures were followed, i.e., the minimum constrained and the fully constrained adjustment.

At first, the purpose to run a minimum constrained adjustment is to check the internal consistency of the network and to identify any observation blunders of small or marginal magnitude which may possibly exist in the survey data. This adjustment was done in the three-dimensional space, holding one NGS control point fixed and errorless. No outlying residuals were found and thus the fully constrained network adjustment was followed.

The fully constrained network adjustment evaluates the external consistency of the newly established network with the existing known control, and the adjustment results will be used as the final products.

After a few trial adjustments, the final fully constrained network adjustment was done by fixing the NGS horizontal control point and two elevations derived from benchmarks provided by the client. The NGS Geoid 93 model was also used to improve the elevations of network stations. Table 3.1 lists the final adjusted Iowa State Plane coordinates in US survey feet.

Table 3.1: Final Adjusted Coordinates for Proj# 97-219, Harza, Iowa

Datum = NAD83
Zone = Iowa South
Units = U.S. Survey Foot

Point	Northing	Easting	Elevation	Code
1	301315.985	2265576.512	716.856	
100	301324.870	2265574.678	716.636	
1000	301349.483	2265868.775	713.155	GRND
1001	301349.010	2265868.647	716.249	WELL
1002	301296.878	2265602.975	716.639	VOID
1003	301251.117	2265475.709	714.716	UHA DISC T19
1004	301242.583	2265472.940	714.848	UHA DISC T21
1005	301250.707	2265468.599	714.680	UHA DISC T20
1006	301251.825	2265467.897	714.664	CONC
1007	301252.291	2265475.115	714.710	CONC
1008	301243.938	2265472.365	714.802	CONC
1009	301251.904	2265475.302	717.167	WELL T-19
1010	301252.163	2265258.202	712.656	INITIALIZE
1011	301248.846	2265263.462	713.624	DISC T22
1012	301243.367	2265258.911	713.663	DISC T24
1013	301248.768	2265255.893	713.420	DISC T23
1014	301249.834	2265262.382	713.604	CONC T22
1015	301243.154	2265258.517	713.690	CONC T24
1016	301249.873	2265254.830	713.453	CONC T23
1017	301228.754	2264972.232	713.279	DISC T25
1018	301221.153	2264970.326	713.568	DISC T27
1019	301228.305	2264965.509	713.443	DISC T26
1020	301229.834	2264971.730	713.319	CONC T25
1021	301222.213	2264969.722	713.644	CONC T27
1022	301229.542	2264964.784	713.404	CONC T26
1023	301076.665	2264894.256	713.224	CONC Z2-18A
1024	301048.479	2264894.673	713.224	CONC Z2-18
1025	301235.808	2264783.289	713.758	DISC T28 E713.76
1026	301235.835	2264775.772	713.755	DISC T29 E713.81
1027	301227.547	2264780.362	713.952	DISC T30 E713.95
1028	301228.784	2264779.752	713.955	CONC T30
1029	301237.137	2264775.139	713.768	CONC T29
1030	301237.442	2264783.361	713.653	CONC T28
1031	301235.529	2264425.442	713.644	DISC T33 E713.59
1032	301236.822	2264424.861	713.644	CONC T33
1033	301236.491	2264399.310	713.256	CONC T31
1034	301235.182	2264399.835	713.338	DISC T31 E713.38
1035	301235.162	2264390.727	712.863	DISC T32 E712.94
1036	301236.412	2264390.064	712.846	CONC T32
1037	301161.534	2264132.975	712.840	DISC T34 E712.92
1038	301161.225	2264127.690	712.699	DISC T35 E712.74
1039	301156.399	2264132.017	712.597	DISC T36 E712.66
1040	301157.432	2264131.292	712.627	CONC T36
1041	301162.285	2264126.778	712.640	CONC T35
1042	301162.728	2264132.312	712.833	CONC T34
1043	302164.930	2263899.376	722.157	GRND Z2-1
1044	302164.478	2263899.531	725.507	TOP Z2-1
1045	302088.795	2265715.908	717.567	DISC T15 E717.57
1046	302088.645	2265725.147	717.807	DISC T14 E717.53
1047	302088.375	2265733.119	717.820	DISC T13 E717.67
1048	302089.812	2265732.512	717.856	CONC T13

1049	302090.032	2265724.694	717.774	CONC T14
1050	302090.180	2265715.282	717.607	CONC T15
1051	301882.667	2265729.717	715.691	DISC T16 E715.62
1052	301883.215	2265722.309	715.809	DISC T17 E715.75
1053	301876.854	2265725.147	715.491	DISC T18 E715.42
1054	301877.897	2265724.602	715.566	CONC T18
1055	301884.272	2265721.686	715.881	CONC T17
1056	301883.894	2265729.415	715.747	CONC T16
1057	301277.383	2263958.287	713.358	SET PK BL LINE 6
1058	301287.002	2263959.058	713.076	
1059	301316.002	2265576.535	716.865	FS CK 1
1060	302407.955	2265818.851	719.267	INTI
1061	302424.015	2265207.828	722.879	DISC T10 E722.82
1062	302424.805	2265198.951	722.666	DISC T11 E722.64
1063	302417.115	2265203.485	723.115	DISC T12 E723.08
1064	302418.178	2265202.953	723.060	CONC T12
1065	302426.170	2265198.842	722.600	CONC T11
1066	302425.189	2265207.566	722.820	CONC T10
1067	301461.300	2261943.688	716.796	SET 60D MW WELLS
1068	301172.800	2261315.395	714.566	GRND MW1-91
1069	301172.239	2261315.461	716.787	TOPMW1-91
1070	301173.925	2261324.044	714.628	GRND MW2-91
1071	301173.217	2261324.106	716.682	TOP MW2-91
1072	301109.936	2261367.331	714.329	GRND FL-6
1073	301108.863	2261367.085	717.502	TOP FL-6
1074	301130.067	2261217.285	714.129	GRND FL-7
1075	301129.076	2261217.207	717.190	TOP FL-7
1076	301104.788	2261096.505	717.016	TOP PIEZOMETER
1077	301112.180	2261097.033	717.065	TOP PIEZOMETER
1078	301120.018	2261098.303	717.357	TOP PIEZOMETER
1079	301143.853	2261105.586	715.943	BRASS PLUG
1080	300965.897	2261058.050	716.636	GRND FL-8
1081	300964.661	2261058.168	719.726	TOP FL-8
1082	300606.308	2261093.870	712.403	GRND FL-9
1083	300605.403	2261093.883	714.716	TOP FL-9
1084	300320.853	2261122.450	712.758	TOP PIZO
1085	300315.328	2261123.841	712.840	TOP PIZO
1086	300309.806	2261125.278	713.332	TOP PIZO
1087	300322.962	2261176.718	710.920	GRND FL-10
1088	300321.519	2261176.865	713.667	TOP FL-10
1089	300391.912	2261321.045	711.934	TOP MW6-91
1090	300392.634	2261320.796	710.081	CONCMW6-91
1091	300428.871	2261389.372	710.402	GRND FL-4
1092	300428.189	2261389.670	712.886	TOP FL-4
1093	300488.133	2261484.503	714.454	GRND MW5-91
1094	300487.536	2261484.942	716.783	TOP MW5-91
1095	300513.894	2261536.143	716.685	TOP MW4-91
1096	300514.448	2261535.854	714.654	GRND MW4-91
1097	300517.339	2261578.239	714.208	GRND FL-3
1098	300516.272	2261578.971	716.331	TOP FL-3
1099	300565.419	2261636.497	714.401	CONC MW3-91
1100	300624.143	2261752.832	711.449	GRND FL-2
1101	300623.155	2261753.659	714.149	TOP FL-2
1102	300653.405	2261792.278	716.997	TOP PIEZO
1103	300653.765	2261787.655	717.325	TOP PIEZO
1104	300653.985	2261782.123	717.764	TOP PIEZO
1105	300871.711	2261809.026	711.337	GRND FL-1
1106	300870.993	2261809.535	714.096	TOP FL-1
1107	301461.254	2261943.668	716.836	FS CK 1067
1108	300045.752	2264586.196	710.143	CONC JAW610

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1109	299948.442	2264587.866	711.170	CONC JAW-29
1110	299859.016	2264589.765	710.973	CONC JAW-31
1111	299839.400	2264653.919	711.367	CONC JAW-30
1112	299833.600	2264775.598	710.812	CONC JAW-611
113	299564.791	2264674.316	707.951	CONC JAW-612
1114	299637.547	2264505.090	707.462	GRND R10-PZ-01
1115	299696.927	2264444.464	705.291	GRND R10-PZ-02
1116	300137.497	2264597.187	710.717	FS CK 1108
1117	304011.620	2262612.076	726.173	60D 1117
1118	306987.050	2261296.642	724.136	SET PK
1119	307705.894	2261192.961	726.747	SET PK
1120	307122.745	2261303.640	724.999	FND ACOF BRS DIS
1121	301316.002	2265576.515	716.875	FS CK 1
1122	307925.943	2261360.149	728.611	DM
1123	308175.965	2261326.855	729.123	DM10
1124	308178.019	2261336.498	729.136	DM
1125	308178.593	2261345.933	729.195	DM
1126	308222.435	2261387.561	729.073	5-94
1127	308222.264	2261339.368	728.778	6-94
1128	308243.321	2261293.952	729.080	DM9
1129	308266.411	2261314.697	729.060	DM1
1130	308272.300	2261332.269	729.090	DM2
1131	308260.722	2261340.740	728.558	4-94
1132	308292.848	2261365.914	728.844	DM8
1133	308251.372	2261254.018	728.791	1-94
1134	308342.379	2261251.724	728.939	2-94
1135	308380.666	2261274.191	728.821	3-94
1136	308424.869	2261281.376	729.467	DM7
1137	308292.884	2261365.917	728.893	CHECK DM8
1138	308176.054	2261326.868	729.165	CHECK DM4
.139	299889.942	2258628.353	701.505	SET 60D
1140	300010.817	2258636.060	703.489	SET 60D N. RR
1141	304011.675	2262612.105	726.170	FS CK 1117
1142	302745.070	2268552.267	702.666	SET IR D ROAD
1143	301386.773	2269379.008	687.413	SET IR GR D RD.
1144	301315.975	2265576.561	716.836	FS CK 1
1145	303276.611	2265625.675	717.758	CONC JAW-605
1146	303445.158	2263209.630	719.395	CONC JAW-604
1147	305655.806	2263723.586	727.761	CONC JAW-607
1148	306360.240	2262749.743	727.702	CONC JAW-608
1149	305421.489	2265655.308	720.294	CONC JAW-606
1150	305412.772	2265654.983	720.061	CONC JAW-609
1151	306987.021	2261296.688	724.201	FS CK 1118
1152	303483.671	2264626.540	721.718	CONC Z3-4
1153	303881.590	2264509.526	724.716	CONC Z3-2
1154	303801.174	2264358.788	724.257	CONC Z3-1
1155	303521.840	2264561.022	722.886	CONC Z3-5
1156	303649.265	2264636.859	720.222	GRND Z3-3
1157	303648.979	2264636.891	722.925	TOP Z3-3
1158	306987.040	2261296.685	724.129	FS CK 1118
1159	304146.524	2262632.735	725.291	SET PK
1160	305276.840	2268728.809	693.398	CONC JAW
1161	304921.959	2268844.065	692.377	CONC JAW
1162	304746.152	2268941.368	692.974	CONC JAW
1163	304334.821	2269059.094	691.662	CONC JAW
1164	303961.046	2269158.743	686.774	CONC JAW
.165	303599.770	2269677.731	701.383	CONC JAW-48
1166	304335.733	2269943.285	711.212	CONC JAW-602
1167	304420.740	2269872.193	714.323	CONC JAW-50
1168	305164.915	2269635.854	717.357	CONC JAW-52

1169	304887.245	2269646.032	714.648	CONC JAW-51
1170	304880.647	2269640.333	714.792	CONC JAW-603
1171	302494.890	2270005.142	708.814	CONC JAW-47
1172	301997.247	2269809.250	694.136	CONC JAW-46
1173	302416.574	2269530.054	702.935	CONC JAW-45
1174	302450.366	2269297.666	694.838	CONC JAW-44
1175	302681.639	2269208.769	693.788	CONC JAW-43
1176	301386.759	2269379.028	687.318	FS CK 1143
1177	298524.797	2271746.503	688.798	CONC JAW-75
1178	297910.346	2271594.371	691.347	CONC JAW-74
1179	299735.614	2271140.166	696.665	SET 60D NAIL
1180	298812.119	2271188.781	682.338	CONC JAW-76
1181	298818.822	2271164.536	681.669	CONC 10-A
1182	298806.450	2271150.950	681.619	CONC 10-B
1183	298716.584	2271123.916	682.243	CONC JAW-71
1184	298784.750	2270801.449	679.336	CONC 12-A
1185	297922.068	2270834.599	689.346	CONC 12-C
1186	297912.505	2270838.106	689.444	CONC 12-D
1187	297915.940	2270847.355	689.375	CONC 12-B
1188	298118.866	2271156.721	689.766	CONC JAW-73
1189	299735.618	2271140.169	696.711	FS CK 1179
1190	298796.328	2270451.148	666.157	RO2-PZ-29 GRND
1191	301378.446	2269942.803	682.905	CONC Z1-1
1192	301574.978	2269741.307	672.574	GRND SL-91
1193	301359.666	2269625.402	677.761	CONC Z1-3
1194	301369.735	2269782.544	671.301	CONC Z1-2
1195	301383.954	2269776.471	671.508	CONC Z1-2A
1196	302384.530	2268976.446	679.087	CONC JAW
1197	302311.830	2269017.266	679.067	CONC JAW-610
1198	302384.835	2268820.413	694.073	ACOE BRASS DISC
1199	301386.825	2269379.001	687.335	FS CK 1143
1200	299345.746	2257404.934	708.306	CONC ET3
1201	299883.823	2257421.555	710.980	CONC T-1
1202	299882.507	2257422.171	711.075	DISC T-1 E711.05
1203	299882.976	2257432.194	711.226	DISC T-6 E711.24
1204	299884.026	2257431.597	711.209	CONC T-6
1205	299871.185	2257854.270	705.980	GRND G-4
1206	299914.997	2257836.633	704.608	CONC GP-5
1207	299762.081	2257131.227	710.786	CONC GP-4
1208	299582.157	2257124.675	707.440	CONC T-5
1209	299482.649	2257122.120	704.339	CONC WELL
1210	299304.779	2257118.074	703.673	TOP T-9
1211	298888.641	2257105.351	698.558	TOP JAW
1212	299112.673	2257685.055	702.646	GRND GV6
1213	298712.920	2257973.975	704.572	TOP G-6
2000	307726.481	2257834.979	723.125	
2001	308429.527	2257796.410	724.913	60D 2001
2002	293696.995	2255957.430	688.959	2002
2003	294013.949	2253191.281	708.667	2010
2004	292055.567	2256989.341	703.926	2004 PK
2005	292588.873	2257360.800	693.519	
2006	303605.426	2246707.403	678.923	60D 2006
2007	303620.669	2246928.200	684.569	
2008	306229.525	2250613.865	717.692	60D 2008
2009	306256.579	2251065.216	717.699	
2010	300154.019	2249808.876	699.510	
2011	300163.219	2249789.063	700.382	
2012	295344.655	2265762.909	694.011	PK 2012
2012	295344.655	2265762.909	694.011	
2013	296212.734	2266677.934	692.876	

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2014	286199.054	2257143.694	663.152	2014 PK
2015	286535.877	2257528.923	670.724	
2016	307280.773	2269301.803	722.604	2016
2017	307297.122	2267593.513	722.239	
2018	301426.750	2275963.985	690.386	2018
2019	302242.273	2275942.144	676.783	
2020	298944.405	2282546.744	675.251	2020
2021	298937.480	2282183.963	672.653	
2022	298133.905	2273904.137	697.312	
2022	298133.951	2273904.117	697.128	
2023	298124.692	2273436.795	696.327	
2024	293398.478	2269317.286	680.327	
2025	293449.758	2272076.187	665.625	PK 2025
2026	290971.551	2272216.112	665.402	PK 2026
2027	290961.072	2272891.307	642.509	
2028	287823.890	2277901.074	616.154	
2029	287800.225	2277787.948	614.989	60D 2029
2035	282987.190	2272354.917	678.302	
2036	282971.475	2275291.171	672.010	
2038	285469.718	2280387.420	599.874	
2039	285366.613	2280333.041	601.373	
2040	282824.559	2266225.540	536.800	
2041	282828.800	2266189.734	536.528	
2042	295070.046	2283155.378	665.855	
3100	294485.861	2252762.578	711.367	CONC JAW-22
3101	294739.224	2252369.544	713.227	CONC JAW-19
3102	295159.872	2252073.649	710.980	CONC JAW-16
3103	295233.681	2251812.852	710.681	CONC JAW-15
3104	295635.229	2251938.701	709.326	CONC JAW-17
3105	295621.013	2251952.960	709.244	CONC JAW-18
3106	295012.025	2252816.944	711.895	CONC JAW-20
3107	295005.936	2252808.611	711.882	CONC JAW-21
3108	292588.893	2257360.712	693.788	FS CK PK 2005
3110	295080.785	2265164.085	698.932	SET 60D
3111	295098.622	2264820.812	699.598	SET 60D
3112	295009.213	2264672.088	690.996	SET 60D
3113	295200.653	2265113.153	696.012	SET 60D
3114	296069.080	2266281.645	693.493	60D G-16
3115	296091.534	2266714.817	691.436	CONC JAW-616
3116	296093.991	2266719.827	691.797	PIZ
3117	296077.991	2266827.428	691.642	CONC JAW-617
3118	295985.907	2266737.599	691.265	CONC JAW-615
3119	296131.025	2266708.921	693.214	CL CL F-RD/I-RD
3120	302687.525	2276046.330	696.383	CONC JAW-625
3121	302610.989	2276254.201	696.075	LIP MW1-92
3122	302660.546	2276320.884	693.355	LIP MW2-92
3123	302600.018	2276357.842	693.430	LIP MW3-92
3124	302648.181	2276529.495	677.525	CONC JAW-626
3125	302719.014	2276506.205	680.615	CONC JAW-627
3126	302277.830	2276101.550	688.594	CONC JAW-11
3127	302004.822	2276224.440	674.129	CONC JAW-12
3128	301965.118	2276121.163	667.177	CONC JAW-13
3129	302035.479	2276036.114	671.272	CONC JAW-14
3130	301736.355	2276281.179	654.185	CONC JAW-23
3131	301437.160	2276178.932	687.269	CONC JAW-25
3132	301171.898	2275739.635	688.959	CONC JAW-63
3133	301039.916	2275699.845	685.786	CONC JAW-62
3134	300933.273	2275714.619	683.017	CONC JAW-61
3135	300889.923	2275808.221	681.462	CONC JAW-60
3136	300689.655	2275879.274	672.692	CONC JAW-80

3137	300977.692	2276000.409	682.525	CONC JAW-59
3138	301090.914	2275971.977	685.927	CONC JAW-58
3139	301118.069	2276554.971	655.455	TOP G-30
3140	301337.563	2276366.028	677.082	CONC JAW-68
3141	301677.612	2276782.425	640.609	CONC JAW-24
3142	301422.806	2277113.139	651.511	SET 60D
3143	301492.842	2277201.824	655.681	SET 60D
3144	301525.493	2277775.372	673.489	CONC JAW-64
3145	301532.760	2277786.849	674.323	CONC EDA-3
3146	301754.977	2277542.679	671.619	CONC EDA-2
3147	302331.692	2278505.765	683.404	CONC EDA-4
3148	302113.179	2278574.583	686.993	CONC JAW-7
3149	301932.159	2278390.345	684.277	CONC JAW-5
3150	301798.671	2278171.589	685.097	TOP G-29
3151	302604.070	2278362.425	684.073	CONC JAW-64
3152	302531.226	2277976.002	692.469	CONC EDA-1
3153	302373.578	2278350.778	688.483	SET 60D
3154	302310.389	2278479.770	686.642	SET 60D
3155	301426.654	2275963.968	690.399	FS CK 2018
3156	293478.009	2270172.146	674.776	CONC JAW-78
3157	293477.559	2270162.819	674.835	CONC JAW-79
3158	293389.085	2269644.424	678.424	G-46
3159	293377.838	2269645.881	678.450	G-47
3160	294094.323	2269126.728	682.443	LIP G-57
3161	294143.949	2269201.794	683.325	LIP G-58
3162	294229.726	2269098.661	681.970	LIP G-56
3163	293533.514	2268442.560	684.280	TOP G-40
3164	293536.588	2268438.331	684.428	TOP G-41
3165	293628.517	2269126.758	686.255	TOP G-20
3166	293799.681	2269409.356	683.863	TOP G-19
3167	294333.863	2269584.447	684.989	TOP G-17
3168	294485.973	2269970.004	685.796	TOP G-43
3169	294492.643	2269968.518	685.740	TOP G-42
3170	294164.631	2270107.737	681.888	TOP G-45
3171	294176.849	2270109.994	682.036	TOP G-44
3172	294298.234	2268682.812	684.205	LIP G-48
3173	294034.566	2269584.539	683.391	TOP G-18
3174	292254.885	2276161.786	678.276	CONC WELL YARD-D
3175	298163.347	2275920.274	691.570	CONC 14-A
3176	298133.892	2273904.173	697.203	FS CK 2022
3177	298933.316	2282183.969	672.876	SET 60D
3178	298944.343	2282546.773	675.373	FS CK 2020
3179	290961.551	2272086.791	667.912	CL RD-K/CL YD-D
3180	286080.609	2256943.153	666.570	TOP G-12
3181	286524.351	2257480.108	670.415	CL CL K-RD/J-RD
3182	293480.401	2256222.840	687.079	CL CL C-RD/I-RD
3183	285498.920	2260874.061	675.163	CONC 14-F
3184	286199.096	2257143.691	663.230	FS CK 2014
3185	287800.560	2277788.066	614.979	FS CK 2029
3186	288268.479	2278597.329	656.800	60DTOPOPTTO 13-F
3187	286557.560	2282801.986	646.944	FS CP 60D 2031
3188	286577.668	2282661.918	643.690	FS CP 60D 2030
3189	292009.068	2282817.711	659.549	SET 60D NEW /F
3190	291794.397	2282787.022	657.791	SET 60D CP 2028
3191	287800.684	2277787.994	614.966	FS CK 2029
3192	295083.928	2283154.269	665.976	SET 60D
3193	295064.813	2282763.322	664.395	SET 60D
3194	298958.959	2282638.273	674.011	VOID
3195	298933.457	2282184.002	672.679	FS CK 3177
3196	294671.645	2256262.013	694.638	CONC JAW-36

3197	296005.356	2256025.606	652.781	SET 60D
3198	296138.909	2256015.563	646.777	SET 60D
3199	297767.072	2255418.908	682.423	CONC JAW-619
3200	297759.982	2255406.165	682.223	CONC JAW-33
01	297766.576	2255403.800	682.423	CONC JAW-34
3202	298003.935	2255311.060	682.778	CONC JAW-37
3203	297979.473	2255452.097	688.470	CONC JAW-32
3204	297991.665	2255466.349	690.547	CONC JAW-618
3205	294013.907	2253191.340	708.719	FS CK 2003
3206	299416.891	2267439.366	700.569	CONC JAW-77
3207	299892.645	2267414.438	703.867	CONC JAW-57
3208	300057.920	2267988.456	698.919	CONC JAW-56
3209	299889.604	2267896.836	696.436	CONC JAW-55
3210	299621.770	2267899.985	695.786	CONC JAW-54
3211	299600.884	2267990.910	694.349	CONC 16-A
3212	299430.212	2267984.985	694.034	CONC JAW-53
3213	298983.329	2268246.038	695.773	CONC 16-D
3214	298986.446	2268235.552	695.694	CONC 16-E
3215	300002.277	2268670.778	695.655	CONC 16-C
3216	300701.105	2268410.424	699.146	CONC 16-B
3217	303383.163	2266593.928	708.270	CL CL F-RD/D-RD
3218	307096.935	2266565.040	727.305	CL CL F-RD/B-RD
3219	307021.013	2261239.526	724.693	CL CL A-RD/B-RD
3220	301277.557	2263958.297	713.365	FS CK 1057
3221	298203.147	2271214.523	688.401	CONC JAW-72
3222	298192.914	2271212.039	688.444	CONC 12-F
3223	304203.542	2271958.803	717.571	CL CL RD H RD G
3224	298124.712	2273436.788	696.554	FS CK 2023
3600	299637.416	2264505.006	711.101	TOP PVC R10PZ-01
3601	299696.710	2264444.329	706.501	TOP PVC R10PZ-02
3602	299770.227	2264593.941	710.018	TOP PVC R10PZ-03
3604	300137.502	2264597.154	710.681	FS CK 1108
3605	301171.346	2261753.498	716.557	TOP PVC NE PIZ
3606	301167.834	2261748.815	716.606	TOP PVC NE PIZ
3607	301163.838	2261744.806	716.872	TOP PVC NE PIZ
3608	301104.783	2261096.363	716.974	TOP PVC NWS PIZ
3609	301112.195	2261097.075	717.006	TOP PVC NWC PIZ
3610	301120.134	2261098.231	717.279	TOP PVC NWN PIZ
3611	300320.868	2261122.514	712.758	TOP PVC SWN PIZ
3612	300315.168	2261123.929	712.784	TOP PVC CWN PIZ
3613	300309.566	2261125.476	713.302	TOP PVC SWN PIZ
3614	300653.582	2261792.418	716.947	TOP PVC SEE PIZ
3615	300653.860	2261787.553	717.302	TOP PVC SEC PIZ
3616	300654.193	2261782.138	717.715	TOP PVC SEW PIZ
3619	301260.109	2246677.490	692.318	SET 60D
3624	308431.255	2257254.927	719.851	TOP PVC G1
3625	288128.012	2278281.711	654.592	TOP PVC 13D
3626	288119.438	2278285.282	654.211	TOP PVC 13E
3627	289406.497	2281445.829	583.004	
3628	289386.571	2281419.639	583.519	
3631	290968.311	2272241.739	664.562	VOID
3632	290968.309	2272241.743	664.572	VOID
3633	290968.324	2272241.747	664.549	VOID
3634	290968.321	2272241.745	664.523	VOID
3636	290752.720	2267497.684	686.239	TOP PVC 14C
637	294456.037	2272035.879	649.057	SET PK
638	294369.021	2272037.522	648.161	SET PK
3641	300768.847	2273471.572	700.048	TOP PVC JAW 621
3642	300773.056	2273415.772	701.239	TOP PVC 6E
3643	300774.660	2273362.352	698.860	TOP PVC JAW 622

3644	300775.464	2273261.742	700.255	TOP PVC 6D
3645	301133.736	2273447.605	704.680	TOP PVC 6F
3646	300960.255	2273445.470	702.682	TOP PVC 6A
3647	300972.396	2273526.286	704.342	TOP PVC JAW 620
3648	300871.410	2273477.455	700.248	TOP PVC 6B
3649	300770.316	2273582.704	699.201	TOP PVC 6G
3650	301048.896	2275807.374	688.348	TOP PVC JAW 69
3651	301086.994	2275822.703	689.917	TOP PVC PIZ?
3652	301106.880	2275820.409	689.021	TOP PVC PIZ?
3653	301115.327	2275820.717	689.411	TOP PVC PIZ?
3654	301109.549	2275804.808	689.697	TOP PVC PIZ?
3655	301103.027	2275787.140	689.795	TOP PVC PIZ?
3656	301106.854	2275852.937	690.491	TOP PVC PIZ?
3658	297090.861	2270105.307	656.081	G15 +1.258TO PVC
3660	298035.122	2270441.183	689.995	TOP PVC 12G
3661	297294.431	2271125.723	690.369	TOP PVC 12E
3662	299254.490	2271455.995	702.358	TOP PVC C3
3663	299169.731	2271406.308	703.447	TOP PVC C4
3664	299117.099	2271409.033	702.935	TOP PVC C5
3665	301574.798	2269740.834	674.047	TOP PVC SL-91
3666	302383.992	2268977.120	681.117	TOP PVC SL-81
3667	302311.372	2269017.174	681.406	TOP PVC JAW-601
3669	291119.772	2254639.534	688.837	60D NAIL 2045
3670	291209.225	2254913.385	693.978	60D NAIL 2044
3671	290488.486	2255342.011	680.888	TOP PVC DA-2
3672	290436.273	2255121.330	690.963	60D NAIL 2046
3673	290457.856	2254760.350	692.381	60D NAIL 2047
3674	295034.972	2257762.120	628.437	SET PK
3675	295164.164	2257893.574	628.906	SET PK
3676	298415.974	2258672.431	699.756	SET PK
3689	298714.475	2269728.117	689.602	TOP PVC 12H
3692	303620.579	2268948.896	691.760	VOID
3693	303583.617	2269008.879	683.653	VOID
3694	303583.882	2269004.797	686.803	TOP PVC Z1-6
3800	282970.939	2275157.383	674.598	60D 2037
3801	283003.561	2272237.339	677.436	SET 60D
3802	282997.378	2272342.274	678.008	SET 60D
3803	282971.079	2275157.359	674.562	FS CK 2037/3800
3804	301352.554	2246677.071	693.873	60D G31/CP 3618
3805	301352.513	2246677.097	693.905	CK ON SAME 3618
3806	301260.178	2246677.441	692.251	60D G31/CP 3619
3807	301260.182	2246677.428	692.260	CK SAME AS 3619
3808	306229.536	2250613.851	717.720	FS CK 2008
3809	299889.983	2258628.531	701.606	FS CK 1139
3810	299168.058	2257981.051	704.061	TOP PVC JAW-65
3811	299373.942	2258039.468	703.786	TOP PVC JAW 26
3812	299459.600	2258077.999	703.359	TOP PVC GP 1
3813	299870.694	2257854.092	708.337	TOP PVC G 4
3814	299914.286	2257836.626	707.459	TOP PVC GP 5
3815	299761.545	2257131.497	713.628	TOP PVC GP 4
3816	299482.163	2257121.988	706.562	TOP PVC T 4
3817	298640.676	2257049.021	689.097	GRND AT G 5+3.23
3818	298888.744	2257105.727	698.416	TOP PVC JAW 28
3819	298405.029	2257400.410	695.479	TOP PVC G 7
3820	298438.177	2257546.515	686.519	TOP PVC JAW 27
3821	299890.024	2258628.539	701.661	FS CK 1139
3822	298556.607	2262676.483	691.035	TOP PVC 14E
3823	301315.976	2265576.538	716.841	FS CK 1
3824	290960.991	2272891.281	642.409	FS CK 2027
3825	287166.847	2273458.783	676.806	TOP CONC 14D

3826	293449.675	2272076.242	665.690	FS CK 2025
3827	302242.295	2275942.040	676.809	FS CK 2019
3828	302630.079	2276346.813	692.466	TOP PVC CWP
3829	302242.139	2275942.170	676.747	FS CK 2019
3830	302311.520	2269017.603	681.472	TOP PVC JAW-601
831	298811.877	2271188.792	685.220	TOP PVC JAW- 70
3832	301258.036	2269865.805	690.985	SET60D FOR G14
3833	302744.967	2268552.317	702.831	FS CK 1142

Combination scale factors:

Ground-to-grid = 0.999945715386487
Grid-to-Ground = 1.00005428756049

Proj# 97-219: Harza, Iowa

Datum = NAD83
Zone = Iowa South
Units = U.S. feet

Note = '*****' Requires field checks

FILE: HARZA3.WK4
90297A.TXT DATE 9/02/97

Combination scale factors

Ground-to-grid = 0.999945715386487
Grid-to-Ground = 1.00005428756049

Point	Northing	Easting	Elev	Desc		Measure+/-	Top of PVC
3223	304203.542	2271958.803	717.571	CL CL RD H RD G			
3182	293480.401	2256222.840	687.079	CL CL C-RD/I-RD			
3218	307096.935	2266565.040	727.305	CL CL F-RD/B-RD			
3217	303383.163	2266593.928	708.270	CL CL F-RD/D-RD			
3179	290961.551	2272086.791	667.912	CL RD-K/CL YD-D			
3181	286524.351	2257480.108	670.415	CL CL K-RD/J-RD			
3219	307021.013	2261239.526	724.693	CL CL A-RD/B-RD			
3119	296131.025	2266708.921	693.214	CL CL F-RD/I-RD			
3116	296093.991	2266719.827	691.797	PIZ			691.797
1181	298818.822	2271164.536	681.650	CONC	10-A	2.10	683.750
1182	298806.450	2271150.950	681.550	CONC	10-B	2.39	683.940
1184	298784.750	2270801.449	679.140	CONC	12-A	2.11	681.250
1187	297915.940	2270847.355	689.230	CONC	12-B	2.21	691.440
1185	297922.068	2270834.599	689.180	CONC	12-C	2.48	691.660
1186	297912.505	2270838.106	689.280	CONC	12-D	1.98	691.260
3661	297294.431	2271125.723	690.369	TOP PVC	12E"	0.00	690.369
3222	298192.914	2271212.039	688.260	CONC	12-F	2.28	690.540
3660	298035.122	2270441.183	689.995	TOP PVC	12G"	0.00	689.995
3689	298714.475	2269728.117	689.602	TOP PVC	12H"	0.00	689.602
3356	287765.677	2277255.505	629.589		13-B	-0.05	629.539
3625	288128.012	2278281.711	654.592	TOP PVC	13D"	0.00	654.592
3626	288119.438	2278285.282	654.211	TOP PVC	13E"	0.00	654.211
3355	288227.218	2278612.309	660.554	LIP OF LID	13-F	-0.11	660.444
3175	298163.347	2275920.274	691.570	CONC	14-A	2.26	693.830
3174	292254.885	2276161.786	678.276	CONC	14-B	2.56	680.836
3636	290752.72	2267497.684	686.239	TOP PVC	14C"	0.00	686.239
3635	287166.854	2273457.530	679.053	TOP PVC	14-D	0.00	679.053
3617	298555.568	2262676.38	691.278	TOP PVC	14-E	0.00	691.278
3183	285498.920	2260874.061	675.163	CONC	14-F	2.04	677.203
3211	299600.884	2267990.910	694.349	CONC	16-A	1.95	696.299
3216	300701.105	2268410.424	699.146	CONC	16-B	1.95	701.096
3215	300002.277	2268670.778	695.655	CONC	16-C	2.03	697.685
3213	298983.329	2268246.038	695.773	CONC	16-D	1.89	697.663
3214	298986.446	2268235.552	695.694	CONC	16-E	1.86	697.554

3649	300770.316	2273582.704	699.201	TOP PVC	6G"	0.00	699.201	
3662	299254.49	2271455.995	702.357	TOP PVC	C3"	0.00	702.357	
3	299169.731	2271406.308	703.447	TOP PVC	C4"	0.00	703.447	
3664	299117.099	2271409.033	702.935	TOP PVC	C5"	0.00	702.935	
3612	300315.168	2261123.929	712.784	TOP PVC	CWN PIZ"	0.00	712.784	
3828	302630.079	2276346.813	692.466	TOP PVC	CWP	0.00	692.466	ADDED
3315	290997.363	2254503.286	673.527	CONC	DA-1	2.25	675.777	
3671	290488.486	2255342.011	680.888	TOP PVC	DA-2"	0.00	680.888	
1122	307925.943	2261360.149	728.611	RIM	DM 5	-0.6	728.011	REVISED ELEV.
1125	308178.593	2261345.933	729.195	TOP/CAP	DM SS		729.195	
1129	308266.411	2261314.697	729.060	TOP/CAP	DM1	-1.03	728.030	REVISED ELEV.
1123	308175.965	2261326.855	729.123	RIM	DM10	-0.68	728.443	REVISED ELEV.
1130	308272.300	2261332.269	729.090	TOP/CAP	DM2	-0.64	728.450	REVISED ELEV.
1138	308176.054	2261326.868	729.165	TOP/CAP	DM4	-0.62	728.545	REVISED ELEV.
1136	308424.869	2261281.376	729.467	TOP/CAP	DM7	-0.8	728.667	REVISED ELEV.
1137	308292.884	2261365.917	728.893	TOP/CAP	DM8	-0.78	728.113	REVISED ELEV.
1128	308243.321	2261293.952	729.080	TOP/CAP	DM9	*******	********	NEED ****
3152	302531.226	2277976.002	692.469	CONC	EDA-1	2.90	695.369	
3146	301754.977	2277542.679	671.619	CONC	EDA-2	1.60	673.219	
3145	301532.760	2277786.849	674.323	CONC	EDA-3	2.27	676.593	
3147	302331.692	2278505.765	683.404	CONC	EDA-4	1.80	685.204	
1200	299345.746	2257404.934	708.306	CONC	ET-3	2.43	710.736	
1106	300870.993	2261809.535	714.096	TOP	FL-1	-0.42	713.676	
1088	300321.519	2261176.865	713.570	TOP	FL-10	-0.86	712.710	
1101	300623.155	2261753.659	714.130	TOP	FL-2	-0.94	713.190	
1098	300516.272	2261578.971	716.310	TOP	FL-3	-0.24	716.070	
1092	300428.189	2261389.670	712.840	TOP	FL-4	-0.38	712.460	
1073	301108.863	2261367.085	717.450	TOP	FL-6	-0.41	717.040	
1075	301129.076	2261217.207	717.190	TOP	FL-7	-1.22	715.970	
1081	300964.661	2261058.168	719.700	TOP	FL-8	-1.16	718.540	
1083	300605.403	2261093.883	714.660	TOP	FL-9	-0.55	714.110	
3624	308431.255	2257254.927	719.851	TOP PVC	G-1	0.00	719.851	
8	290362.463	2254583.304	681.921	CONC	G-10	3.42	685.341	09/02/97
3616	290363.429	2255073.451	691.643	GRND	G-11	3.39	695.033	
3180	286080.609	2256943.153	666.570	TOP	G-12	-0.50	666.070	
3321	285340.429	2256682.915	650.142	TOP	G-13	-0.75	649.392	
3900	301223.155	2269900.129	678.59	TOP PVC	G-14	-2.65	675.940	09/02/97
3658	297090.861	2270105.307	660.208	TOP PVC	G15	0.00	660.208	
3114	296069.080	2266281.645	693.493	60D	G-16	2.62	696.113	
3167	294333.863	2269584.447	684.989	TOP	G-17	-0.78	684.209	
3173	294034.566	2269584.539	683.391	TOP	G-18	-0.60	682.791	
3166	293799.681	2269409.356	683.863	TOP	G-19	-0.46	683.403	
3357	306250.000	2251075.750	718.07	Top PVC	G-2	0.00	718.070	
3165	293628.517	2269126.758	686.255	TOP	G-20	-0.48	685.775	
3358	282927.210	2266240.673	540.870	TOP PVC	G-21	0.00	540.870	ADDED
3362	283054.139	2272254.625	678.036	TOP PVC	G-22	0.00	678.036	ADDED
3361	283038.354	2275300.304	671.73	TOP PVC	G-23	0.00	671.730	ADDED
3359	285423.67	2280303.83	602.373	TOP PVC	G-24	0.00	602.373	ADDED
3308	286728.663	2282607.649	631.090	TOP WELL	G-25	-0.37	630.720	REVISED ELEV.
3307	291572.369	2282728.111	659.921	TOP WELL	G-26	-3.5	656.421	09/02/97
3323	295091.229	2282664.394	666.845	TOP	G-27	-0.67	666.175	
3322	298829.667	2282580.547	674.691	CONC	G-28	3.41	678.101	
3150	301798.671	2278171.589	685.097	TOP	G-29	-0.77	684.327	
3300	303605.525	2246948.516	688.020	WELL	G-3	-1.25	686.770	
3139	301118.069	2276554.971	655.455	TOP	G-30	-0.70	654.755	
3621	301369.519	2246846.139	669.618	TOP PVC	G-31	0.00	669.618	ADDED
1205	299871.185	2257854.270	705.980	GRND	G-4	2.19	708.170	
3163	293533.514	2268442.560	684.280	TOP	G-40	-0.20	684.080	
3164	293536.588	2268438.331	684.428	TOP	G-41	-0.20	684.228	
3169	294492.643	2269968.518	685.740	TOP	G-42	-0.47	685.270	

3168	294485.973	2269970.004	685.796	TOP	G-43	-0.20	685.596	
3171	294176.849	2270109.994	682.036	TOP	G-44	-0.02	682.016	
3170	294164.631	2270107.737	681.888	TOP	G-45	-0.51	681.378	
3158	293389.085	2269644.424	678.424	GRND	G-46	2.02	680.444	
3159	293377.838	2269645.881	678.450	GRND	G-47	2.14	680.590	
3172	294298.234	2268682.812	684.205	LIP	G-48	-1.10	683.105	
3312	307173.596	2267602.088	720.429	TOP	G-49	-0.40	720.029	
3817	298640.676	2257049.021	689.097	GRND	G-5	3.23	692.327	ADDED
3631	294463.361	2271971.047	648.02	TOP PUMP	G-51	TOP PUMP>>>	648.02	ADDED
3351	290931.405	2272885.614	636.739	TOP PVC	G-52	0.00	636.739	
3352	290938.263	2272872.350	637.019	TOP PVC	G-53	0.00	637.019	
3353	287849.316	2277849.862	613.744	TOP PVC	G-54	0.00	613.744	
3354	287858.386	2277845.893	613.084	TOP PVC	G-55	0.00	613.084	
3162	294229.726	2269098.661	681.970	LIP	G-56	-0.07	681.900	
3160	294094.323	2269126.728	682.443	LIP	G-57	0.00	682.443	
3161	294143.949	2269201.794	683.325	LIP	G-58	-0.05	683.275	
1213	298712.920	2257973.975	704.572	TOP	G-6	-0.53	704.042	
3819	298405.029	2257400.410	695.479	TOP PVC	G-7	0.00	695.479	ADDED
3677	295073.534	2257681.42	614.362	TOP PVC	G-8	0.00	614.362	ADDED
3313	291348.179	2254924.652	692.108	CONC	G-9	2.75	694.858	
3812	299459.6	2258077.999	703.359	TOP PVC	GP-1	0.00	703.359	ADDED
1207	299762.081	2257131.227	710.786	CONC	GP-4	2.19	712.976	
1206	299914.997	2257836.633	704.608	CONC	GP-5	2.78	707.388	
1212	299112.673	2257685.055	702.646	GRND	GV6	2.20	704.846	
1191	301378.446	2269942.803	682.905	CONC	GZ-1	2.83	685.735	
1194	301369.735	2269782.544	671.240	CONC	GZ-2	2.37	673.610	
1044	302164.478	2263899.531	725.507	TOP	GZ2-1	0.00	725.507	
1024	301048.479	2264894.673	713.210	CONC	GZ2-18	3.13	716.340	
1023	301076.665	2264894.256	713.280	CONC	GZ2-18A	4.06	717.340	
1000	301349.483	2265868.775	713.155	GRND	GZ2-19	3.10	716.255	09/02/97
1195	301383.954	2269776.471	671.560	CONC	GZ-2A	2.50	674.060	
1193	301359.666	2269625.402	678.060	CONC	GZ-3	2.70	680.760	
1154	303801.174	2264358.788	724.257	CONC	GZ3-1	2.75	727.007	
1153	303881.590	2264509.526	724.716	CONC	GZ3-2	2.67	727.386	
1156	303648.979	2264636.891	722.925	GRND	GZ3-3	2.59	725.515	
1152	303483.671	2264626.540	721.718	CONC	GZ3-4	4.19	725.908	
1155	303521.840	2264561.022	722.886	CONC	GZ3-5	3.63	726.516	
3694	303583.882	2269004.797	686.803	GRND	GZ-6	2.96	689.763	ADDED
1196	302384.530	2268976.446	679.190	CONC	JAW	2.10	681.290	
1211	298888.641	2257105.351	698.558	TOP	JAW	*****	698.558	
3314	291010.029	2254502.797	674.447	CONC	JAW 1	*******	*******	
3303	295053.699	2264610.153	686.856	CONC	JAW 10	2.06	688.916	
3317	290453.071	2254903.05	682.751	CONC	JAW 2	2.29	685.041	
3304	301600.473	2277336.615	657.951	CONC	JAW 4	3.05	661.001	
3305	302366.369	2278608.671	675.402	CONC	JAW 6	2.64	678.042	
3126	302277.830	2276101.550	688.594	CONC	JAW-11	2.42	691.014	
3127	302004.822	2276224.440	674.129	CONC	JAW-12	2.68	676.809	
3128	301965.118	2276121.163	667.177	CONC	JAW-13	2.43	669.607	
3129	302035.479	2276036.114	671.272	CONC	JAW-14	2.70	673.972	
3103	295233.681	2251812.852	710.681	CONC	JAW-15	2.20	712.881	
3102	295159.872	2252073.649	710.980	CONC	JAW-16	2.09	713.070	
3104	295635.229	2251938.701	709.326	CONC	JAW-17	2.50	711.826	
3105	295621.013	2251952.960	709.244	CONC	JAW-18	2.50	711.744	
3101	294739.224	2252369.544	713.227	CONC	JAW-19	2.54	715.767	
3106	295012.025	2252816.944	711.895	CONC	JAW-20	1.92	713.815	
3107	295005.936	2252808.611	711.882	CONC	JAW-21	2.78	714.662	
3100	294485.861	2252762.578	711.367	CONC	JAW-22	2.20	713.567	
3130	301736.355	2276281.179	654.185	CONC	JAW-23	3.11	657.295	
3141	301677.612	2276782.425	640.609	CONC	JAW-24	2.53	643.139	
3131	301437.160	2276178.932	687.269	CONC	JAW-25	2.64	689.909	

3811	299373.942	2258039.468	703.786	TOP PVC	JAW-26	0.00	703.786	ADDED
[illegible]0	298438.177	2257546.515	686.519	TOP PVC	JAW-27	0.00	686.519	ADDED
[illegible]3	298888.744	2257105.727	698.416	TOP PVC	JAW-28	0.00	698.416	ADDED
1109	299948.442	2264587.866	711.170	CONC	JAW-29	2.76	713.930	
1111	299839.400	2264653.919	711.367	CONC	JAW-30	2.78	714.147	
1110	299859.016	2264589.765	710.973	CONC	JAW-31	2.50	713.473	
3203	297979.473	2255452.097	688.470	CONC	JAW-32	2.26	690.730	
3200	297759.982	2255406.165	682.223	CONC	JAW-33	2.52	684.743	
3201	297766.576	2255403.800	682.423	CONC	JAW-34	2.46	684.883	
3350	296256.474	2256029.285	640.043		JAW-35	2.70	642.743	
3196	294671.645	2256262.013	694.638	CONC	JAW-36	2.16	696.798	ADDED
3202	298003.935	2255311.060	682.778	CONC	JAW-37	2.14	684.918	
1160	305276.840	2268728.809	693.450	CONC	JAW-38 $$	3.07	696.520	
1161	304921.959	2268844.065	692.377	CONC	JAW-39 $$	2.84	695.217	
1162	304746.152	2268941.368	692.960	CONC	JAW-40 $$	2.88	695.840	
1163	304334.821	2269059.094	691.650	CONC	JAW-41 $$	2.91	694.560	
1164	303961.046	2269158.743	686.870	CONC	JAW-42 $$	2.95	689.820	
1175	302681.639	2269208.769	693.920	CONC	JAW-43	3.10	697.020	
1174	302450.366	2269297.666	694.930	CONC	JAW-44	3.74	698.670	
1173	302416.574	2269530.054	702.980	CONC	JAW-45	2.74	705.720	
1172	301997.247	2269809.250	694.270	CONC	JAW-46	2.84	697.110	
1171	302494.890	2270005.142	708.920	CONC	JAW-47	2.65	711.570	
1165	303599.770	2269677.731	701.480	CONC	JAW-48	2.70	704.180	
3149	301932.159	2278390.345	684.277	CONC	JAW-5	2.58	686.857	
1167	304420.740	2269872.193	714.323	CONC	JAW-50	2.53	716.853	
1169	304887.245	2269646.032	714.648	CONC	JAW-51	3.24	717.888	
1168	305164.915	2269635.854	717.357	CONC	JAW-52	2.80	720.157	
3212	299430.212	2267984.985	694.034	CONC	JAW-53	2.08	696.114	
3210	299621.770	2267899.985	695.786	CONC	JAW-54	2.30	698.086	
3209	299889.604	2267896.836	696.436	CONC	JAW-55	2.25	698.686	
3208	300057.920	2267988.456	698.919	CONC	JAW-56	2.29	701.209	
[illegible]07	299892.645	2267414.438	703.867	CONC	JAW-57	2.10	705.967	
[illegible]3	301090.914	2275971.977	685.927	CONC	JAW-58	2.96	688.887	
[illegible]37	300977.692	2276000.409	682.525	CONC	JAW-59	2.58	685.105	
3135	300889.923	2275808.221	681.462	CONC	JAW-60	2.75	684.212	
3667	302311.372	2269017.174	681.406	TOP PVC	JAW-601"	0.00	681.406	
1166	304335.733	2269943.285	711.212	CONC	JAW-602	2.70	713.912	
1170	304880.647	2269640.333	714.792	CONC	JAW-603	2.63	717.422	
1146	303445.158	2263209.630	719.395	CONC	JAW-604	2.41	721.805	
1145	303276.611	2265625.675	717.758	CONC	JAW-605	2.23	719.988	
1149	305421.489	2265655.308	720.294	CONC	JAW-606	2.00	722.294	
1147	305655.806	2263723.586	727.761	CONC	JAW-607	2.35	730.111	
1148	306360.240	2262749.743	727.702	CONC	JAW-608	2.14	729.842	
1150	305412.772	2265654.983	720.061	CONC	JAW-609	2.13	722.191	
3134	300933.273	2275714.619	683.017	CONC	JAW-61	2.46	685.477	
1108	300045.752	2264586.196	710.143	CONC	JAW-610	2.64	712.783	
1112	299833.600	2264775.598	710.812	CONC	JAW-611	2.20	713.012	
1113	299564.791	2264674.316	707.951	CONC	JAW-612	1.11	709.061	
3144	301525.493	2277775.372	673.489	CONC	JAW-614$$	2.25	675.739	CHANGED/CHECK
3118	295985.907	2266737.599	691.290	CONC	JAW-615	2.21	693.500	
3115	296091.534	2266714.817	691.430	CONC	JAW-616	2.33	693.760	
3117	296077.991	2266827.428	691.570	CONC	JAW-617	2.26	693.830	
3204	297991.665	2255466.349	690.547	CONC	JAW-618	2.37	692.917	
3199	297767.072	2255418.908	682.423	CONC	JAW-619	2.14	684.563	
3133	301039.916	2275699.845	685.786	CONC	JAW-62	2.62	688.406	
3647	300972.396	2273526.286	704.342	TOP PVC	JAW-620"	0.00	704.342	
3641	300768.834	2273471.546	700.047	TOP PVC	JAW-621	0.00	700.047	
3643	300774.648	2273362.323	698.859	TOP PVC	JAW-622	0.00	698.859	
3310	306235.261	2261043.987	724.706	CONC	JAW-623	2.18	726.886	
3311	306175.613	2261141.127	725.296	CONC	JAW-624	2.20	727.496	

3120	302687.525	2276046.330	696.383	CONC	JAW-625	2.05	698.433	
3124	302648.181	2276529.495	677.525	CONC	JAW-626	2.27	679.795	
3125	302719.014	2276506.205	680.615	CONC	JAW-627	2.48	683.095	
3132	301171.898	2275739.635	688.959	CONC	JAW-63	2.53	691.489	
3151	302604.070	2278362.425	684.073	CONC	JAW-64	2.64	686.713	
3810	299168.058	2257981.051	704.061	TOP PVC	JAW-65	0.00	704.061	ADDED
3140	301337.563	2276366.028	677.082	CONC	JAW-68	2.53	679.612	
3650	301048.896	2275807.374	688.348	TOP PVC	JAW-69"	0.00	688.348	
3148	302113.179	2278574.583	686.993	CONC	JAW-7	2.33	689.323	
3831	298811.877	2271188.792	685.220	TOP PVC	JAW-70	0.00	685.220	REVISED Pnt. No.
1183	298716.584	2271123.916	682.250	CONC	JAW-71	2.36	684.610	
3221	298203.147	2271214.523	688.140	CONC	JAW-72	2.95	691.090	
1188	298118.866	2271156.721	689.710	CONC	JAW-73	2.70	692.410	
1178	297910.346	2271594.371	691.360	CONC	JAW-74	2.59	693.950	
1177	298524.797	2271746.503	688.780	CONC	JAW-75	3.19	691.970	
3360	285416.046	2280296.136	603.413	TOP PVC	JAW-76	0.00	603.413	ADDED
3206	299416.891	2267439.366	700.569	CONC	JAW-77	2.19	702.759	
3156	293478.009	2270172.146	674.776	CONC	JAW-78	2.93	677.706	
3157	293477.559	2270162.819	674.835	CONC	JAW-79	2.78	677.615	
3301	295355.342	2265187.483	695.432	CONC	JAW-8	2.14	697.572	
3136	300689.655	2275879.274	672.692	CONC	JAW-80	2.64	675.332	
3302	295016.740	2265224.458	695.282	CONC	JAW-9	2.10	697.382	
3629	289366.603	2281379.246	585.419	TOP PVC	JAZ-629	0.00	585.419	
1124	308178.019	2261336.498	729.136	TOP/NO-CAP	MW1-1-94*	0.00	729.136	GRND=TOP PVC
1069	301172.239	2261315.461	716.740	TOP	MW1-91	-0.59	716.150	
3121	302610.989	2276254.201	696.075	LIP	MW1-92	-0.06	696.015	
1134	308342.379	2261251.724	728.939	TOP/NO-CAP	MW2-2-94*	0.00	728.939	GRND=TOP PVC
1071	301173.217	2261324.106	716.650	TOP	MW2-91	-0.18	716.470	
3122	302660.546	2276320.884	693.355	LIP	MW2-92	0.05	693.405	
1135	308380.666	2261274.191	728.821	TOP/CAP	MW3-3-94*	-0.4	728.421	
1099	300565.419	2261636.497	714.360	CONC	MW3-91	1.68	716.040	
3123	302600.018	2276357.842	693.430	LIP	MW3-92	0.13	693.560	
1131	308260.722	2261340.740	728.558	TOP/CAP	MW4-4-94*	-0.45	728.108	
1095	300513.894	2261536.143	716.620	TOP	MW4-91	-0.23	716.390	
1126	308222.435	2261387.561	729.073	TOP/CAP	MW5-5-94*	-0.21	728.863	
1093	300488.133	2261484.503	714.454	GRND	MW5-91	2.44	716.894	
1127	308222.264	2261339.368	728.778	TOP/CAP	MW6-6-94*	-0.32	728.458	
1090	300392.634	2261320.796	710.081	CONC	MW6-91	1.47	711.551	
3606	301167.834	2261748.815	716.606	TOP PVC	NE PIZ"	0.00	716.606	
3607	301163.838	2261744.806	716.872	TOP PVC	NE PIZ"	0.00	716.872	
3605	301171.346	2261753.498	716.557	TOP PVC	NE PIZ"	0.00	716.557	
3609	301112.195	2261097.075	717.006	TOP PVC	NWC PIZ"	0.00	717.006	
3610	301120.134	2261098.231	717.279	TOP PVC	NWN PIZ"	0.00	717.279	
3608	301104.783	2261096.363	716.974	TOP PVC	NWS PIZ"	0.00	716.974	
1102	300653.405	2261792.278	716.997	TOP	PIEZO	0.00	716.997	
1103	300653.765	2261787.655	717.325	TOP	PIEZO	0.00	717.325	
1104	300653.985	2261782.123	717.764	TOP	PIEZO	0.00	717.764	
1077	301112.180	2261097.033	717.065	TOP	PIEZOMETE	0.00	717.065	
1078	301120.018	2261098.303	717.357	TOP	PIEZOMETE	0.00	717.357	
1076	301104.788	2261096.505	717.016	TOP	PIEZOMETE	0.00	717.016	
1086	300309.806	2261125.278	713.332	TOP	PIZO	0.00	713.332	
1085	300315.328	2261123.841	712.840	TOP	PIZO	0.00	712.840	
1084	300320.853	2261122.450	712.758	TOP	PIZO	0.00	712.758	
3651	301086.994	2275822.703	689.917	TOP PVC	PIZ?"	0.00	689.917	
3655	301103.027	2275787.14	689.795	TOP PVC	PIZ?"	0.00	689.795	
3654	301109.549	2275804.808	689.697	TOP PVC	PIZ?"	0.00	689.697	
3652	301106.88	2275820.409	689.021	TOP PVC	PIZ?"	0.00	689.021	
3653	301115.327	2275820.717	689.411	TOP PVC	PIZ?"	0.00	689.411	
3656	301106.854	2275852.937	690.491	TOP PVC	PIZ?"	0.00	690.491	
3600	299637.416	2264505.006	711.101	TOP PVC	R10PZ-01"	0.00	711.101	

3601	299696.71	2264444.329	706.501	TOP PVC	R10PZ-02"	0.00	706.501	
[illegible]2	299770.227	2264593.941	710.018	TOP PVC	R10PZ-03"	0.00	710.018	
[illegible]	298796.328	2270451.148	666.157	GRND	RO2-PZ-29		*********	
3615	300653.86	2261787.553	717.302	TOP PVC	SEC PIZ"	0.00	717.302	
3614	300653.582	2261792.418	716.947	TOP PVC	SEE PIZ"	0.00	716.947	
3616	300654.193	2261782.138	717.715	TOP PVC	SEW PIZ"	0.00	717.715	
3666	302383.992	2268977.12	681.117	TOP PVC	SL-81"	0.00	681.117	
3665	301574.798	2269740.834	674.047	TOP PVC	SL-91"	0.00	674.047	
3611	300320.868	2261122.514	712.758	TOP PVC	SWN PIZ"	0.00	712.758	
3613	300309.566	2261125.476	713.302	TOP PVC	SWN PIZ"	0.00	713.302	
1201	299883.823	2257421.555	710.980	CONC	T-1	1.67	712.650	
1066	302425.189	2265207.566	722.820	CONC	T10	2.20	725.020	
1065	302426.170	2265198.842	722.600	CONC	T11	1.86	724.460	
1064	302418.178	2265202.953	723.060	CONC	T12	2.06	725.120	
1048	302089.812	2265732.512	717.856	CONC	T13	2.06	719.916	
1049	302090.032	2265724.694	717.774	CONC	T14	2.05	719.824	
1050	302090.180	2265715.282	717.607	CONC	T15	2.07	719.677	
1056	301883.894	2265729.415	715.747	CONC	T16	2.06	717.807	
1055	301884.272	2265721.686	715.881	CONC	T17	1.96	717.841	
1054	301877.897	2265724.602	715.566	CONC	T18	1.97	717.536	
1008	301243.938	2265472.365	714.802	CONC	T-19	2.41	717.212	
1006	301251.825	2265467.897	714.664	CONC	T-20	2.37	717.034	
1007	301252.291	2265475.115	714.710	CONC	T-21	2.08	716.790	
1014	301249.834	2265262.382	713.604	CONC	T22	2.10	715.704	
1016	301249.873	2265254.830	713.453	CONC	T23	2.18	715.633	
1015	301243.154	2265258.517	713.690	CONC	T24	2.10	715.790	
1020	301229.834	2264971.730	713.200	CONC	T25	2.28	715.480	
1022	301229.542	2264964.784	713.360	CONC	T26	2.07	715.430	
1021	301222.213	2264969.722	713.520	CONC	T27	2.12	715.640	
1030	301237.442	2264783.361	713.670	CONC	T28	2.10	715.770	
1029	301237.137	2264775.139	713.740	CONC	T29	2.05	715.790	
[illegible]8	301228.784	2264779.752	713.910	CONC	T30	2.23	716.140	
[illegible]3	301236.491	2264399.310	713.260	CONC	T31	2.02	715.280	
1036	301236.412	2264390.064	712.850	CONC	T32	2.00	714.850	
1032	301236.822	2264424.861	713.644	CONC	T33	1.86	715.504	
1042	301162.728	2264132.312	712.770	CONC	T34	2.28	715.050	
1041	301162.285	2264126.778	712.610	CONC	T35	3.40	716.010	
1040	301157.432	2264131.292	712.520	CONC	T36	2.43	714.950	
3816	299482.163	2257121.988	706.562	TOP PVC	T-4	0.00	706.562	ADDED
1208	299582.157	2257124.675	707.440	CONC	T-5	2.15	709.590	
1204	299884.026	2257431.597	711.209	CONC	T-6	1.66	712.869	
1210	299304.779	2257118.074	703.673	TOP	T-9	-0.37	703.303	
1133	308251.372	2261254.018	728.791	TOP/CAP	???1-94		728.791	

$$ Per Lori Landesh wells were miss marked or not marked
Well shot as No. 3144 should be JAW 614
points 1160-1164 were given the well names by Lori
points 1122,1124,1125 posible DM-5, 1-94 COULD NOT READ IN FIELD
JAW-49 Unknown location per Lori
T-2 & T-3 were destroyed by ECC per Lori
R01-PZ-96 Was destroyed by lawn mower per Lori
JAW-76 was miss labeled, was point 1180, now is point 3360 & JAW-70 is point 3831
the "GZ*" & "MW*" wells were renamed per Harza well inventory

Proj# 97-219: Harza, Iowa

Datum = NAD8 Units = U.S. feet
Zone = Iowa South

Note = '*****' Requires field checks

Combination scale factors

DATE:9/02/97

Ground-to-grid = 0.999945715386487
Grid-to-Ground = 1.00005428756049

FILE: HARZA4.WK4
90297B.TXT

Point	Northing	Easting	Elevatio	Descriptor	Well No.	
1006	301251.83	2265467.90	714.664	CONC		
1007	301252.29	2265475.12	714.710	GRND		
1008	301243.94	2265472.37	714.802	CONC		
1181	298818.82	2271164.54	681.650	CONC	10-A	
1182	298806.45	2271150.95	681.550	CONC	10-B	
1184	298784.75	2270801.45	679.140	CONC	12-A	
1187	297915.94	2270847.36	689.230	CONC	12-B	
1185	297922.07	2270834.60	689.180	CONC	12-C	
1186	297912.51	2270838.11	689.280	CONC	12-D	
3661	297294.43	2271125.72	688.53	GRND	12E"	CHANGE ELEV.
3222	298192.91	2271212.04	688.260	CONC	12-F	
3660	298035.12	2270441.18	687.97	GRND	12G"	CHANGE ELEV.
3689	298714.48	2269728.12	688.13	GRND	12H"	CHANGE ELEV.
3356	287765.68	2277255.51	627.67	GRND	13-B	ADDED
3625	288128.01	2278281.71	652.84	GRND	13D"	CHANGE ELEV.
3626	288119.44	2278285.28	652.56	GRND	13E"	CHANGE ELEV.
3355	288227.22	2278612.31	658.65	GRND	13-F	ADDED
3175	298163.35	2275920.27	691.570	CONC	14-A	
3174	292254.885	2276161.786	678.276	CONC	14-B	ADDED
3636	290752.72	2267497.68	684.35	GRND	14C"	CHANGE ELEV.
3825	287166.847	2273458.783	676.806	TOP CONC	14D	ADDED
3617	298555.57	2262676.38	689.81	GRND	14-E	ADDED
3183	285498.92	2260874.06	675.163	CONC	14-F	
3211	299600.88	2267990.91	694.349	CONC	16-A	
3216	300701.11	2268410.42	699.146	CONC	16-B	
3215	300002.28	2268670.78	695.655	CONC	16-C	

3213	298983.33	2268246.04	695.773	CONC	16-D	
3214	298986.45	2268235.55	695.694	CONC	16-E	
3646	300960.26	2273445.47	702.08	GRND	6A"	CHANGE ELEV.
3648	300871.41	2273477.46	700.05	GRND	6B"	CHANGE ELEV.
44	300775.46	2273261.74	698.76	GRND	6D"	CHANGE ELEV.
3642	300773.06	2273415.77	698.14	GRND	6E"	CHANGE ELEV.
3645	301133.74	2273447.61	704.28	GRND	6F"	CHANGE ELEV.
3649	300770.32	2273582.7	699.1	GRND	6G"	CHANGE ELEV.
3662	299254.49	2271456	699.86	GRND	C3"	CHANGE ELEV.
3663	299169.73	2271406.31	700.95	GRND	C4"	CHANGE ELEV.
3664	299117.1	2271409.03	700.44	GRND	C5"	CHANGE ELEV.
3612	300315.17	2261123.93	711.08	GRND	CWN PIZ"	CHANGE ELEV.
3828	302630.079	2276346.813	690.67	GRND	CWP	ADDED
3315	290997.36	2254503.29	673.53	CONC	DA-1	
3671	290488.49	2255342.01	678.29	GRND	DA-2"	CHANGE ELEV.
1125	308178.593	2261345.933	729.195	TOP/CAP	DM $$	
1129	308266.411	2261314.697	729.060	TOP/CAP	DM1	
1123	308175.965	2261326.855	729.123	TOP/CAP	DM10	
1130	308272.300	2261332.269	729.090	TOP/CAP	DM2	
1138	308176.054	2261326.868	729.165	TOP/CAP	DM4	
1122	307925.943	2261360.149	728.611	TOP/CAP	DM5	
1136	308424.869	2261281.376	729.467	TOP/CAP	DM7	
1137	308292.884	2261365.917	728.893	TOP/CAP	DM8	
1132	308292.848	2261365.914	728.844	TOP/CAP	DM8	
1128	308243.321	2261293.952	729.080	TOP/CAP	DM9	
3152	302531.23	2277976.00	692.469	CONC	EDA-1	
46	301754.98	2277542.68	671.619	CONC	EDA-2	
3145	301532.76	2277786.85	674.323	CONC	EDA-3	
3147	302331.69	2278505.77	683.404	CONC	EDA-4	
1200	299345.75	2257404.93	708.306	CONC	ET3	
1105	300871.71	2261809.03	711.34	GRND	FL-1	
1087	300322.96	2261176.72	710.92	GRND	FL-10	
1100	300624.14	2261752.83	711.45	GRND	FL-2	
1097	300517.34	2261578.24	714.21	GRND	FL-3	
1091	300428.87	2261389.37	710.40	GRND	FL-4	
1072	301109.94	2261367.33	714.33	GRND	FL-6	
1074	301130.07	2261217.29	714.13	GRND	FL-7	
1080	300965.90	2261058.05	716.64	GRND	FL-8	
1082	300606.31	2261093.87	712.40	GRND	FL-9	
3624	308431.26	2257254.93	715.95	GRND	G-1	CHANGE ELEV.
3318	290362.46	2254583.3	681.92	CONC	G-10	
3316	290363.43	2255073.45	691.64	GRND	G-11	
3180	286080.609	2256943.153	663.32	GRND	G-12	
3321	285340.429	2256682.915	646.74	GRND	G-13	
3900	301223.16	2269900.13	675.94	GRND	G-14	

3658	297090.86	2270105.31	656.08	GRND	G15	9/02/97
3167	294333.863	2269584.447	681.17	GRND	G-17	
3173	294034.566	2269584.539	680.06	GRND	G-18	
3166	293799.681	2269409.356	680.26	GRND	G-19	
3357	306250.000	2251075.750	715.24	GRND	G-2	
3165	293628.517	2269126.758	683.42	GRND	G-20	
3358	282927.210	2266240.673	538.79	GRND	G-21	ADDED
3362	283054.14	2272254.63	675.94	GRND	G-22	ADDED
3361	283038.35	2275300.3	669.55	GRND	G-23	ADDED
3359	285423.67	2280303.83	600.11	GRND	G-24	9/02/97
3308	286728.663	2282607.649	628.09	GRND	G-25	
3307	291572.369	2282728.111	656.42	GRND	G-26	
3323	295091.229	2282664.394	666.85	GRND	G-27	
3322	298829.667	2282580.547	674.691	CONC	G-28	
3150	301798.671	2278171.589	681.9	GRND	G-29	
3300	303605.525	2246948.516	684.10	GRND	G-3	
3139	301118.069	2276554.971	652.01	GRND	G-30	
3621	301369.519	2246846.139	666.818	GRND	G-31	
1205	299871.19	2257854.27	705.980	GRND	G-4	
3163	293533.514	2268442.560	682.28	GRND	G-40	
3164	293536.588	2268438.331	682.53	GRND	G-41	
3169	294492.643	2269968.518	683.14	GRND	G-42	
3168	294485.973	2269970.004	683.26	GRND	G-43	
3171	294176.849	2270109.994	679.70	GRND	G-44	
3170	294164.631	2270107.737	679.73	GRND	G-45	
3172	294298.234	2268682.812	681.88	GRND	G-48	
3312	307173.596	2267602.088	718.11	GRND	G-49	
3817	298640.676	2257049.021	689.097	GRND	G-5	ADDED
3631	294463.36	2271971.05	643.92	GRND	G-51	ADDED
3351	290931.405	2272885.614	634.72	GRND	G-52	
3352	290938.263	2272872.350	634.82	GRND	G-53	
3353	287849.316	2277849.862	611.64	GRND	G-54	
3354	287858.386	2277845.893	610.98	GRND	G-55	
3162	294229.726	2269098.661	679.87	GRND	G-56	
3160	294094.323	2269126.728	680.29	GRND	G-57	
3161	294143.949	2269201.794	680.23	GRND	G-58	
1213	298712.920	2257973.975	**********	GRND	G-6	
3819	298405.029	2257400.410	692.78	GRND	G-7	ADDED
3677	295073.53	2257681.42	611.06	TOP PVC	G-8	ADDED
3313	291348.18	2254924.65	692.11	CONC	G-9	
3812	299459.6	2258078	700.76	GRND	GP-1	ADDED
1207	299762.081	2257131.227	710.786	CONC	GP-4	
1206	299915.00	2257836.63	704.61	CONC	GP-5	
1212	299112.67	2257685.06	702.646	GRND	GV6	
1191	301378.45	2269942.80	682.905	CONC	GZ-1	

1194	301369.74	2269782.54	671.240	CONC	GZ-2	
1043	302164.93	2263899.38	722.16	GRND	GZ2-1	
1024	301048.48	2264894.67	713.210	CONC	GZ2-18	
1023	301076.67	2264894.26	713.280	CONC	GZ2-18A	
1000	301349.483	2265868.775	713.155	GRND	GZ2-19	ADDED
1195	301383.95	2269776.47	671.560	CONC	GZ-2A	
1193	301359.67	2269625.40	678.060	CONC	GZ-3	
1154	303801.17	2264358.79	724.257	CONC	GZ3-1	
1153	303881.59	2264509.53	724.716	CONC	GZ3-2	
1156	303649.27	2264636.86	722.925	GRND	GZ3-3	
1152	303483.67	2264626.54	721.718	CONC	GZ3-4	
1155	303521.84	2264561.02	722.886	CONC	GZ3-5	
3694	303583.88	2269004.8	683.84	GRND	GZ-6	ADDED
1196	302384.53	2268976.45	679.190	CONC	JAW	
3314	291010.03	2254502.8	674.45	CONC	JAW 1	
3303	295053.699	2264610.153	686.856	CONC.	JAW 10	
3126	302277.83	2276101.55	688.594	CONC	JAW-11	
3127	302004.82	2276224.44	674.129	CONC	JAW-12	
3128	301965.12	2276121.16	667.177	CONC	JAW-13	
3129	302035.48	2276036.11	671.272	CONC	JAW-14	
3103	295233.68	2251812.85	710.681	CONC	JAW-15	
3102	295159.87	2252073.65	710.980	CONC	JAW-16	
3104	295635.23	2251938.70	709.326	CONC	JAW-17	
3105	295621.01	2251952.96	709.244	CONC	JAW-18	
3101	294739.22	2252369.54	713.227	CONC	JAW-19	
3317	290453.07	2254903.05	682.75	CONC	JAW-2	
3106	295012.03	2252816.94	711.895	CONC	JAW-20	
3107	295005.94	2252808.61	711.882	CONC	JAW-21	
3100	294485.86	2252762.58	711.367	CONC	JAW-22	
3130	301736.36	2276281.18	654.185	CONC	JAW-23	
3141	301677.61	2276782.43	640.609	CONC	JAW-24	
3131	301437.16	2276178.93	687.269	CONC	JAW-25	
3811	299373.94	2258039.47	701.69	GRND	JAW-26	ADDED
3820	298438.177	2257546.515	684.22	GRND	JAW-27	ADDED
3818	298888.744	2257105.727	695.82	GRND	JAW-28	ADDED
1109	299948.44	2264587.87	711.170	CONC	JAW-29	
1111	299839.40	2264653.92	711.367	CONC	JAW-30	
1110	299859.02	2264589.77	710.973	CONC	JAW-31	
3203	297979.47	2255452.10	688.470	CONC	JAW-32	
3200	297759.98	2255406.17	682.223	CONC	JAW-33	
3201	297766.58	2255403.80	682.423	CONC	JAW-34	
3196	294671.65	2256262.01	694.64	CONC	JAW-36	ADDED
3202	298003.94	2255311.06	682.778	CONC	JAW-37	
1160	305276.84	2268728.81	693.450	CONC	JAW-38 $$	
1161	304921.96	2268844.07	692.377	CONC	JAW-39 $$	

3304	301600.473	2277336.615	657.951	CONC.	JAW-4	
1162	304746.15	2268941.37	692.960	CONC	JAW-40 $$	
1163	304334.82	2269059.09	691.650	CONC	JAW-41 $$	
1164	303961.05	2269158.74	686.870	CONC	JAW-42 $$	
1175	302681.64	2269208.77	693.920	CONC	JAW-43	
1174	302450.37	2269297.67	694.930	CONC	JAW-44	
1173	302416.57	2269530.05	702.980	CONC	JAW-45	
1172	301997.25	2269809.25	694.270	CONC	JAW-46	
1171	302494.89	2270005.14	708.920	CONC	JAW-47	
1165	303599.77	2269677.73	701.480	CONC	JAW-48	
3149	301932.16	2278390.35	684.277	CONC	JAW-5	
1167	304420.74	2269872.19	714.323	CONC	JAW-50	
1169	304887.25	2269646.03	714.648	CONC	JAW-51	
1168	305164.92	2269635.85	717.357	CONC	JAW-52	
3212	299430.21	2267984.99	694.034	CONC	JAW-53	
3210	299621.77	2267899.99	695.786	CONC	JAW-54	
3209	299889.60	2267896.84	696.436	CONC	JAW-55	
3208	300057.92	2267988.46	698.919	CONC	JAW-56	
3207	299892.65	2267414.44	703.867	CONC	JAW-57	
3138	301090.91	2275971.98	685.927	CONC	JAW-58	
3137	300977.69	2276000.41	682.525	CONC	JAW-59	
3305	302366.369	2278608.671	675.402	CONC.	JAW-6	
3135	300889.92	2275808.22	681.462	CONC	JAW-60	
1197	302311.830	2269017.266	679.210	CONC	JAW-601	
1166	304335.73	2269943.29	711.212	CONC	JAW-602	
1170	304880.65	2269640.33	714.792	CONC	JAW-603	
1146	303445.16	2263209.63	719.395	CONC	JAW-604	
1145	303276.61	2265625.68	717.758	CONC	JAW-605	
1149	305421.49	2265655.31	720.294	CONC	JAW-606	
1147	305655.81	2263723.59	727.761	CONC	JAW-607	
1148	306360.24	2262749.74	727.702	CONC	JAW-608	
1150	305412.77	2265654.98	720.061	CONC	JAW-609	
3134	300933.27	2275714.62	683.017	CONC	JAW-61	
1108	300045.75	2264586.20	710.143	CONC	JAW-610	
1112	299833.60	2264775.60	710.812	CONC	JAW-611	
1113	299564.79	2264674.32	707.951	CONC	JAW-612	
3144	301525.493	2277775.372	673.489	CONC	JAW-614$$	
3118	295985.91	2266737.60	691.290	CONC	JAW-615	
3115	296091.53	2266714.82	691.430	CONC	JAW-616	
3117	296077.99	2266827.43	691.570	CONC	JAW-617	
3204	297991.67	2255466.35	690.547	CONC	JAW-618	
3199	297767.07	2255418.91	682.423	CONC	JAW-619	
3133	301039.92	2275699.85	685.786	CONC	JAW-62	
3647	300972.4	2273526.29	702.07	GRND	JAW-620"	CHANGE ELEV.
3641	300768.83	2273471.55	697.85	GRND	JAW-621	CHANGE ELEV.

3643	300774.66	2273362.35	697.06	GRND	JAW-622"	CHANGE ELEV.
3310	306235.261	2261043.987	724.706	CONC.	JAW-623	
3311	306175.613	2261141.127	725.296	CONC.	JAW-624	
20	302687.53	2276046.33	696.383	CONC	JAW-625	
3124	302648.18	2276529.50	677.525	CONC	JAW-626	
3125	302719.01	2276506.21	680.615	CONC	JAW-627	
3132	301171.90	2275739.64	688.959	CONC	JAW-63	
3151	302604.07	2278362.43	673.489	CONC	JAW-64	
3144	301525.49	2277775.37	684.073	CONC	JAW-64??	
3810	299168.06	2257981.05	702.16	GRND	JAW-65	ADDED
3140	301337.56	2276366.03	677.082	CONC	JAW-68	
3650	301048.9	2275807.37	685.87	GRND	JAW-69"	CHANGE ELEV.
3148	302113.18	2278574.58	686.993	CONC	JAW-7	
3831	298811.877	2271188.792	682.37	GRND	JAW-70	ADDED
1183	298716.58	2271123.92	682.250	CONC	JAW-71	
3221	298203.15	2271214.52	688.140	CONC	JAW-72	
1188	298118.87	2271156.72	689.710	CONC	JAW-73	
1178	297910.35	2271594.37	691.360	CONC	JAW-74	
1177	298524.80	2271746.50	688.780	CONC	JAW-75	
3360	285416.05	2280296.14	600.83	GRND	JAW-76	9/02/97
3206	299416.89	2267439.37	700.569	CONC	JAW-77	
3156	293478.01	2270172.15	674.776	CONC	JAW-78	
3157	293477.56	2270162.82	674.835	CONC	JAW-79	
3301	295355.342	2265187.483	695.432	CONC.	JAW-8	
3136	300689.66	2275879.27	672.692	CONC	JAW-80	
02	295016.740	2265224.458	692.000	CONC.	JAW-9	CHANGE ELEV.
3629	289366.603	2281379.246	582.95	TOP PVC	JAZ-629.	CHANGE ELEV.
1124	308178.019	2261336.498	729.136	TOP/CAP	MW1-1-94*	
1068	301172.80	2261315.40	714.57	GRND	MW1-91	
3121	302610.989	2276254.201	694.68	GRND	MW1-92	ADDED
1134	308342.379	2261251.724	728.939	TOP/CAP	MW2-2-94*	
1070	301173.93	2261324.04	714.63	GRND	MW2-91	
3122	302660.546	2276320.884	691.31	GRND	MW2-92	ADDED
3122	302660.546	2276320.884	691.31	GRND	MW2-92	ADDED
1135	308380.666	2261274.191	728.821	TOP/CAP	MW3-3-94*	
1099	300565.42	2261636.50	714.360	CONC	MW3-91	
3123	302600.018	2276357.842	691.73	GRND	MW3-92	ADDED
3123	302600.018	2276357.842	691.73	GRND	MW3-92	ADDED
1131	308260.722	2261340.740	728.558	TOP/CAP	MW4-4-94*	
1096	300514.45	2261535.85	714.65	GRND	MW4-91	
1126	308222.435	2261387.561	729.073	TOP/CAP	MW5-5-94*	
1093	300488.13	2261484.50	714.454	GRND	MW5-91	
1127	308222.264	2261339.368	728.778	TOP/CAP	MW6-6-94*	
1090	300392.634	2261320.796	710.081	CONC	MW6-91	
3606	301167.83	2261748.82	715.31	GRND	NE PIZ"	CHANGE ELEV.

3607	301163.84	2261744.81	715.27	GRND	NE PIZ"	CHANGE ELEV.
3605	301171.35	2261753.5	715.36	GRND	NE PIZ"	CHANGE ELEV.
3609	301112.2	2261097.08	715.51	GRND	NWC PIZ"	CHANGE ELEV.
3610	301120.13	2261098.23	715.58	GRND	NWN PIZ"	CHANGE ELEV.
3608	301104.78	2261096.36	715.37	GRND	NWS PIZ"	CHANGE ELEV.
3654	301109.55	2275804.81	686.4	GRND	PIZ?"	CHANGE ELEV.
3655	301103.03	2275787.14	686	GRND	PIZ?"	CHANGE ELEV.
3652	301106.88	2275820.41	685.52	GRND	PIZ?"	CHANGE ELEV.
3651	301086.99	2275822.7	686.52	GRND	PIZ?"	CHANGE ELEV.
3656	301106.85	2275852.94	687.49	GRND	PIZ?"	CHANGE ELEV.
3653	301115.33	2275820.72	686.41	GRND	PIZ?"	CHANGE ELEV.
3600	299637.42	2264505.01	707.55	GRND	R10PZ-01"	CHANGE ELEV.
3601	299696.71	2264444.33	705.4	GRND	R10PZ-02"	CHANGE ELEV.
3602	299770.23	2264593.94	709.02	GRND	R10PZ-03"	CHANGE ELEV.
1190	298796.33	2270451.15	666.16	GRND	RO2-PZ-29	
3615	300653.86	2261787.55	716	GRND	SEC PIZ"	CHANGE ELEV.
3614	300653.58	2261792.42	715.95	GRND	SEE PIZ"	CHANGE ELEV.
3616	300654.19	2261782.14	716.32	GRND	SEW PIZ"	CHANGE ELEV.
3666	302383.99	2268977.12	679.02	GRND	SL-81"	CHANGE ELEV.
3665	301574.8	2269740.83	671.95	GRND	SL-91"	CHANGE ELEV.
3613	300309.57	2261125.48	711	GRND	SWN PIZ"	CHANGE ELEV.
3611	300320.87	2261122.51	711.36	GRND	SWN PIZ"	CHANGE ELEV.
1201	299883.82	2257421.56	710.980	CONC	T-1	
1066	302425.19	2265207.57	722.820	CONC	T10	
1065	302426.17	2265198.84	722.600	CONC	T11	
1064	302418.18	2265202.95	723.060	CONC	T12	
1048	302089.81	2265732.51	717.856	CONC	T13	
1049	302090.03	2265724.69	717.774	CONC	T14	
1050	302090.18	2265715.28	717.607	CONC	T15	
1056	301883.89	2265729.42	715.747	CONC	T16	
1055	301884.27	2265721.69	715.881	CONC	T17	
1054	301877.90	2265724.60	715.566	CONC	T18	
1014	301249.83	2265262.38	713.604	CONC	T22	
1016	301249.87	2265254.83	713.453	CONC	T23	
1015	301243.15	2265258.52	713.690	CONC	T24	
1020	301229.83	2264971.73	713.200	CONC	T25	
1022	301229.54	2264964.78	713.360	CONC	T26	
1021	301222.21	2264969.72	713.520	CONC	T27	
1030	301237.44	2264783.36	713.670	CONC	T28	
1029	301237.14	2264775.14	713.740	CONC	T29	
1028	301228.78	2264779.75	713.910	CONC	T30	
1033	301236.49	2264399.31	713.260	CONC	T31	
1036	301236.41	2264390.06	712.850	CONC	T32	
1032	301236.82	2264424.86	713.644	CONC	T33	
1042	301162.73	2264132.31	712.770	CONC	T34	

1041	301162.29	2264126.78	712.610	CONC	T35	
1040	301157.43	2264131.29	712.520	CONC	T36	
3816	299482.163	2257121.988	704.56	GRND	T-4	ADDED
[illegible]08	299582.16	2257124.68	707.440	CONC	T-5	
[illegible]04	299884.03	2257431.60	711.209	CONC	T-6	
1209	299482.65	2257122.12	704.339	CONC	WELL	
3174	292254.89	2276161.79	678.276	CONC	WELL YARD-D	
1133	308251.372	2261254.018	728.791	TOP/CAP	???1-94	

NOTE: revised JAW 9 elevation 8/28/97. (Found reduction error during QC)
JAW-76 was miss labeled, was point 1180, now is point 3360 & JAW-70 is point 3831

CHAPTER 4

CONCLUSION

ASC American Surveying Consultants, P.C. has successfully conducted a survey campaign to determine horizontal and vertical positions of Monitor Wells, Piezometers, and Borings using Global Positioning System (GPS) technique for Iowa Army Ammunition Plant in Des Moines County, Iowa. Analysis of the results has shown that the actually achieved survey accuracy is about 1 cm horizontally, and 1 to 2 cm vertically, and that has met or exceeded the project standards and specifications.

REFERENCES

1. Geometric Geodetic Accuracy Standards and Specifications for Using GPS Relative Positioning Techniques, Version 5.0. Federal Geodetic Control Committee, 1988

HARZA

IOWA

EMRR

Field Book

F-644

RTR

HARZA ENGINEERING COMPANY
CHICAGO

35

CLR 42

1/1

97-219 6-23-97

		RTK			
		Line 6			
TG: 1	HI = 5.15				
1001	22-19	Dirt			
1002	Re-Initialization.				
1010	"	"	"		
1011	Disc	T-22	Elev = 713.66		
1012	Disc	T-24	Elev = 713.64		
1013	Disc	T-23	Elev = 713.44		
1014	Conc	T-22			
1015	Conc	T-24			
1016	Conc	T-23			
1017	Disc	T-25			
1018	Disc	T-27			
1019	Disc	T-26			
1020	Conc	T-25			
1021	Conc	T-27			
1022	Conc	T-26			
1023	Conc	22-18 A			
1024	Conc	22-18			
1025	Disc	T-28			

6-25-97

2/1

97-219

		Line 6			
		CONC.			
1026	Disc.	T-29			
1027	Disc.	T-30			
1028	CONC	T-30			
1029	CONC	T-29			
1030	CONC	T-28			
1031	Disc	T-33			
1032	CONC	T-33			
1033	CONC	T-31			
1034	Disc	T-31			
1035	Disc	T-32			
1036	CONC	T-32			
1037	Disc	T-34			
1038	Disc	T-35			
1039	Disc	T-36			
1040	CONC	T-36			
1041	CONC	T-35			
1042	CONC	T-34			
1043	Ground	ZZ-1	(GZZ-1)		
1044	Top	ZZ-1	(GZZ-1)		
		CONT...			

6-23-97

3/1

97-219

		Line 6			
		CONT...			
1045	Disc	T-15			
1046	Disc	T-14			
1047	Disc	T-13			
1048	CONC	T-13			
1049	CONC	T-14			
1050	CONC	T-15			
1051	Disc	T-16			
1052	Disc	T-17			
1053	Disc	T-18			
1054	CONC	T-18			
1055	CONC	T-17			
1056	CONC	T-16			
1057	Set PK	FS	&	Pt	

38

RTK
Line 6

TB 1057 HI: 5.26

1058 Ground Vector

1059 FS ch 1

1060 Initialize

TB 1057 HI: 5.26

1061 Disc T-10
1062 Disc T-11
1063 Disc T-12
1064 Conc T-12
1065 Conc T-11
1066 Conc. T-10
1067 FS set 60D Nail
1068 Ground MW1-91
1069 Top " "
1070 Ground MW2-91
1071 Top " "

CONT...

6-24-97
CLR 90°

97-219

4/1

6-24

5/1

97-219

1072	Ground	FL-6			
1073	Top	FL-6			
1074	Ground	FL-7			
1075	Top	FL-7			
1076	Top	Piezometer			
1077	"	"			
1078	"	"			
1079	Brass	Plug ?			
1080	Ground	FL-8			
1081	Top	FL-8			
1082	Ground	FL-9			
1083	Top	FL-9			
1107	FS	CK	1067	60D Nail	
1116	FS	CK	1108	PK	Line 9
1121	FS	CK	1	IR	

4

6-24-97

6/1

97-219

⊼ @ 1119 HI: 4.85

⊼ @ 1067 HI: 5.23

1141 FS ck 1117

6-25-97
CLDY / CLR 88°

7/1

97-219

T @ 1117 HI: 5.21

1142 set 5/8" IR D RD.
1143 Set 5/8" IR @ Gavid Rail D Rd.

1144 FS CK ON 1 ✓ ok
Shut Down for Sets. and
I have to have a safty class
To go in to Line 4A

T @ 1117 HI: 5.21 (CONT.)
after safty class

1145 CONC JAW-605 ~ Need Safty class to get to #1 hour.

1146 CONC. JAW-604
1147 CONC JAW-607
1148 CONC JAW-608
1149 CONC JAW-606
1150 CONC JAW-609
1151 FS CK 1118 PK
1152 CONC 23-4
1153 CONC 23-2
1154 CONC 23-1
CONT..

6-25-97

97-219

8/1

CONT

1155	CONC.	Z3-5
1156	Ground	Z3-3
1157	Top	Z3-3
1158	FS CK	1118
1159	set PK	

X@ 1142 HI: 5.18

1160	CONC	JAW-38
1161	CONC	JAW-39
1162		
1163		
1164		
1165		
1166		
1167		
1168		
1169		
1170		
1171		

CONT...

CONT

1172
1173
1174
1175

1176 FS CK 1143

TO 1142 HI: 5.18 (CONT)

6-25-97

9/1

97.219

T@ 1139 HI: 5.30

6-27-97
CLR 85°

10/1

97-219

RR
JO

97-219

Base ① 7884 @ 1118 PK HI: 1.596
(Tim 14:17)

Base ② 7853 @ 1057 PK HI: 1.685
(Tim 14:30)

	Pt #	HI	Rover #	NOTE
① Rover	2000	HI: 2.000 m	3675	
① A Rover	2001	HI: ~~2.000 m~~	16288 M	NOTE: Rod is 2.103 m NOT 2.000
② Rover	2002	HI: 2.000 m	3675	
③ Rover	2003	HI: 2.000 m	3675	
② A Rover	2005	HI: 2.103	16288	
④ Rover	2004	HI: 2.000	3675	

NOTE: IN Down Load of 7853 I changed # to 1057

Base ① 7884 @ 1139 HI: 1.658

Base ② 7853 @ 1 HI 1.603

SESSION 1

2006 16288 HI: 2.103 m
↳ 60D

2007 3675 HI: 2.000m
↳ 60D

SESSION 2

2008 3675 HI: 2.000m
↳ 60D

2009 16288 HI: 2.103m
↳ 60D

SESSION 3

2010 16288 HI: 2.103m
↳ 60D

2011 3675 HI: 2.000m
↳ 60D

7-2-97
RR
JO

CLR 850

12/1

97-219

SESSION 4

2012 16288 HI: 2.103 m
↳ PK

2013 3675 HI: 2.000m
↳ PK

SESSION 5

2014 16288 HI: 2.103m
↳ PK

2015 3675 HI: 2.000m
↳ PK

SESSION 6

2016 16288 HI: 2.103m
↳ PK

2017 3675 HI: 2.000m
↳ PK

Base ① Check 7884 @ 1139 HI 1.657 ✓ OK

Base ② check 7853 @ 1 HI: 1.603 ✓ OK

Base ① 7884 @ 1117 HI=1.560 m

Base ② 7853 @ 1142 HI=1.574 m

SESSION 7

2018 16288 HI: 2.103 m
↳ 60D (Rod moved Re-Started) NOTE

2019 3675 HI: 2.000 m
↳ 60D

SESSION 8

2020 16288 HI: 2.103 m
↳ 60D

2021 3675 HI: 2.000 m
↳ 60D

SESSION 9

2022 16288 HI: 2.103 m
↳ PK

2023 3675 HI: 2.000 m
↳ PK

7-2-97

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97-219

SESSION 10

2024 16288 HI: 2.103 m
↳ 60D

2025 3675 HI: 2.000 m
↳ PK

SESSION 11

2026 16288 HI: 2.103 m
↳ PK

2027 3675 HI: 2.000
↳ PK

SESSION 12

2028 16288 HI: 2.103 m
↳ 60D

Change to 2029

2029 3675 HI: 2.000 m
↳

Base 7884 @ 1117 HI: 1.560 m OK ✓

Base 7853 @ 1142 HI: 1.574 m (was Slot Down)

7-3-97
RR
JO

CLR 800

97-219

14/1

Base ① 7884 ② 2013 HI: 1.565m

Base ② 7853 ③ 2023 HI: 1.674m

2034 SESSION 1

~~2028~~ 16288 HI: 2.103

↳ 60D

2033

~~2029~~ 3675 HI: 2.000

↳ 60D

SESSION 2

2030 16288 HI: 2.103

↳ 60D

2031 3675 HI: 2.000m

↳ 60D

SESSION 3

~~2032 16288~~

~~↳ 60D~~

~~2033 3675~~

~~↳ 60D~~

OIP

SESSION 5

SESSION 6

SESSION 7

7-7-97
JR
JO

CLR 80°

15/1

97-219

Base ① 7884 @ ① HI: 1.638

Base ② 7853 @ 2023 HI: 1.608

SESSION 1

2026 16288 HI: 2.100
↳ 60D

2027 3675 HI: 2.000
↳ 60D

SESSION 2

2028 16288 HI: 2.100
↳ 60D

2029 3675 HI: 2.000
↳ 60D

check

Base ① 7884 @ ① HI: 1.638 ✓ OK

Base ② 7854 @ 2023 HI: 1.608 ✓ OK

25

Base ① 7884 @ 2022 HI = 1.580

Base ② 7853 @ 2012 HI: 1.635

SESSION 1

2034 3675 HI: 2.000
↳ 60D

2035 16288 HI: 2.100
↳ 60D

SESSION 2

2036 ~~16288~~ ~~HI: 2.100~~
↳ ~~60D~~

2037 3675 HI: 2.000
↳ 60D

SESSION 3

2038 16288 HI: 2.100
↳ Set PN
set in New spot.

7-8-97
JR
JO

CLR 80°

16/1

97-219

SESSION 3

2038 ~~16288~~ VOID ~~HI: 2.100~~
↳ ~~60D~~ VOID

2039 3675 HI: 2.000
↳ 60D

SESSION 4

2040 16288 HI: 2.100
↳ 60D

2041 3675 HI: 2.000
↳ 60D

~~SESSION 5~~

~~2042~~
↳

~~2043~~
↳

Check 2022 7884
HI = 1.580 ✓
Start w/New Bat.

Check 2012 7853
HI: 1.635 ✓ Power was Down
Start w/New Bat.
New HI: ~~1.638~~ 1.635

7-8-97

17/

97-219

CONT...

SESSION 5

(2042) 16288 HI: 2.100
↳ 60D

(2043) HI:
↳ 60D

Base 7884 @ (2022) HI: 1.580
OK ✓

Base 7853 @ (2012) HI: 1.635
Power was Down for ±50 min.

5-2

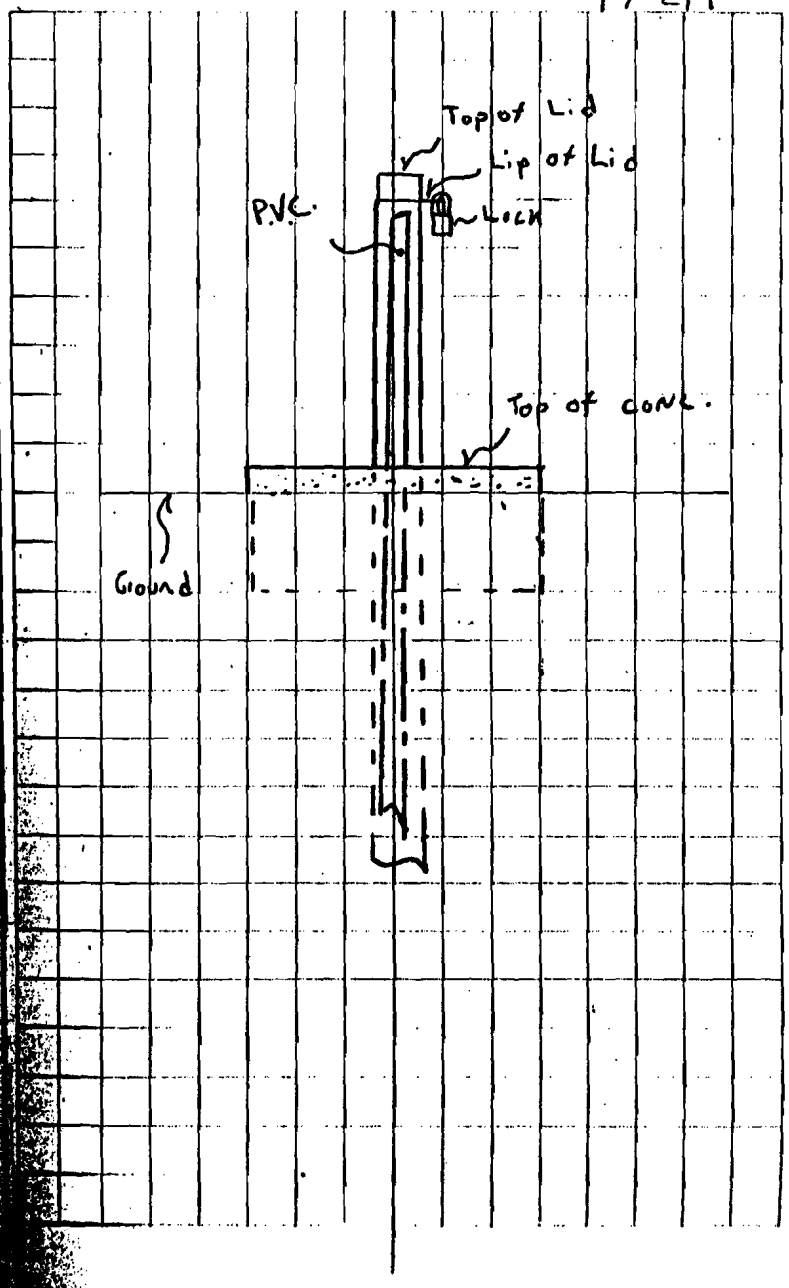
CLDY 80°

18/1

97-219

Inverts of wells

Well #	Invert.	Desc.
G 1		
JAW-608	+2.14	2" PVC
JAW-607	+2.35	2" PVC
JAW-606	+2.00	2" PVC
JAW-609	+2.13	4" PVC
Z3-2	+2.67	4" PVC
Z3-1	+2.75	4" PVC
Z3-5	+3.63	4" PVC
Z3-3	+2.59	4" PVC
JAW-624	+2.20	2" PVC
JAW-604	+2.41	2" PVC
FL-6	-0.41	4" PVC (From Top of Lid)
MW1-91	-0.59	4" PVC (From Top Lid)
MW2-91	-0.18	" " "
FL-7	-1.22	" " "
FL-8	-1.16	" " "
FL-9	-0.55	" " "
FL-10	-0.86	" " "
MW6-91	+1.47	4" PVC
FL-4	-0.38	4" PVC (From Top of Lid)
MW5-91	+1.63	4" PVC
MW4-91	-0.23	4" PVC (From Top of Lid)
FL-3		" " "



97-219

CONT...

Well #	INV.	Desc.			
FL-3	-0.24	4" PVC	(From	Top of	Lid)
MW3-91	+1.68	4" PVC			
FL-2	-0.94	4" PVC	(From	Top of	Lid)
FL-1	-0.42	"	"	"	
ZZ-1		Shot is Good			
T-13	+2.06	4" PVC	(X:2625348	/ Y:302071)	
T-14	+2.05	4" PVC	(X:2625341	/ Y:302071)	
T-15	+2.07	2" PVC	(X:2625331	/ Y:302071)	
T-16	+2.06	4" PVC	(X:2625340	/ Y:301859)	
T-17	+1.96	4" PVC	(X:2625338	/ Y:301866)	
T-18	+1.97	2" PVC	(X:2625348	/ Y:301865)	
ZZ-19	+2.46	~~Shot is Good~~		Top PVC.	
T-19	+2.41	4" PVC	(X:2625091	/ Y:301234)	
T-20	+2.37	4" PVC	(X:2625084	/ Y:301233)	
T-21	+2.08	2" PVC	(X:2625088	/ Y:301225)	
T-22	+2.10	4" PVC	(X:2624878	/ Y:301231)	
T-23	+2.18	4" PVC	(X:2624871	/ Y:301231)	
T-24	+2.10	2" PVC	(X:2624874	/ Y:301224)	
T-25	+2.28	4" PVC	(X:2624588	/ Y:301211)	
T-26	+2.07	4" PVC	(X:2624581	/ Y:301211)	
T-27	+2.12	2" PVC	(X:2624586	/ Y:301203)	
ZZ-18A	+4.06	4" PVC			
ZZ-18	+3.13	4" PVC			

97-219

CONT...

Well #	INV.	Desc.
T-28	+2.10	4" PVC (X: 2624399 / Y: 301218)
T-29	+2.05	4" PVC (X: 2624391 / Y: 301218
T-30	+2.23	2" PVC (X: 2624396 / Y: 301210)
T-31	+2.02	4" PVC (X: 2624015 / Y: 301217)
T-32	+2.00	4" PVC (X: 2624006 / Y: 301217)
T-33	+1.86	2" PVC (X: 2624041 / Y: 301218)
T-34	+2.28	4" PVC (X: 2623748 / Y: 301144)
T-35	+3.40	4" PVC (X: 2623743 / Y: 301143)
T-36	+2.43	2" PVC (X: 2623747 / Y: 301138)
JAW-610	+2.25	2" PVC
JAW-611	+2.20	2" PVC
JAW-29	+2.76	2" PVC
JAW-31	+2.50	2" PVC
JAW-30	+2.78	2" PVC
JAW-612	+1.11	2" PVC
T-10	+2.20	4" PVC (X: 2624823 / Y: 302407)
T-11	+1.86	4" PVC (X: 2624814 / Y: 302407)
T-12	+2.06	2" PVC (X: 2624819 / Y: 302400)
JAW ?	+2.10	2" PVC
JAW-601	+2.28	4" PVC
Z1-3	+2.70	4" PVC
Z1-2A	+2.50	4" PVC
Z1-2	+2.37	4" PVC
Z1-1	+2.83	4" PVC

± 80' NW of JAW-601

97-219

CONT...

Well #	INV.	Desc
JAW-60S	+2.23	2" PVC
Z3-4	+4.19	4" PVC
ET3	+2.43	2" PVC
T-6	+1.66	2" PVC (X:2617038 / Y:299864)
T-1	+1.67	4" PVC (X:2617042 / Y:299865)
G-4	+2.19	4" PVC
GP-5	+2.78	can not open. INV. Lip of Lid
GP-4	+2.69	" " "
T-5	+2.15	4" PVC (X:261674 / Y:299563)
T-4	+1.94 Ground	4" PVC (Lid 0.35 / PVC -0.13)
T-9	+ Ground	2" PVC (Lid 0.35 / PVC -0.02)
JAW-28		2" PVC (Lid 0.35 / PVC 0.00)
G-5	+3.69	4" PVC
G-6	-0.53	4" PVC (From Top of Lid)
G-49	+1.92	4" PVC
NW cor Line 1 Ⓐ	+3.07	2" PVC Line 1
S of Ⓐ/Ⓑ	+2.84	2" PVC Line 1
S of Ⓑ/Ⓒ	+2.88	2" PVC " "
JAW-48	+2.70	2" PVC
JAW-47	+2.65	2" PVC
JAW-46	+2.84	2" PVC
JAW-45	+2.74	2" PVC
JAW-44	+3.74	2" PVC
JAW-43	+3.10	2" PVC

97-219

CONT...

well #	INV.	Desc
G-2	+2.83	4" PVC
G-3	+2.67	4" PVC
JAW-52	+2.80	2" PVC
JAW-51	+3.24	2" PVC
JAW-603	+2.63	4" PVC
JAW-75	+3.19	2" PVC
JAW-74	+2.59	2" PVC
✓12-A	~~+2.03~~	Master Lock (~~No Key~~)
✓12-F	~~+2.17~~	" " "
JAW-72	+2.95	2" PVC
JAW-71	+2.36	2" PVC
✓10-B	~~+2.35~~	Master Lock (~~No Key~~)
✓10-A	~~+1.95~~	" "
JAW-70	+2.85	2" PVC
JAW-78	+2.92	2" PVC
JAW-79	+2.88	2" PVC
G-45	+1.63	4" PVC
G-44	+2.06	4" PVC
G-43	+2.24	4" PVC
G-42	+2.00	4" PVC
G-46	+2.02	4" PVC
G-47	+2.14	4" PVC

(CONT. TO Page 23/2)

~~INV. to Lip of Lid~~ = OK ✓

~~INV. to Lip of Lid~~ = OK ✓

7-11-97

23/1

97-219

Base ① 7853 @ 2005 HI: 1.696 m

Base ② 7884 @ 2015 HI: 1.582 m

SESSION 1

2044 3675 HI: 2.000 m
↳ 60D

2045 16288 HI: 2.100 m
↳ 60D

SESSION 2

2046 3675 HI: 2.000
↳ 60D

2047 16288 HI: 2.100
↳ 60D

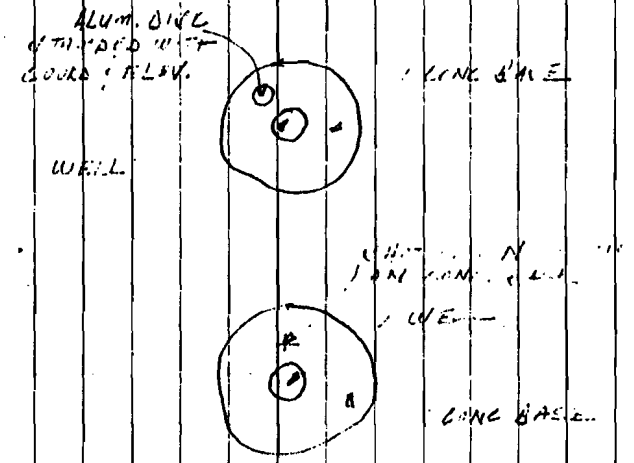
Base ① 7853 @ 2005
Base ② 7884 @ 2015

97-219

LINE #9

RUN LEVEL CIRCUIT AND SIDESHOT DISC; CONC BASE @ WELLS

NOTE: SEE PL#30, BL#1 FOR WELLS T10, T11, T12



07-2-97 (LINE 6)

TP
KR

OVERCAST 72°		99.219		
B.P. #057	2.83			P.K. NAIL
TP #1	2.76		2.58	
T 36			5.85	DISC
T 35			5.76	DISC
T 34			5.60	DISC
T 32			5.52	DISC
T 31			5.11	DISC
T 33			4.80	DISC
TP #2	5.94		4.10	
T 28			6.55	DISC
T 29			6.48	DISC.

25/1

60

07-22-97
TG
DR
OVERCAST 72°

		97	219	
T 3.0			6.34	DISC
Z2-18			7.03	0.50 N ON CONC. BASE
Z2-18A			7.00	0.50N. ON CONC BASE
T26			6.84	DISC
T27			6.68	DISC
T25	8.22		7.00	DISC
T22			7.90	DISC
T23			8.08	DISC
T24			7.87	DISC
T20			6.82	DISC
T21			6.61	DISC

07-22-97
TC
KR

97-219

T-19		6.72	DIVE
CP#1	6.12	4.60	PERINAL (WET EXTENSION)
T2-19		9.93	DIVE
T-18		7.55	DIVE
T 16		7.34	DIVE
T 17	8.42	7.23	
T13		6.40	DIVE
T 14		6.41	DIVE
T 15		6.59	DIVE
WET TBM#1	3.37	4.58	A FLANGE BOLT ON ED OPPOSITE METAL OPENED @ 6-22-96

07-22-97
TG

97219

SET TBM 2	5.64		3.94
ZZ-1	2.04		2.40
TP 3	1.52		7.28
CLOSE BM 1057			5.14

8. PLANE OUT ON FIRST ENTRANCE ENT. OPPOSITE BRICK BLDG - 6-137-5

NOTE: NO VISIBLE CONC FACE OTHER BLOCK MATERIAL OVERLAIN ON FACE OF MVC CASING

N.S.S.

SAME AS START

97619

[illegible] VALUE
[illegible] LIST

(NOTE: [illegible] IN CAPS.)
GROUP IS PLUS [illegible]
CIT PAIRING

[illegible]		97·219			
TM KR					
OVECA = 75°					
[illegible]	7.15				
WELL 6-04	4.05		5.16		
WELL DM-4			4.66		
WELL 5-94			4.67		
WELL DM-9			4.72		
WELL DM-1			4.76		
WELL DM-2			4.79		
WELL 4-94			5.15		
WELL DM-8			4.86		
3-94			4.96		
DM-7			4.27		

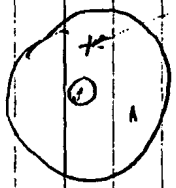
PL. V-4

23-97 T-KR			97-219		
WELL 1-94			4.97		
WELL 294			4.76		
TP-1	3.83		4.99		
Bm 11.9			5.78		

97219

LINE 9

LEVEL TO WELLS



WELL

K.R. Survey 80°			97.219		
Bm 108	6.70				RL. No
WELL CAW 610			7.30		CONC.
WELL CAW 611	5.01	↓	6.60		
WELL CAW 29			4.74		CONC.
WELL CAW 31			4.95		CONC.
WELL CAW 30			4.58		CONC.
WELL CAW 612	9.36	↑	7.93		CONC
Bm 108B			6.56		S.A.S

97219

(AREA JUST WEST OF LINE 9)

RUN LEVEL CIRCUIT

NOTE: NO STABLE CONC BASE @ WELLS.
RUN LEVEL CIRCUIT NEEDED TO
CHECK WELLS IN THE FIELD

SEE PAGE 52-56 FOR ELEV.
ON TOP WELL OUTSIDE CASING
& GROUND ELEV (1) WELLS
IN THE AREA

07-23-97
TR
PC. 8.

97-519

E.M.307	4.17	
TP# 1	5.05	0.63
SET TBM 3	4.09	4.86
	9.33	9.75
TP# 2	4.38	4.82
SET TBM 4	4.82	4.59
MM3-91	10.62	10.64
TP# 3	1.04	4.52
CLOSE EM.307		4.72

GOOD NAIL.

SET 5/8" IR IN TB BETWEEN WELL FL-7 & FL-9

COPPER DISC

SET 5/8" IR IN TB OPPOSITE WELL FL-10

SP CUT ON N. SIDE OF CURB SAME AS WELL # MM3-91

SAP

97-819

(EXPLOSIVE AREA)

RUN LEVEL TO MONITORING WELLS

SLIT TRENCH 2-3 M OF NELLON CONC.

CONC. PADS

WELL

07-23-97
TC
KR

JUNNY	83°	97-219	
BM 2019	11.80		
TP #1	12.72	0.47	
WELL JAW-625	2.24	4.47	CONC. 0.50 N. OF WELL
TP #2	6.73	11.72	
WELL JAW 627		13.06	CONC. 0.50 N. OF WELL
TP #3	9.90	11.88	
WELL JAW 626	14.89	14.15	CONC. 0.50 N OF WELL
TP #4	8.78	2.54	
TP #5	0.62	7.70	
CLOSE BM 2019	~~TP~~	14.75	CAME AS START

07-23-97
TG
ER

97.219

BM-019	12.39		
WELL JAW 11	1.44	0.52	0.50 N OF ... N CNC
TP 1	4.66	14.36	
WELL JAW 12		6.15	LONC. 0.50 N OF WELL
WELL JAW 13		13.10	LONC 0.50 N OF WELL
WELL JAW 14	4.92	8.98	LONC. 0.50 N. OF WELL
TP 2	7.15	3.58	
CLOSE BM 2019		3.00	SAME AS START

07-22-97 TG KL WEATHER 90°		97.9		
Cap 2018	2.07			GAS NA
WELL JAW 65	1.77		5.19	CONC 0.60 N. OF WELL
WELL JAW 63	1.20		11.93	CONC 0.60 N OF WELL
TP 1	2.28		11.83	
WELL G-30	12.24		13.30	TOP OF CAP, NO CONC SEAL ON CASING
WELL EM 5	1.28		14.33	P.K. NAIL IN TOP OF WOOD GRAND POST
TP 2	2.30		13.58	
WELL JAW 24	(SIDE SHOT)		9.90	CONC. 0.60 N. OF WELL
TP 3	13.44		6.10	
WELL JAW 23	13.82		5.62	

07-2-97

SUNNY-80°

97-19

TP 4	14.58		0.33
TP 5	12.82		1.08
CLOVE Bm 2018			3.62

40/1

SAME AS START

0-[illegible]-97		97[illegible]9		41/1
JUNE 85°				
LM 2018	1.78			6.0 D NAIL
WELL JAW 58			6.20	CONC. 0.50 N OF WELL
WELL JAW 63			3.23	CONC. 0.50 N OF WELL
WELL JAW 62			6.40	CONC. 0.50 N. OF WELL
WELL JAW 69			6.46	CONC. 0.50 N. OF WELL
WELL JAW 60			10.72	CONC. 0.50 N OF WELL
WELL JAW 61			9.18	CONC. 0.50 N OF WELL
WELL JAW 59			9.69	CONC. 0.50 N OF WELL
TP 1	1.96		11.00	
WELL JAW 80			10.46	CONC 0.50 N. OF WELL
TP 2	12.36		2.52	
CLOSE LM 2018			2.56	SAME AS START

07-24-97

JANNY 88°

97-19

TBM 5	2.90	
TP 1	6.77	1.59
WELL JAW 04	14.33	3.60
TP 2	13.57	2.87
WELL JAW 614		9.58
WELL EDA-3		8.83
WELL EDA-2		11.38
TP 2	9.74	3.55
TP 3	9.32	3.02
WELL EDA 1		3.01
TP 4	3.46	3.38

RE. WELL N JAW 04 [illegible]
USE P-#39

CONC 0.5 N WELL

CONC 0.5 N WELL

CONC. 0.5 N WELL

CONC 0.5 N WELL

CONC 0.5 N WELL

07-24-97
T-
KR
CUNNY 96

97219

43/1

EDA-0.4	10.01		10.20
TBM 6	1.84		7.73
TP 5	0.68		9.36
TP 6	0.43		13.49
ELOPE TBM 5			12.26

BOX CUT ON CONC [illegible]

R.R. [illegible] N [illegible]
of EXPLOSIVE DISPOSAL [illegible]
opposite WELL G-29

SAME AS [illegible]

07-28-97 TC KR SUNNY 88		97219		
TBM6	7.66			KC COLLAPSE AP (SEE 1 → 43)
WELL JAW 07			6.33	CONC. 0.50N HCL
WELL JAW 05			9.06	CONC.
G-29			8.22	(NO CONC ADDED) [illegible] TOP OF CAP ON OUTSIDE CASING
CLOSE TBM6			7.66	SAME AS [illegible]

07-21-97

97219

Rm EDA-4	5.80		
WELL JAW 06		15.80	
WELL JAW 64		5.15	
LINE EDA-4		5.80	

BOX CUT ON CONC WELL EDA-4

CONC. 0.50 [illegible]

CONC. 0.5 [illegible]

SAME [illegible]

07-24-97
TG
KR
SUNNY 85°

(97-19)
INTERSECTION OF ROADS
A, F & J

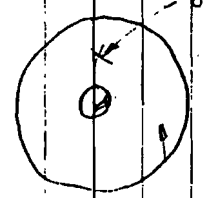
BM 2013	6.07 ~~6.00~~			PK. NAIL
WELL G-16			2.22	NO CONC. SAW CUT TOP OF LID FOR METAL CASING
WELL JAW 616			7.52	CONC. 0.50 N. OF WELL
WELL JAW 615			7.66	CONC. 0.50 N. OF WELL
WELL JAW 617	7.16		7.58	CONC. 0.50 N. OF WELL
CLOSE BM 2013			5.83	SAME AS START

07-25-97 97-219 47/1

TG
KR

SUNNY 90°

LEVEL TO CAW 8, 9 & 10



P2

07-25-97
T-
K2
SUNNY 90°

97-214

BM 201L	3.78		
TP 1	5.68	3.89	
TP 2	4.94	5.74	
WELL JAW 09		6.79	CONC. 0.50 N. OF WELL
TP 3	7.32	4.92	
WELL JAW 08		5.76	CONC. 0.50 N. OF WELL
TP 4	6.10	3.00	
TP 5	3.95	13.12	
WELL JAW 10		8.30	CONC. 0.50 N'LY OF WELL
TP 6	13.37	4.03	

30-97
TC
KR
SUNNY 90

97-219

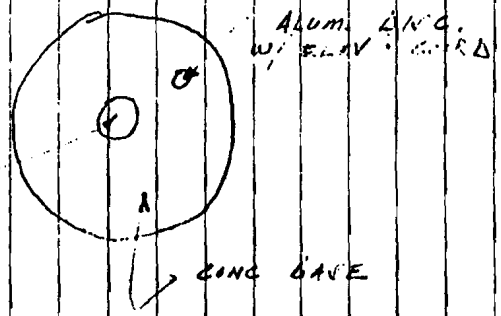
TP 7	4.56		9.13
TP 8	4.41		6.81
LOVE BM 2012			3.45

SAME AS START

97219

LINE 9

WELLS T-10, T-11, T-12



KR
SUNNY 90°

TBM #1	6.50		
WELL T-12			3.06
WELL T-11			3.50
WELL T-10	3.43		3.32
LLOYD TBM #1			6.62

51/1

CHANGE BOLT ON E-
(SEE 1-1-27) BK #1)

DIOC.

DIOC

DIOC

CHANGE AS START

97-219

ALL APPROACHES LINE 9
(OUT WEST) SEE DG 34-20
FOR LEVEL CIRCUIT

LID ON TOP OF
OUTSIDE METER
GROUND

WELL INSIDE
METER

GROUND

07-[illegible]-97
TG
KL

CUNNING

TBM #2	4.97		
WELL FL-8			5.80 TOP LID ON CASING OF WELL
			8.8 GROUND 0.50 N.
WELL FL-9			8.38 TOP LID ON CASING OF WELL
			11.4 GROUND 0.50 N.
WELL MW1-91			8.76 TOP LID ON CASING OF WELL
			11.0 GROUND 0.50 N.
WELL MW2-91			8.85 TOP LID ON CASING OF WELL
			10.9 GROUND
WELL FL-6			8.05 TOP LID ON CASING
			11.2 GROUND
CLOSE TBM #3			4.97

9-[illegible]-19

53/1

53' JC (FROM [illegible] 5, BL #1)

07-25-97
TG
KK
SUNNY 90°

97219

54/1

TBM #4 4.94

WELL FL-9
10.46
LID TOP OF CASING
12.7
GROUND 0.50N

WELL FL-10
11.55
LID TOP OF METAL CASING
~~GROUND~~
14.2
GROUND 0.50N

WELL MW6-91
13.28
LID TOP OF CASING
15.10
~~GROUND~~ CONC. 0.50N

WELL FL-4
12.28
LID TOP OF CASING
14.7
GROUND 0.50S.

WELL MW5-91
8.37
LID TOP OF CASING
10.7
GROUND 0.50N

5/8 IE (CEL PL-#35, BK#1)

07-[illegible]-97
KR
SUNNY 90°

9-[illegible]-9

TP 1	7.58		8.37
WELL MW4-91			7.66 TOP LID CASING
			9.7 GROUND 0.50N.
WELL FL-3			7.97 TOP LID CASING
			10.1 GROUND
WELL FL-2			10.15 LID TOP CASING
			12.8 GROUND 0.50N
MW3-91			8.00 TOP LID CASING
CLOSE BM MW 3-91			9.92

SEE LIST ON LONG BACK FOR N.G. WELLS (S.L. T.E. 35 INCLUDED IN ORIGINAL LEVEL RUN

7-25-97 TI KR SUNNY 95°		97-19		
BM 2017	3.98			PK NAIL IN CRACK
WELL 6.49			2.47 LID TOP OF CAN =	
			4.7 GROUND 0.50 N.	
TP 1 CLOSE BM 2017	4.33		4.14	
			4.16	

7-28-97

5

97-219

	Clean-up	RTK		
Base	@ 2010			
Rover ①	OK			TDC1 #
2006	✓			16269
2008	✓			"
2001	✓			"
1117	✓			"
1057	Lost	Radio	Link	
Base	@ 2022			
Rover ②	OK			TDC1 #
2029	✓			16269
2026	✓			"
2025	✓			"
2012	✓			"

9.97

CLR 850

58/1

97-219

93

7-29-97

59/1

97-219

Line 9

BM	BS	HI	FS	EL	BM	Desc
T-29	6.63					Disc Brass.
CONC T-29			6.66			1/2" N.
CONC T-30			6.49			"
CONC T-28			6.73			"
T-26			6.98			Brass Disc
CONC T 26			7.04			1/2" N
CONC T-27			6.88			"
CONC T-25			7.20			"
CONC ZZ-18A			7.12			"
CONC ZZ-18			7.19			"
T-23			7.00			Brass Disc
CONC T-23			6.99			
CONC T-22			6.84			

(CONT ON PG 60/1)

(CONC. From pg 59/1)

7-29-97

60/1

97-219

Bm	BS	HI	FS	EL	Bm	Desc
CO-C T-24			6.82			1/2" N
DISC T-24			6.80			Brass Disc
T-20	7.22					Brass Disc
CONC T-20			7.25			1/2" N.
CONC T-19			7.16			"
CONC T-21			6.99			"
T-21			7.01			Brass Disc

Line 9

7-29-97

61/1

97-219

Bm	BS	HI	FS	EL	Bm	
T-17	8.32					Disc
CONC T-17			8.20			1/2 N
CONC T-18			8.55			"
CONC T-16			8.35			"
CONC T-15			6.50			"
CONC T-14			6.31			"
CONC T-13			6.24			"
T-13			6.30			Brass Disc.
T-11	4.23					Brass Disc
CONC T-11			4.28			1/2' N.
CONC T-12			3.78			"
CONC T-10			4.07			"
T-10			4.04			Brass Disc

Side Shot to wall

7-29-97

62/1

97-219

T⊙ (2009) BS to (2008)

BS Dist 452.08 ft

BS ∡ 0:00-00

FS	∡	Dist
G-2	215-24-57	12.42 ft

BS CM 0-00-02. ✓ OK

BM	BS	HI	FS	EL	BM
(2008)	5.47				
G-2	4.91		5.09		
(2008)			5.28		

97

7.29.97

63

97-219

side shot to well

TB (2027) HI- 5.29 BS to (2026) HI= 5.00

BS Dist= 675.30 Vert Dif: +22.62

BS ∡ 0-00-00

FS	∡	Dist	Vert	Dif	Rod	Desc
G-52	279-58-24	30.21	-7.77		3.00'	N. Edge of 4" PVC
G-53	308-50-33	29.66	-7.49		"	N. Edge of 4" PVC

BS CK 0-00-21

CONT...

T@ 2028 HI: 5.08 BS to 2029 HT: 5.00

Dist 115.44 vert Diff -1.18

3000 159.00.57 339.00.53

00-00-06 180-00-01

159.00.57 159.00.52

AVG ∡ Rt =

Dist: 826.06' vert Dif = +42.18 Rod: 6.50

BS = 0.00.00

SS	∡ Rt	Dist	vert Dif	Rod
G-54	38-13-09	57.18'	-2.49	5.00
G-55	43-47-35	65.08'	-3.15	5.00

T@ 3000 HI: 4.94 BS to 2028 HT: ~~4.77~~ 3.25

Dist: 826.10 vert Dif: -42.41

BS : 0-00-00

SS	∡ Rt	Dist	vert Dif	Rod
13-F	281-49-45	47.27	+3.70	5.00

BS CK : 359.59.57

7-29-97

64/1

97-219

3000 set 60 D

13-F Shot is on Lip of Lid
Master Lock No key.

Cont

T@ (2029) HI= 5.07 BS to (2028) HI= 3.25

Dist = 115.47 Vert Dif = -0.70

(3001) 187-16-57 07-16-51

0-00-00 179-59-57

AUG ∡ Rt:

Dist: ~~396.62~~ 396.42 Vert Dif: +3.75 Rod: 6.30

(3001) set 60D

T@ (3001) HI= 4.92 BS to (2029) HI= 4.75

BS Dist = 396.42 Vert Dif = -2.68

SS	∡ Rt	Dist	Vert Dif.	Rod
13 B	183-11-29	137.33	+8.66	1.50'

BS CK 0-00-02 ✓ok

7-29-97

65/1

97-219

CONT...

T@ 2039 HI = 4.75 BS to 2038 HI: 5.00
BS Dist: 116.49' Vert Dif: -1.33

SS	∡ Rt	Dist	Vert Dif	Rod
G-24	305-04-55	64.10	+0.25	4.00
JAW-76	295-26-55	61.69	+2.29	5.00

BS ck: 359-58-58 ✓ ok

T@ 2036 HI: 4.64 BS to 2037 HI: 5.00
BS Dist: 133.86' Vert Dif: +2.98

SS	∡ Rt	Dist	Vert Dif	Rod
G-23	98-00-20	67.50	-2.92	2.00'

BS ck: 0-00-28

7-29-97

66/1

97-219

Top of 4" PVC N. Edge
-2.26 to Ground

Top of 2" PVC N. Edge
-2.58 to Ground

N. Edge of 4" PVC

7-29-97

67/1

97-219

CONT...

T @ 2034 HI: 5.10 BS to 2035 HI: 5.00

BS Dist: 110.22 ft Vert Dif: +0.12

SS	∡ Rt	Dist	Vert Dif	Rod	
G-22	274-41-02	58.60	+1.80	3.00	N. Edge of 4" PVC
BS ch	0-00-00				

T @ 2040 HI: 5.12 BS to 2041 HI: 5.00

BS Dist: 36.15 ft Vert Dif: -0.13

SS	∡ Rt	Dist	Vert Dif	Rod	
G-21	91-37-53	103.76	+3.95	5.00	N. Edge of 4" PVC
BS ch	0-00-02				

Level Loop for Line 1

BM	BS	HI	FS	FL	BM
IR 1143	4.61				
T.P.	4.52		2.39		
CONC JAW-3			14.96		
CONC JAW-601			14.94		
T.P.	0.66		4.55		
T.P.	4.66		10.68		
Z1-3			6.18		
T.P.	6.14		8.46		
Z1-2A			10.36		
Z1-2			10.68		
T.P.	12.19		4.67		
C1-1			6.56		
		CONT.			

7-29-97

68/1

97-219

PK 1143 S. of Line 1 @ Guard Rail

~ ± 80' W of JAW-601

CONC

CONC.

Line 1

BM	BS	HI	FS	EL	BM
T.B.M ①	2.78		2.75		
I² 1143			2.04		
TBM ①	12.55				
TBM ②	1.32		1.13		
TBM ①			12.74		
TBM ②	11.10				
CONC. JAW.46			14.93		
T.P.	3.37		1.90		
CONC. JAW.45			7.69		
T.P.			13.78		

CONT... PG 70/1

7-30-97
TG
JC
JO

CLR 85°

97-219

① Misc conc Slab w/ Eight Bolts Turn on Top of Very NW Bolt.
Slab is @ the Very SW cor of Line 1 out side of Fence.

TBM ① misc conc Slab T/NW Bolt.

TBM ② set Hub on site

TBM ① Close Loop.

TBM ② set Hub on site.

conc.

conc.

7-30-97

70/1

97-219

Line 1
CONT... From 69/1

BM	BS	HI	FS	EL	BM	
T.P.	5.86					
CONC JAW-44			7.82			CONC.
CONC JAW-43	8.60		8.83			CONC.
T.P.	13.19		5.62			
T.P.	13.43		2.75			
TBM ③	3.43		6.14			TBM ③ "□" marker on SE corn of conc Fnd. of Fire Alarm Post E of Post w/sign 1-473A BLDG
CONC JAW-47			9.14			
T.P.	5.70		10.58			
TP	10.16		13.49			
TBM ②			11.73			TBM ② Hub on Site

BM	BS	Line HI	FS	EL	BM
T.BM ③	2.32				
T.P.	2.16		5.55		
CONC. JAW-46			12.06		
T.P.	3.13		3.66		
T.P	0.96		12.72		
CONC JAW-42?			14.38		
T.P.	5.70		1.99		
CONC JAW-?			13.31		
T.P.	9.37		9.15		
CONC JAW-?			12.22		
CONC JAW-?	12.53		12.90		
CONC JAW-?			11.36		

CONT... TO PG 72/1

7-30-97

97-219

TBM ③ "D"	Marker	Mark	on	FH	Conc	Fnd.					
CONC.											
CONC. Most S. well W of Rd going N.											
CONC. N. of Most S. well. going N.											
CONC. N. of Last well											
CONC. N. of Last well											
CONC Most N'LY well W. of Rd.											

Line 1
cont... From 71/1

BM	BS	HI	FS	EL	BM
T.P.	11.17		1.48		
TBM ④	1.98		2.55		
T.B.M ⑤	2.42		2.40		
T.P.	4.13		3.86		
T.P.	6.81		3.58		
T.B.M ③			2.86		
T.B.M. ⑤	1.44				
T.P.	9.40		5.94		
CONC JAW-50	4.82		2.06		
CONC JAW-602			7.92		
T.P.	6.27		6.13		

CONT. ON PG 73/1

97-219

T.B.M. ④ (N.W. Bolt) Arrow Bolt ON F.H.# 1-43 on W. Side of Rd W of BLDG 1-06-2

T.B.M. ⑤ (N.W. Bolt) Arrow Bolt ON F.H.# 1-41 on W. Side of Rd. W of BLDG 1-08-1A

T.B.M ③ "O" cone Fwd of Fire Alarm Post.

T.B.M. ⑤ Arrow Bolt ON F.H. # 1-41

CONC.

CONC.

Line 1
CONT... FROM PG 72/1

BM	BS	HI	FS	EL	BM
CONC JAW-51			4.66		
CONC. JAW-603	6.99		4.48		
CONC JAW-52			4.34		
T.P.	1.40		9.60		
T.P	8.69		9.45		
TBM (5)			1.33		

7-30-97

73/1

97-219

CONC.

CONC.

CONC

7-30-97

74/1

97-219

West of J Road
South of I Road

BM	BS	HI	FS	EL	BM	
ASC 2045	2.16					
T.P.	6.37		12.02			
CONC JAW-01			10.94			CONC.
CONC DA-1			11.81			CONC.
T.P.	11.24		1.23			
T.P.	2.54		12.58			
PVC G-10			4.84			Top of 4" PVC
T.P.	14.72		4.80			
CONC JAW-02	13.15		12.46			CONC.
GOD G-11			4.30			Top GOD 1/2' N of well to get INV.
T.P.	6.35		11.90			
GOD DA-2			12.20			Top GOD 1/2' N of well to get INV.
		CONT TO PG 75/1				

CONT. From PG 74/1

BM	BS	HI	FS	EL	BM
~~BM~~ 600 DA-2	14.04				
T.P.	11.73		0.98		
T.P.	3.43		8.35		
~~600~~ G-9			5.95		
~~Asc~~ 2045			9.20		

7-30-97

75/1

97-219

600 1/2' N of well

600 1/2 N of well for Inv.

600 Nail.

Line 4B/4A

BM	BS	HI	FS	EL	BM
ASC 1157	3.30				
T.P.	5.81		5.76		
TBM ⑥	3.39		3.97		
T.P.	6.49		5.21		
ASC 1157			4.04		
TBM ⑥	3.60				
CONC 23-1	4.23		4.88		
CONC. 23-5	6.48		5.64		
PVC 23-3			6.45		
T.P.	8.59		8.74		
23-2			4.48		

CONT TO PG 77/1

T.B.M. ⑥ 60D Nail in S. Face of PP second PP W of Main Rd 1.1 Line 5A + 5B @ End in Line 4B.

T.B.M. ⑥ 60D Nail in S. Face of PP 4Line 4B.

CONC.

CONC.

Top of 4" PVC

CONT FROM PG 76/1

BM	BS	HI	FS	EL	BM
T.P.	5.12		4.68		
T.B.M.①			4.05		

7-30-97

97-219

IDOT TMAP

Field Book
F-644

KARA

BK 2

113

		LINE	800		
BM	BS	HI	FS	EL	BM
ASL 2024	2.80				
G-46			4.79		
G-47			4.68		
T.P.	3.44		5.97		
CONC. JAW-79			5.82		
CONC. JAW-78			5.84		
T.P.	5.64		4.49		
T.P.	4.34		2.39		
G-45			3.97		
G-44			4.00		
T.P.	2.63		4.38		
T.P.	11.39		7.68		

CONT... PG 2/2

7-31-97 CLR 85° 1/2

JO
JC
JG

97-219

CONC

CONC

Shot ON Ground

CONC.

CONC.

CONC

CONC

LINE 800

CONT FROM 1/2

BM	BS	HI	FS	EL	BM
G-43			2.40		
G-42			2.52		
T.P.	4.39		1.82		
G-17			7.06		
TBM (7)	8.96		8.19		
G-18			8.94		
G-19			8.74		
G-20			5.58		
T.P.	2.58		4.42		
~~ASC~~ (2024)			6.80		

7-31-97

2/2

97-2191

~~CONC~~

~~CONC~~

Shot ON Ground.

TBM (7) Set 60D Nail. R side of Fence. Line 800

~~CONC~~

~~CONC~~

~~CONC~~

Line 800

BM	BS	HI	FS	EL	BM
TBM ⑦	4.55	—		—	
G-48	2.81	○	2.71	○	
T.B.M ⑦		>	4.64	>	

7-31-97

3/2

97-219

T.B.M. ⑦ 60 D E of Fence Line 800

Slot on Ground.

7-31-97

4/2

97-219

Yard C

BM	BS	HI	FS	EL	BM
ASC	3.62				
T.P.	4.57		5.81		
T.P.	5.10		6.91		
T.P.	3.24		5.01		
WELL 14-A			4.62		
T.P.	5.57		5.36		

0.5 FOR WELL ON CONC.

7-31-97

5/2

97-219

BM	BS	HI	FS	FL	Bn

Fast static.

Base 1 @ 1119 PK @ Fnt.
HI: 1.540 # 7884

Base 2 @ 1157 : PK Line 9
HI: 2.100 # 16288

Session 1

Rover #	Mon.	HT:	Desc.
7853	A126	2.100	Brass disc @ the SE cor of Main st + Angular st. USGS mon.

Session 2

River	Mon	HT	
7853	794	2.100	Brass Disc @ the SW cor of US 61 + PFEIFF. USGS mon.

7-31-97

6/2

97-219

Line 2

BM	BS	HI	FS	FL	BM

7-31-97
JC Ø
JO M
TG T Level

CLR-850

7/2

97-219

Line 2

BM	BS	HI	FS	EL	BM
T.B.M.	5.14				
T.P.	8.57		4.60		
CONC JAW-74			5.74		
T.P.	4.82		1.40		
CONC JAW-75			11.74		
T.P.	12.40		9.72		
T.P.	7.87		5.28		
T.P.	2.43		14.51		
CONC JAW-70			11.41		
CONC 10-A			12.06		
CONC 10-B			12.16		
CONC JAW-71			11.46		

CONT. TO PG 9/2

7-31-97

97-219

T.B.M.	"D" on NE cor of conc. End of Stop Sign @ the S. End to Line 2	
CONC.		
CONC		
CONC		
CONC.		
CONC.		

Line 2
cont. From PG 8/2

BM	BS	HI	FS	EL	BM
CONC 12-A			14.57		
T.P.	9.47		9.96		
CONC JAW-72			5.08		
CONC 12-F			4.96		
T.P.	4.77		6.60		
CONC JAW-73			1.68		
CONC. 12-E	4.93		3.16		
CONC 12-B			3.93		
CONC 12-D			3.88		
CONC 12-C			3.98		
T.P.	2.96		9.43		
T.P.	7.02		0.73		
TBM 6 7			5.03		

7-31-97

9/2

97-219

CONC.

CONC.

CONC.

CONC

CONC

CONC.

Bm	BS	HI	FS	EL	BM

10/2

97-219

LINE 3A

[illegible] @ [illegible] [illegible] 1.532 N.

1884

TDC # 16269

Rover #	Pr #	Well	
7853	3100	JAW-22	CONC.
"	3101	JAW-19	CONC.
"	3102	JAW-16	CONC.
"	3103	JAW-15	CONC
"	3104	JAW-17	CONC
"	3105	JAW-18	CONC.
"	3106	JAW-20	CONC.
"	3107	JAW-21	CONC.
"	3108	FS CK	CP # 2005

97-219

11/2

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F-Road
I-Road

BASE @ 2013 HI = 1.593

#7884

TDC1 #16269

Rover #	Pt #	well	Desc
7853	3110	-	set 60D
"	3111	-	set 60D
"	3112	-	set 60D
"	3113	-	set 60D
"	3114	G-16	Top 60D for INV.
"	3115	JAW-616	CONC.
"	3116	P12	Top of PVC
"	3117	JAW-617	CONC.
"	3118	JAW-615	CONC.
"	3119	-	&& F-Road & I-Road

8-4-97

12/2

97-219

Burning Ground

Base @ 2019 Hz: 1312 m

7884

TDC1 #16269

Rover #	Pt #	well	Desc
7853	3120	JAW-625	CONC
"	3121	MW1-92	Lip of Lid.
"	3122	MW2-92	Lip of Lid.
"	3123	MW3-92	Lip of Lid
"	3124	JAW-626	CONC
"	3125	JAW-627	CONC.
"	3126	JAW-11	CONC
"	3127	JAW-12	CONC.
"	3128	JAW-13	CONC.
"	3129	JAW-14	CONC.
"	3130	JAW-23	CONC.
"	3131	JAW-25	CONC.
"	3132	JAW-63	CONC.
"	3133	JAW-62	CONC.
"	3134	JAW-61	CONC.
"	3135	JAW-60	CONC.
"	3136	JAW-80	CONC
"	3137	JAW-59	CONC.
"	3138	JAW-58	CONC.
"	3139	G-30	Top cap.

97-219

Rover #	Pt #	well	Desc.
7853	3140	JAW-68	CONC.
"	3141	JAW-24	CONC.
"	3142	–	set 60D
"	3143	–	set 60D
"	3144	JAW-614	CONC.
"	3145	EDA-3	CONC.
"	3146	EDA-2	CONC.
"	3147	EDA-4	CONC.
"	3148	JAW-7	CONC.
"	3149	JAW-5	CONC
"	3150	G-29	Top Lid.
"	3151	JAW-64	CONC
"	3152	EDA-1	CONC
"	3153	–	set 60D
"	3154	–	set 60D
"	3155	–	FS CK 2018

RTK
Line 800

Base @ 2024 HI= 1.303m
#7884

TDC1 #16269

Rover #	Pt #	well	Desc
7853	3156	JAW-78	CONC.
"	3157	JAW-79	CONC.
"	3158	G-46	GOD on Ground
"	3159	G-47	GOD on Ground.
"	3160	G-57	Lip of Lid.
"	3161	G-58	Lip of Lid.
"	3162	G-56	Lip of Lid
"	3163	G-40	Top of Lid
"	3164	G-41	Top of Lid.
"	3165	G-20	Top of Lid
"	3166	G-19	Top of Lid
"	3167	G-17	Top of Lid.
"	3168	G-43	Top of Lid
"	3169	G-42	Top of Lid
"	3170	G-45	Top of Lid
"	3171	G-44	Top of Lid
"	3172	G-48	Top of Lid.
"	3173	G-18	Top of Lid.

8-5-97

14/2

97-219

RTK
Yard D / Yard C

Base @ 2026 HT = 1.422
#7884

TDC #16269

Rover #	Pt #	Well	Desc
7853	3174	?	conc. (well in Yard D)
"	3175	14-A	conc.
"	3176	-	FS ck 2022
"	3177	-	set 60D
"	3178	x -	FS ck 2020
"	3179	-	¢ & Road K & Ent YARD D

8-5-97

97-219

15/2

RTK
South Gate #5

Base @ 2015 HI: 1.459
#7884

TDC1 #16269

Rover	Pt #	Well	Desc.
7053	3180	G-12	Top of Lid.
"	3181	-	¢¢ K-Road & J-Road
"	3182	-	¢¢ C-Road & I-Road
"	3183	14F	CONC.
"	3184	-	FS CK 2014

8-6-97 -CLR 80° 16/2

97-219

RTK

Misc control

Base @ 2028 HI = 1.343

#7884

TDC1 #16269

Rover #	Pt. #	well	Desc
7853	3185	-	FS CK 2029
"	3186	-	60D Tape Pt to use for well 13-F
"	3187	-	60D old CP # 2031
"	3188	-	60D old CP# 2030
"	3189	-	set 60D for well (G-26)
"	3190	-	" " "
"	3191	-	FS CK 2029

8-6-97

17/2

97-219

AKA 3000
for well (G-25)
" "

RTK
CONTROL FOR well G-27

Base @ 2020 HT:
7884

TDC1 #16269

Rover #	Pt #	Well	Desc.
7853	3192	-	set GOD for well (G-27)
"	3193	-	topo Pt's
"	3194	-	VOID
"	3195	-	FS ck 3177

8-6-97

18/2

97-219

8-7-97

19/2

97-219

RTK
FIRING SITE

Base @ 2002 HI= 1.442
7884
TDC #16269

Rover #	Pt #	well	Desc	
7853	3196	JAW-36	CONC	
"	3197	-	set 600	Topo Pt
"	3198	-	for well	(JAW-35)
"	3199	JAW-619	CONC	
"	3200	JAW-33	CONC	
"	3201	JAW-34	CONC.	
"	3202	JAW-37		
"	3203	JAW-32	CONC	
"	3204	JAW-618	CONC	
"	3205	-	FS CK	2003

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Test Firing
well

8-7-97

20/2

97-219

T@ 3198 HI: 5.435 ft. Dist: 40.831m

BS to 3197 HI: 1.500m Vert Dif: +1.681m

Well # CONC.	∡Rt	Dist	Vert Dif	Desc.
JAW-35	190-57-28	36.079m	-2.208m	½ N of well ON CONC.

RTK

Clean-up Line 2

Base ⊙ 2022 HI: 1.524m
#7884

TDC1 #16269

Rover #	Pt #	Well	Desc.
7853	3221	JAW-72	CONC
"	3222	12-F	CONC
"	3223	-	C&E H-Road / G-Road
"	3224	-	FS CK 2023

8-8-97 CLR 80° 22/2

97-219

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INV. on wells.
(CONT. From Page 22/1)

well	INV.	Desc.
JAW-4	+3.05	
JAW-614	+2.25	
EDA-3	+2.27	
EDA-2	+1.60	
EDA-4	+1.80	
EDA-1	+2.90	
JAW-64	+2.53	
JAW-06	+2.64	
JAW-07	+2.33	
JAW-05	+2.58	
G-29	-0.77	
JAW-78	+2.93	
JAW-79	+2.78	
G-46	+0.03	
G-47	-0.36	
G-57	0.00	
G-58	+0.05	
G-56	-0.07	
G-41	-0.20	
G-40	-0.20	
G-20	-0.48	
G-19	-0.46	
G-18	-0.60	
G-17	-0.78	

(CONT. PG 24/2)

8-11-97

97-219

97.219

CONT..
(CONT. From Pg 23/2)

Well	INV.	Desc.
G-43	-0.20	
G-42	-0.47	
G-45	-0.51	
G-44	-0.02	
G-48	-1.10	
JAW-623	+2.18	
JAW-624	+2.20	
JAW-36	+2.16	
JAW-35	+2.70	
JAW-619	+2.14	
JAW-33	+2.52	
JAW-34	+2.46	
JAW-32	+2.26	
JAW-618	+2.37	
JAW-37	+2.14	
JAW-15	+2.20	
JAW-16	+2.09	
JAW-19	+2.54	
JAW-22	+2.20	
JAW-17	+2.50	
JAW-18	+2.50	
JAW-21	+2.78	
JAW-20	+1.92	
G-13	-0.75	

(CONT. TO PG 25/2)

97-219

CONT..
(CONT.. From PG 24/2)

well	INV.	Desc.
G-12	-0.50	
14-F	+2.04	
G-9	+2.75	
DA-1	+2.25	
G-11	+3.39	
JAW-02	+2.29	
G-10	0.00	
G-3	-1.25	
G-2	+2.85	
JAW-8	+2.14	
JAW-9	+2.10	
JAW-10	+2.06	
G-16	-0.51	
G-616	+2.33	
JAW-617	+2.26	
JAW-615	+2.21	
13B	+2.03	
G-25	-0.37	
JAW-26	-0.75	
HARZA Yard D	+2.56	HARZA Well "Yard D"
14A	+2.26	
G-28	+3.41	
JAW-69	+2.68	
JAW-63	+2.53	

(CONT. TO PG 26/2)

CONT..
(CONT. FROM PG 25/2)

WELL	INV.
JAW-62	+2.62
JAW-61	+2.46
JAW-60	+2.75
JAW-80	+2.64
JAW-58	+2.96
JAW-25	+2.64
JAW-68	+2.53
G-30	-0.70
JAW-24	+2.53
MW1-92	-0.06
JAW-625	+2.05
MW2-92	+0.05
MW3-92	+0.13
JAW-626	+2.27
JAW-627	+2.48
JAW-11	+2.42
JAW-12	+2.68
JAW-13	+2.43
JAW-23	+3.11
JAW-14	+2.70
12 B	+2.21
12 C	+2.48
12 D	+1.98
12 A	+2.11

(CONT. TO PG 27/2)

97-219

CONT...
(CONT.. TO PG 26/2)

Well	INV.
12F	+2.28
10A	+2.10
10B	+2.39
G-49	-0.40
JAW-77	+2.19
JAW-57	+2.10
JAW-56	+2.29
JAW-55	+2.25
JAW-54	+2.30
16A	+1.95
JAW-53	+2.08
16D	+1.89
16E	+1.86
16C	+2.03
16B	+1.95
G-27	-0.56

97-219

RTK Clean-up

8-20-97
JC
JO

CLK: 05°

28/2

97-219

Base @ 1057 HI= 1.465 m
#3675

TDC \ \ #16269

Rover	Pt #	well	Desc.
7853	3600	R10-PZ-01	TOP PVC
"	3601	R10-PZ-02	" "
"	3602	R10-PZ-03	" "
"	3603	-	VOID
"	3604	-	FS CM 1108
"	3605	NE PIZ	Top PVC
"	3606	NE PIZ	"
"	3607	NE PIZ	"
"	3608	~~NWS~~ PIZ	"
"	3609	NWC PIZ	"
"	3610	NWN PIZ	"
"	3611	SWN PIZ	"
"	3612	SWC PIZ	"
"	3613	SWS PIZ	"
"	3614	SEE PIZ	"
"	3615	SEC PIZ	"
"	3616	SEW PIZ	"
"	3617	14 E	"

8-2-97

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97-219

RTK Clean-up
Well G-31

Base @ 2011 HI = 1,571
3675

TDC # 16269

Rover #	Pt #	Well	Desc.
7853	3618	-	Set 60D
"	3619	-	Set 60D

WELL G31

T@ 3618 HI: 1.545m BS to 3619 HI: 1.500m

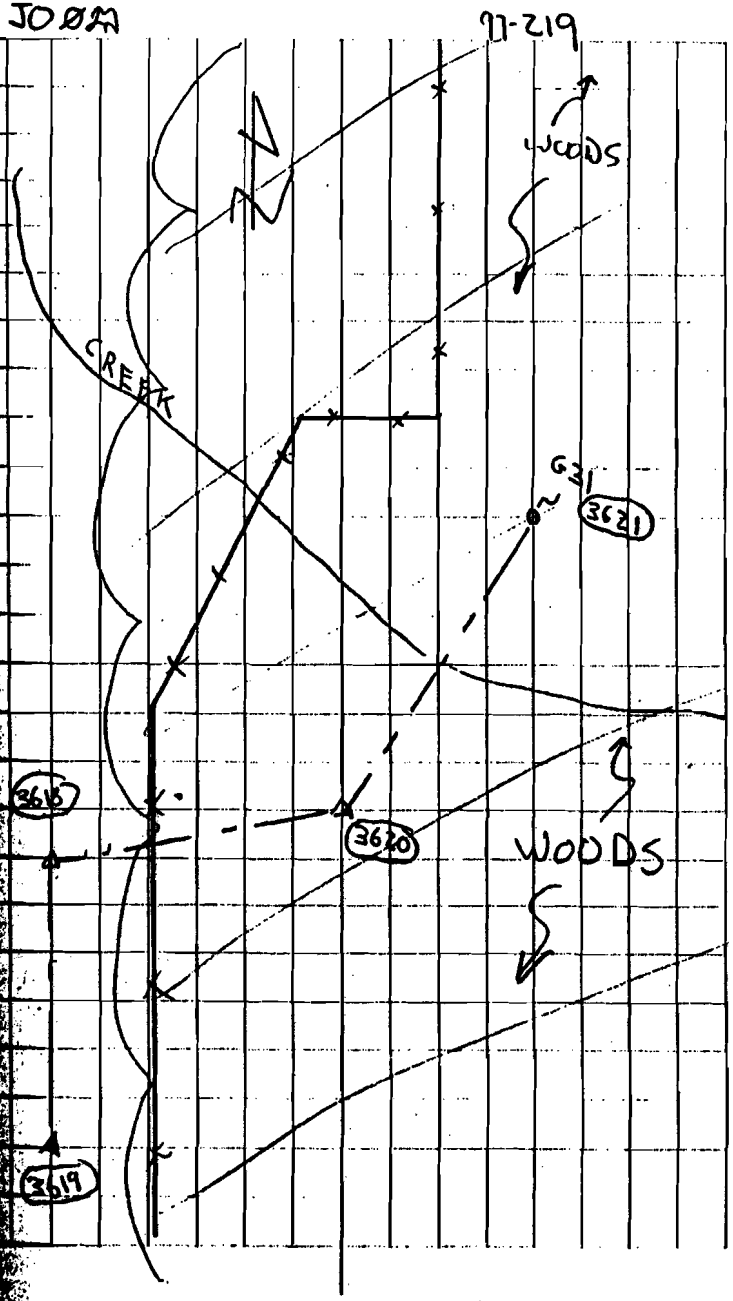
Pt #	Desc.
3620	Set GOD

T@ 3620 HI: 1.550 BS to 3618 HI: 1.50

Pt #	Desc.
3621	Top PVC G31
3622	BS ch 3618

8-20-97
JC T SM 3C SDR-33 #2
JO ØM

30/2



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RTK WELL
G1

Base @ (2001) HI: 1.396
#3675

TDC1 #16269

Rover #	Pt #	well	Desc.
7853	(3623)	–	Shot ?
"	3624	G1	Top PVC

8-20-97

31/2

97-219

RTK
Clean-up

Base @ 2028 HI: 1.478
#3675

TOC1 #16269

Rover #	Pt #	well	Desc.	
7853	3625	13D	Top	PVC
"	3626	13E	"	"

8-20-97

32/2

97-219

RTK
Clean-up

Base @ 2030 HI = 1.480
#3675

TDC1 #16269

Rover	Pt #	well	Desc	
7853	3627	-	Set	PK
"	3628	-	set	PK

NOTE: Check coords for (2030) pt to meter coords do not match TDC1 coords.

T@ 3627 HI: 1.475m BS to 3628 HI: 1.500

Pt #	Desc.
3629	Top PVC WELL #AZ-629
3630	BS CK 3628

8-20-97

33/2

97-219

8-21-97

34/2

97-419

RTK
Clean up

Base @ 2026 HI= 1.612
#3675

Rover #	Pt #	Well	Desc
7853	3631	-	VOID
"	3632	-	VOID
"	3633	-	VOID
"	3634		VOID
"	3635	14D	Top PVC
"	3636	14C	Top PVC
"	3637	-	Set PK (GSI)
"	3638	-	Set PK (GSI)

8-21-97

35/2

97-219

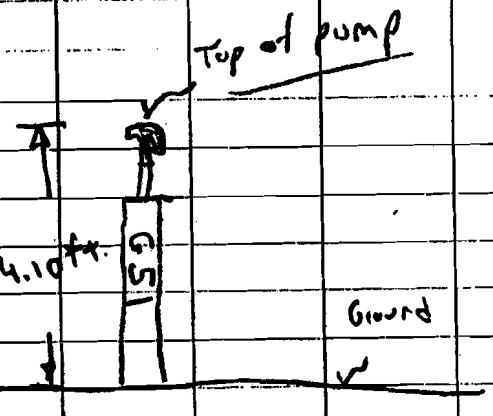
well
G-51

TO @ 3637 HI: 1.563 BS 3638 HI: 1.500

Pt #	Desc		
3639	Top Pump	G-51	(Top of Pump)
3640	BS	CK	3638

→ Shot as Pt # 3632

→ Shot as Pt # 3631



RTK

8-21-97

36/2

97-219

Base @ 2023 HI: 1.590

#3675

TDC1 #16269

Rover #	Pt #	well	Desc
7853	3641	JAW-621	Top PVC
	3642	6E	"
	3643	JAW-622	"
	3644	6D	"
	3645	6F	"
	3646	6A	"
	3647	JAW-620	"
	3648	6B	"
	3649	6G	"
	3650	JAW-69	"
	3651	PIZ?	"
	3652	PIZ?	"
	3653	PIZ?	"
	3654	PIZ?	"
	3655	PIZ?	"
	3656	PIZ?	"
	3657	CWP	"
	3658	G15	Add +1.258m to top of PVC
	3659	JAW-70	Top PVC
	3660	12G	"
	3661	12E	"
	3662	C3	"

Rover #	Pt #	well	Desc
7853	3663	C4	Top PVC
	3664	C5	

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RTK

Base @ 1142 HI: 1.638
#3675

TDC1 #16269

Row #	Pt #	well	Desc
7853	3665	SL-91	Top PVC
	3666	SL-81	" "
	3667	JAW-601	" "
	3668	G14	" "

8-21-97 NTJ 37/2

97-219

RTK

8-21-97

38/2

97-219

Base @ 2002 HI: 1.530
#3675

TPC1 # 16269

Rover #	Pt #	well	Desc
7853	3669	-	60D Nail 2045
	3670	-	60D Nail 2044
	3671	DA-2	Top PVC
	3672	-	60D Nail 2046
	3673	-	60D Nail 2047
	3674	-	set PK
	3675	-	set PK
	3676	-	set PK

TO 3674 HI: 1.522m BS to 3675 HI: 1.504m

Pt #	Desc
3677	Top PVC G-8
3678	BS ch 3675

RTK

39/2

97-219

Base @ 3676 HI = 1.428m
#3675

TBC1 # 16269

Row #	Pt #	well	Desc.
7853	3680	JAW-27	Top PVC
	3681	G-7	" "
	3682	G-5	" "
	3683	JAW-28	" "
	3684	T-4	" "
	3685	GP4	" "
	3686	GP1	" "
	3687	JAW-26	" "
	3688	JAW-65	

RTK

8-22-97

40/2

97-219

Base @ (1142) HI: 1.628
#3675

TDC 1 #16269

Rover #	Pt #	Well	Disc	
7853	(3689)	12H	Top	PVC
	3690	–	VOID	
	3691	–	VOID	
	3692	–	VOID	
	3693	–	VOID	
	3694	~~71-6~~ G2-6	Top	PVC

97219

HARZ 4

BOOK #3

Field Book

F-642

KARA

153

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CHICAGO 60631

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DT-0659

Projects 01-05 MISC.

04 HORIZ. VERT. LOC. WELL G-3

07-08 RELEVEL THRU WELLS LINE 9 THAT HAVE ALUM. DISKS

09-10 LEVEL CIRCUIT TO LINE 2

10-13 LEVEL TO WELLS LINE 3A

14-16 HORIZ. LOC. WELLS JAN 89 10

17-18 LEVEL ADDITIONAL WELLS ~~EXPL~~ EXPLOSION DISPOSAL AREA

19-19A HORIZ. LOC. WELLS EXPLOSION DISPOSAL AREA

20-23 RELEVEL THRU WELLS LINE 800

24-37 HORIZ. LOC. MISC. WELLS

38-44 LEVEL TO WELLS IN FIRING AREA

45-50 LEVEL TO WELLS LINE 3

51-52 LEVEL ADD. WELLS LINE 800

KARA COMPANY INC.
SURVEYING, CARTOGRAPHY & SUPPLIES

5255 DANSHER • COUNTRYSIDE, ILLINOIS 60525
(708) 482-8888

07-28-97
TG
JC
SUNNY 83°

		#2007 GOD opposite WELL		
	⊼ ~~2006~~		BS 2006	
WELL G-3 CONTROL OF CASING	220-38-49	40-39-13	78-45-3	
	00-00-00	179-59-49	218-06-16	
	220-38-49	220-39-23	220-38-57	
AVERT	[220-39-03]			
BS HA 2006	67.476m	221.38 FT		
FWD (WELL G-3)	7.725m	25.34 FT		
BM 2006	11.05			
WELL G-3		1.95 TOP CASING OF WELL		
		5.80 GROUND OF WELL		
TP #1	1.80	1.95		
CLOSE BM #2006		10.86		

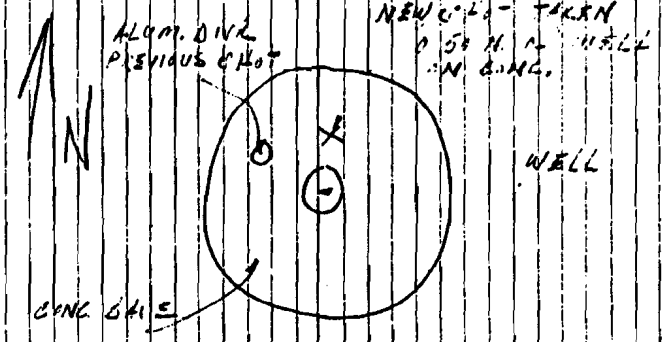
6/8

Time for AVERT

7/8

97219

RELEVEL TO MONITORING
WELLS LINE UP WITH
ALUM. DISKS



251

07-29-97
TG
CC

97-219

SUNNY 78° (R.R. IN FEET)

BM-35	5.58		
WELL T-35			5.65
T-36			5.66
T-34			5.43
T-32			5.34
T-31			4.96
T-33			4.62
CLOSE T-32			5.34

8/3

TIME
DIG WELL T-35

0.50M of WELL IN CONC.

0.50M of WELL ON CONC.

AGAIN DIG WELL T-32

9/B

97219

RUN LEVEL CIRCUIT
TO LINE 2 : GET TBM
@ LINE 2 ENTRANCE

07-31-97
JC

97219

10/13

JUNNY 80° (RR IN FEET)

BM #2023	4.44		
TP 1	3.78		3.56
TP 2	2.04		6.94
SET TBM #7	9.35		9.02
TP 3	6.93		3.28
TP 4	4.32		4.60
CLOSE BM 2023			4.40

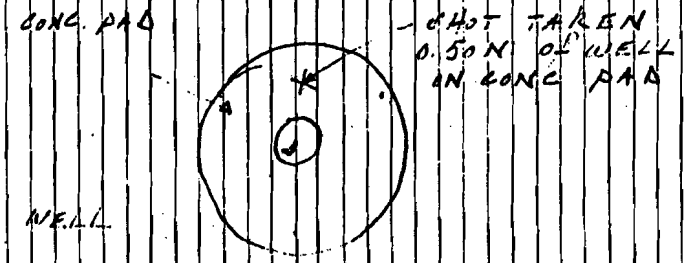
PK NAIL

CUT IN SET ON PK NAIL ON LANE DAILE FOR GUARD POST @ ENTRANCE TO LIVE 2 OFF OF "4" ROAD

SAME AS ABOVE

97219

LINE 3A
LEVEL CIRCUIT
RUN ELEVATIONS TO
MONITORING WELLS



08-06-97
TG
FC

14/B

SUNNY 85°

	BS +	HI	FS −	ELEV.
		97219		
BM 2003	1.47	100.47		100.00
TP 1	6.40	103.15	1.82	103.05
JAW-20	8.75		6.87	10[illegible]
JAW-19	4.32		6.90	
JAW-16	4.65		6.50	
JAW-15	5.93		5.02	
TP 2	5.42		9.00	
TP 3	3.44		2.55	
JAW 17			4.70	
JAW 18			4.68	
TP 4	5.58		6.47	

AF NAIL

CONC.

CONC.

CONC.

CONC.

CONC.

CONC.

08 10 -
TG
SL
SUNNYBD

97219

TP 5	5.61	3.38
JAW 20		3.38
JAW 21	3.46	3.32
TP 6	4.58	6.98
TP 7	6.72	5.55
TP 8	4.72	6.34
TP 9	4.37	0.87
TP 10	4.85	1.44
TP 11	~~4~~ 3.66	~~4.85~~ 4.93
TP 12	3.60	6.38
CLOSE BM 2003		6.56

CONC.

CONC.

SAME AS START

97219

4 ET, 4D ; VD TO
CAW 8, 9, 10

08-04-97

TL

JL

SUNNY 80°

97219

15

	⊼ 3113		BC 3110	
(HI=1.600m)	BC HΔ = 138.21FT 37.687m		(CE = 00-00-00)	
	⊼ RIGHT	FS HΔ	VΔ	
JAW 8	228-41-08	171.63FT 52.134m	-0.91FT -0.278m	

(BC VΔ = +2.55 FT +0.778 m)

PRISM POLE HT = 1.500 m

164

08-04-97
TI-
JC

97219

SUNNY BC

	X 3110		BU 3112	
	HI = 1.523 m		TAR HT = 1.500 m	
FS				
JAW 9	159-42-40			
BU 3112	00-00-00			
AVG RT	159-42-40			
BS HD	130.02 FT	39.690 m		
FS HD	88.06 FT	26.839 m		
VD BS	-2.96 FT	-0.901 m		
~~VD FS~~	CHANGE TAR HT ON FS 2.500 m			
VD FS	-3.73 FT	-1.138 m		

97219

10/8

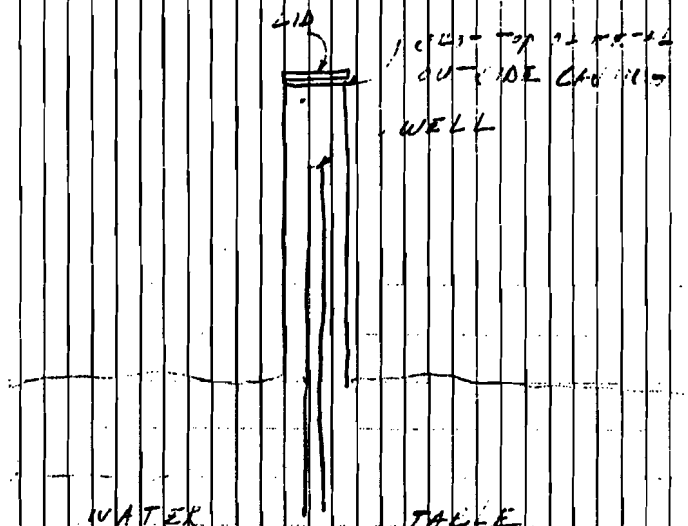
	X 3112		BU 3114
	HI = 1.628 m		TAR HT = 1.500 m
FS			
JAW 1-10	240-42-07		
BU 3114	00-00-00		
AVG RT	240-42-07		
BS HD	173.53 FT	52.893 m	
FS HD	76.26 FT	23.244 m	
VD BS	+8.39 FT	+2.558 m	
	TAR HT FS = 1.500 m		
VD FS	-4.56 FT	-1.389	

17/8

97E19

(EXPLORATORY WATER DISCHARGE AREA)

LEVEL TO MONITORING WELLS
MW2-92, MW1-92 :



08-05-97
TC
JC

97219

18/5

SUNNYSIDE					
BM(JAW625)	2.12				
MW2-92			5.16		
			4.56		
MW1-92			2.45		
SLOPE BM(JAW625)			2.12		

0.50 M. OF WELL ON SLOPE PREVIOUS SHOT

TOP OF STEEL WELL OUTSIDE CASING

TOP OF 4" P.V.C. OUTSIDE CASING OF WELL

TOP OF STEEL WELL OUTSIDE CASING SAME AS START

19/B

97219

EXPLOSION DISPOSAL AREA

< RT, H. DIST. V. DIST

TO MONITORING WELLS

08-05-97
TL
JC
SUNNY 80°

19A
19A/3

	97219			
	⊼ "A" (GPS 3143)	BS "B" (GPS 3142)		
	HI = 1.502 m	TAR HT = 1.500		
FS CAN 04	179-41-29			
BS	00-00-00			
∡ RT	179-41-29			
BS HD	113.01 FT	34.444 m		
BS VD	-4.16 FT	-1.267 m		
	FS TAR HT = 1.500 m			
FS HD	172.50 FT	52.578 m		
FS VD	2.26 FT	0.689 m		

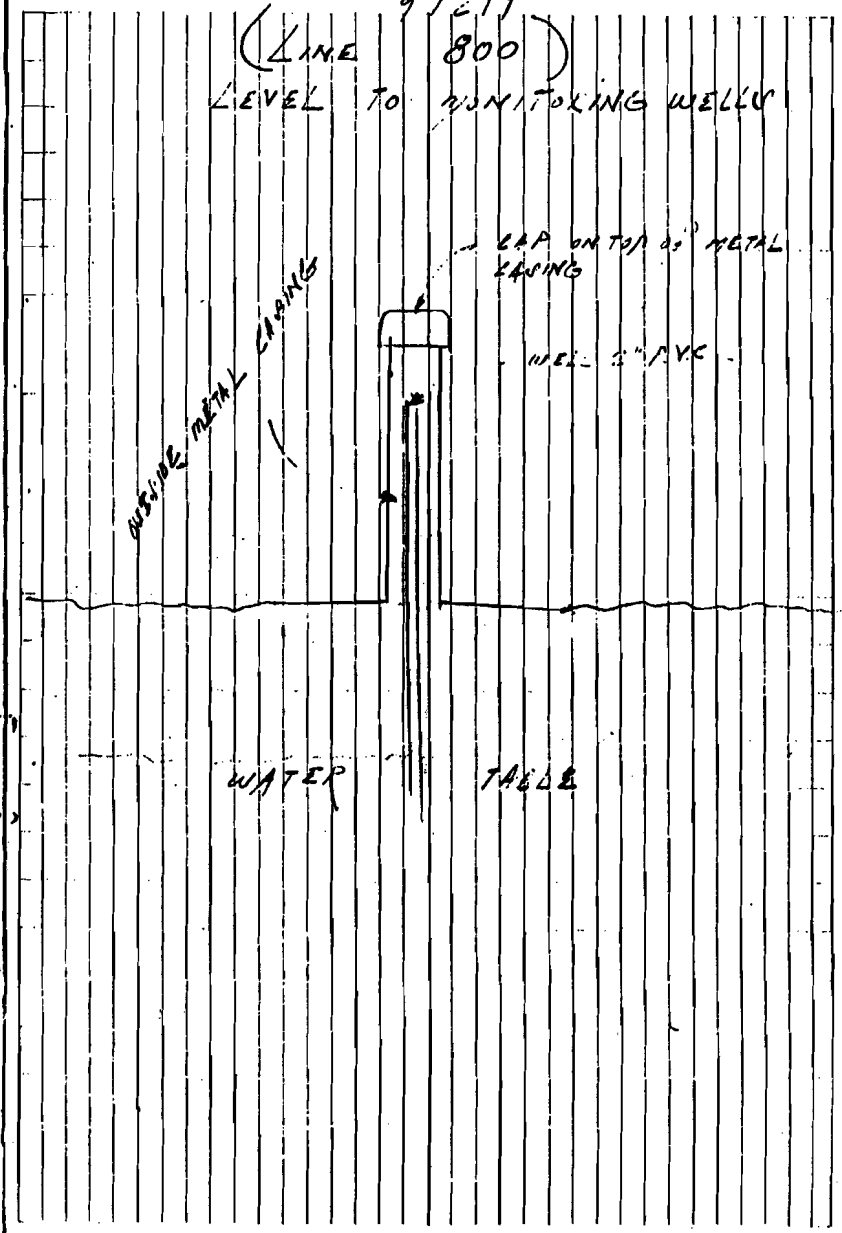
	97219		
	⊼ A (GPS 3154)	BS D (GPS 3153)	
	HI = 1.624 m	TAR HT = 2.000 m	
FS TAW 0/0	130-25-35		
BS	00-00-00		
∡ RT	130-25-35		
BS HD	143.62 FT	43.778 m	
BS VD	3.10 FT	0.946 m	
	F/O TAR HT = 2.000 m		
FS HD	140.5 FT	42.860 m	
FS VD	-10.0 FT	-3.050 m	

20/B

97219

(LINE 800)

LEVEL TO MONITORING WELLS



Line 800

8-6-97

21/3

97-219

BM	BS	HI	FS	EL	BM
ASC 2024	5.08				
G-46			4.66		
G-47			4.19		
T.P	4.09		7.95		
CONC JAW-79			6.75		
CONC JAW-78			6.79		
T.P.	5.84		6.49		
T.P.	4.74		2.48		
T.P.	4.54		3.79		
G.45			2.01		
G.44			1.86		
T.P.	3.22		4.60		

Top of cap

Top of cap

CONT TO PG 22

LINE 800

8-6-97

22/3

97-219

BM	BS	HI	FS	EL	BM	
T.P.	9.83		8.48			
T.P.	5.06		2.28			
G-43			0.89			Top of cap
G-42			1.04			Top of cap
T.P.	4.22		3.55			
G-17	4.05		2.38			Top of cap
G-18			5.57			Top of cap
G-19			5.18			Top of cap
T.P	6.31		8.24			
G-20			0.82			Top of cap
T.P.	4.16		3.19			
G-41			3.78			Top of cap
G-40			3.64			Top of cap

CONT. ON PG 23

8-6-97

23/3

97-219

BM	BS	HI	FS	EL	BM
T.P.	2.71		3.58		
ASC 2024			6.86		

24/3

97219

4 AT, 4 DIST, V DIST
MONITORING WELLS
G-28, G-45, CTW 623, CTW 624, G-49

174

TRAV. G

T GPS (A.K.A. 8[illegible]) (A.K.A.) BU GPS "F"

SET GEO NAL

FS G 173-[illegible] 3[illegible]-46-[illegible]

BS 00-00-00 180-00-08

AV ∠ RT

BU H.D ~~BU H.D~~ ~~196.[illegible]~~

BU V.D

08-05-97
TB
CC
SUNNY 80°

97519

25/B

T GPS ~~[illegible]~~ (3190) BS GPS (3189)

HI = 1.565 m TAR HT = 1.500 m

GPS "F" SET GEO NAL (RANDOM PT)

FS "G" 173-45-31 353-45-28

BS 00-00-00 180-00-08

173-45-31 173-45-20

AV ∠ RT. (173-45-25 ±)

BU/HD 216.89 ft 66.107 m

BU/VD +1.71 ft +0.521 m

FS TAR HT = 1.500 m

FS/HD 196.29 ft 59.829 m

FS/V.D. -2.30 ft -0.724 m

08-05-97
TG
CE

SUNNY 80°

97219

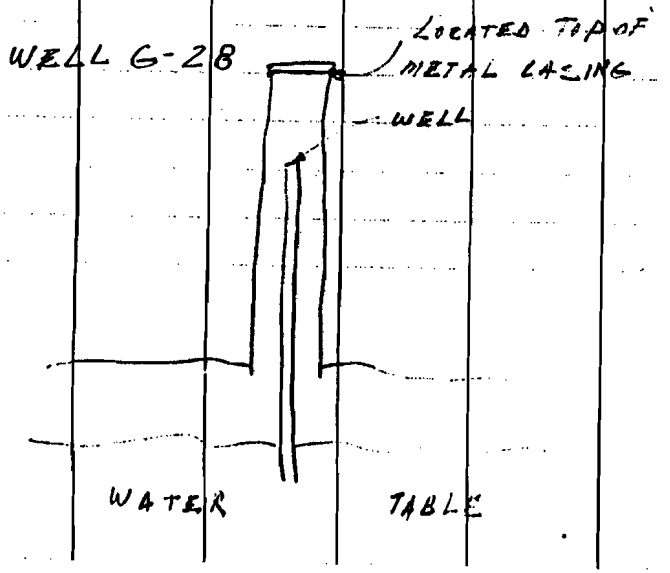
3190

T "G" ON GPS

HI = 1.502 m TAR HT = 1.500 m

WELL
FS (G-28) 241-51-24
BS 00-00-00
∡ RT 241-51-24

BS HD 196.37 FT 59.853 m
BS VD +2.20 FT +0.670 m
CHANGE (FS TAR HT = 0.000)
FS HD 58.46 FT 17.820 m
FS VD - 0.60 FT - 0.184 m



26/3

97219

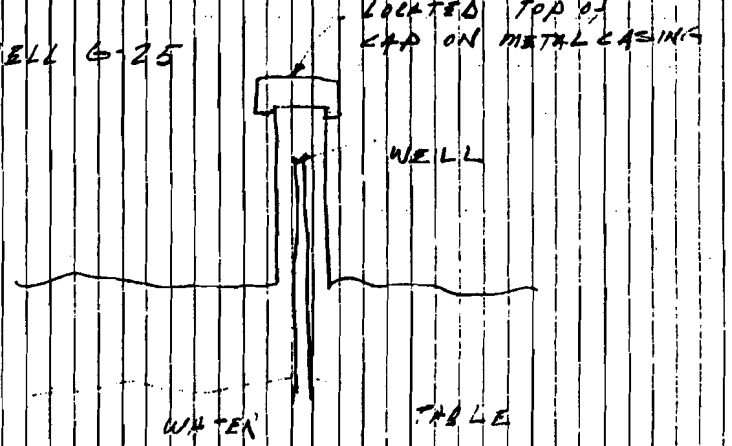
T GPS 3188

BS GPS 3187

HI = 1.621 m TAR HT = 1.500 m

FS (WELL G-25) 242-03-41
BS 00-00-00
∡ RT 242-03-41

BS HD 141.46 FT 43.116 m
BS VD +2.85 FT +0.869 m
CHANGE (FS TAR HT = 1.500 m)
FS HD 160.46 FT 48.909 m
FS VD - 13.00 - 3.963 m



08-05-97
TM
LC

CUNNY80'

97219

GPS
1118

LS GPS 1119

HI = ~~1.600~~ 1.597 m

TAR HT = ~~1.554~~ 1.500 m

"H"

SET AL NAIL (RANDOM PT)

FS "H" 190-12-09 ~~190-00-00~~

10-12-30

190-00-08 ~~190-12-09~~

BS 00-00-00

190-12-09

190-12-22

LVLRT (190-12-15)

BS HD 726.26 FT 221.365 m

BS VD +2.53 FT 0.772 m

FS TAR HT = 1.600 m

FS HD 773.48 FT 235.817 m

FS VD +1.21 FT + 0.368 m

08-05-97
TG
JC
SUNNY 80°

97219

"H"

BS GPS 1119

HI = 1.527 TAR HT = 1.500 m

FS
JAW 623 278-21-18
BS 00-00-00
∠ RT 278-21-18
BS HD 773.71 FT 235.826 m
BS VD -1.65 -0.503 m

FS TAR HT = 1.500 m

FS HD 226.72 FT 69.103 m
FS VD -1.05 FT -0.319 m

FS TAR HT = 1.500 m

FS
JAW 624 256-22-00
BS 00-00-00
∠ RT ~~256-22-00~~
~~00-00-00~~

FS TAR HT = 1.500

FS HD 134.14 FT 40.886 m
FS VD -0.46 FT -0.141 m

58/3

97219

WELL JAW 623 - 624

SLO- TAKEN 0.50 M
FT WELL IN CONE

CONE

WELL

178

08-0[illegible]-97

CUNNY BS 97219

T (GPS 2017) BS (GPS F016)

HI: 1.621 THR HT: ~~1.500m~~ 2.400 m

FS WELL G-49 85-28-49

BS 00-00-00

∡ RT 85-28-49

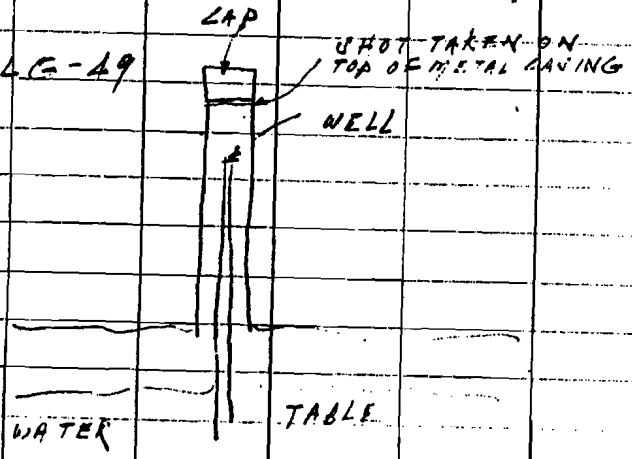
BS HΔ 1708.48 FT 520.746 m

BS VΔ +2.92 FT +0.889 m

FS HΔ 123.83 FT 37.743 m

FS VΔ +0.74 FT +0.225 m

WELL G-49



[illegible]

DEVELOPING FLEET

[illegible]

NON-PRODUCING WELL

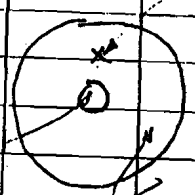
08-06-97
FC

(WIN) BC

97-19

	π FPC 2.64 1.585 m	BC GPS 2.65
	HI = 5.20 FT	TAR HT = 2.500 m
FS WELL 6-9	112-43-30	
BS	00-00-00	
∡ RT	112-43-30	
BS HD	288.31 FT	87.878 m
SVD ↑	- 2.15 FT	- 0.655 m
	FS TAR HT = 2.500 m	
FS HD	139.41 FT	42.492 m
FS VD	+ 1.[illegible] FT	+ 0.343

WELL 6-9
DA-1
JAW 0



NOTE: WELL 6-9 HAS NO CONC. BASE. LOCATED A 60A NAIL 0.50 N. of WELL

31/3

97-19

	π FPC 2.60 1.606 m	BS GPS 2.44
	HI = 5.27 FT	TAR HT = 2.500
(FS WELL JAW 0)	159-[illegible]-[illegible]	
BS	00-00-00	
∡ RT	159-[illegible]-[illegible]	
BS HD	308.19 FT	87.641 m
BS VD	+ 8.04 FT	+ 2.450 m
	FS TAR HT = 2.500 m	
FS HD	175.30 FT	53.440 m
FS VD	- 11.46	- 3.493 m
FS DA-1	156-09-08	
BS	00-00-00	
∡ RT	156-[illegible]-[illegible]	
	FS TAR HT = 2.500	
FS HD	183.16 FT	55.846 m
FS VD	- 12.39 FT	- 3.77[illegible] m

08-06-97
T:
FC
CONNC) 80

9721

32/B

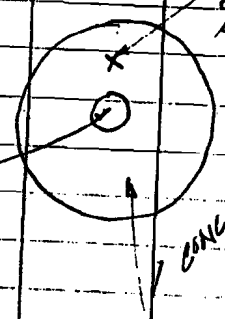
K GPS 2046
HI = 1.606m
5.27 FT

BS GPS 2047
TAR HT = 2.000 m

FS
WELL G-11 299-53-41
BS 00-00-00
∡ RT 299-53-41

BS HD 361.69 FT 110.243 m
BS VD +2.72 FT +0.828 m
FS TAR HT = 2.000 m
FS HD 87.17 FT 26.570 m
FS VD +1.97 FT +0.601 m

WELL G-11



08-26-97
TG
JC

SUNNY 80°

97219

A GPS 2047
9.740 m
HT = 6.71 FT

BS GPS 2046
TAR HT = 2.000 m

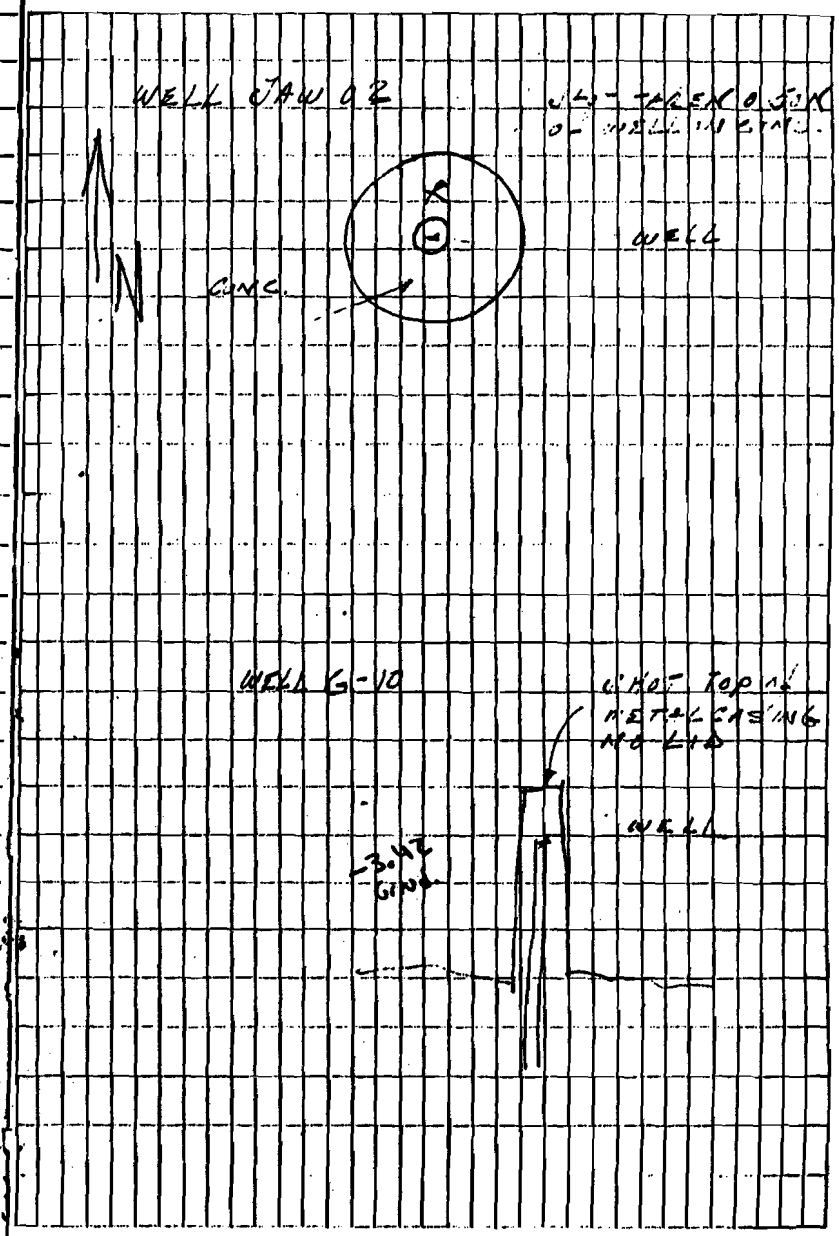
(FS WELL JAN 02) 358-29-56
BS 00-00-00
∡ RT 358-29-56

BS HD 361.61 FT 110.220 m
BS VD -0.61 FT -0.185 m

FS TAR HT = 2.000 m
FS HD 142.78 FT 43.518 m
FS VD -8.78 FT -2.675 m

FS TAR HT = 2.000
FS WELL G-10 128-15-45
BS 00-00-00
∡ RT 128-15-45

FS HD 201.11 FT 61.299 m
FS VD -9.61 FT -2.928



08-06-97
T-
C
SUNNY 80°

97219

R GPS 2014 1.582m HI = 5.19 FT

BS GPS 2015 TAR HT = 1.500m

"I" SET PK. NAIL (RANDOM PT)

FS "I"	174-06-03	354-06-02
BS	00-00-00	180-00-17
	174-06-03	174-05-45
AVGRT	(174-05-54)	

BS HΔ	511.80 FT	155.996 m
BS VΔ	7.25 FT	2.209 m

FS TAR HT = 1.500m

FS HΔ	448.73 FT	136.775 m
FS VΔ	-5.93 FT	-1.808 m

34/~~8~~

97219

R "I" HI = 5.25 FT 1.600m

BS GPS 2014 TAR HT = 5.07 FT

"J" SET PK NAIL (RANDOM PT)

FS "J"	160-46-28	340-46-56
BS	00-00-00	~~00~~ 180-00-05
	160-46-28	160-46-51
AVGRT	160-46-39.5	

BS HΔ	448.74 FT	136.775 m
BS VΔ	+5.56 FT	+1.694 m

FS TAR HT = 1.500m

FS HΔ	569.80 FT	173.674 m
FS VΔ	-8.44 FT	-2.574

08-06-97
TG
JC

Lovo x 80°

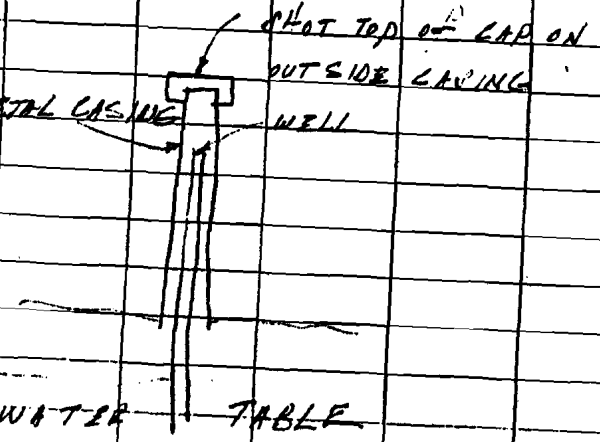
97219

∡ "J" 1.649 m
HI = 5.41 FT

BS "I"
TAR HT = 1.500 m

WELL
G-13 72-47-15
BS 00-00-00
∡ RT 72-47-45

BS HD 569.82 FT 173.680 m
BS VD +7.63 FT +2.367 m
FS TAR HT = 2.555 m
FS HD 74.40 FT 22.695 m
FS VD +3.73 FT +1.137 m



06-97
TG
JC
CLOUDY 80°

97-19

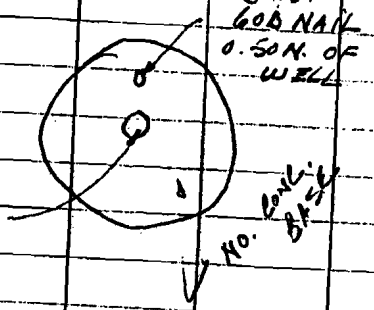
π GPS 2020 BS GPS 3177
1.576m
HI = 5.17FT THR HT = 1.500 m

FS
WELL G-28 255-20-06
BS 00-00-00
∡ RT 255-20-06

BS HD 362.95 FT 110.628 m
BS VD -2.89 FT -0.880 m

FS THR HT = 1.500 m
FS HD 119.62 FT 36.460 m
FS VD -0.81 FT -0.247 m

WELL G-28



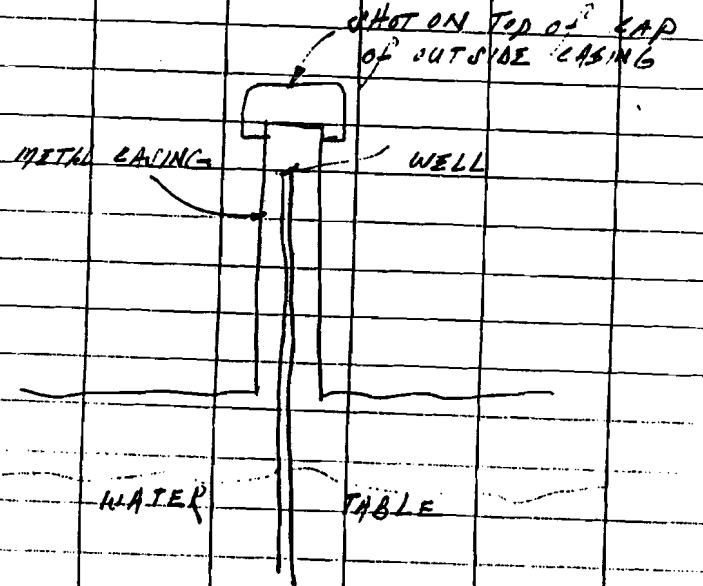
36/BB

08-06-97
TS
JC

CONDT 80°

97219

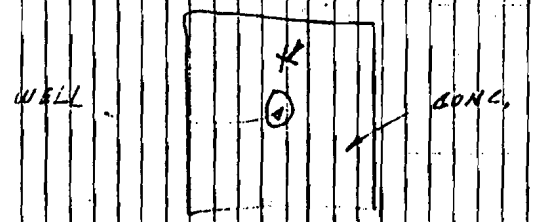
	TGPS 3193	BS GPS 3192
	1.575 m	
FS	HI = 5.17 FT	TAR HT = 1.500 m
WELL G-27	197-44-59	
BS	00-00-00	
∡ RT	197-44-59	
BS HΔ	391.50 FT	119.329 m
BS VΔ	+1.39	+0.425 m
	FS TAR HT = 0.50	
FS HΔ	102.40 FT	31.211 m
FS VΔ	-1.08 FT	-0.330 m



97219

FIRING AREA B
LEVEL, CIRCUIT AND
SIDESLOPE MONITORING
WELLS

SHOT TAKEN 0.50 M.
OF WELL ON CONC



08-07-97
TG
JC
SUNNY 80

		97219	
BM 2002	3.45		
TP 1	7.18		3.14
TP 2	7.37		0.42
JAN 36			8.84
SET TBM B	5.41		4.58
TP 3	5.90		4.48
TP 4	5.06		4.53
TP 5	3.35		6.91
TP 6	3.19		7.53

BR. NAIL

0.50 N. OF [illegible] ENG

SET SPIKE OUT ON [illegible]
FENCE POST [illegible]
4 WAY INTERSECT. N. OF [illegible]
ENT. IN FRONT AREA

08[illegible]7

SUNNY 88°

9721 9

TP 7	0.38	5.91
TP 8	0.76	14.38
TP 9	0.44	14.28
TP 10	0.88	8.07
TP 11	12.96	1.73
TP 12	13.08	1.51
TP 13	8.50	0.29
JAW 619		6.78
JAW 34		6.79
JAW 33		6.99
JAW 37	13.68	6.40

CONC. 0.50 N. of WELL

08-07-91
FG
JC
SUNNY 80°

97219

4 1/3

JAW 32			8.02
JAW 618			6.00
TP 14	0.98		12.84
TP 15	0.29		10.95
TP 16	0.40		10.52
TP 17	12.24		13.34
TP 18	14.62		1.32
TP 19	14.59		0.82
TP 20	9.53		1.66
TP 21	6.27		4.03

0.50 N. of WELLON CONC.

08-[illegible] 97219

SUNNY 80°

TP 22	4.82	0.67
TP 23	5.16	2.87
TP 24	4.15	5.66
TP 25	4.45	5.72
TP 26	2.05	11.07
LLOYE BM 2002		5.50

42/B

SAME AS START

08-07 11 11215

TG
RC
TC

SUNNY 80°

TBM 8	5.08		
TP 1	4.48		4.68
TP 2	1.12		12.02
TP 3	0.68		11.62
TP 4	1.49		12.85
TP 5	0.64		12.86
TP 6	3.47		11.63
WELL JAW 35			10.22
TP 7	12.84		3.47
TP 8	14.64		2.19
TP 9	14.79		1.38

SEE PG 39 FOR DESCRIPTION

0.50 N. WELL ON BENC

9 1 C 19

JC
SUNNY 80°

TP 10	14.14	1.24
TP 11	7.40	1.36
TP 12	3.60	4.76
CLOSE TBM 8		4.31

44/3

SAME AS START

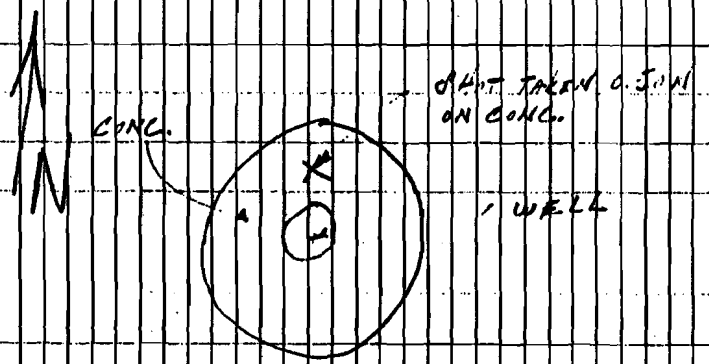
84.71

97219

45/3

LINE 3

RUN LEVEL CIRCUIT TO LINE 3
AND SUBSHOT MONITORING WELLS



08·[illegible]
TC
JC
SUNNY 80°

97219

46/3

ASC BM #1	3.68	
TP 1	2.64	5.21
TP 2	5.35	1.55
TP 3	2.73	5.79
TP 4	2.50	5.87
VET TBM #9	3.12	5.52
TP 5	5.33	4.23
TP 6	5.39	4.92
WELL JAW 57		8.70
TP 7	2.46	7.01

60Δ NAIL

N. FLANGE BOLT ON F.H. JUST S. of
BLDG # 3-52 LINE 3

0.50 W. of WELL ON CONC.

08-07-97
TG
JC
R
~~Sunny 80°~~

97219

JAW 77			7.48
TP 8	6.46		2.15
JET # TBM 10	4.14		3.95
TP 9	5.88		5.74
CLOSE TBM #9			2.82

47/3

0.5 IN AFTER IN CONC.

TOP SPINDLE NUT ON FH APP. N BLDG
3-05-2 IN LINE 3

(SEE DESCRIP. PG #46)

08-07-97
TG
JC
SUNNY 80°

97219

48/3

TBM 10	1.18		SEE PLAT A7 for DESCRIP. of BM
TP 1	5.25	9.64	
JAW 56 ~~TP 2~~	3.71	6.30	0.60N. of WELL ON CONC
JAW 55		6.15	0.50N. of WELL ON CONC.
TP 2	3.69	5.88	
JAW 54		4.60	0.50N. of WELL ON CONC.
WELL 16-A		6.05	0.50N. of WELL ON CONC.
JAW 53	5.56	6.18	0.50N. of WELL ON CONC.
WELL 16-D		3.67	CONC. 0.50N. of WELL
WELL 16-E	5.82	3.80	CONC. 0.50N. of WELL

08-07-97
JC
SUNNY 80°

97219

49/B

TP 3	5.44		4.40	
WELL 16-C			6.93	LONG. 0.50 N. of WELL
TP 4	4.90		3.78	
TP 5	8.25		4.34	
WELL 16-B			8.47	LONG. 0.50 N. of WELL
TP 6	2.10		4.39	
TP 7	8.87		1.82	
ELEV TBM 10			3.90	

08-07-97
TG
JC
SUNNY 80°

97219

TBM #9	6.14	
TP 1	6.28	2.44
TP 2	3.97	3.15
TP 3	5.11	6.70
TP 4	5.13	3.40
CLOSE BM ASC#1		3.90

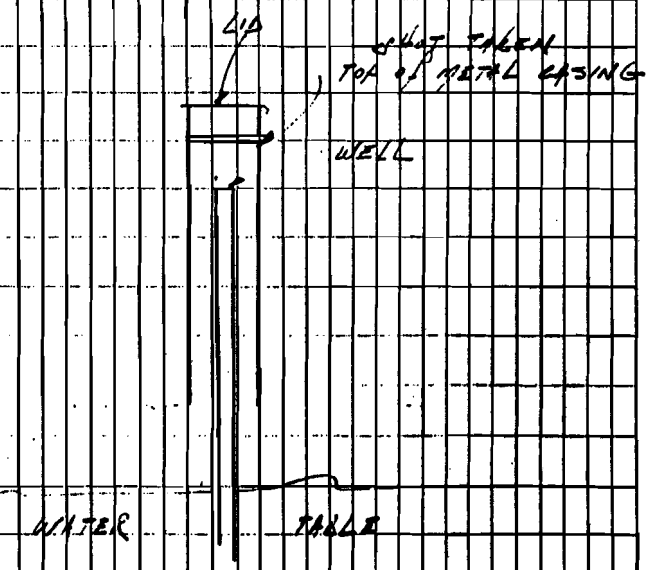
50/3

(SEE PG# 46 FOR DETAIL)

SAME AS START (SEE PG# 46 FOR BEGINNING OF THIS LEVEL CIRCUIT TO LINE 3) TIED TBM#9 BACK INTO BM#1 START OF CIRCUIT

97219

LINE 800



08-08-97
TT
JC

SUNNY 82		97819	
BM WELL G-17	5.24		
G-57			7.79
G-58			6.89
G-56			8.29
G-48			6.09
CLOSE BM G-17			5.24

52

TOP OF LID G-17 WELL LINE 800

TOP OF METAL CASING

TOP OF METAL CASING

TOP OF METAL CASING

TOP OF METAL CASING

SAME AS START

202

APPENDIX I
MONITORING WELL INVENTORY
(Current as of 1997)

I-1 Well Inventory Tabulation

I-2 Well Inspection Forms

APPENDIX I
MONITORING WELL INVENTORY
(Current as of 1997)

I-1 Well Inventory Tabulation

Groundwater Monitoring Well Inventory (1997)

Well	Drainage	Line	Year	Installed By	Diam.	Unit	Coordinates East	Coordinates North	Boring Depth	Ground Elev.	TOC Elev.	Top of Screen Depth	Top of Screen Elev.	Bottom of Screen Depth	Bottom of Screen Elev.	Screen Length	Groundwater Depth	Groundwater Elev.	Bedrock Depth	Bedrock Elev.	Comments
10- A	Brush	Line 2	1997	Harza	4	U+L	2271165	298819	50.4	681.65	683.75	10	671.65	50.4	631.25	40	4.07	679.68	NA	NA	Accessible.
10- B	Brush	Line 2	1997	Harza	2	U+L	2271151	298806	50	681.55	683.94	10	671.55	50	631.55	40	4.28	679.66	NA	NA	Accessible.
12- A	Brush	Line 2	1997	Harza	2	U	2270801	298785	20.5	679.14	681.25	10.5	668.64	20.5	658.64	10	8.15	673.10	NA	NA	Accessible.
12- B	Brush	Line 2	1997	Harza	2	U	2270647	297916	20.5	689.23	691.44	10.5	678.73	20.5	668.73	10	7.09	684.35	NA	NA	Accessible.
12- C	Brush	Line 2	1997	Harza	2	L	2270635	297922	50.2	689.18	691.66	40.2	648.98	50.2	638.98	10	19.76	671.90	NA	NA	Accessible.
12- D	Brush	Line 2	1997	Harza	2	B	2270636	297913	120	689.28	691.26	110	579.28	120	569.28	10	44.53	646.73	110.00	579.28	Accessible.
12- E	Brush	Line 2	1997	Harza	2	U	2271126	297294	20	688.53	690.37	10	678.53	20	668.53	10	8.20	682.17	NA	NA	Accessible.
12- F	Brush	Line 2	1997	Harza	2	L	2271212	298193	50.4	688.26	690.54	40.4	647.86	50.4	637.86	10	Dry	<637.86	NA	NA	Accessible. Dry.
12- G	Brush	Line 2	1997	Harza	2	U	2270441	298035	20.3	687.97	690.00	10.3	677.67	20.3	667.67	10	8.04	681.96	NA	NA	Accessible.
12- H	Brush	Line 2	1997	Harza	1	U	2269728	298714	30	688.13	689.60	28	660.13	30	658.13	2	6.00	683.60	NA	NA	Accessible. Porous tip piezometer.
13- B	Brush	General/K Road	1997	Harza	2	B	2277256	287766	45.4	627.67	629.54	33.6	594.07	43.6	584.07	10	21.62	607.92	7.50	620.17	Accessible.
13- D	Brush	General/K Road	1997	Harza	2	L	2278282	288126	85	652.84	654.59	74.6	578.04	84.8	568.04	10	37.30	617.29	NA	NA	Accessible.
13- E	Brush	General/K Road	1997	Harza	2	L	2278285	288119	35	652.56	654.21	24.5	628.06	34.5	618.06	10	30.03	624.18	NA	NA	Accessible.
13- F	Brush	General/K Road	1997	Harza	2	L	2278612	288227	55	658.65	660.44	45	613.65	55	603.65	10	52.56	607.88	NA	NA	Accessible.
14- A	Spring	General	1997	Harza	1	B	2275920	298163	67.5	691.57	693.83	65.3	626.27	67.5	624.07	2	33.68	660.15	47.50	644.07	Accessible. Porous tip piezometer.
14- B	Brush/Spring	General	1997	Harza	1	B	2276162	292255	98	678.28	680.84	95.8	582.48	98	580.28	2	49.74	631.10	77.20	601.08	Accessible. Porous tip piezometer.
14- C	Long/Brush	General	1997	Harza	1	B	2267498	290753	77.1	684.35	686.24	75.1	609.25	77.1	607.25	2	40.22	646.02	56.00	628.35	Accessible. Porous tip piezometer.
14- D	Brush	General	1997	Harza	1	B	2273458	287167	43.6	676.81	679.05	41.4	635.41	43.6	633.21	2	12.33	666.72	22.50	654.31	Accessible. Porous tip piezometer.
14- E	Long	General	1997	Harza	1	B	2262676	298556	108.5	689.81	691.28	106.6	583.21	108.5	581.31	2	46.61	644.67	88.50	601.31	Accessible. Porous tip piezometer.
14- F	Skunk/Long	General	1997	Harza	1	B	2260874	285499	43.5	675.16	677.20	40.4	634.76	42.4	632.76	2	26.63	650.57	21.60	653.56	Accessible. Porous tip piezometer.
16- A	Brush	Line 3	1997	Harza	2	B	2267991	299601	110	694.35	696.30	99.4	594.95	109.4	584.95	10	17.42	678.88	109.50	584.85	Accessible.
16- B	Brush	Line 3	1997	Harza	2	U	2268410	300701	25.2	699.15	701.10	15.1	684.05	25.1	674.05	10	3.71	697.39	NA	NA	Accessible.
16- C	Brush	Line 3	1997	Harza	2	U	2268671	300002	25.6	695.66	697.69	15.6	680.06	25.6	670.06	10	4.74	692.95	NA	NA	Accessible.
16- D	Brush	Line 3	1997	Harza	2	U	2268248	298983	25.1	695.77	697.66	15	680.77	25	670.77	10	5.00	692.66	NA	NA	Accessible.
16- E	Brush	Line 3	1997	Harza	2	L	2268236	298986	55	695.69	697.55	45	650.69	55	640.69	10	12.90	684.65	NA	NA	Accessible.
MW- 01	Brush	Line 800	1998	Harza	2	U	2269290	293479	20	682.60	684.71	9.9	672.70	19.9	662.70	10	6.31	679.14	NA	NA	Accessible.
MW- 02	Brush	Line 600	1998	Harza	2	B	2269592	294042	76	680.90	682.72	66	614.90	76	604.90	10	11.64	671.75	53.00	627.90	Accessible.
MW- 03	Brush	Line 800	1998	Harza	2	B	2269416	293807	79	680.90	682.63	69	611.90	79	601.90	10	24.00	658.41	58.00	622.90	Accessible.
MW- 04	Brush	Line 800	1998	Harza	2	B	2269109	293590	74	683.80	685.92	64	619.80	74	609.80	10	23.29	657.78	52.50	631.30	Accessible.
MW- 05	Brush	Line 800	1998	Harza	2	U	2269327	294383	18	677.50	678.80	7.5	670.00	17.5	660.00	10	3.15	675.93	NA	NA	Accessible.
MW- 06	Brush	Line 600	1998	Harza	2	U	2269447	294374	18	679.30	681.54	7.5	671.80	17.5	661.80	10	4.82	676.71	NA	NA	Accessible.
MW- 07	Brush	Line 800	1998	Harza	2	L	2269403	293794	38	681.10	682.64	27.5	653.60	37.5	643.60	10	5.38	677.66	NA	NA	Accessible.
MW- 08	Brush	Line 800	1998	Harza	2	U	2268746	294111	18	683.30	685.38	7.5	675.80	17.5	665.80	10	5.16	680.77	NA	NA	Accessible.
MW- 09	Brush	Line 800	1998	Harza	2	U	2268216	293495	18	683.90	685.59	7.5	676.40	17.5	666.40	10	7.72	678.27	NA	NA	Accessible.
MW- 10	Brush	Line 600	1998	Harza	2	U	2269848	293889	16	679.20	681.25	7.5	671.70	17.5	661.70	10	5.06	677.47	NA	NA	Accessible.
MW- 11	Brush	Line 800	1998	Harza	2	B	2269848	293901	76.2	679.20	681.33	66.2	613.00	76.2	603.00	10	18.21	662.99	55.50	623.70	Accessible.
MW- 12	Brush	Line 800	1998	Harza	2	U	2268626	293907	18	685.50	687.37	7.5	678.00	17.5	668.00	10	6.28	682.95	NA	NA	Accessible.
MW- 13	Brush	Line 800	1998	Harza	2	U	2268819	293868	18	684.00	686.06	7.5	676.50	17.5	666.50	10	5.78	680.26	NA	NA	Accessible.
MW- 14	Brush	Line 800	1998	Harza	2	L	2269135	293576	35	683.60	685.72	25	658.60	35	648.60	10	6.76	679.36	NA	NA	Accessible.
MW- 15	Brush	Line 600	1998	Harza	2	U	2269406	293057	18	680.20	682.14	7.5	672.70	17.5	662.70	10	7.33	675.43	NA	NA	Accessible.
MW- 16	Brush	Line 600	1998	Harza	2	B	2269326	294392	70.5	677.50	679.59	60.5	617.00	70.5	607.00	10	29.10	644.04	38.00	639.50	Accessible.
MW- 17	Brush	Line 800	1998	Harza	2	L	2269327	294372	34.5	677.70	679.55	24.5	653.20	34.5	643.20	10	2.95	676.81	NA	NA	Accessible.
MW- 18	Brush	Line 800	1998	Harza	2	U	2269640	293744	18	679.50	681.86	7.5	672.00	17.5	662.00	10	4.91	678.28	NA	NA	Accessible.
MW- 19	Brush	Line 800	1998	Harza	2	B	2270154	293883	74	678.40	680.67	64	614.40	74	604.40	10	16.00	664.58	52.50	625.90	Accessible.
MW- 20	Brush	Line 800	1998	Harza	2	U	2269296	294457	18	676.70	678.81	7.5	669.20	17.5	659.20	10	6.17	674.35	NA	NA	Accessible.
MW- 21	Brush	Line 800	1998	Harza	2	B	2269852	294174	77	680.10	682.17	67	613.10	77	603.10	10	19.05	663.02	54.50	625.60	Accessible.
M 01	Spring	Fire Training Pit	1996	Harza																	Accessible.
CW- P	Spring	North Burn Pad					2276347	302630	NA	690.67	NA	NA	NA	NA	NA	2	6.14	NA	NA	NA	Accessible. No surf. casing. No lock.
DA- 1	Skunk	Demolition Area	1984	USACE	4	B	2254503	290997	21.00	673.53	675.78	11.00	662.53	20.60	652.93	9.6	9.97	665.81	7.90	665.63	Well wizard installed.
DA- 2	Skunk	Demolition Area	1984	USACE	4	B	2255342	290488	25.00	678.29	680.56	15.00	663.29	24.50	653.79	9.5	13.67	666.89	11.80	666.49	Well wizard installed.
DM- 1	Flint/Long/Brush	Fuel Station	1989	D&M	4	U	2261315	308266	16.00	729.08	729.06	5.00	724.08	15.00	714.08	10	5.43	723.63	NA	NA	Does not recover. Rehab or abandon.
DM- 2	Flint/Long/Brush	Fuel Station	1989	D&M	4	L	2261332	308272	38.00	729.09	729.09	30.00	699.09	35.00	694.09	5	4.13	724.96	NA	NA	Accessible.
DM- 3	Flint/Long/Brush	Fuel Station	1989	D&M	4	L	NA	NA	55.00	NA	NA	50.00	NA	55.00	NA	5	NA	NA	NA	NA	Could not locate.
DM- 4	Flint/Long/Brush	Fuel Station	1989	D&M	4	U	2261327	308176	17.00	729.17	729.17	5.00	724.17	15.00	714.17	10	4.53	724.64	NA	NA	Accessible.
DM- 5	Flint/Long/Brush	Fuel Station	1989	D&M	4	L	2261360	307926	38.00	728.61	728.01	30.00	698.61	35.00	693.61	5	4.71	723.30	NA	NA	Accessible.
DM- 6	Flint/Long/Brush	Fuel Station	1989	D&M	4	L	NA	NA	58.00	NA	NA	46.00	NA	54.00	NA	6	NA	NA	NA	NA	Could not locate.
DM- 7	Flint/Long/Brush	Fuel Station	1989	D&M	4	U	2261281	308425	18.00	729.47	729.47	5.00	724.47	15.00	714.47	10	5.34	724.13	NA	NA	Accessible.
DM- 8	Flint/Long/Brush	Fuel Station	1989	D&M	4	U	2261366	308293	15.00	728.89	728.89	5.00	723.89	15.00	713.89	10	3.88	725.01	NA	NA	Accessible.
DM- 9	Flint/Long/Brush	Fuel Station	1989	D&M	4	U	2261294	308243	17.00	729.08	729.08	5.00	724.08	15.00	714.08	10	4.34	724.74	NA	NA	Accessible.
DM- 10	Flint/Long/Brush	Fuel Station	1989	D&M	4	U	2261327	308176	17.00	729.12	729.12	5.30	723.82	15.30	713.82	10	4.90	724.22	NA	NA	Accessible.
EDA- 1	Spring	Explosive Disposal Area	1984	USACE	4	U	2277976	302531	26.00	692.47	695.37	16.00	676.47	25.80	666.67	9.8	7.50	687.87	NA	NA	Well wizard installed.
EDA- 2	Spring	Explosive Disposal Area	1984	USACE	4	B	2277543	301755	27.00	671.62	673.22	17.80	653.82	27.40	644.22	9.6	19.98	653.24	32.60	639.02	Well wizard installed.
EDA- 3	Spring	Explosive Disposal Area	1984	USACE	4		2277787	301533	37.00	674.32	676.59	28.00	646.32	37.60	636.72	9.8	20.38	656.21	NA	NA	Well wizard installed.
EDA- 4	Spring	Explosive Disposal Area	1984	USACE	4	U	2278506	302332	19.00	683.40	685.20	9.40	674.00	18.40	665.00	9	8.38	676.82	NA	NA	Well wizard installed. Low PID reading.
ET- 1	Long	Inert Disposal Area					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Abandoned. Removed by ECC.
ET- 2	Long	Inert Disposal Area					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Abandoned. Removed by ECC.
ET- 3	Long	Inert Disposal Area					2257405	299346	NA	708.31	710.74	NA	NA	NA	NA	NA	21.10	689.64	NA	NA	Well wizard installed.
FL- 1	Long	Flyash Landfill			4		2261610	300871	NA	711.34	713.68	NA	NA	NA	NA	NA	5.39	708.29	NA	NA	Accessible.
FL- 2	Long	Flyash Landfill			4		2261754	300623	NA	711.45	713.19	NA	NA	NA	NA	NA	5.15	708.04	NA	NA	Accessible.
FL- 3	Long	Flyash Landfill			4		2261579	300516	NA	714.21	716.07	NA	NA	NA	NA	NA	8.35	707.72	NA	NA	Accessible.
FL- 4	Long	Flyash Landfill			4		2261390	300428	NA	710.40	712.46	NA	NA	NA	NA	NA	6.05	706.41	NA	NA	Accessible.
FL- 6	Long	Flyash Landfill			4		2261367	301109	NA	714.33	717.04	NA	NA	NA	NA	NA	5.22	711.82	NA	NA	Accessible.
FL- 7	Long	Flyash Landfill			4		2261217	301129	NA	714.13	715.97	NA	NA	NA	NA	NA	3.65	712.32	NA	NA	Accessible.

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Groundwater Monitoring Well Inventory (1997)

Well	Drainage	Line	Year	Installed By	Diam.	Unit	Coordinates East	Coordinates North	Boring Depth	Ground Elev.	TOC Elev.	Top of Screen Depth	Top of Screen Elev.	Bottom of Screen Depth	Bottom of Screen Elev.	Screen Length	Groundwater Depth	Groundwater Elev.	Bedrock Depth	Bedrock Elev.	Comments
FL- 8	Long	Flyash Landfill			4		2261058	300965	NA	716.64	718.54	NA	NA	NA	NA	NA	5.47	713.07	NA	NA	Accessible.
FL- 9	Long	Flyash Landfill			4		2261094	300605	NA	712.40	714.11	NA	NA	NA	NA	NA	3.13	710.98	NA	NA	Accessible.
FL- 10	Long	Flyash Landfill			4		2261177	300322	NA	710.92	712.71	NA	NA	NA	NA	NA	4.40	708.31	NA	NA	Accessible.
G- 1	Long	Perimeter/N	1981	STS	4	U	2257255	308431	NA	715.95	719.85	10.00	NA	20.00	NA	10	8.48	711.37	NA	NA	Accessible.
G- 2	Long	Perimeter/NW	1981	STS	4	U	2251076	306250	NA	715.24	718.07	8.00	NA	18.00	NA	10	6.55	711.52	NA	NA	Accessible.
G- 3	Long	Perimeter/W	1981	STS	4	L	2246949	303606	30.00	684.10	688.02	20.50	663.60	30.50	653.60	10	12.85	675.17	NA	NA	Well wizard installed.
G- 4	Long	Inert Disposal Area	1981	STS	4	U	2257854	299871	26.00	705.98	708.17	16.00	689.98	26.00	679.98	10	8.91	699.26	NA	NA	Well wizard installed.
G- 5	Long	Inert Disposal Area	1981	STS	4	L	2257049	298541	50.00	689.10	692.33	40.00	649.10	50.00	639.10	10	41.74	650.59	NA	NA	Well wizard installed.
G- 6	Long	Inert Disposal Area	1981	STS	4	U	2257974	298713	28.00	0.00	704.04	17.00	-17.00	27.00	-27.00	10	8.38	695.66	NA	NA	Well wizard installed.
G- 7	Long	Inert Disposal Area	1981	STS	4	L	2257400	298405	42.00	692.78	695.48	32.00	660.78	42.00	650.78	10	23.70	671.78	NA	NA	Well wizard installed.
G- 8	Long	Firing Site	1981	STS	4	U	2257681	295074	16.00	0.00	614.36	5.00	-5.00	15.00	-15.00	10	5.91	608.45	NA	NA	Accessible.
G- 9	Skunk	Demolition Area	1981	STS	4	U	2254925	291348	28.00	692.11	694.86	16.50	675.61	26.50	665.61	10	9.59	685.27	NA	NA	Well wizard installed.
G- 10	Skunk	Demolition Area	1981	STS	4	U	2254583	290362	24.00	681.92	685.34	14.00	667.92	24.00	657.92	10	19.55	665.79	15.00	666.92	Well wizard installed.
G- 11	Skunk	Demolition Area	1981	STS	4	B	2255073	290363	37.00	691.64	695.03	26.00	665.64	36.00	655.64	10	30.25	664.78	25.00	666.64	Well wizard installed.
G- 12	Skunk	Perimeter/SW	1981	STS	4	U	2256943	286081	20.00	663.32	666.07	9.50	653.82	19.50	643.82	10	8.30	657.77	NA	NA	Well wizard installed.
G- 13	Skunk	Perimeter/SW	1981	STS	4	B	2256683	285340	30.00	646.74	649.39	18.50	628.24	28.50	618.24	10	24.53	624.86	18.50	628.24	Well wizard installed.
G- 14	Brush	Brush Creek/Line 1	1981	STS	4	L	2269900	301223	38.00	675.94	678.59	26.00	649.94	36.00	839.94	10	0.30	678.29	NA	NA	Accessible. Water above ground surface.
G- 15	Brush	Brush Creek/Line 2	1981	STS	4	U	2270105	297091	18.00	655.75	660.21	6.50	649.25	16.50	639.25	10	9.66	650.55	NA	NA	Accessible, but no comments noted.
G- 16	Brush/Long	Pesticide Pit	1981	STS	4	U	2266282	296069	20.00	693.49	696.11	10.00	683.49	20.00	673.49	10	7.72	688.39	NA	NA	Accessible.
G- 17	Brush	Line 800	1981	STS	4	U	2269584	294334	20.00	681.17	684.21	9.00	672.17	19.00	662.17	10	7.80	676.41	NA	NA	Accessible.
G- 18	Brush	Line 800	1981	STS	4	U	2269585	294035	20.00	680.06	682.79	9.00	671.06	19.00	661.06	10	5.71	677.08	NA	NA	Accessible.
G- 19	Brush	Line 800	1981	STS	4	U	2269409	293800	20.00	680.26	683.40	9.50	670.76	19.50	660.76	10	6.79	676.61	NA	NA	Accessible.
G- 20	Brush	Line 800	1981	STS	4	U	2269127	293629	20.00	683.42	685.78	9.50	673.92	19.50	663.92	10	10.57	675.21	NA	NA	Well wizard installed.
G- 21	Long	Perimeter/S	1981	STS	4	U	2266241	282927	18.00	538.79	540.87	7.00	531.79	17.00	521.79	10	NA	NA	NA	NA	Well wizard installed. Tape blocked.
G- 22	Skunk	Perimeter/S	1981	STS	4	L	2272255	283054	42.00	675.94	678.04	32.00	643.94	42.00	633.94	10	12.45	665.59	NA	NA	Well wizard installed.
G- 23	Spring	Perimeter/S	1981	STS	4	U	2275300	283038	20.00	669.55	671.76	9.00	660.55	19.00	650.55	10	8.64	663.12	NA	NA	Well wizard installed.
G- 24	Brush	Perimeter/SE	1981	STS	4	B	2280304	285424	17.00	600.11	602.37	6.00	594.11	16.00	584.11	10	13.88	588.49	6.00	594.11	Well wizard installed.
G- 25	Spring	Perimeter/E	1981	STS	4	L	2282608	286729	81.00	628.09	630.72	71.00	557.09	81.00	547.09	10	16.48	614.24	NA	NA	Well wizard installed.
G- 26	Spring	Perimeter/E	1981	STS	4	L	2282728	291572	100.00	656.42	659.92	90.00	566.42	100.00	556.42	10	42.29	617.63	NA	NA	Well wizard installed.
G- 27	Spring	Perimeter/E	1981	STS	4	U	2282664	295091	24.00		666.18	14.00	-14.00	24.00	-24.00	10	6.45	659.73	NA	NA	Well wizard installed.
G- 28	Spring	Perimeter/E	1981	STS	4	U	2282581	298830	20.00	674.69	678.10	10.00	664.69	20.00	654.69	10	8.18	669.92	NA	NA	Well wizard installed.
G- 29	Spring	Explosive Disposal Area	1981	STS	4	U	2278172	301799	20.00	681.90	684.33	8.00	673.90	18.00	663.90	10	6.94	677.39	NA	NA	Well wizard installed.
G- 30	Spring	West Burn Pad	1981	STS	4	B	2276555	301118	17.00	652.01	654.76	7.00	645.01	17.00	635.01	10	11.27	643.49	4.40	647.61	Well wizard installed.
G- 31	Long	Perimeter/W	1981	STS	4	U	2246846	301370	16.00	0.00	669.62	5.50	-5.50	15.50	-15.50	10	8.25	661.37	NA	NA	Well wizard installed.
G- 40	Brush	Line 800	1983	Batelle	4	B	2268443	293534	83.00	682.28	684.08	73.25	609.03	83.25	599.03	10	29.21	654.87	58.00	624.28	Accessible.
G- 41	Brush	Line 800	1983	Batelle	4	U	2268438	293537	22.00	682.53	684.23	9.80	672.73	19.80	662.73	10	5.21	679.02	NA	NA	Accessible.
G- 42	Brush	Line 800	1983	Batelle	4	B	2269969	294493	77.00	683.14	685.27	66.50	616.64	76.50	606.64	10	22.86	662.41	49.00	634.14	Accessible.
G- 43	Brush	Line 800	1983	Batelle	4	L	2269970	294486	42.00	683.26	685.60	32.10	651.16	42.10	641.16	10	14.92	670.68	NA	NA	Accessible.
G- 44	Brush	Line 800	1983	Batelle	4	B	2270110	294177	80.00	679.70	682.02	68.00	611.70	78.00	601.70	10	18.57	663.45	50.00	629.70	Accessible.
G- 45	Brush	Line 800	1983	Batelle	4	L	2270108	294165	40.00	679.73	681.38	30.00	649.73	40.00	639.73	10	7.25	674.13	NA	NA	Accessible.
G- 46	Brush	Line 800	1983	Batelle	4	B	2269644	293389	68.00	678.42	680.44	58.00	620.42	68.00	610.42	10	10.19	670.25	41.00	637.42	Accessible.
G- 47	Brush	Line 800	1983	Batelle	4	U	2269646	293378	26.00	678.45	680.59	16.00	662.45	26.00	652.45	10	7.42	673.17	NA	NA	Accessible.
G- 48	Brush	Line 800	1987	D&M	4	L	2268683	294298	31.00	681.88	683.11	20.41	661.47	30.42	651.46	10.01	4.94	678.17	NA	NA	Accessible.
G- 49	Brush	Line 1	1987	D&M	4	L	2267602	307174	32.00	718.11	720.03	19.49	698.62	29.50	688.61	10.01	5.73	714.30	NA	NA	Accessible.
G- 50	Brush	Brush Creek	1987	D&M	4	B	NA	NA	82.00	NA	NA	76.21	NA	81.20	NA	4.99	NA	NA	63.00		Not accessible. Manual pump installed.
G- 51	Brush	Brush Creek	1987	D&M	4	U	2271971	294463	16.00	643.92	648.02	10.20	633.72	15.00	628.92	4.8	6.25	641.77	NA	NA	Accessible.
G- 52	Brush	Brush Creek	1987	D&M	4	B	2272886	290931	39.00	634.72	636.74	31.66	603.06	36.65	598.07	4.99	0.20	636.54	21.00	613.72	Accessible.
G- 53	Brush	Brush Creek	1987	D&M	4	U	2272872	290938	11.00	634.82	637.02	5.00	629.82	10.00	624.82	5	9.45	627.57	NA	NA	Accessible.
G- 54	Brush	Brush Creek/K Road	1987	D&M	4	B	2277850	287849	65.00	611.64	613.74	59.22	552.42	64.21	547.43	4.99	8.26	605.48	45.00	566.64	Accessible.
G- 55	Brush	Brush Creek/K Road	1987	D&M	4	U	2277846	287858	16.00	610.98	613.08	10.30	600.68	15.30	595.68	5	10.92	602.16	NA	NA	Accessible.
G- 56	Brush	Line 800	1987	D&M	4	L	2269099	294230	31.00	679.87	681.90	18.50	661.37	28.51	651.36	10.01	5.22	676.68	NA	NA	Accessible.
G- 57	Brush	Line 800	1987	D&M	4	L	2269127	294094	31.00	680.29	682.44	19.95	660.34	29.96	650.33	10.01	5.84	676.60	NA	NA	Accessible.
G- 58	Brush	Line 800	1987	D&M	4	L	2269202	294144	31.00	680.23	683.38	20.11	660.12	30.08	650.15	9.97	6.89	676.49	NA	NA	Accessible.
GP- 1	Long	Inert Disposal Area					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Gas probe.
GP- 3	Long	Inert Disposal Area					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Gas probe.
GP- 4	Long	Inert Disposal Area					2257131	299762	NA	710.79	712.98	NA	NA	NA	NA	NA	NA	NA	NA	NA	Gas probe.
GP- 5	Long	Inert Disposal Area					2257837	299915	NA	704.61	707.39	NA	NA	NA	NA	NA	NA	NA	NA	NA	Gas probe.
GZ- 1	Brush	Line 1	1980	SCS	4	L	2269943	301378	51.00	682.91	885.74	40.00	642.91	50.00	632.91	10	6.51	679.23	NA	NA	Accessible.
GZ- 2	Brush	Line 1	1980	SCS	4	L	2269783	301370	30.00	671.24	673.61	20.00	651.24	30.00	641.24	10	1.20	672.41	NA	NA	Accessible.
GZ- 3	Brush	Line 1	1980	SCS	4	L	2269625	301360	50.00	678.06	680.76	36.00	642.06	46.00	632.06	10	1.93	678.83	NA	NA	Accessible.
GZ- 6	Brush	Line 1	1980	SCS	4	L	NA	NA	54.00	686.80	689.76	39.00	647.80	49.00	637.80	10	0.00	689.76	NA	NA	Accessible. Flowing well.
GZ- 2A	Brush	Line 1	1980	SCS	4	U	2269776	301384	10.00	671.56	674.06	5.00	666.56	10.00	661.56	5	5.53	668.53	NA	NA	Accessible.
GZ2- 1	Brush	Line 6	1980	SCS	4	L	2263900	302164	58.00	722.16	725.51	44.00	678.16	54.00	668.16	10	16.11	709.40	NA	NA	Accessible.
GZ2- 2	Brush	Line 6	1980	SCS	4	L	NA	NA	30.00	NA	NA	20.00	NA	30.08	NA	10.08	NA	NA	NA	NA	Could not locate.
GZ2- 18	Brush	Line 6	1980	SCS	4	L	2264895	301048	50.00	713.21	716.34	40.00	673.21	50.00	663.21	10	7.05	709.29	NA	NA	Accessible. Labeled Z2-2.
GZ2- 19	Brush	Line 6	1980	SCS	4	L	2265869	301349	50.00	713.16	716.26	40.00	673.16	50.00	663.16	10	6.55	709.71	NA	NA	Accessible. Labeled Z2-18.
GZ2- 18A	Brush	Line 6	1980	SCS	4	U	2264894	301077	10.00	713.28	717.34	5.00	708.28	10.00	703.28	5	7.71	709.63	NA	NA	Accessible. Labeled Z2-18A.
GZ3- 1	Brush	Line 4B	1980	SCS	4	U	2264359	303801	21.00	724.26	727.01	9.00	715.26	19.00	705.26	10	7.79	719.22	NA	NA	Accessible. Labeled Z3-1.
GZ3- 2	Brush	Line 4B	1980	SCS	4	U	2264510	303882	10.00	724.72	727.39	3.00	721.72	8.00	716.72	5	9.37	718.02	NA	NA	Accessible. Labeled Z3-2. Contains little water.
GZ3- 3	Brush	Line 4B	1980	SCS	4	U	2264637	303649	13.00	722.93	725.52	5.50	717.43	11.50	711.43	6	7.85	717.67	NA	NA	Accessible. Labeled Z3-3.
GZ3- 4	Brush	Line 4B	1980	SCS	4	U	2264627	303484	28.00	721.72	725.91	18.00	703.72	28.00	693.72	10	12.20	713.71	NA	NA	Accessible. Labeled Z3-4.
GZ3- 5	Brush	Line 4B	1980	SCS	4	U	2264561	303522	20.00	722.89	726.52	8.50	714.39	18.50	704.39	10	12.85	713.67	NA	NA	Accessible. Labeled Z3-5.
JAW- 1	Skunk	Demolition Area		Jaycor		B	2254503	291010	20.00	674.45	0.00	5.00	669.45	20.00	654.45	15	11.27	-11.27	10.00	664.45	Well wizard installed.

Groundwater Monitoring Well Inventory (1997)

Well	Drainage	Line	Year	Installed By	Diam.	Unit	Coordinates East	Coordinates North	Boring Depth	Ground Elev.	TOC Elev.	Top of Screen Depth	Top of Screen Elev.	Bottom of Screen Depth	Bottom of Screen Elev.	Screen Length	Groundwater Depth	Groundwater Elev.	Bedrock Depth	Bedrock Elev.	Comments
10- A	Brush	Line 2	1997	Harza	4	U+L	2271165	298819	50.4	681.65	683.75	10	671.65	50.4	631.25	40	4.07	679.68	NA	NA	Accessible.
10- B	Brush	Line 2	1997	Harza	2	U+L	2271151	298806	50	681.55	683.94	10	671.55	50	631.55	40	4.28	679.66	NA	NA	Accessible.
12- A	Brush	Line 2	1997	Herza	2	U	2270801	298785	20.5	679.14	681.25	10.5	668.64	20.5	658.64	10	8.15	673.10	NA	NA	Accessible.
12- B	Brush	Line 2	1997	Harza	2	U	2270847	297916	20.5	689.23	691.44	10.5	678.73	20.5	668.73	10	7.09	684.35	NA	NA	Accessible.
12- C	Brush	Line 2	1997	Harza	2	L	2270835	297922	50.2	689.18	691.66	40.2	648.98	50.2	638.98	10	19.76	671.90	NA	NA	Accessible.
12- D	Brush	Line 2	1997	Harza	2	B	2270838	297913	120	689.28	691.26	110	579.28	120	569.28	10	44.53	646.73	110.00	579.28	Accessible.
12- E	Brush	Line 2	1997	Harza	2	U	2271126	297294	20	688.53	690.37	10	678.53	20	668.53	10	8.20	662.17	NA	NA	Accessible.
12- F	Brush	Line 2	1997	Harza	2	L	2271212	298193	50.4	688.26	690.54	40.4	647.86	50.4	637.86	10	Dry	<637.86	NA	NA	Accessible. Dry.
12- G	Brush	Line 2	1997	Harza	2	U	2270441	298035	20.3	687.97	690.00	10.3	677.67	20.3	667.67	10	8.04	681.96	NA	NA	Accessible.
12- H	Brush	Line 2	1997	Harza	1	U	2269728	298714	30	688.13	689.60	28	660.13	30	658.13	2	6.00	683.60	NA	NA	Accessible. Porous tip piezometer.
13- B	Brush	General/K Road	1997	Harza	2	B	2277256	287766	45.4	627.67	629.54	33.6	594.07	43.6	584.07	10	21.62	607.92	7.50	620.17	Accessible.
13- D	Brush	General/K Road	1997	Harza	2	L	2278282	288128	85	652.84	654.59	74.8	578.04	84.8	568.04	10	37.30	617.29	NA	NA	Accessible.
13- E	Brush	General/K Road	1997	Harza	2	L	2278285	288119	35	652.56	654.21	24.5	626.06	34.5	618.06	10	30.03	624.18	NA	NA	Accessible.
13- F	Brush	General/K Road	1997	Harza	2	L	2278612	288227	55	658.65	660.44	45	613.65	55	603.65	10	52.56	607.88	NA	NA	Accessible.
14- A	Spring	General	1997	Harza	1	B	2275920	298163	67.5	691.57	693.83	65.3	626.27	67.5	624.07	2	33.68	660.15	47.50	644.07	Accessible. Porous tip piezometer.
14- B	Brush/Spring	General	1997	Harza	1	B	2276162	292255	98	678.28	680.84	95.8	582.48	98	580.28	2	49.74	631.10	77.20	601.08	Accessible. Porous tip piezometer.
14- C	Long/Brush	General	1997	Harza	1	B	2267498	290753	77.1	684.35	686.24	75.1	609.25	77.1	607.25	2	40.22	646.02	56.00	628.35	Accessible. Porous tip piezometer.
14- D	Brush	General	1997	Harza	1	B	2273458	287167	43.6	676.81	679.05	41.4	635.41	43.6	633.21	2	12.33	666.72	22.50	654.31	Accessible. Porous tip piezometer.
14- E	Long	General	1997	Harza	1	B	2262676	298556	108.5	689.81	691.28	106.6	583.21	108.5	581.31	2	46.61	644.67	88.50	601.31	Accessible. Porous tip piezometer.
14- F	Skunk/Long	General	1997	Harza	1	B	2260874	285499	43.5	675.16	677.20	40.4	634.76	42.4	632.76	2	26.63	650.57	21.60	653.56	Accessible. Porous tip piezometer.
16- A	Brush	Line 3	1997	Harza	2	B	2267991	299601	110	694.35	696.30	99.4	594.95	109.4	584.95	10	17.42	678.88	109.50	584.85	Accessible.
16- B	Brush	Line 3	1997	Harza	2	U	2268410	300701	25.2	699.15	701.10	15.1	684.05	25.1	674.05	10	3.71	697.39	NA	NA	Accessible.
16- C	Brush	Line 3	1997	Harza	2	U	2268671	300002	25.6	695.66	697.69	15.6	680.06	25.6	670.06	10	4.74	692.95	NA	NA	Accessible.
16- D	Brush	Line 3	1997	Harza	2	U	2268246	298983	25.1	695.77	697.66	15	680.77	25	670.77	10	5.00	692.66	NA	NA	Accessible.
16- E	Brush	Line 3	1997	Harza	2	L	2268236	298986	55	695.69	697.55	45	650.69	55	640.69	10	12.90	684.65	NA	NA	Accessible.
MW- 01	Brush	Line 800	1998	Harza	2	U	2269290	293479	20	682.60	684.71	9.9	672.70	19.9	662.70	10	6.31	679.14	NA	NA	Accessible.
MW- 02	Brush	Line 800	1998	Harza	2	B	2269592	294042	76	680.90	682.72	66	614.90	76	604.90	10	11.64	671.75	53.00	627.90	Accessible.
MW- 03	Brush	Line 800	1998	Harza	2	B	2269416	293807	79	680.90	682.63	69	611.90	79	601.90	10	24.00	658.41	58.00	622.90	Accessible.
MW- 04	Brush	Line 800	1998	Harza	2	B	2269109	293590	74	683.80	685.92	64	619.80	74	609.80	10	23.29	657.78	52.50	631.30	Accessible.
MW- 05	Brush	Line 800	1998	Harza	2	U	2269327	294363	18	677.50	678.80	7.5	670.00	17.5	660.00	10	3.15	675.93	NA	NA	Accessible.
MW- 06	Brush	Line 800	1998	Harza	2	U	2269447	294374	18	679.30	681.54	7.5	671.80	17.5	661.80	10	4.82	676.71	NA	NA	Accessible.
MW- 07	Brush	Line 800	1998	Harza	2	L	2269403	293794	38	681.10	682.64	27.5	653.60	37.5	643.60	10	5.38	677.66	NA	NA	Accessible.
MW- 08	Brush	Line 800	1998	Harza	2	U	2268746	294111	18	683.30	685.38	7.5	675.80	17.5	665.80	10	5.16	680.77	NA	NA	Accessible.
MW- 09	Brush	Line 800	1998	Harza	2	U	2268216	293495	18	683.90	685.59	7.5	676.40	17.5	666.40	10	7.72	678.27	NA	NA	Accessible.
MW- 10	Brush	Line 800	1998	Harza	2	U	2269648	293889	18	679.20	681.25	7.5	671.70	17.5	661.70	10	5.06	677.47	NA	NA	Accessible.
MW- 11	Brush	Line 800	1998	Harza	2	B	2269648	293901	76.2	679.20	681.33	66.2	613.00	76.2	603.00	10	18.21	662.99	55.50	623.70	Accessible.
MW- 12	Brush	Line 800	1998	Harza	2	U	2268626	293907	18	685.50	687.37	7.5	678.00	17.5	668.00	10	6.28	682.95	NA	NA	Accessible.
MW- 13	Brush	Line 800	1998	Harza	2	U	2268819	293868	18	684.00	686.06	7.5	676.50	17.5	666.50	10	5.78	680.26	NA	NA	Accessible.
MW- 14	Brush	Line 800	1998	Harza	2	L	2269135	293576	35	683.60	685.72	25	658.60	35	648.60	10	6.76	679.36	NA	NA	Accessible.
MW- 15	Brush	Line 800	1998	Harza	2	U	2269406	293057	18	680.20	682.14	7.5	672.70	17.5	662.70	10	7.33	675.43	NA	NA	Accessible.
MW- 16	Brush	Line 800	1998	Harza	2	B	2269326	294392	70.5	677.50	679.59	60.5	617.00	70.5	607.00	10	29.10	644.04	38.00	639.50	Accessible.
MW- 17	Brush	Line 800	1998	Harza	2	L	2269327	294372	34.5	677.70	679.55	24.5	653.20	34.5	643.20	10	2.95	676.81	NA	NA	Accessible.
MW- 18	Brush	Line 800	1998	Harza	2	U	2269640	293744	18	679.50	681.86	7.5	672.00	17.5	662.00	10	4.91	678.28	NA	NA	Accessible.
MW- 19	Brush	Line 800	1998	Harza	2	B	2270154	293883	74	678.40	680.67	64	614.40	74	604.40	10	16.00	664.58	52.50	625.90	Accessible.
MW- 20	Brush	Line 800	1998	Harza	2	U	2269296	294457	18	676.70	678.81	7.5	669.20	17.5	659.20	10	6.17	674.35	NA	NA	Accessible.
MW- 21	Brush	Line 800	1998	Harza	2	B	2269852	294174	77	680.10	682.17	67	613.10	77	603.10	10	19.05	663.02	54.50	625.60	Accessible.
M 01	Spring	Fire Training Pit	1996	Harza																	Accessible.
CW- P	Spring	North Burn Pad					2276347	302630	NA	690.67	NA	NA	NA	NA	NA	2	6.14	NA	NA	NA	Accessible. No surf. casing. No lock.
DA- 1	Skunk	Demolition Araa	1984	USACE	4	B	2254503	290997	21.00	673.53	675.78	11.00	662.53	20.60	652.93	9.6	9.97	665.81	7.90	665.63	Well wizard installed.
DA- 2	Skunk	Demolition Area	1984	USACE	4	B	2255342	290488	25.00	678.29	680.56	15.00	663.29	24.50	653.79	9.5	13.67	666.89	11.80	666.49	Well wizard installed.
DM- 1	Flint/Long/Brush	Fuel Station	1989	D&M	4	U	2261315	308266	16.00	729.08	729.06	5.00	724.08	15.00	714.08	10	5.43	723.63	NA	NA	Does not recover. Rehab or abandon.
DM- 2	Flint/Long/Brush	Fuel Station	1989	D&M	4	L	2261332	308272	38.00	729.09	729.09	30.00	699.09	35.00	694.09	5	4.13	724.96	NA	NA	Accessible.
DM- 3	Flint/Long/Brush	Fuel Station	1989	D&M	4	L	NA	NA	55.00	NA	NA	50.00	NA	55.00	NA	5	NA	NA	NA	NA	Could not locate.
DM- 4	Flint/Long/Brush	Fuel Station	1989	D&M	4	U	2261327	308176	17.00	729.17	729.17	5.00	724.17	15.00	714.17	10	4.53	724.64	NA	NA	Accessible.
DM- 5	Flint/Long/Brush	Fuel Station	1989	D&M	4	L	2261360	307926	38.00	728.61	728.01	30.00	698.61	35.00	693.61	5	4.71	723.30	NA	NA	Accessible.
DM- 6	Flint/Long/Brush	Fuel Station	1989	D&M	4	L	NA	NA	58.00	NA	NA	48.00	NA	54.00	NA	6	NA	NA	NA	NA	Could not locate.
DM- 7	Flint/Long/Brush	Fuel Station	1989	D&M	4	U	2261281	308425	18.00	729.47	729.47	5.00	724.47	15.00	714.47	10	5.34	724.13	NA	NA	Accessible.
DM- 8	Flint/Long/Brush	Fuel Station	1989	D&M	4	U	2261366	308293	15.00	728.89	728.89	5.00	723.89	15.00	713.89	10	3.88	725.01	NA	NA	Accessible.
DM- 9	Flint/Long/Brush	Fuel Station	1989	D&M	4	U	2261294	308243	17.00	729.08	729.08	5.00	724.08	15.00	714.08	10	4.34	724.74	NA	NA	Accessible.
DM- 10	Flint/Long/Brush	Fuel Station	1989	D&M	4	U	2261327	308176	17.00	729.12	729.12	5.30	723.82	15.30	713.82	10	4.90	724.22	NA	NA	Accessible.
EDA- 1	Spring	Explosive Disposal Area	1984	USACE	4	U	2277976	302531	26.00	692.47	695.37	16.00	676.47	25.80	666.67	9.8	7.50	687.87	NA	NA	Well wizard installed.
EDA- 2	Spring	Explosive Disposal Area	1984	USACE	4	B	2277543	301755	27.00	671.62	673.22	17.80	653.82	27.40	644.22	9.6	19.98	653.24	32.60	639.02	Well wizard installed.
EDA- 3	Spring	Explosive Disposal Area	1984	USACE	4		2277787	301533	37.00	674.32	676.59	28.00	646.32	37.60	636.72	9.6	20.38	656.21	NA	NA	Well wizard installed.
EDA- 4	Spring	Explosive Disposal Area	1984	USACE	4	U	2276506	302332	19.00	683.40	685.20	9.40	674.00	18.40	665.00	9	8.38	676.82	NA	NA	Well wizard installed. Low PID reading.
ET- 1	Long	Inert Disposal Area					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Abandoned. Removed by ECC.
ET- 2	Long	Inert Disposal Area					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Abandoned. Removed by ECC.
ET- 3	Long	Inert Disposal Area					2257405	299346	NA	708.31	710.74	NA	NA	NA	NA	NA	21.10	689.64	NA	NA	Well wizard installed.
FL- 1	Long	Flyash Landfill			4		2261810	300871	NA	711.34	713.68	NA	NA	NA	NA	NA	5.39	708.29	NA	NA	Accessible.
FL- 2	Long	Flyash Landfill			4		2261754	300623	NA	711.45	713.19	NA	NA	NA	NA	NA	5.15	708.04	NA	NA	Accessible.
FL- 3	Long	Flyash Landfill			4		2261579	300516	NA	714.21	716.07	NA	NA	NA	NA	NA	8.35	707.72	NA	NA	Accessible.
FL- 4	Long	Flyash Landfill			4		2261390	300428	NA	710.40	712.46	NA	NA	NA	NA	NA	6.05	706.41	NA	NA	Accessible.
FL- 6	Long	Flyash Landfill			4		2261367	301109	NA	714.33	717.04	NA	NA	NA	NA	NA	5.22	711.82	NA	NA	Accessible.
FL- 7	Long	Flyash Landfill			4		2261217	301129	NA	714.13	715.97	NA	NA	NA	NA	NA	3.65	712.32	NA	NA	Accessible.

Well Inventory Current as of 1997. Subsequent changes not incorporated.

Loc

Groundwater Monitoring Well Inventory (1997)

Well	Drainage	Line	Year	Installed By	Diam.	Unit	Coordinates East	Coordinates North	Boring Depth	Ground Elev.	TOC Elev.	Top of Screen Depth	Top of Screen Elev.	Bottom of Screen Depth	Bottom of Screen Elev.	Screen Length	Groundwater Depth	Groundwater Elev.	Bedrock Depth	Bedrock Elev.	Comments
FL- 8	Long	Flyash Landfill			4		2261058	300965	NA	716.64	718.54	NA	NA	NA	NA	NA	5.47	713.07	NA	NA	Accessible.
FL- 9	Long	Flyash Landfill			4		2261094	300605	NA	712.40	714.11	NA	NA	NA	NA	NA	3.13	710.98	NA	NA	Accessible.
FL- 10	Long	Flyash Landfill			4		2261177	300322	NA	710.92	712.71	NA	NA	NA	NA	NA	4.40	708.31	NA	NA	Accessible.
G- 1	Long	Perimeter/N	1981	STS	4	U	2257255	308431	NA	715.95	719.85	10.00	NA	20.00	NA	10	8.48	711.37	NA	NA	Accessible.
G- 2	Long	Perimeter/NW	1981	STS	4	U	2251076	306250	NA	715.24	718.07	8.00	NA	18.00	NA	10	6.55	711.52	NA	NA	Accessible.
G- 3	Long	Perimeter/W	1981	STS	4	L	2246949	303606	30.00	684.10	688.02	20.50	663.60	30.50	653.60	10	12.85	675.17	NA	NA	Well wizard installed.
G- 4	Long	Inert Disposal Area	1981	STS	4	U	2257854	299871	26.00	705.98	708.17	16.00	689.98	26.00	679.98	10	8.91	699.26	NA	NA	Well wizard installed.
G- 5	Long	Inert Disposal Area	1981	STS	4	L	2257049	298541	50.00	689.10	692.33	40.00	649.10	50.00	639.10	10	41.74	650.59	NA	NA	Well wizard installed.
G- 6	Long	Inert Disposal Area	1981	STS	4	U	2257974	298713	28.00	0.00	704.04	17.00	-17.00	27.00	-27.00	10	8.38	695.66	NA	NA	Well wizard installed.
G- 7	Long	Inert Disposal Area	1981	STS	4	L	2257400	298405	42.00	692.78	695.48	32.00	660.78	42.00	650.78	10	23.70	671.78	NA	NA	Well wizard installed.
G- 8	Long	Firing Site	1981	STS	4	U	2257681	295074	16.00	0.00	614.36	5.00	-5.00	15.00	-15.00	10	5.91	608.45	NA	NA	Accessible.
G- 9	Skunk	Demolition Area	1981	STS	4	U	2254925	291348	28.00	692.11	694.88	18.50	675.61	26.50	665.61	10	9.59	685.27	NA	NA	Well wizard installed.
G- 10	Skunk	Demolition Area	1981	STS	4	U	2254583	290362	24.00	681.92	685.34	14.00	667.92	24.00	657.92	10	19.55	665.79	15.00	666.92	Well wizard installed.
G- 11	Skunk	Demolition Area	1981	STS	4	B	2255073	290363	37.00	691.64	695.03	26.00	665.64	36.00	655.64	10	30.25	664.78	25.00	666.64	Well wizard installed.
G- 12	Skunk	Perimeter/SW	1981	STS	4	U	2256943	286081	20.00	663.32	666.07	9.50	653.82	19.50	643.82	10	8.30	657.77	NA	NA	Well wizard installed.
G- 13	Skunk	Perimeter/SW	1981	STS	4	B	2256683	285340	30.00	646.74	649.39	18.50	628.24	28.50	618.24	10	24.53	624.86	18.50	628.24	Well wizard installed.
G- 14	Brush	Brush Creek/Line 1	1981	STS	4	L	2269900	301223	38.00	675.94	678.59	26.00	649.94	36.00	639.94	10	0.30	678.29	NA	NA	Accessible. Water above ground surface.
G- 15	Brush	Brush Creek/Line 2	1981	STS	4	U	2270105	297091	18.00	655.75	660.21	6.50	649.25	16.50	639.25	10	9.66	650.55	NA	NA	Accessible, but no comments noted.
G- 16	Brush/Long	Pesticide Pit	1981	STS	4	U	2266282	296069	20.00	693.49	696.11	10.00	683.49	20.00	673.49	10	7.72	688.39	NA	NA	Accessible.
G- 17	Brush	Line 800	1981	STS	4	U	2269584	294334	20.00	681.17	684.21	9.00	672.17	19.00	662.17	10	7.80	676.41	NA	NA	Accessible.
G- 18	Brush	Line 800	1981	STS	4	U	2269585	294035	20.00	680.06	682.79	9.00	671.06	19.00	661.06	10	5.71	677.08	NA	NA	Accessible.
G- 19	Brush	Line 800	1981	STS	4	U	2269409	293800	20.00	680.26	683.40	9.50	670.76	19.50	660.76	10	6.79	676.61	NA	NA	Accessible.
G- 20	Brush	Line 800	1981	STS	4	U	2269127	293629	20.00	683.42	685.78	9.50	673.92	19.50	663.92	10	10.57	675.21	NA	NA	Well wizard installed.
G- 21	Long	Perimeter/S	1981	STS	4	U	2266241	282927	18.00	538.79	540.87	7.00	531.79	17.00	521.79	10	NA	NA	NA	NA	Well wizard installed. Tape blocked.
G- 22	Skunk	Perimeter/S	1981	STS	4	L	2272255	283054	42.00	675.94	678.04	32.00	643.94	42.00	633.94	10	12.45	665.59	NA	NA	Well wizard installed.
G- 23	Spring	Perimeter/S	1981	STS	4	U	2275300	283038	20.00	669.55	671.76	9.00	660.55	19.00	650.55	10	8.64	663.12	NA	NA	Well wizard installed.
G- 24	Brush	Perimeter/SE	1981	STS	4	B	2280304	285424	17.00	600.11	602.37	6.00	594.11	16.00	584.11	10	13.88	588.49	6.00	594.11	Well wizard installed.
G- 25	Spring	Perimeter/E	1981	STS	4	L	2282608	286729	81.00	628.09	630.72	71.00	557.09	81.00	547.09	10	16.48	614.24	NA	NA	Well wizard installed.
G- 26	Spring	Perimeter/E	1981	STS	4	L	2282728	291572	100.00	656.42	659.92	90.00	566.42	100.00	556.42	10	42.29	617.63	NA	NA	Well wizard installed.
G- 27	Spring	Perimeter/E	1981	STS	4	U	2282664	295091	24.00		666.18	14.00	-14.00	24.00	-24.00	10	6.45	659.73	NA	NA	Well wizard installed.
G- 28	Spring	Perimeter/E	1981	STS	4	U	2282581	298830	20.00	674.69	678.10	10.00	664.69	20.00	654.69	10	8.18	669.92	NA	NA	Well wizard installed.
G- 29	Spring	Explosive Disposal Area	1981	STS	4	U	2278172	301799	20.00	681.90	684.33	8.00	673.90	18.00	663.90	10	6.94	677.39	NA	NA	Well wizard installed.
G- 30	Spring	West Burn Pad	1981	STS	4	B	2276555	301118	17.00	652.01	654.76	7.00	645.01	17.00	635.01	10	11.27	643.49	4.40	647.61	Well wizard installed.
G- 31	Long	Perimeter/W	1981	STS	4	U	2246846	301370	16.00	0.00	669.62	5.50	-5.50	15.50	-15.50	10	8.25	661.37	NA	NA	Well wizard installed.
G- 40	Brush	Line 800	1983	Batelle	4	B	2268443	293534	83.00	682.28	684.08	73.25	609.03	83.25	599.03	10	29.21	654.87	58.00	624.28	Accessible.
G- 41	Brush	Line 800	1983	Batelle	4	U	2268438	293537	22.00	682.53	684.23	9.80	672.73	19.80	662.73	10	5.21	679.02	NA	NA	Accessible.
G- 42	Brush	Line 800	1983	Batelle	4	B	2269969	294493	77.00	683.14	685.27	66.50	616.64	76.50	606.64	10	22.86	662.41	49.00	634.14	Accessible.
G- 43	Brush	Line 800	1983	Batelle	4	L	2269970	294486	42.00	683.26	685.60	32.10	651.16	42.10	641.16	10	14.92	670.68	NA	NA	Accessible.
G- 44	Brush	Line 800	1983	Batelle	4	B	2270110	294177	80.00	679.70	682.02	68.00	611.70	78.00	601.70	10	18.57	663.45	50.00	629.70	Accessible.
G- 45	Brush	Line 800	1983	Batelle	4	L	2270108	294165	40.00	679.73	681.38	30.00	649.73	40.00	639.73	10	7.25	674.13	NA	NA	Accessible.
G- 46	Brush	Line 800	1983	Batelle	4	B	2269644	293389	68.00	678.42	680.44	58.00	620.42	68.00	610.42	10	10.19	670.25	41.00	637.42	Accessible.
G- 47	Brush	Line 800	1983	Batelle	4	U	2269646	293378	26.00	678.45	680.59	16.00	662.45	26.00	652.45	10	7.42	673.17	NA	NA	Accessible.
G- 48	Brush	Line 800	1987	D&M	4	L	2268683	294298	31.00	681.88	683.11	20.41	661.47	30.42	651.46	10.01	4.94	678.17	NA	NA	Accessible.
G- 49	Brush	Line 1	1987	D&M	4	L	2267602	307174	32.00	718.11	720.03	19.49	698.62	29.50	688.61	10.01	5.73	714.30	NA	NA	Accessible.
G- 50	Brush	Brush Creek	1987	D&M	4	B	NA	NA	82.00	NA	NA	76.21	NA	81.20	NA	4.99	NA	NA	63.00		Not accessible. Manual pump installed.
G- 51	Brush	Brush Creek	1987	D&M	4	U	2271971	294463	16.00	643.92	648.02	10.20	633.72	15.00	628.92	4.8	6.25	641.77	NA	NA	Accessible.
G- 52	Brush	Brush Creek	1987	D&M	4	B	2272886	290931	39.00	634.72	636.74	31.66	603.06	36.65	598.07	4.99	0.20	636.54	21.00	613.72	Accessible.
G- 53	Brush	Brush Creek	1987	D&M	4	U	2272872	290938	11.00	634.82	637.02	5.00	629.82	10.00	624.82	5	9.45	627.57	NA	NA	Accessible.
G- 54	Brush	Brush Creek/K Road	1987	D&M	4	B	2277850	287849	65.00	611.64	613.74	59.22	552.42	64.21	547.43	4.99	8.26	605.46	45.00	566.64	Accessible.
G- 55	Brush	Brush Creek/K Road	1987	D&M	4	U	2277846	287858	16.00	610.98	613.08	10.30	600.68	15.30	595.68	5	10.92	602.16	NA	NA	Accessible.
G- 56	Brush	Line 800	1987	D&M	4	L	2269099	294230	31.00	679.87	681.90	18.50	661.37	28.51	651.36	10.01	5.22	676.68	NA	NA	Accessible.
G- 57	Brush	Line 800	1987	D&M	4	L	2269127	294094	31.00	680.29	682.44	19.95	660.34	29.96	650.33	10.01	5.84	676.60	NA	NA	Accessible.
G- 58	Brush	Line 800	1987	D&M	4	L	2269202	294144	31.00	680.23	683.38	20.11	660.12	30.08	650.15	9.97	6.89	676.49	NA	NA	Accessible.
GP- 1	Long	Inert Disposal Area					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Gas probe.
GP- 3	Long	Inert Disposal Area					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Gas probe.
GP- 4	Long	Inert Disposal Area					2257131	299762	NA	710.79	712.98	NA	NA	NA	NA	NA	NA	NA	NA	NA	Gas probe.
GP- 5	Long	Inert Disposal Area					2257837	299915	NA	704.61	707.39	NA	NA	NA	NA	NA	NA	NA	NA	NA	Gas probe.
GZ- 1	Brush	Line 1	1980	SCS	4	L	2269943	301378	51.00	682.91	685.74	40.00	642.91	50.00	632.91	10	6.51	679.23	NA	NA	Accessible.
GZ- 2	Brush	Line 1	1980	SCS	4	L	2269783	301370	30.00	671.24	673.61	20.00	651.24	30.00	641.24	10	1.20	672.41	NA	NA	Accessible.
GZ- 3	Brush	Line 1	1980	SCS	4	L	2269625	301360	50.00	678.06	680.76	36.00	642.06	46.00	632.06	10	1.93	678.83	NA	NA	Accessible.
GZ- 6	Brush	Line 1	1980	SCS	4	L	NA	NA	54.00	686.80	689.76	39.00	647.80	49.00	637.80	10	0.00	689.76	NA	NA	Accessible. Flowing well.
GZ- 2A	Brush	Line 1	1980	SCS	4	U	2269776	301384	10.00	671.56	674.06	5.00	666.56	10.00	661.56	5	5.53	668.53	NA	NA	Accessible.
GZ2- 1	Brush	Line 6	1980	SCS	4	L	2263900	302164	58.00	722.16	725.51	44.00	678.16	54.00	668.16	10	16.11	709.40	NA	NA	Accessible.
GZ2- 2	Brush	Line 6	1980	SCS	4	L	NA	NA	30.00	NA	NA	20.00	NA	30.08	NA	10.08	NA	NA	NA	NA	Could not locate.
GZ2- 18	Brush	Line 6	1980	SCS	4	L	2264895	301048	50.00	713.21	716.34	40.00	673.21	50.00	663.21	10	7.05	709.29	NA	NA	Accessible. Labeled Z2-2.
GZ2- 19	Brush	Line 6	1980	SCS	4	L	2265869	301349	50.00	713.16	716.26	40.00	673.16	50.00	663.16	10	6.55	709.71	NA	NA	Accessible. Labeled Z2-18.
GZ2- 18A	Brush	Line 6	1980	SCS	4	U	2264894	301077	10.00	713.28	717.34	5.00	708.28	10.00	703.28	5	7.71	709.63	NA	NA	Accessible. Labeled Z2-18A.
GZ3- 1	Brush	Line 4B	1980	SCS	4	U	2264359	303801	21.00	724.26	727.01	9.00	715.26	19.00	705.26	10	7.79	719.22	NA	NA	Accessible. Labeled Z3-1.
GZ3- 2	Brush	Line 4B	1980	SCS	4	U	2264510	303882	10.00	724.72	727.39	3.00	721.72	8.00	716.72	5	9.37	718.02	NA	NA	Accessible. Labeled Z3-2. Contains little water.
GZ3- 3	Brush	Line 4B	1980	SCS	4	U	2264637	303649	13.00	722.93	725.52	5.50	717.43	11.50	711.43	6	7.85	717.67	NA	NA	Accessible. Labeled Z3-3.
GZ3- 4	Brush	Line 4B	1980	SCS	4	U	2264627	303484	28.00	721.72	725.91	18.00	703.72	28.00	693.72	10	12.20	713.71	NA	NA	Accessible. Labeled Z3-4.
GZ3- 5	Brush	Line 4B	1980	SCS	4	U	2264561	303522	20.00	722.89	726.52	8.50	714.39	18.50	704.39	10	12.85	713.67	NA	NA	Accessible. Labeled Z3-5.
JAW- 1	Skunk	Demolition Area		Jaycor		B	2254503	291010	20.00	674.45	0.00	5.00	669.45	20.00	654.45	15	11.27	-11.27	10.00	664.45	Well wizard installed.

Groundwater Monitoring Well Inventory (1997)

Well	Drainage	Line	Year	Installed By	Diam.	Unit	Coordinates East	Coordinates North	Boring Depth	Ground Elev.	TOC Elev.	Top of Screen Depth	Top of Screen Elev.	Bottom of Screen Depth	Bottom of Screen Elev.	Screen Length	Groundwater Depth	Groundwater Elev.	Bedrock Depth	Bedrock Elev.	Comments
FL- 8	Long	Flyash Landfill			4		2261058	300965	NA	716.64	718.54	NA	NA	NA	NA	NA	5.47	713.07	NA	NA	Accessible.
FL- 9	Long	Flyash Landfill			4		2261094	300605	NA	712.40	714.11	NA	NA	NA	NA	NA	3.13	710.98	NA	NA	Accessible.
FL- 10	Long	Flyash Landfill			4		2261177	300322	NA	710.92	712.71	NA	NA	NA	NA	NA	4.40	708.31	NA	NA	Accessible.
G- 1	Long	Perimeter/N	1981	STS	4	U	2257255	308431	NA	715.95	719.85	10.00	NA	20.00	NA	10	8.48	711.37	NA	NA	Accessible.
G- 2	Long	Perimeter/NW	1981	STS	4	U	2251076	306250	NA	715.24	718.07	8.00	NA	18.00	NA	10	6.55	711.52	NA	NA	Accessible.
G- 3	Long	Perimeter/W	1981	STS	4	L	2246949	303606	30.00	684.10	688.02	20.50	663.60	30.50	653.60	10	12.85	675.17	NA	NA	Well wizard installed.
G- 4	Long	Inert Disposal Area	1981	STS	4	U	2257854	299871	26.00	705.98	708.17	16.00	689.98	26.00	679.98	10	8.91	699.26	NA	NA	Well wizard installed.
G- 5	Long	Inert Disposal Area	1981	STS	4	L	2257049	298541	50.00	689.10	692.33	40.00	649.10	50.00	639.10	10	41.74	650.59	NA	NA	Well wizard installed.
G- 6	Long	Inert Disposal Area	1981	STS	4	U	2257974	298713	28.00	0.00	704.04	17.00	-17.00	27.00	-27.00	10	8.38	695.66	NA	NA	Well wizard installed.
G- 7	Long	Inert Disposal Area	1981	STS	4	L	2257400	298405	42.00	692.78	695.48	32.00	660.78	42.00	650.78	10	23.70	671.78	NA	NA	Well wizard installed.
G- 8	Long	Firing Site	1981	STS	4	U	2257681	295074	16.00	0.00	614.36	5.00	-5.00	15.00	-15.00	10	5.91	608.45	NA	NA	Accessible.
G- 9	Skunk	Demolition Area	1981	STS	4	U	2254925	291348	28.00	692.11	694.86	16.50	675.61	26.50	665.61	10	9.59	685.27	NA	NA	Well wizard installed.
G- 10	Skunk	Demolition Area	1981	STS	4	U	2254583	290362	24.00	681.92	685.34	14.00	667.92	24.00	657.92	10	19.55	665.79	15.00	666.92	Well wizard installed.
G- 11	Skunk	Demolition Area	1981	STS	4	B	2255073	290363	37.00	691.64	695.03	26.00	665.64	36.00	655.64	10	30.25	664.78	25.00	666.64	Well wizard installed.
G- 12	Skunk	Perimeter/SW	1981	STS	4	U	2256943	286081	20.00	663.32	666.07	9.50	653.82	19.50	643.82	10	8.30	657.77	NA	NA	Well wizard installed.
G- 13	Skunk	Perimeter/SW	1981	STS	4	B	2256683	285340	30.00	646.74	649.39	18.50	628.24	28.50	618.24	10	24.53	624.86	18.50	628.24	Well wizard installed.
G- 14	Brush	Brush Creek/Line 1	1981	STS	4	L	2269900	301223	38.00	675.94	678.59	26.00	649.94	36.00	639.94	10	0.30	678.29	NA	NA	Accessible. Water above ground surface.
G- 15	Brush	Brush Creek/Line 2	1981	STS	4	U	2270105	297091	18.00	655.75	660.21	6.50	649.25	16.50	639.25	10	9.66	650.55	NA	NA	Accessible, but no comments noted.
G- 16	Brush/Long	Pesticide Pit	1981	STS	4	U	2266282	296069	20.00	693.49	696.11	10.00	683.49	20.00	673.49	10	7.72	688.39	NA	NA	Accessible.
G- 17	Brush	Line 800	1981	STS	4	U	2269584	294334	20.00	681.17	684.21	9.00	672.17	19.00	662.17	10	7.80	676.41	NA	NA	Accessible.
G- 18	Brush	Line 800	1981	STS	4	U	2269585	294035	20.00	680.06	682.79	9.00	671.06	19.00	661.06	10	5.71	677.08	NA	NA	Accessible.
G- 19	Brush	Line 800	1981	STS	4	U	2269409	293800	20.00	680.26	683.40	9.50	670.76	19.50	660.76	10	6.79	676.61	NA	NA	Accessible.
G- 20	Brush	Line 800	1981	STS	4	U	2269127	293629	20.00	683.42	685.78	9.50	673.92	19.50	663.92	10	10.57	675.21	NA	NA	Well wizard installed.
G- 21	Long	Perimeter/S	1981	STS	4	U	2266241	282927	18.00	538.79	540.87	7.00	531.79	17.00	521.79	10	NA	NA	NA	NA	Well wizard installed. Tape blocked.
G- 22	Skunk	Perimeter/S	1981	STS	4	L	2272255	283054	42.00	675.94	678.04	32.00	643.94	42.00	633.94	10	12.45	665.59	NA	NA	Well wizard installed.
G- 23	Spring	Perimeter/S	1981	STS	4	U	2275300	283038	20.00	669.55	671.76	9.00	660.55	19.00	650.55	10	8.64	663.12	NA	NA	Well wizard installed.
G- 24	Brush	Perimeter/SE	1981	STS	4	B	2280304	285424	17.00	600.11	602.37	6.00	594.11	16.00	584.11	10	13.88	588.49	6.00	594.11	Well wizard installed.
G- 25	Spring	Perimeter/E	1981	STS	4	L	2282608	286729	81.00	628.09	630.72	71.00	557.09	81.00	547.09	10	16.48	614.24	NA	NA	Well wizard installed.
G- 26	Spring	Perimeter/E	1981	STS	4	L	2282728	291572	100.00	656.42	659.92	90.00	566.42	100.00	556.42	10	42.29	617.63	NA	NA	Well wizard installed.
G- 27	Spring	Perimeter/E	1981	STS	4	U	2282664	295091	24.00		666.18	14.00	-14.00	24.00	-24.00	10	6.45	659.73	NA	NA	Well wizard installed.
G- 28	Spring	Perimeter/E	1981	STS	4	U	2282581	298830	20.00	674.69	678.10	10.00	664.69	20.00	654.69	10	8.18	669.92	NA	NA	Well wizard installed.
G- 29	Spring	Explosive Disposal Area	1981	STS	4	U	2278172	301799	20.00	681.90	684.33	8.00	673.90	18.00	663.90	10	6.94	677.39	NA	NA	Well wizard installed.
G- 30	Spring	West Burn Pad	1981	STS	4	B	2276555	301118	17.00	652.01	654.76	7.00	645.01	17.00	635.01	10	11.27	643.49	4.40	647.61	Well wizard installed.
G- 31	Long	Perimeter/W	1981	STS	4	U	2246846	301370	16.00	0.00	669.62	5.50	-5.50	15.50	-15.50	10	8.25	661.37	NA	NA	Well wizard installed.
G- 40	Brush	Line 800	1983	Batelle	4	B	2268443	293534	83.00	682.28	684.08	73.25	609.03	83.25	599.03	10	29.21	654.87	58.00	624.28	Accessible.
G- 41	Brush	Line 800	1983	Batelle	4	U	2268438	293537	22.00	682.53	684.23	9.80	672.73	19.80	662.73	10	5.21	679.02	NA	NA	Accessible.
G- 42	Brush	Line 800	1983	Batelle	4	B	2269969	294493	77.00	683.14	685.27	66.50	616.64	76.50	606.64	10	22.86	662.41	49.00	634.14	Accessible.
G- 43	Brush	Line 800	1983	Batelle	4	L	2269970	294486	42.00	683.26	685.60	32.10	651.16	42.10	641.16	10	14.92	670.68	NA	NA	Accessible.
G- 44	Brush	Line 800	1983	Batelle	4	B	2270110	294177	80.00	679.70	682.02	68.00	611.70	78.00	601.70	10	18.57	663.45	50.00	629.70	Accessible.
G- 45	Brush	Line 800	1983	Batelle	4	L	2270108	294165	40.00	679.73	681.38	30.00	649.73	40.00	639.73	10	7.25	674.13	NA	NA	Accessible.
G- 46	Brush	Line 800	1983	Batelle	4	B	2269644	293389	58.00	678.42	680.44	58.00	620.42	58.00	610.42	10	10.19	670.25	41.00	637.42	Accessible.
G- 47	Brush	Line 800	1983	Batelle	4	U	2269646	293378	26.00	678.45	680.59	16.00	662.45	26.00	652.45	10	7.42	673.17	NA	NA	Accessible.
G- 48	Brush	Line 800	1987	D&M	4	L	2268683	294298	31.00	681.88	683.11	20.41	661.47	30.42	651.46	10.01	4.94	678.17	NA	NA	Accessible.
G- 49	Brush	Line 1	1987	D&M	4	L	2267602	307174	32.00	718.11	720.03	19.49	698.62	29.50	688.61	10.01	5.73	714.30	NA	NA	Accessible.
G- 50	Brush	Brush Creek	1987	D&M	4	B	NA	NA	82.00	NA	NA	76.21	NA	81.20	NA	4.99	NA	NA	63.00		Not accessible. Manual pump installed.
G- 51	Brush	Brush Creek	1987	D&M	4	U	2271971	294463	16.00	643.92	648.02	10.20	633.72	15.00	628.92	4.8	6.25	641.77	NA	NA	Accessible.
G- 52	Brush	Brush Creek	1987	D&M	4	B	2272886	290931	39.00	634.72	636.74	31.66	603.06	36.65	598.07	4.99	0.20	636.54	21.00	613.72	Accessible.
G- 53	Brush	Brush Creek	1987	D&M	4	U	2272872	290938	11.00	634.82	637.02	5.00	629.82	10.00	624.82	5	9.45	627.57	NA	NA	Accessible.
G- 54	Brush	Brush Creek/K Road	1987	D&M	4	B	2277850	287849	65.00	611.64	613.74	59.22	552.42	64.21	547.43	4.99	8.26	605.48	45.00	566.64	Accessible.
G- 55	Brush	Brush Creek/K Road	1987	D&M	4	U	2277846	287858	16.00	610.98	613.08	10.30	600.68	15.30	595.68	5	10.92	602.16	NA	NA	Accessible.
G- 56	Brush	Line 800	1987	D&M	4	L	2269099	294230	31.00	679.87	681.90	18.50	661.37	28.51	651.36	10.01	5.22	676.68	NA	NA	Accessible.
G- 57	Brush	Line 800	1987	D&M	4	L	2269127	294094	31.00	680.29	682.44	19.95	660.34	29.96	650.33	10.01	5.84	676.60	NA	NA	Accessible.
G- 58	Brush	Line 800	1987	D&M	4	L	2269202	294144	31.00	680.23	683.38	20.11	660.12	30.08	650.15	9.97	6.89	676.49	NA	NA	Accessible.
GP- 1	Long	Inert Disposal Area					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Gas probe.
GP- 3	Long	Inert Disposal Area					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Gas probe.
GP- 4	Long	Inert Disposal Area					2257131	299762	NA	710.79	712.98	NA	NA	NA	NA	NA	NA	NA	NA	NA	Gas probe.
GP- 5	Long	Inert Disposal Area					2257837	299915	NA	704.61	707.39	NA	NA	NA	NA	NA	NA	NA	NA	NA	Gas probe.
GZ- 1	Brush	Line 1	1980	SCS	4	L	2269943	301378	51.00	682.91	685.74	40.00	642.91	50.00	632.91	10	6.51	679.23	NA	NA	Accessible.
GZ- 2	Brush	Line 1	1980	SCS	4	L	2269783	301370	30.00	671.24	673.61	20.00	651.24	30.00	641.24	10	1.20	672.41	NA	NA	Accessible.
GZ- 3	Brush	Line 1	1980	SCS	4	L	2269625	301360	50.00	678.06	680.75	36.00	642.06	46.00	632.06	10	1.93	678.83	NA	NA	Accessible.
GZ- 6	Brush	Line 1	1980	SCS	4	L	NA	NA	54.00	686.80	689.75	39.00	647.80	49.00	637.80	10	0.00	689.76	NA	NA	Accessible. Flowing well.
GZ- 2A	Brush	Line 1	1980	SCS	4	U	2269776	301384	10.00	671.56	674.06	5.00	666.56	10.00	661.56	5	5.53	668.53	NA	NA	Accessible.
GZ2- 1	Brush	Line 6	1980	SCS	4	L	2263900	302164	58.00	722.16	725.51	44.00	678.16	54.00	668.16	10	16.11	709.40	NA	NA	Accessible.
GZ2- 2	Brush	Line 6	1980	SCS	4	L	NA	NA	30.00	NA	NA	20.00	NA	30.08	NA	10.08	NA	NA	NA	NA	Could not locate.
GZ2- 18	Brush	Line 6	1980	SCS	4	L	2264895	301048	50.00	713.21	716.34	40.00	673.21	50.00	663.21	10	7.05	709.29	NA	NA	Accessible. Labeled Z2-2.
GZ2- 19	Brush	Line 6	1980	SCS	4	L	2265869	301349	50.00	713.16	716.26	40.00	673.16	50.00	663.16	10	6.55	709.71	NA	NA	Accessible. Labeled Z2-18.
GZ2- 18A	Brush	Line 6	1980	SCS	4	U	2264894	301077	10.00	713.28	717.34	5.00	708.28	10.00	703.28	5	7.71	709.63	NA	NA	Accessible. Labeled Z2-18A.
GZ3- 1	Brush	Line 4B	1980	SCS	4	U	2264359	303801	21.00	724.26	727.01	9.00	715.26	19.00	705.26	10	7.79	719.22	NA	NA	Accessible. Labeled Z3-1.
GZ3- 2	Brush	Line 4B	1980	SCS	4	U	2264510	303882	10.00	724.72	727.39	3.00	721.72	8.00	716.72	5	9.37	718.02	NA	NA	Accessible. Labeled Z3-2. Contains little water.
GZ3- 3	Brush	Line 4B	1980	SCS	4	U	2264637	303649	13.00	722.93	725.52	5.50	717.43	11.50	711.43	6	7.85	717.67	NA	NA	Accessible. Labeled Z3-3.
GZ3- 4	Brush	Line 4B	1980	SCS	4	U	2264627	303484	28.00	721.72	725.91	18.00	703.72	28.00	693.72	10	12.20	713.71	NA	NA	Accessible. Labeled Z3-4.
GZ3- 5	Brush	Line 4B	1980	SCS	4	U	2264561	303522	20.00	722.89	726.52	8.50	714.39	18.50	704.39	10	12.85	713.67	NA	NA	Accessible. Labeled Z3-5.
JAW- 1	Skunk	Demolition Area		Jaycor		B	2254503	291010	20.00	674.45	0.00	5.00	669.45	20.00	654.45	15	11.27	-11.27	10.00	664.45	Well wizard installed.

Groundwater Monitoring Well Inventory (1997)

Well	Drainage	Line	Year	Installed By	Diam.	Unit	Coordinates East	Coordinates North	Boring Depth	Ground Elev.	TOC Elev.	Top of Screen Depth	Top of Screen Elev.	Bottom of Screen Depth	Bottom of Screen Elev.	Screen Length	Groundwater Depth	Groundwater Elev.	Bedrock Depth	Bedrock Elev.	Comments
10- A	Brush	Line 2	1997	Harza	4	U+L	2271165	298819	50.4	681.65	683.75	10	671.65	50.4	631.25	40	4.07	679.68	NA	NA	Accessible.
10- B	Brush	Line 2	1997	Harza	2	U+L	2271151	298806	50	681.55	683.94	10	671.55	50	631.55	40	4.28	679.66	NA	NA	Accessible.
12- A	Brush	Line 2	1997	Harza	2	U	2270801	298785	20.5	679.14	681.25	10.5	668.64	20.5	658.64	10	8.15	673.10	NA	NA	Accessible.
12- B	Brush	Line 2	1997	Harza	2	U	2270847	297916	20.5	689.23	691.44	10.5	678.73	20.5	668.73	10	7.09	684.35	NA	NA	Accessible.
12- C	Brush	Line 2	1997	Harza	2	L	2270835	297922	50.2	689.18	691.66	40.2	648.98	50.2	638.98	10	19.76	671.90	NA	NA	Accessible.
12- D	Brush	Line 2	1997	Harza	2	B	2270838	297913	120	689.28	691.26	110	579.28	120	569.28	10	44.53	646.73	110.00	579.28	Accessible.
12- E	Brush	Line 2	1997	Harza	2	U	2271126	297294	20	688.53	690.37	10	678.53	20	668.53	10	8.20	682.17	NA	NA	Accessible.
12- F	Brush	Line 2	1997	Harza	2	L	2271212	298193	50.4	688.26	690.54	40.4	647.86	50.4	637.86	10	Dry	<637.86	NA	NA	Accessible. Dry.
12- G	Brush	Line 2	1997	Harza	2	U	2270441	298035	20.3	687.97	690.00	10.3	677.67	20.3	667.67	10	8.04	681.96	NA	NA	Accessible.
12- H	Brush	Line 2	1997	Harza	1	U	2269728	298714	30	688.13	689.60	28	660.13	30	658.13	2	6.00	683.60	NA	NA	Accessible. Porous tip piezometer.
13- B	Brush	General/K Road	1997	Harza	2	B	2277256	287766	45.4	627.67	629.54	33.6	594.07	43.6	584.07	10	21.62	607.92	7.50	620.17	Accessible.
13- D	Brush	General/K Road	1997	Harza	2	L	2278282	288128	85	652.84	654.59	74.8	578.04	84.8	568.04	10	37.30	617.29	NA	NA	Accessible.
13- E	Brush	General/K Road	1997	Harza	2	L	2278285	288119	35	652.56	654.21	24.5	628.06	34.5	618.06	10	30.03	624.18	NA	NA	Accessible.
13- F	Brush	General/K Road	1997	Harza	2	L	2278612	288227	55	658.65	660.44	45	613.65	55	603.65	10	52.56	607.88	NA	NA	Accessible.
14- A	Spring	General	1997	Harza	1	B	2275920	298163	67.5	691.57	693.83	65.3	626.27	67.5	624.07	2	33.68	660.15	47.50	644.07	Accessible. Porous tip piezometer.
14- B	Brush/Spring	General	1997	Harza	1	B	2278162	292255	98	678.28	680.84	95.8	582.48	98	580.28	2	49.74	631.10	77.20	601.08	Accessible. Porous tip piezometer.
14- C	Long/Brush	General	1997	Harza	1	B	2267498	290753	77.1	684.35	686.24	75.1	609.25	77.1	607.25	2	40.22	646.02	56.00	628.35	Accessible. Porous tip piezometer.
14- D	Brush	General	1997	Harza	1	B	2273458	287167	43.6	676.81	679.05	41.4	635.41	43.6	633.21	2	12.33	666.72	22.50	654.31	Accessible. Porous tip piezometer.
14- E	Long	General	1997	Harza	1	B	2262676	298556	108.5	689.81	691.28	106.6	583.21	108.5	581.31	2	46.61	644.67	88.50	601.31	Accessible. Porous tip piezometer.
14- F	Skunk/Long	General	1997	Harza	1	B	2260874	285499	43.5	675.16	677.20	40.4	634.76	42.4	632.76	2	26.63	650.57	21.60	653.56	Accessible. Porous tip piezometer.
16- A	Brush	Line 3	1997	Harza	2	B	2267991	299601	110	694.35	696.30	99.4	594.95	109.4	584.95	10	17.42	678.88	109.50	584.85	Accessible.
16- B	Brush	Line 3	1997	Harza	2	U	2268410	300701	25.2	699.15	701.10	15.1	684.05	25.1	674.05	10	3.71	697.39	NA	NA	Accessible.
16- C	Brush	Line 3	1997	Harza	2	U	2268671	300002	25.8	695.66	697.69	15.6	680.06	25.6	670.06	10	4.74	692.95	NA	NA	Accessible.
16- D	Brush	Line 3	1997	Harza	2	U	2268246	298983	25.1	695.77	697.56	15	680.77	25	670.77	10	5.00	692.66	NA	NA	Accessible.
16- E	Brush	Line 3	1997	Harza	2	L	2268236	298966	55	695.69	697.55	45	650.69	55	640.69	10	12.90	684.65	NA	NA	Accessible.
MW- 01	Brush	Line 800	1998	Harza	2	U	2269290	293479	20	682.60	684.71	9.9	672.70	19.9	662.70	10	6.31	679.14	NA	NA	Accessible.
MW- 02	Brush	Line 800	1998	Harza	2	B	2269592	294042	76	680.90	682.72	66	614.90	76	604.90	10	11.64	671.75	53.00	627.90	Accessible.
MW- 03	Brush	Line 800	1998	Harza	2	B	2269416	293807	79	680.90	682.63	69	611.90	79	601.90	10	24.00	658.41	58.00	622.90	Accessible.
MW- 04	Brush	Line 800	1998	Harza	2	B	2269109	293590	74	683.80	685.92	64	619.80	74	609.80	10	23.29	657.78	52.50	631.30	Accessible.
MW- 05	Brush	Line 800	1998	Harza	2	U	2269327	294383	18	677.50	878.80	7.5	670.00	17.5	660.00	10	3.15	675.93	NA	NA	Accessible.
MW- 06	Brush	Line 800	1998	Harza	2	U	2289447	294374	18	679.30	681.54	7.5	671.80	17.5	661.80	10	4.82	676.71	NA	NA	Accessible.
MW- 07	Brush	Line 800	1998	Harza	2	L	2269403	293794	38	681.10	682.64	27.5	653.60	37.5	643.60	10	5.38	677.66	NA	NA	Accessible.
MW- 08	Brush	Line 800	1998	Harza	2	U	2268746	294111	18	683.30	685.38	7.5	675.80	17.5	665.80	10	5.16	680.77	NA	NA	Accessible.
MW- 09	Brush	Line 800	1998	Harza	2	U	2268216	293495	18	683.90	685.59	7.5	676.40	17.5	666.40	10	7.72	678.27	NA	NA	Accessible.
MW- 10	Brush	Line 800	1998	Harza	2	U	2269848	293889	18	679.20	681.25	7.5	671.70	17.5	661.70	10	5.06	677.47	NA	NA	Accessible.
MW- 11	Brush	Line 800	1998	Harza	2	B	2269848	293901	76.2	679.20	681.33	66.2	613.00	76.2	603.00	10	18.21	662.99	55.50	623.70	Accessible.
MW- 12	Brush	Line 800	1998	Harza	2	U	2268626	293907	18	685.50	687.37	7.5	678.00	17.5	668.00	10	6.28	682.95	NA	NA	Accessible.
MW- 13	Brush	Line 800	1998	Harza	2	U	2268819	293868	18	684.00	686.06	7.5	676.50	17.5	666.50	10	5.78	680.26	NA	NA	Accessible.
MW- 14	Brush	Line 800	1998	Harza	2	L	2269135	293575	35	683.60	685.72	25	658.60	35	648.60	10	6.76	679.36	NA	NA	Accessible.
MW- 15	Brush	Line 800	1998	Harza	2	U	2269406	293057	18	680.20	682.14	7.5	672.70	17.5	662.70	10	7.33	675.43	NA	NA	Accessible.
MW- 16	Brush	Line 800	1998	Harza	2	B	2269326	294392	70.5	677.50	679.59	60.5	617.00	70.5	607.00	10	29.10	644.04	38.00	639.50	Accessible.
MW- 17	Brush	Line 800	1998	Harza	2	L	2269327	294372	34.5	677.70	679.55	24.5	653.20	34.5	643.20	10	2.95	676.81	NA	NA	Accessible.
MW- 18	Brush	Line 800	1998	Harza	2	U	2269640	293744	18	679.50	681.86	7.5	672.00	17.5	682.00	10	4.91	676.28	NA	NA	Accessible.
MW- 19	Brush	Line 800	1998	Harza	2	B	2270154	293883	74	678.40	680.67	64	614.40	74	604.40	10	16.00	664.58	52.50	625.90	Accessible.
MW- 20	Brush	Line 800	1998	Harza	2	U	2269296	294457	18	678.70	678.81	7.5	669.20	17.5	659.20	10	6.17	674.35	NA	NA	Accessible.
MW- 21	Brush	Line 800	1998	Harza	2	B	2269852	294174	77	680.10	682.17	67	613.10	77	603.10	10	19.05	663.02	54.50	625.60	Accessible.
M 01	Spring	Fire Training Pit	1996	Harza																	Accessible.
CW- P	Spring	North Burn Pad					2276347	302630	NA	690.67	NA	NA	NA	NA	NA	2	6.14	NA	NA	NA	Accessible. No surf. casing. No lock.
DA- 1	Skunk	Demolition Area	1984	USACE	4	B	2254503	290997	21.00	673.53	675.78	11.00	662.53	20.80	652.93	9.8	9.97	665.81	7.90	665.63	Well wizard installed.
DA- 2	Skunk	Demolition Area	1984	USACE	4	B	2255342	290488	25.00	678.29	680.56	15.00	663.29	24.50	653.79	9.5	13.67	666.89	11.80	666.49	Well wizard installed.
DM- 1	Flint/Long/Brush	Fuel Station	1989	D&M	4	U	2261315	308266	16.00	729.08	729.08	5.00	724.08	15.00	714.08	10	5.43	723.63	NA	NA	Does not recover. Rehab or abandon.
DM- 2	Flint/Long/Brush	Fual Station	1989	D&M	4	L	2261332	308272	38.00	729.09	729.09	30.00	699.09	35.00	694.09	5	4.13	724.96	NA	NA	Accessible.
DM- 3	Flint/Long/Brush	Fuel Station	1989	D&M	4	L	NA	NA	55.00	NA	NA	50.00	NA	55.00	NA	5	NA	NA	NA	NA	Could not locate.
DM- 4	Flint/Long/Brush	Fuel Station	1989	D&M	4	U	2261327	308176	17.00	729.17	729.17	5.00	724.17	15.00	714.17	10	4.53	724.64	NA	NA	Accessible.
DM- 5	Flint/Long/Brush	Fuel Station	1989	D&M	4	L	2261360	307926	38.00	728.61	728.01	30.00	698.61	35.00	693.61	5	4.71	723.30	NA	NA	Accessible.
DM- 6	Flint/Long/Brush	Fuel Station	1989	D&M	4	L	NA	NA	58.00	NA	NA	48.00	NA	54.00	NA	6	NA	NA	NA	NA	Could not locate.
DM- 7	Flint/Long/Brush	Fuel Station	1989	D&M	4	U	2261281	308425	18.00	729.47	729.47	5.00	724.47	15.00	714.47	10	5.34	724.13	NA	NA	Accessible.
DM- 8	Flint/Long/Brush	Fuel Station	1989	D&M	4	U	2261366	308293	15.00	728.89	728.89	5.00	723.89	15.00	713.89	10	3.88	725.01	NA	NA	Accessible.
DM- 9	Flint/Long/Brush	Fuel Station	1989	D&M	4	U	2261294	308243	17.00	729.08	729.08	5.00	724.08	15.00	714.08	10	4.34	724.74	NA	NA	Accessible.
DM- 10	Flint/Long/Brush	Fuel Station	1989	D&M	4	U	2261327	308176	17.00	729.12	729.12	5.30	723.82	15.30	713.82	10	4.90	724.22	NA	NA	Accessible.
EDA- 1	Spring	Explosive Disposal Area	1984	USACE	4	U	2277976	302531	26.00	692.47	695.37	16.00	676.47	25.80	666.67	9.8	7.50	687.87	NA	NA	Well wizard installed.
EDA- 2	Spring	Explosive Disposal Area	1984	USACE	4	B	2277543	301755	27.00	671.62	673.22	17.80	653.82	27.40	644.22	9.6	19.98	653.24	32.60	639.02	Well wizard installed.
EDA- 3	Spring	Explosive Disposal Area	1984	USACE	4		2277787	301533	37.00	674.32	676.59	26.00	646.32	37.60	636.72	9.6	20.38	656.21	NA	NA	Well wizard installed.
EDA- 4	Spring	Explosive Disposal Area	1984	USACE	4	U	2278506	302332	19.00	683.40	685.20	9.40	674.00	18.40	665.00	9	8.38	676.82	NA	NA	Well wizard installed. Low PID reading.
ET- 1	Long	Inert Disposal Area					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Abandoned. Removed by ECC.
ET- 2	Long	Inert Disposal Area					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Abandoned. Removed by ECC.
ET- 3	Long	Inert Disposal Area					2257405	299346	NA	708.31	710.74	NA	NA	NA	NA	NA	21.10	689.64	NA	NA	Well wizard installed.
FL- 1	Long	Flyash Landfill			4		2261810	300871	NA	711.34	713.68	NA	NA	NA	NA	NA	5.39	708.29	NA	NA	Accessible.
FL- 2	Long	Flyash Landfill			4		2261754	300623	NA	711.45	713.19	NA	NA	NA	NA	NA	5.15	708.04	NA	NA	Accessible.
FL- 3	Long	Flyash Landfill			4		2261579	300516	NA	714.21	716.07	NA	NA	NA	NA	NA	8.35	707.72	NA	NA	Accessible.
FL- 4	Long	Flyash Landfill			4		2261390	300428	NA	710.40	712.46	NA	NA	NA	NA	NA	6.05	706.41	NA	NA	Accessible.
FL- 6	Long	Flyash Landfill			4		2261367	301109	NA	714.33	717.04	NA	NA	NA	NA	NA	5.22	711.82	NA	NA	Accessible.
FL- 7	Long	Flyash Landfill			4		2261217	301129	NA	714.13	715.97	NA	NA	NA	NA	NA	3.65	712.32	NA	NA	Accessible.

APPENDIX I
MONITORING WELL INVENTORY

I-2 Well Inspection Forms

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: CWP

Date Inspected: 5/7/97

Inspected By: Hess Maggin

Time Inspected: 930

Well Location (describe):			
100' N. of NE corner of Building BG-199-2 North Burn Pad grass area			
Located By:	Map ✓ 18	GPS	Other:

Photo Reference: Roll 3, Photo 9

Item	Yes	No	Comment/Description
Lock inplace?	✓		Damaged / Removed Cap
Well clearly labelled?		✓	Estimated with map location
Well Number:		✓	" " " "
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?		✓	2" high 4" PVC Pipe
Concrete pad inplace?	✓*	✓	* It shows pad under grass
Bumper posts in place?	✓*	✓	* Yes
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	No
Type of inner casing?	No Casing, it is 4" Pipe pre well		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: DA-1 Date Inspected: 5/6/97

Inspected By: Hess Naggar Time Inspected: 1615

Well Location (describe):			
Northwest Section			
Located By:	Map ✓	GPS	Other:

13

Photo Reference: Roll 3 - Photo - 2

Item	Yes	No	Comment/Description
Lock inplace?	✓		S.S. Best
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" Casing Pipe, Flat Hinged lid
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: DA-02 Date Inspected: 5/6/97

Inspected By: Hossi Nagy Time Inspected: 16:25

Well Location (describe):			
Located in East Central Section of Demolition Area			
Located By:	Map ✓	GPS	Other:

13

Photo Reference: Roll #3, Photo 3

Item	Yes	No	Comment/Description
Lock inplace?	✓		Best S.S.
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" hangal Gaffat
Concrete pad inplace?		✓	gravel
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: DM-1 Date Inspected: 5-8-97

Inspected By: KAK, HNP Time Inspected: 1524

Well Location (describe):			
FUEL STATION — ~~3~~ APPROX ~~20~~ 15 FT S-SE of Gas Pump 1			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 5

Item	Yes	No	Comment/Description
Lock inplace?		✓	Flush Mount, 3 Bolts
Well clearly labelled?		✓	NO NUMBER
Well Number:			
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: DM-2 Date Inspected: 5-8-97
Inspected By: KAR, HNP Time Inspected: 1526

Well Location (describe):			
FUEL STATION - APPROX. 20 FT SE OF			
Gas Pump 1			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 5

Item	Yes	No	Comment/Description
Lock inplace?		✓	Flush Mount, 3 Bolts
Well clearly labelled?		✓	NO NUMBER
Well Number:			
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: DM4 Date Inspected: 5-8-97
Inspected By: KAK, HNP Time Inspected: 1504

Well Location (describe):			
FUEL STATION – 10 FT W of DM5			
~ 30 FT E of Fence			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 2

Item	Yes	No	Comment/Description
Lock inplace?		✓	Flush Mount, 3 Bolts
Well clearly labelled?		✓	NO NUMBER
Well Number:			
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?	✓		water in Recessed Hole
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: ~~DM4~~ DM5 Date Inspected: 5-8-97

Inspected By: KAK, HNP Time Inspected: 1456

Well Location (describe):			
FUEL STATION – APPROX. 85 FT W of			
Vehicle Inspection Entrance Door (BLDG 500-129)			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 1

Item	Yes	No	Comment/Description
Lock inplace?		✓	Flush Mounted, 3 Bolts
Well clearly labelled?		✓	NO NUMBER
Well Number:			
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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HARZA ENVIRONMENTAL SERVICES, INC.

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: DM7 Date Inspected: 5-8-97

Inspected By: KAK, HNP Time Inspected: 1432

Well Location (describe):			
FUEL STATION — CENTER OF ASPHALT PAD			
SW of Red Brick Building and Tank 500-152-16			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 6, PHOTO 34

Item	Yes	No	Comment/Description
Lock inplace?		✓	Flush Mounted, 3 Bolts
Well clearly labelled?		✓	NO NUMBER
Well Number:			
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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HARZA ENVIRONMENTAL SERVICES, INC. 6

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: DM 8 Date Inspected: 5-8-97

Inspected By: KAK, HNP Time Inspected: 1411

Well Location (describe):			
FUEL STATION - APPROX. 70 FT E of			
Gasoline Pump 2			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 6, PHOTO 35

Item	Yes	No	Comment/Description
Lock inplace?		✓	Flush Mount, 3 Bolts
Well clearly labelled?		✓	NO NUMBER
Well Number:			
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: DM9 Date Inspected: 5-8-97

Inspected By: KAK, HNP Time Inspected: 1530

Well Location (describe):			
FUEL STATION — APPROX. 30 FT S of			
Pump House Awning			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 6

Item	Yes	No	Comment/Description
Lock inplace?		✓	Flush mount, 3 Bolts
Well clearly labelled?		✓	NO NUMBER
Well Number:			
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: DM10 Date Inspected: 5-8-97

Inspected By: KAK, HNP Time Inspected: 1543

Well Location (describe):			
FUEL STATION - APROX. 70 FT W of Southern-Most Garage Door on Building 500-129			
Located By:	~~Map~~	GPS	Other:

MAP IS BELIEVED TO BE INCORRECT

Photo Reference: ROLL 8, PHOTO 9

REAL LOCATION IS E. of Map Location

Item	Yes	No	Comment/Description
Lock inplace?		✓	Flush Mount, 3 Bolts
Well clearly labelled?		✓	NO NUMBER
Well Number:			
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?			
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: EDA-1 Date Inspected: 5/13/97

Inspected By: H. Wajjwa Time Inspected: 1420

Well Location (describe):			
Explosive Disposal Area; outside Fence NE Area			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 4, Photo 29

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	4" Steel
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: EDA-2 Date Inspected: 5/13/97

Inspected By: [illegible] Time Inspected: 14:15

Well Location (describe):			
Explosive Disposal Area: SW Area			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 4, photo 27

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:			
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	4" steel
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: EDA-3 Date Inspected: 5/13/97

Inspected By: H. Nagjian Time Inspected: 14:10

Well Location (describe):			
Explosive Disposal area: SE corner			
15' E. of JA-WB14			
Located By:	Map ✓	GPS	Other:

8

Photo Reference: Roll 4, Photo 25

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	4"- steel
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: EDA-4 Date Inspected: 5/13/97

Inspected By: H. Nuijten Time Inspected: 14:12

Well Location (describe):			
Explosive Disposal Area, inside Fence, NE area			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 4, Photo 26

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" steel
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	4"
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: ET 3 Date Inspected: 5-12-97

Inspected By: KAK, HNP Time Inspected: 1533

Well Location (describe):			
IDA - Central		Under windsock	
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 25

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Best
Well clearly labelled?	✓		Paint on Riser + Posts
Well Number:	✓		ET3
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3 FT Riser, 4X4' SQ
Concrete pad inplace?	✓		Under cut and hanging on
Bumper posts in place?	✓		4 Concrete Pro Cove
Survey mark present?		✓	
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?		✓	?
Evidence of well subsidence?	✓		Subsidence below Pad
Evidence of casing degradation?		✓	Subsidence
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: FL-1 Date Inspected: 5/2/97
Inspected By: Joe Mark Time Inspected: 12:15

Well Location (describe):			
East Side of Fly Ash Landfill			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 2 Photo 18

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless steel
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		≈ 10" galvanized
Concrete pad inplace?		✓	
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ☑ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

HARZA *Consulting Engineers and Scientists*

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WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: FL-2 Date Inspected: 5/2/97
Inspected By: Joe Mark Time Inspected: 12:01

Well Location (describe):			
Southeast corner of the Flyash Landfill.			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 2 Photo ~~15~~ 16

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		≈ 12" diameter galvanized
Concrete pad inplace?		✓	
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	unknown		

Well Appears: *Usable* ☑ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: FL-3 Date Inspected: 5-2-97
Inspected By: Joe Mark Time Inspected: 11:53

Well Location (describe):			
South side of fly ash landfill			
Located By:	Map ✓ 4	GPS	Other:

Photo Reference: Roll 2, Photo 14

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		≈ 12" galvanized
Concrete pad inplace?		✓	
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: FL-4 Date Inspected: 5/2/97
Inspected By: Joe Mord Time Inspected: 11:39

Well Location (describe):			
Southside of Fly Ash Landfill.			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 2, Photo 11

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		x 12" galvanized
Concrete pad inplace?		✓	
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

Photographed from SW to NE due to drum blocking view of well from north. Dry Erase board marked as FL-4 used in photo to ID well. JM 5/2/97

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: FL-6 Date Inspected: 4/30/97
Inspected By: RNeronberg Time Inspected: 1:20 pm

Well Location (describe):			
North side, center of Flyash Landfill			
Located By:	(Map)	GPS	Other:

See Fig. 4

Photo Reference: Roll 1, Photo 2

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless steel, good condition
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:			
Surface casing inplace?	✓		Galvanized cylinder
Concrete pad inplace?		✓	
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: FL-7 Date Inspected: 5 2-97

Inspected By: Joe Mark Time Inspected: 10:38

Well Location (describe):			
NW corner of the fly ash landfill			
Located By:	Map ✓ 4	GPS	Other:

Photo Reference: Roll 2, Photo 4

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless steel
Well clearly labelled?	✓		
Well Number:	✓		FL-7
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		x 12" galvanized
Concrete pad inplace?		✓	
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	unknown		

Well Appears: *Usable* ☑ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: FL-8 Date Inspected: 5-2-97
Inspected By: Joe Mark Time Inspected: 10:55

Well Location (describe):			
West side of fly ash landfill, south of the northwest corner of the landfill			
Located By:	Map ✓ 4	GPS	Other:

Photo Reference: Roll 2 Photo 6

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless steel
Well clearly labelled?	✓		
Well Number:	✓		FL-8
Date(s):		✓	–
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		x 6" galvanized ZED
Concrete pad inplace?		✓	
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: FL-9 Date Inspected: 5-2-97

Inspected By: Joe Mark Time Inspected: 11:06

Well Location (describe):			
West side of Fly Ash Landfill. North of SW corner			
Located By:	Map ✓ 4	GPS	Other:

Photo Reference: Roll 2 Photo 7

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless steel
Well clearly labelled?	✓		FL-9
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		≈ 12" galvanized
Concrete pad inplace?		✓	
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: FL-10 Date Inspected: 5-2-97
Inspected By: Joe Mark Time Inspected: 11:13

Well Location (describe):			
Southwest corner of the Fly ash landfill			
Located By:	Map ✓ 4	GPS	Other:

Photo Reference: Roll 2, Photo 9

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless
Well clearly labelled?	✓		
Well Number:	✓	~~✓~~	
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		≈ 12" galvanized
Concrete pad inplace?		✓	
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-1 Date Inspected: 5-14-97

Inspected By: KAK Time Inspected: 0943

Well Location (describe):			
Picnic Area - 50 ft into woods, SW corner of IAAAP Picnic Area			
Located By:	Map (general)	GPS	Other: Driving Survey

Photo Reference: ROLL 9 PHOTO 22 Taken NE

Item	Yes	No	Comment/Description
Lock inplace?		✓	LOCK PRESENT NOT LOCKED
Well clearly labelled?	✓		Sign Facing N
Well Number:	✓		G-1
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		4 FT Riser, 8" DIA, Threaded Cap
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		3 - 4x4" wood
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-2 Date Inspected: 5-14-97

Inspected By: KAK Time Inspected: 1046

Well Location (describe):			
NW Corner of Yard F			
Outside of Fence			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 9 PHOTO 25
Taken SE

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Best
Well clearly labelled?	✓		Sign facing NW
Well Number:	✓		G-2
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3FT Riser, 8" DIA, Thread Cap
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		3 - 4X4" Wood
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

5

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-3 Date Inspected: 5-14-97

Inspected By: KAK Time Inspected: 1053

Well Location (describe):			
NW Plant, where Dirt road running E-W through Yard F terminates at the Fence (Left side) (S)			
Located By:	Map	GPS	Other:

Photo Reference: Roll 9 Photo 26 Taken SW

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Bust
Well clearly labelled?	✓		Sign Facing N
Well Number:	✓		G-3
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		4FT Riser, 8"DIA, Thread Cap
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		3 - 4X4" wood
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-4 Date Inspected: 5-12-97

Inspected By: KAK, HNP Time Inspected: 1424

Well Location (describe):			
IDA - N. Central (NE corner)			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 14

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Best
Well clearly labelled?	✓		Sign Facing S
Well Number:	✓		G-4
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3 FT, 8" DIA, Threaded cap
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		3 - 4X4" Wood
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-5 Date Inspected: 5-12-96

Inspected By: KAK, HMP Time Inspected: 1507

Well Location (describe):			
IDA - SW Corner (SW of trench along trees)			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8 PHOTO 23

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Best
Well clearly labelled?	✓		Sign Facing N
Well Number:	✓		G-5
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		5 FT RISER, 8" DIA Threaded Cap
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		3 - 4x4" wood
Survey mark present?		✓	
Standing or Ponded water around well?			1 Barell
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-6 Date Inspected: 5-12-97

Inspected By: KAK, HNP Time Inspected: 1614

Well Location (describe):			
IDA - E of ECC Trailer			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8 PHOTO 27

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Steel
Well clearly labelled?	✓		Sign facing SW
Well Number:	✓		G-6
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		5 FT Riser, 8" DIA, Threaded cap
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		3 - 4x4" wood
Survey mark present?		✓	
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-7 Date Inspected: 5-12-97
Inspected By: KAK, HNP Time Inspected: 1353

Well Location (describe):			
IDA – South Central			
(W of JAW 27)			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 10

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless BEST
Well clearly labelled?	✓		sign facing N
Well Number:	✓		
Date(s):			G-7
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		8" DIA., Threaded Cap, 3 FT
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		3 - 4x4" wooden
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-8 Date Inspected: 5-14-97

Inspected By: KAK Time Inspected: 0919

Well Location (describe):			
Long Creek Intersection w/ Road C — W side Road			
N side Creek — Down in Creek Bottom ~ 200ft off Road			
Located By:	Map (General)	GPS	Other:

Photo Reference: ROLL 9 PHOTO 21

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Best
Well clearly labelled?	✓		Sign facing E
Well Number:	✓		G-8
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		4 FT Riser, 8" DIA, Thread Cap
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		3 - 4x4" wood
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-9 Date Inspected: 5/6/97

Inspected By: Hoss Time Inspected: 16:00

Well Location (describe):			
N. Central Section of Demolition Area			
Located By:	Map ✓	GPS	Other:

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Photo Reference: Roll -3, Photo-1

Item	Yes	No	Comment/Description
Lock inplace?	✓		S.S.
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:			
Surface casing inplace?	✓		Screw on Cap 6"
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?			

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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1419

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: 6-10 Date Inspected: 5-6-97

Inspected By: K. Kraske Time Inspected: 16:55

Well Location (describe):			
Demolition Area : SW Corner			
Located By:	Map	GPS	Other:

B

Photo Reference: ROLL 3, PHOTO 6

Item	Yes	No	Comment/Description
Lock inplace?		✓	NO LOCK, CAP REMOVED
Well clearly labelled?	✓		Sign is out of ground
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" STEEL SCREW CAP, RUSTY
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		wood (3)
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?	✓		Casing may have subsided
Evidence of casing degradation?	✓		Very Rusty, CAP IS OFF
Type of inner casing?	4" PVC / PNEUMATIC PUMP (WELL WIZARD) IN PLACE		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

* PUMP IN PLACE

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-11 Date Inspected: 5/5/97

Inspected By: Hoss Nayjar Time Inspected: 1630

Well Location (describe):			
Demolition Area, South Central			
Located By:	Map ✓ 13	GPS	Other:

Photo Reference: Roll 3, Photo #4

Item	Yes	No	Comment/Description
Lock inplace?	✓		Covered lock c/ Best Stock
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-12 Date Inspected: 5-14-97

Inspected By: KAK Time Inspected: 1012

Well Location (describe):			
Gate 5 – N of Road J, W of Gate			
Inside Fence			
Located By:	Map	GPS	Other:

General

Photo Reference: ROLL 9 PHOTO 23
Taken NE

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Best
Well clearly labelled?	✓		Sign Facing N
Well Number:	✓		G-12
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3FT Riser, 8" DIA, Thread cap
Concrete pad inplace?		✓	
Bumper posts in place?	✓		3 - 4x4" Wood
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-13 Date Inspected: 5-14-97
Inspected By: KAK Time Inspected: 1024

Well Location (describe):			
Gate 5 - SW fence corner on E side of			
Road J outside Gate 5			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 9 PHOTO 24
Taken NE

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Best
Well clearly labelled?	✓		Sign facing W
Well Number:	✓		G-13
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3FT Riser, 8" DIA, Thread Cap
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		3- 4x4" Wood
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-14 Date Inspected: 5/14/97

Inspected By: Hoss Nagjar Time Inspected: 10 45

Well Location (describe):			
South West of Brush creek + D Road intersection ≈ 150' South			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 10, Photo 2

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?		✓	gravel
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	8" screwed cap steel
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: 6-15 Date Inspected: 5-14-97

Inspected By: KAK, HNP Time Inspected: 1700

Well Location (describe):			
NW Section of Intersection of Brush Creek and Road I			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 9 PHOTO 33 taken SE

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Best
Well clearly labelled?	✓		Sign facing W
Well Number:	✓		6-15
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3FT Riser, 8" DIA, Thread Cap
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		3 - 4X4" Wood
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

* Must walk around wooded area to get to well

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-16 Date Inspected: 5/14/97

Inspected By: Hoss Naggar Time Inspected: 1205

Well Location (describe):			
North of I Road at A" Road and F Road Intersection			
Located By:	Map	GPS	Other:

Photo Reference: Roll 10, Photos

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:			
Surface casing inplace?	✓		6" Screwed
Concrete pad inplace?		✓	gravel
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-17 Date Inspected: 5-12-97

Inspected By: KAK, HNP Time Inspected: 1702

Well Location (describe):			
LINE 800 - NE Corner Perimeter of			
Pink Water Lagoon			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8 PHOTO 32

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Bent
Well clearly labelled?	✓		Sign Facing S
Well Number:	✓		G-17
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		4 FT Riser, 8" DIA, Threaded Cap
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		3 - 4x4" wood
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: 6-18 Date Inspected: 5-12-97

Inspected By: KAK, HNP Time Inspected: 1659

Well Location (describe):			
LINE 800 – E of Pink Water Lagoon			
Excavation			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 31

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Bolt
Well clearly labelled?	✓		Sign facing E
Well Number:	✓		6-18
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3FT Riser, 8" DIA, Threaded Cap
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		3 – 4x4" wood
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-19 Date Inspected: 5-12-97
Inspected By: KAK, HNP Time Inspected: 1655

Well Location (describe):			
LINE 800 – SE of Pink water Lagoon Excavation Perimeter			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8 PHOTO 30

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Bolt
Well clearly labelled?	✓		Sign facing S
Well Number:	✓		G-19
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		4 FT Riser, 8" DIA Threaded Cap
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		3 - 4x4" wood
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

10.0'

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: 6-20 Date Inspected: 5-12-97

Inspected By: KAK, HNP Time Inspected: 1651

Well Location (describe):			
LINE 800 - PINK WATER LAGOON EXCAVATION			
Located By:	Map. ✓	GPS	Other:

Photo Reference: ROLL 8 PHOTO 29

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless Bost
Well clearly labelled?	✓		sign facing S
Well Number:	✓		6-20
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3 FT Riser, 8" DIA, Threaded Cap
Concrete pad inplace?		✓	
Bumper posts in place?	✓		2 - 4x4" wood
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

* Excavation surrounds well on an island
Need ladder

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-21 Date Inspected: 5-14-97
Inspected By: KAK Time Inspected: 1145

Well Location (describe):			
Plant South - End of Dirt Road starting			
SW corner of Yard E on Road K			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 9 PHOTO 27
Taken W

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Best
Well clearly labelled?	✓		Sign facing E
Well Number:	✓		6-21
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3FT Riser, 8" DIA, Thread Cap
Concrete pad inplace?		✓	
Bumper posts in place?	✓		3 - 4X4" wood
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-22 Date Inspected: 5-14-97

Inspected By: KAX, HNP Time Inspected: 1537

Well Location (describe):			
South central Plant - Enter from Outside (County Rd)			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 9 PHOTO 30
Taken SE

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless Best
Well clearly labelled?	✓		Sign facing West
Well Number:	✓		G-22
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3 FT Riser, 8" DIA, Thread Cap
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		3 - 4x4" wood
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-23 Date Inspected: 5-14-97

Inspected By: KAK, HNP Time Inspected: 1546

Well Location (describe):			
South central - Enter from outside			
(County Rd) - E of G-22			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 9 PHOTO 31
Taken W

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless Best
Well clearly labelled?	✓		sign facing NE(C)
Well Number:	✓		G-23
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3FT Riser, 8" DIA, Thread cap
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		3 - 4x4" Wood
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-24 Date Inspected: 5-9-97

Inspected By: KAK, HNP Time Inspected: 1140

Well Location (describe): West Creek Bank			
Directly W of Bridge across Brush Creek			
Bridge 73 located SW of Substation 500-169-1			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 3, PHOTO 29

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Best
Well clearly labelled?	✓		Sign facing S
Well Number:	✓		G-24
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3 FT Riser, 8" DIA, Threaded outer case cap
Concrete pad inplace?	✓		Broken
Bumper posts in place?	✓		3-4x4", wood
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?	✓		Broken Concrete
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	RUST
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

X Threaded Outer Case Cap

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-25 Date Inspected: 5-9-97

Inspected By: KAK, HNP Time Inspected: 1055

Well Location (describe): From Road K			
SE - Most Ungraved Road - At the end			
on the left — Next to Electrical Substation 500-169-1			
Located By:	Map	GPS	Other: (W of Substation?)

Photo Reference: ROLL 3 PHOTO 28

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless BEST
Well clearly labelled?	✓		sign facing SE
Well Number:	✓		G-25
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3 FT Riser, 8" Diam., threaded cap outer
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		3 - 4X4" Wood
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			RUST
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

* Threaded Outer Cap

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-26 Date Inspected: 5-9-97

Inspected By: KAK, HNP Time Inspected: 1250

(~300 Ft from well)

(Tree on Rd) **Well Location (describe):**

NE of End of Level B Service Minimum Maintenance Rd (From Rd K)

Located By: (Map) GPS Other:

Photo Reference: ROLL 3 PHOTO 30

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Steel
Well clearly labelled?	✓		Bent Sign Facing west
Well Number:	✓		G-26
Date(s):			
Depth(s):			
Installed By:			
Other:			3 Barrels
Surface casing inplace?		✓	square 4x4" Casing stuck inside 8" Round Casing — open to rain entry
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		3 - 4x4" Wood
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-27 Date Inspected: 5-14-97

Inspected By: KAK, HNP Time Inspected: 1600

Well Location (describe):			
E End of Road Running E-W through Line D			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 9 PHOTO 32

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Bolt
Well clearly labelled?	✓		Sign facing E
Well Number:	✓		G-27
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3 FT Riser, 8" DIA, Thread Cap
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		3- 4x4" wood
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-28 Date Inspected: 5-14-97

Inspected By: KAK, HNP Time Inspected: 1344

Well Location (describe):			
Gate 1 — South along Fence Perimeter			
P Road Terminates (Right)			
Located By:	Map (General)	GPS	Other:

Photo Reference: ROLL 9 PHOTO 28 Taken SE

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Bolt
Well clearly labelled?	✓		Sign Facing N
Well Number:	✓		G-28
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		4 FT Riser, 8" DIA, Thread Cap
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		2 - 4x4" Wood
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-29

Inspected By: H. Nagjan

Date Inspected: 5/13/92

Time Inspected: 15:11

Well Location (describe):			
Explosive Disposal area: outside fence at South central			
Located By:	Map ✓ 8	GPS	Other:

Photo Reference: Roll 4, Photo 34

Item	Yes	No	Comment/Description
Lock inplace?		✓	
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:			
Surface casing inplace?	✓		
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-30 Date Inspected: 5/7/97

Inspected By: Hess Naughton Time Inspected: 1545

Well Location (describe):			
West Burn Pads			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 3, Photo 25

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?	✓		
Well Number:		✓	
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		8" Screw on Cap Locks
Concrete pad inplace?		✓	gravel
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-31 Date Inspected: 5-14-97
Inspected By: KAK, HNP Time Inspected: 1427

Well Location (describe):			
S of G-3 along fenceline, At Tributary Bend W Central Section Fud			
Located By:	Map	GPS	Other:

Photo Reference: Roll 9, Photo 29
Taken S

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Bcst
Well clearly labelled?	✓		Sign Facing N
Well Number:	✓		G-31
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3FT Riser, 8" DIA, Thread Cap
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		2 - 4x4" Wood
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-40 Date Inspected: 5-12-97

Inspected By: KAK, HNP Time Inspected: 1729

Pair w/ G-41	Well Location (describe):		
LINE 800 — APPROX 200 FT SE of LINE			
800 S Entrance			
Located By:	Map	GPS	Other:

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Photo Reference: ROLL 8, PHOTO 35

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Best
Well clearly labelled?	✓		Sign facing W
Well Number:	✓		G-40
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		2 FT Riser, 6" DIA, Hinge
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		4 - 4x4" Wood
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-41 Date Inspected: 5-12-97

Inspected By: KAK, HNP Time Inspected: 1733

Well Location (describe):			
LINE 800 – APPROX. 200 FT SE of LINE 800 S Entrance			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 35

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Bust
Well clearly labelled?	✓		Sign facing W
Well Number:	✓		G-41
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		2 FT Riser, 6" DIA, Hinge
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		4 – 4X4" wood
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-42 Date Inspected: 5-12-97
Inspected By: KAK, HNP Time Inspected: 1717

Paired w/ G-43 **Well Location (describe):**			
LINE 800 - NE corner			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 34

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Best
Well clearly labelled?	✓		Sign Facing S
Well Number:	✓		G-42
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3 FT Riser, 6" DIA, Hinge Top
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		3 - 4X4" Wood
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-43 Date Inspected: 5-12-97
Inspected By: KAK, HNP Time Inspected: 1719

Paired w/ G-42	Well Location (describe):		
LINE 800 - NE Corner			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 34

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Best
Well clearly labelled?	✓		sign facing S
Well Number:	✓		G-43
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3 FT Riser, 6" DIA, Hinged top
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		3 - 4X4" Wood
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-44 Date Inspected: 5-12-97

Inspected By: KAK, HNP Time Inspected: 1709

Paired w/ G-45	Well Location (describe):		
LINE 800 - Middle of Corn Field E of Pink water Lagoon			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 33

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Bolt
Well clearly labelled?	✓		Sign facing S
Well Number:	✓		G-44
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		2 FT Riser, 6" DIA, Hinge TOP
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		4 Metal Pipes (Tall)
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-45 Date Inspected: 5-2-96
Inspected By: KAK, HNP Time Inspected: 1711

Paired w/ G-44	Well Location (describe):		
LINE 800 - Middle of Corn field E of Pink water Lagoon			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8 PHOTO 33

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Steel
Well clearly labelled?	✓		Sign Facing S
Well Number:	✓		G-45
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		2 FT Riser, 6" DIA, Hinge top
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		4 tall Metal Pipes
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-46 Date Inspected: 5-12-97

Inspected By: KAK, HNP Time Inspected: 1640

Well Location (describe):			
LINE 800 - SE corner of Road L and H Intersection (Paired w/ G-47)			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8 PHOTO 28

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Bust
Well clearly labelled?	✓		Sign facing N
Well Number:	✓		G-46
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		2½ FT Riser, 6" DIA Hinge Cov
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		2 - 4X4" wood
Survey mark present?		✓	
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-47 Date Inspected: 5-12-97
Inspected By: KAK, HNP Time Inspected: 1643

Well Location (describe):			
LINE 800 – SE Corner of Road C and H			
Intersection (paired w/ G-46)			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8 PHOTO 28

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Best
Well clearly labelled?	✓		Sign Facing N
Well Number:	✓		G-47
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3FT Riser, 6" DIA Hinge cap
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		2 – 4X4" Wood
Survey mark present?		✓	
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-48 Date Inspected: 5/13/97

Inspected By: H. Najjar Time Inspected: 1825

Well Location (describe):			
Line 800: outside Fenced area, NE Section			
Located By:	Map ✓ 22	GPS	Other:

Photo Reference: Roll 10, Pkt #1

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:			
Surface casing inplace?	✓		Rusted
Concrete pad inplace?		✓	gravel
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	4"
Type of inner casing?	Unknown (≈4" PVC)		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-49 Date Inspected: 5-8-97
Inspected By: KAK Time Inspected: 1303

Well Location (describe): Far Outside Fence
LINE 1 — APPROX 300 FT N of Railroad track running along Road B, and 600 FT from signed RR crossing on Road B (SEE sketch, ON BACK

Located By:	Map	GPS	Other:

Photo Reference: ROLL 6, PHOTO 31 TAKEN SOUTH

Item	Yes	No	Comment/Description
Lock inplace?	✓		Brass/Stainless BEST
Well clearly labelled?	✓		Sign Facing N
Well Number:	✓		G-49
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		2 FT Riser, 5X5" SQ
Concrete pad inplace?		✓	Pea Gravel
Bumper posts in place?	✓		3 Driven Metal Fence Posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	Painted Orange
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

* Can be seen from Rd B

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-50 Date Inspected: 5/14/97

Inspected By: Hoss Najjar Time Inspected: 11 20

Well Location (describe):			
West of H Road and North of Brush Creek, Same location of G-51			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 10, Phot 3

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:			
Surface casing inplace?	✓		4" Rounded
Concrete pad inplace?		✓	
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	1" Steel		

Well Appears: *Usable* ✓* *Unusable* ☐ *Cannot Evaluate* ☐

Broken Trees over the wells (G-50 & G-51)

* May not be used for water elev measurement due to fill

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-51 Date Inspected: _____

Inspected By: H. Najjar Time Inspected: _____

Well Location (describe):			
West of H Road and North of Brush Creek located by G-50			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 4, Photo 3, (Same as G-50)

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:			
Surface casing inplace?	✓		4" square
Concrete pad inplace?		✓	
Bumper posts in place?	✓		damaged by fallen Trees
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?			

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-52 Date Inspected: 5/14/97

Inspected By: Hoss Najjar Time Inspected: 1145

Well Location (describe):			
Brush Creek and entrance to The Yard			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 10, Photo 4 (same as G-53)

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:			
Surface casing inplace?	✓		4" square
Concrete pad inplace?		✓	gravel
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-53 Date Inspected: 5/14/97

Inspected By: Hoss Najjar Time Inspected: 11 47

Well Location (describe):			
Brush Creek and entrance to the Yard D			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 10, Photo 4 (Same as G-52)

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):	✓	✓	
Depth(s):		✓	
Installed By:		✓	
Other:			
Surface casing inplace?	✓		4" Sleeve
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-54 Date Inspected: 5-9-97

Inspected By: KAK, HNP Time Inspected: 1034

Well Location (describe):			
ROAD K / ~~Spring~~ Brush Creek Intersection			
NE of Bridge			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 3, PHOTO 27

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless BEST
Well clearly labelled?	✓		Sign facing S
Well Number:	✓		G-54
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		5x5" SQ, 3 FT RISER
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		Sign and 2 Driven metal fence
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-55 Date Inspected: 5-7-97

Inspected By: KAK, HNP Time Inspected: 1038

Well Location (describe):			
Road K / Brush Creek Intersection			
NE of Bridge, NE of G-54			
Located By:	(Map)	GPS	Other:

Photo Reference: ROLL 3 PHOTO 27

Item	Yes	No	Comment/Description
Lock inplace?		✓	NO LOCK
Well clearly labelled?	✓		sign facing S
Well Number:	✓		G-55
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3FT RISER, 5x5" SQ
Concrete pad inplace?		✓	gravel
Bumper posts in place?	✓		3 Driven metal fence
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	4" PVC, END CAP		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC. 10

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-56 Date Inspected: 5/13/97

Inspected By: Hoss Nuffer Time Inspected: 1040

Well Location (describe):			
Line 800 inside Fenced, East end			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 4, Photo 17

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		Rusted
Concrete pad inplace?		✓	gravel
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?	✓		Rusted Casing
Type of inner casing?			

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-57 Date Inspected: 5/13/97

Inspected By: Hoss [illegible] Time Inspected: 1030

Line 800	Well Location (describe):		
Inside Line 800 Fence, South east area			
This well is located within Hot zone			
Located By:	Map ✓	GPS	Other:

Photo Reference: 4 Roll, Photo 15

Item	Yes	No	Comment/Description
Lock inplace?	✓		Rusted Cap
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		Rusted
Concrete pad inplace?		✓	gravel
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?	✓		Rusted casing
Type of inner casing?	4"		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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HARZA ENVIRONMENTAL SERVICES, INC.

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: G-58 Date Inspected: 5/13/97

Inspected By: Hoss Nagjor Time Inspected: 1035

Well Location (describe):			
Line 800 · inside fenced area, Southeast area			
This well is located within Hot Zone			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 4, Photo 16

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		Rusted
Concrete pad inplace?		✓	gravel
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?	✓		Rusted Casing
Type of inner casing?	4" PVC		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: GP-1 Date Inspected: 5-12-97
Inspected By: KAK, HNP Time Inspected: 1419

Well Location (describe):			
IDA - E. Central (N of JAW 26)			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 13

Item	Yes	No	Comment/Description
Lock inplace?	✓		Brass Master
Well clearly labelled?	✓		white Paint on Riser
Well Number:	✓		GP-1
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		Black 3 FT, 4X4" SQ
Concrete pad inplace?	✓		3X3 FT
Bumper posts in place?	✓		3 YELLOW Concrete
Survey mark present?		✓	
Standing or Ponded water around well?		✓	11 Barrels
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			NEW!
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC. 16

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: GP-3 Date Inspected: 5-12-97

Inspected By: KAK, ANP Time Inspected: 1457

Well Location (describe):			
IDA - NW Corner of Site			
SE Corner of Pond Area - In trees			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 21

Item	Yes	No	Comment/Description
Lock inplace?	✓		Brass Master
Well clearly labelled?	✓		White Paint on Riser
Well Number:	✓		GP-3
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		4 FT Riser, 4X4" SQ
Concrete pad inplace?	✓		3X3 FT
Bumper posts in place?	✓		3 Yellow Concrete
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			NEW!
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: GP-4 Date Inspected: 5-12-97
Inspected By: KAK, HNP Time Inspected: 1411

Well Location (describe):			
JDA — NW Corner			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 16

Item	Yes	No	Comment/Description
Lock inplace?	✓		Brass Master
Well clearly labelled?	✓		white Paint on Riser
Well Number:	✓		GP-4
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		Black 4 FT Riser, 4X4" SQ
Concrete pad inplace?	✓		3X3 FT
Bumper posts in place?	✓		3 Concrete Yellow
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			NEW!
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

* NE of lined Pond Area

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: GP-5 Date Inspected: 5-12-97
Inspected By: KAK, HNP Time Inspected: 1428

Well Location (describe):			
IDA - N. central, (NE corner)			
(NW of G-4)			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8 PHOTO 15

Item	Yes	No	Comment/Description
Lock inplace?	✓		Brass Master
Well clearly labelled?	✓		white Paint on Riser
Well Number:	✓		GP-5
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3 FT, Black, 4x4 SQ
Concrete pad inplace?	✓		3X3 FT
Bumper posts in place?	✓		3 yellow concrete
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: Z1-1 (GZ-1) Date Inspected: 5-8-97
Inspected By: K. Kraske Time Inspected: 0846

Well Location (describe): Outside Fence			
LINE 1 - 200 FT S-SW of LINE 1 SW			
FENCE CORNER (BETWEEN ROAD D AND FENCE)			
Located By:	Map	GPS	Other:

25

Photo Reference: ROLL 6, PHOTO 23

Item	Yes	No	Comment/Description
Lock inplace?		✓	NO LOCK
Well clearly labelled?	✓		sign facing S
Well Number:	✓		Z1-1
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		3 FT RISER, STEEL 5"
Concrete pad inplace?	✓		5 X 5", Forms Remain
Bumper posts in place?	✓		3 POSTS
Survey mark present?		✓	
Standing or Ponded water around well?		✓	Low Topo Area
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	RUST
Type of inner casing?	4" PVC with cleanout Plug		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: GZ-21 Date Inspected: 5-8-97
Inspected By: KAR Time Inspected: 0858

Well Location (describe): Outside fence
LINE 1 - N. of Large Culvert under Road D
(NE Bank of Creek)(S. of GZ-24)

Located By:	Map 25	GPS	Other:

Photo Reference: ROLL 6, PHOTO 24

Item	Yes	No	Comment/Description
Lock inplace?	✓		NO LOCK
Well clearly labelled?	✓		Sign facing S.
Well Number:	✓		21-2
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		3 FT RISER, STEEL 5"
Concrete pad inplace?	✓		~5X5', MUD COVERED
Bumper posts in place?	✓		3 POSTS, YELLOW
Survey mark present?		✓	
Standing or Ponded water around well?		✓	Toe Low, LOCATED NEAR SMALL OXBOW
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	4" PVC, END CAP		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

* LOCATED IN CONTRACTOR WORK ZONE

HARZA ENVIRONMENTAL SERVICES, INC.

229

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: GZ-3 Date Inspected: 5-8-97

Inspected By: KMK Time Inspected: 1010

Well Location (describe): Outside fence
LINE 1 — At junction of Road D and Creek
Across [redacted] Creek from GZ-2 and 2A
Located By: Map GPS Other:

Photo Reference: ROLL 6, PHOTO 29

Item	Yes	No	Comment/Description
Lock inplace?		✓	NO LOCK
Well clearly labelled?	✓		Sign Facing SW to Road
Well Number:	✓		Z1-3
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3FT Iron, 5X5" SQ
Concrete pad inplace?	✓		3X3' Approx., cover Mud
Bumper posts in place?	✓		3 Concrete Yellow
Survey mark present?		✓	~~Approx 6 FT~~
Standing or Ponded water around well?	✓		Approx. 6FT SW
Evidence of collision damage?		✓	~~RUST~~
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	RUST
Type of inner casing?	4" PVC, Cleanout Cap		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

* LOCATION IN CONTRACTOR WORK AREA

HARZA ENVIRONMENTAL SERVICES, INC.

230

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: GZ-6 Date Inspected: 5-8-97

Inspected By: KAK Time Inspected: 1342

Well Location (describe): Inside Fence			
LINE 1 - 100' From Fence, NE APPROX. 300' From Dam (outside Fence)			
Located By:	Map	GPS	Other:

21

Photo Reference: Roll 6, PHOTO 32

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless BEST
Well clearly labelled?		✓	
Well Number:			
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3 FT Riser, 5X5" SQ
Concrete pad inplace?	✓		3X3 FT
Bumper posts in place?	✓		3 Driven Metal Fence Posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	Corrosion Resistant
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

S31

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: GZ-2A Date Inspected: 5-8-97
Inspected By: KAR Time Inspected: 0904

Well Location (describe): Outside Fence			
LINE 1 — N. of Large Culvert under Road D			
(NE Creek Bank) (N of GE-2 Approx. 15 FT)			
Located By:	Map	GPS	Other:

25

Photo Reference: ROLL 6, PHOTO 25

Item	Yes	No	Comment/Description
Lock inplace?		✓	NO LOCK
Well clearly labelled?	✓		
Well Number:	✓		Z1-2A
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		3FT RISER, STEEL 5"
Concrete pad inplace?	✓		~ 5X5', MUD COVER
Bumper posts in place?	✓		3 POSTS, YELLOW
Survey mark present?		✓	
Standing or Ponded water around well?		✓	Topo. Low, LOCATED NEAR SMALL OXBOW
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	RUST
Type of inner casing?	4" PVC, END CAP		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

* LOCATED IN CONTRACTOR WORK ZONE

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: Z2-1 Date Inspected: 5-6-97
Inspected By: RAW Time Inspected: 11:30

Well Location (describe):			
Line 6 Located Northwest of building 6-7b. In field.			
Located By:	Map	GPS	Other:

6

Photo Reference: Roll 5 Photo 5

Item	Yes	No	Comment/Description
Lock inplace?		✓	
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?		✓	
Concrete pad inplace?	✓		poorly constructed Decomposing
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?	✓		casing is exposed. Severe UV degradation.
Type of inner casing?	4" PVC (well cap leaks)		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: ZD-18 Date Inspected: 5-6-97

Inspected By: JM Time Inspected:

Well Location (describe):			
Line 6, South of building 6-89. In sq. field			
just south of the Power lines in Clusters w/ ZD-18A			
Located By:	Map ✓	GPS	Other:

Photo Reference: 6 Roll 2, Photo 35

Item	Yes	No	Comment/Description
Lock inplace?		✓	
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" square steel
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	4" PVC		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

RE 298

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: ZZ-19 Date Inspected: 5-6-97

Inspected By: RAW/JM Time Inspected: 10:50

Well Location (describe):			
Line 6 In Field East of building 6-68			
Located By:	Map	GPS	Other:

Photo Reference: 6 Roll 5 Photo 2

Item	Yes	No	Comment/Description
Lock inplace?		✓	
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?		✓	
Concrete pad inplace?	✓		Poorly constructed and decomposing
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?	✓		Top of casing is cracked
Type of inner casing?	4" PVC		Might be double cased

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: ZZ - 18A Date Inspected: 5-6-97
Inspected By: JM Time Inspected:

Well Location (describe):			
Line 6, South of Building 6-85 In the ag. field			
Just south of the power lines. In cluster w/ ZZ-18			
Located By:	Map ✓	GPS	Other:

Photo Reference: 6 Roll 2, Photo 35

Item	Yes	No	Comment/Description
Lock inplace?		✓	
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" steel
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	4" PVC		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: Z3-1 Date Inspected: 5-13-97
Inspected By: KAK Time Inspected: 1523

Well Location (describe):			
OUTSIDE LINE 4A - NW Corner of Lined Pond Area, W of Line 4A			
Located By:	Map	GPS	Other:

Fig. 5-A

Photo Reference: ROLL 9 PHOTO 15
taken NE

Item	Yes	No	Comment/Description
Lock inplace?		✓	NO LOCK
Well clearly labelled?	✓		sign facing N
Well Number:	✓		Z3-1
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		4FT Riser, 5X5" SQ
Concrete pad inplace?	✓		4X4 FT
Bumper posts in place?	✓		3 Concrete
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	4" PVC, Cleanout Plug		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: Z3-2 Date Inspected: 5-13-97

Inspected By: KAK Time Inspected: 1516

Well Location (describe):			
OUTSIDE LINE 4A — N Central from			
Lined Pond Area, W of Line 4A			
Located By:	Map	GPS	Other:

Fig 5-A

Photo Reference: ROLL 9 PHOTO 14
Taken South

Item	Yes	No	Comment/Description
Lock inplace?		✓	NO LOCK
Well clearly labelled?	✓		Sign Facing N
Well Number:	✓		Z3-2
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		4 FT Riser, 5x5" SQ
Concrete pad inplace?	✓		5X4 FT
Bumper posts in place?	✓		3 Concrete
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	4" PVC, Cleanout Plug		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: Z3-3 Date Inspected: 5-13-97
Inspected By: KAK Time Inspected: 1533

Well Location (describe):			
OUTSIDE LINE 4A - S of Pump House			
4A-164-1 Far Pond Area, W of Line 4A			
Located By:	Map	GPS	Other:

Fig 5A

Photo Reference: ROLL 9 PHOTO 17
Taken NE

Item	Yes	No	Comment/Description
Lock inplace?		✓	
Well clearly labelled?	✓		Sign Facing E
Well Number:	✓		Z3-3
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?		✓	No Pro Cover
Concrete pad inplace?		✓	Gravel
Bumper posts in place?	✓		3 Concrete
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	4" PVC, Cleanout Plug		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: Z3-4 Date Inspected: 5-13-97

Inspected By: KAK Time Inspected: 1548

Well Location (describe):			
~~OUTSIDE~~ LINE 4A (INSIDE) - S side of			
fence, N of Road D, W of S loading dock on Line 4A			
Located By:	Map	GPS	Other:

Fig 5A

Photo Reference: ROLL 9 PHOTO 18

Taken NE

Item	Yes	No	Comment/Description
Lock inplace?		✓	NO LOCK
Well clearly labelled?	✓		Sign Facing SE
Well Number:	✓		Z3-4
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		5 FT Riser, 5x5" SQ
Concrete pad inplace?	✓		3X3 FT
Bumper posts in place?	✓		3 Concrete
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	4" PVC, Cleanout Plug		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: Z3-5 Date Inspected: 5-13-97

Inspected By: KAK Time Inspected: 1529

Well Location (describe):			
OUTSIDE LINE 4A - S Central from Lined Pond Area, W of Line 4A			
Located By:	Map (Fig 5A)	GPS	Other:

Photo Reference: ROLL 9 PHOTO 16 Taken N

Item	Yes	No	Comment/Description
Lock inplace?		✓	NO LOCK
Well clearly labelled?	✓		Sign facing NE
Well Number:	✓		Z3-5
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		4 FT Riser, 5X5" SQ
Concrete pad inplace?	✓		3X3 FT
Bumper posts in place?	✓		3 concrete
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	4" PVC, Cleanout Plug		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-01 Date Inspected: 5-5-97

Inspected By: K. Kraske Time Inspected: 16:10

Well Location (describe):			
Demolition Area (Northwest Section)			
Located By:	Map	GPS	Other:

13

Photo Reference: Roll - 3, PHOTO 2

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless "BEST" Lock
Well clearly labelled?	✓		Faded Stenciled
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4 X 4" Painted Steel Hinged
Concrete pad inplace?	✓		2 X 2 FT
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?	✓		RUST ONLY
Type of inner casing?	??		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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HARZA ENVIRONMENTAL SERVICES, INC.

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JACW02 Date Inspected: 5/6/97

Inspected By: ~~Hess~~ Nayyar Time Inspected: 16:40

Well Location (describe):			
Demolition Area: Southwest Section			
Located By:	Map ✓	GPS	Other:

13

Photo Reference: Roll #3, Photo #5

Item	Yes	No	Comment/Description
Lock inplace?	✓		S.S. Best.
Well clearly labelled?		✓	
Well Number:	✓		Faded
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4"x4" Riser
Concrete pad inplace?			
Bumper posts in place?	✓	✓	none
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" white color PVC Pipe		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-4 Date Inspected: _____

Inspected By: H. Na Time Inspected: _____

Well Location (describe):			
Explosive Disposal Area, outside Fence.			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 4, Photo 28

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:			
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?			
Evidence of casing degradation?		✓	4" SS
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-5 Date Inspected: 5/13/97

Inspected By: H. Nigim Time Inspected: 1510

Well Location (describe):			
Explosive Disposal Area, South Central / South Outside fence area			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 4, Photo 33

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:			
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	2" S.S
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

The Photo doesnot shows JAW-5, However it will be written on S.S Casing.

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-06 Date Inspected: 5/13/97
Inspected By: F. Vaji Time Inspected: 1450

Well Location (describe):			
Explosive Disposal Area / NE Area outside fence			
Located By:	Map ✓ 8	GPS	Other:

Photo Reference: Roll 4, Photo 31

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:			
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	2" S.S.
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

12C'

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-7 Date Inspected: 5/13/97

Inspected By: H. Wright Time Inspected: 1500

Well Location (describe):			
Explosive Disposal Area, South, East end, outside Fence Area			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 4, photo 32

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:			
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	2" S.S'
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: JAW-8 Date Inspected: 5-2-97
Inspected By: Jim Mark Time Inspected: 13:53

Well Location (describe):			
North east of construction debris landfill, south of the railroad tracks			
Located By: Jim	Map ✓	GPS	Other:

Photo Reference: 12 Roll 2, Photo 19

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless steel
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" steel
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	~~[illegible]~~ AK. Jim		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

HARZA *Consulting Engineers and Scientists*

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: JAW-09 Date Inspected: 5-2-97
Inspected By: Joe Mark Time Inspected: 14:08

Well Location (describe):			
East Side of Construction Debris Landfill (Fill in The Ditch)			
Located By:	Map ✓	GPS	Other:

Photo Reference: 12 Roll 2 Photo 21

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless steel
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" Steel
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

HARZA *Consulting Engineers and Scientists*

c:\proposal\wellsrp.pm5

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WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: JAW-10 Date Inspected: 5-2-97
Inspected By: JM Time Inspected: 14:00

Well Location (describe):			
West side of Construction Debris Landfill (Yellow the bike flags)			
Located By:	Map ✓	GPS	Other:

Photo Reference: 12 Roll 2, Photo 20

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" Sch 40 steel
Concrete pad inplace?	✓		Bottom of Pad ≈ 3" off ground surface
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?	✓		See above
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC		

Well Appears: *Usable* ☑ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

HARZA Consulting Engineers and Scientists

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-11 Date Inspected: 5/7/97

Inspected By: Hess Nagy Time Inspected: 1500

Well Location (describe):			
N. Burn Pad			
Located By:	Map ✓ 10	GPS	Other:

Photo Reference: Roll #3, Photo #21

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?		✓	
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓*		Standing steel Rail
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-12 Date Inspected: 5/7/97

Inspected By: Hoss Najjar Time Inspected: 14:50

Well Location (describe):			
N. Burn Pond			
Located By:	Map ✓	GPS	Other:

10

Photo Reference: Roll #3, Photo 20

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?		✓	
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓*		standing steel rod
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-13 Date Inspected: 5/7/97

Inspected By: HOSS NAJJAR Time Inspected: 1445

Well Location (describe):			
North Burn Pad			
Located By:	Map ✓ 10	GPS	Other:

Photo Reference: Roll #3, photo #19

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?		✓	
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓*	✓	* standing steel rod.
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" Pipe PVC w/ Pump Spec		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAN-14 Date Inspected: 5/7/97

Inspected By: Hess NATSAC Time Inspected: 2:40

Well Location (describe):			
DECON North Burn PAD			
Located By:	Map ✓ 10	GPS	Other:

Photo Reference: Roll 3, Photo # 18

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?		✓	
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?		✓*	standing steel beat.
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-15 Date Inspected: 5-13-97

Inspected By: KAK Time Inspected: 1212

Well Location (describe):			
LINE 3A - SE of Transformer 3A-169-2			
Located By:	Map	GPS	Other:

Fig D-1 (19)

Photo Reference: ROLL 9 PHOTO 1
taken N

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Best
Well clearly labelled?	✓		Paint on Riser
Well Number:	✓		JAW-15
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		2½ FT Riser, 4x4" SQ
Concrete pad inplace?	✓		3x3 FT
Bumper posts in place?	✓		3 Driven Iron Fence
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-16 Date Inspected: 5-13-97
Inspected By: KAK Time Inspected: 1223

Well Location (describe):			
LINE 3A - NE of the point where walkway 3A-82-21 crosses access road			
Located By:	Map (Fig. D-1)	GPS	Other:

Photo Reference: ROLL 9 PHOTO 2 Taken SW

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Best
Well clearly labelled?	✓		Paint on Riser
Well Number:	✓		JAW-16
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		2 FT Riser, 4X4" SQ
Concrete pad inplace?	✓		2X2 FT
Bumper posts in place?		✓	NO POSTS
Survey mark present?			
Standing or Ponded water around well?			2 Barells
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-17 Date Inspected: 5-13-97

Inspected By: KAK Time Inspected: 1249

Well Location (describe):			
LINE 3A - N of Building 3A-10-5			
Paired w/ JAW-18			
Located By:	Map	GPS	Other:

Fig D-1

Photo Reference: ROLL 9 PHOTO 5
Taken South

Item	Yes	No	Comment/Description
Lock inplace?		✓	LOCK PRESENT CAP OPEN
Well clearly labelled?	✓		Paint on Riser
Well Number:	✓		JAW-17
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3FT Riser, 4X4" SQ
Concrete pad inplace?	✓		2X2 FT
Bumper posts in place?	✓		3 Driven Iron Fence
Survey mark present?		✓	
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	4" PVC, WELL WIZARD		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-18 Date Inspected: 5-13-97
Inspected By: KAK Time Inspected: 1255

Well Location (describe):			
LINE 3A - N of Building 3A-10-5			
Paired w/ JAW-19			
Located By:	Map	GPS	Other:

Fig D-1

Photo Reference: ROLL 9 PHOTO 6
Taken SW

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Best
Well clearly labelled?	✓		Paint on Riser
Well Number:	✓		JAW-18
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3FT Riser, 4X4" SQ
Concrete pad inplace?	✓		2X2 FT
Bumper posts in place?	✓		3 Driven Iron Fence
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-19 Date Inspected: 5-13-97

Inspected By: KAK Time Inspected: 1231

Well Location (describe):			
LINE 3A - SE of BLDG 3A-20-1			
Directly East of Brick Shack 3A-99-3			
Located By:	Map	GPS	Other:

Fig D-1

Photo Reference: ROLL 9 PHOTO 3

Item	Yes	No	Comment/Description
Lock inplace?		✓	LOCK PRESENT CAP OPEN
Well clearly labelled?	✓		Paint on Riser
Well Number:	✓		JAW-19
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		2½' Riser, 4X4" SQ
Concrete pad inplace?	✓		2X2 FT
Bumper posts in place?	✓		3 Driven from Fence
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	4" PVC, WELL WIZARD		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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Mislabeled JAW-22 on Figure

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-20 Date Inspected: 5-13-97

Inspected By: KAK Time Inspected: 1310

Well Location (describe):			
LINE 3A - NW of "V" in 3A-82-9			
Covered walkways			
Located By:	Map	GPS	Other:

Fig D-1 \ 19

Photo Reference: ROLL 9 PHOTO 8 taken 5

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless Best
Well clearly labelled?	✓		Paint on Riser
Well Number:	✓		JAW-20
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		2 1/2 FT Riser, 4X4" SQ
Concrete pad inplace?	✓		2X2 FT
Bumper posts in place?	✓		3 Driven Iron Fence
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-21 Date Inspected: 5-13-97

Inspected By: KAK Time Inspected: 1307

Well Location (describe):			
LINE 3A - NW of "V" in 3A-82-9			
Covered walkways			
Located By:	Map	GPS	Other:

Fig D-1

Photo Reference: ROLL 9 PHOTO 7
Taken S

Item	Yes	No	Comment/Description
Lock inplace?		✓	NO LOCK COVER OPEN
Well clearly labelled?	✓		Paint on Riser
Well Number:	✓		JAW-21
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		2½ FT Riser, 4X4" SQ
Concrete pad inplace?	✓		2X2 FT
Bumper posts in place?	✓		3 Driven Iron Fence
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	4" PVC, WELL WIZARD		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-22 Date Inspected: 5-13-97
Inspected By: KAK Time Inspected: 1238

Well Location (describe):			
LINE 3A - Next to sewer(?) Manhole			
In clover field - S of 3A-05-1E BLDG (NEW)			
Located By:	Map	GPS	Other:

Fig. D-1

Photo Reference: ROLL 9, PHOTO 4
taken NW

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Best
Well clearly labelled?	✓		Paint on Riser
Well Number:	✓		JAW-22
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3FT Riser, 4x4" SQ
Concrete pad inplace?	✓		2X2 FT
Bumper posts in place?	✓		3 Driven Iron
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-23 Date Inspected: 5/2/97

Inspected By: Hoss Naggar Time Inspected: 15:15

Well Location (describe):			
West Burn Pads			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 3, Photo 22* and 23

*Photo 22 - does not show well's No.

Item	Yes	No	Comment/Description
Lock inplace?		✓	
Well clearly labelled?		✓	
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		two standing steel
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?	✓	✓	The 2" inner pipe has moved above the casing.
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC, Pump Equipment		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-24 Date Inspected: 5/7/97

Inspected By: Hess Naggi Time Inspected: 15:50

Well Location (describe):			
West Burn Pads			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 3, Photo 26

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?		✓	
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓*		Stumps of Steel Posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?			
Type of inner casing?	4" PVC		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-25 Date Inspected: 5/7/92

Inspected By: Hoss Naggar Time Inspected: 14 00

Well Location (describe):			
West Burn Pads			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll #3, photo #27 (27)

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?		✓	
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		standing steel Rail
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" pvc		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-26 Date Inspected: 5-12-97
Inspected By: KAK, HNP Time Inspected: 1415

Well Location (describe):			
FDA – E. central, (W of RR Tracks Directly)			
NW corner of Shell Bins Fenced Area			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 12

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Best
Well clearly labelled?	✓		Paint on Side Riser
Well Number:	✓		JAW-26
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3 FT Riser, 4" SQ
Concrete pad inplace?	✓		2X2 FT
Bumper posts in place?	✓		3 Driven Iron Fence Posts
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			RUST
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-27 Date Inspected: 5-12-97
Inspected By: KAK, HNP Time Inspected: 1347

Well Location (describe):			
IDA - South Central			
(E of G-7)			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8 PHOTO 9

Item	Yes	No	Comment/Description
Lock inplace?		✓	NO LOCK
Well clearly labelled?	✓		PAINT ON RISER
Well Number:	✓		JAW-27
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3 FT RISER, 5" SQ
Concrete pad inplace?	✓		2X2 FT
Bumper posts in place?	✓		3 Dirnen Iron Fence Posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	1 Barrel
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	4" PLC, WELL WIZARD INSTALLED		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-28 Date Inspected: 5-12-97
Inspected By: KAK, HNP Time Inspected: 1502

Well Location (describe):			
IDA – W Bank of Trench along trees			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 22

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Best
Well clearly labelled?		✓	Riser covered By Plastic Pipe
Well Number:	✓		JAW-28?
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		4 FT Riser, 4x4" SQ
Concrete pad inplace?		✓	(OR COVERED)
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?			1 Barell
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: JDW-29 Date Inspected: 5-6-97
Inspected By: RJ/JM Time Inspected: 9:00

Well Location (describe):			
Line 9 East Side of 9-82-8			
Located By:	Map ✓	GPS	Other:

Photo Reference: 9 Roll 2 Photo 26

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Steel
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" Square
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC - w/ well wizard		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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/rosa/iowa/iarp.pm5

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: JAU-30 Date Inspected: 5-6-97
Inspected By: RU/JM Time Inspected: 8:50

Well Location (describe):			
Directly East of Building 9-82-8 in Line 9			
Located By:	Map ✓	GPS	Other:

Photo Reference: 9 Roll 2, Photo 24

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Steel
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" square
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC - w/well wires		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

HARZA *Consulting Engineers and Scientists*

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: JAW 31 Date Inspected: 5-6 97
Inspected By: RW / Jim Time Inspected: 8 55

Well Location (describe):			
Line 9 East Side of bldg 9-82-8			
Located By:	Map ✓ 9	GPS	Other:

Photo Reference: Roll 2, Photo 25

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" Square
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC - old well wizard		

Well Appears: *Usable* ☑ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-32 Date Inspected: 5/9/97
Inspected By: R. Nerenberg Time Inspected: 1340

Well Location (describe):			
Firing Area, north portion			
Located By:	(Map)	GPS	Other:

Photo Reference: Roll 4, Photo 8

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless, "Best"
Well clearly labelled?	✓		
Well Number:	✓		Painted on casing
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		2"x2" steel.
Concrete pad inplace?	✓		
Bumper posts in place?	✓		Steel posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC (w pneumatic pump)		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-37 Date Inspected: 5/9/97
Inspected By: R Nerenberg Time Inspected: 1405

Well Location (describe):			
Firing Area, north portion			
Located By:	Map	GPS	Other:

Photo Reference: Roll 4, Photo 10

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless, "Dent"
Well clearly labelled?	✓		
Well Number:	✓		Painted on casing
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		2"x2" steel
Concrete pad inplace?	✓		
Bumper posts in place?	✓		Steel posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC (w/ pneumatic pump)		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-33 Date Inspected: 5/9/97
Inspected By: R. Nerenberg Time Inspected: 1325

Well Location (describe):			
Firing Area, north end.			
Located By:	Map	GPS	Other:

Photo Reference: Roll 4, Photo 6

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless, "Best"
Well clearly labelled?	✓		
Well Number:	✓		Painted on side
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		2"x2" steel
Concrete pad inplace?	✓		
Bumper posts in place?	✓		Steel posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC (w/ pneumatic pump)		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-34 Date Inspected: 5/9/97
Inspected By: R. Nerenberg Time Inspected: 13:25

Well Location (describe):			
Firing Area, north end, adjacent to JAW-33 and JAW-618			
Located By:	(Map)	GPS	Other:

Photo Reference: Roll 4, Photo 5

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless "Best"
Well clearly labelled?	✓		Painted on side of casing
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" x 4" steel
Concrete pad inplace?	✓		
Bumper posts in place?	✓		steel posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	4" PVC (w/pneumatic pump)		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-35 Date Inspected: 5/9/97
Inspected By: RN Time Inspected: 1310

Well Location (describe):			
Firing Area, central portion			
Located By:	(Map)	GPS	Other:

Photo Reference: Roll 4, Photo 4

Item	Yes	No	Comment/Description
Lock inplace?		✓	Casing lid cannot be closed due to pneumatic pump.
Well clearly labelled?		✓	
Well Number:		✓	Label may be covered by plastic bag covering pneumatic pump.
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:			
Surface casing inplace?	✓		4"x4" steel
Concrete pad inplace?	✓		
Bumper posts in place?	✓		Steel posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	4" PVC (w/ pneumatic pump)		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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5

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-36 Date Inspected: 5/9/97

Inspected By: R Nerenberg Time Inspected: 1300

Well Location (describe):			
Firing Area, south end.			
Located By:	(Map)	GPS	Other:

Photo Reference: Roll 4, Photo 3

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless, 'Best'
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:			
Surface casing inplace?	✓		2"x2" steel
Concrete pad inplace?	✓		
Bumper posts in place?	✓		steel posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC (w/ Pneumatic pump)		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

036

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW 38 Date Inspected: 5-7-97

Inspected By: RAW/JM Time Inspected: 1535

Well Location (describe):			
Line 1 - Northwest of building 1-06-2 and ≈ 40' east of			
west boundary of Line 1			
Located By:	Map	GPS	Other:

25

Photo Reference: Roll 6 Photo ~~2~~ 7

Item	Yes	No	Comment/Description
Lock inplace?			
Well clearly labelled?	✓		stainless
Well Number:		✓	
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" sq. Aluminum
Concrete pad inplace?	✓		Appears concrete pad + surface casing have settled as evidenced by wei casing pu up on surface casing
Bumper posts in place?	✓		Fence posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW 39 Date Inspected: 5-7-97
Inspected By: RAW/JM Time Inspected: 1540

Well Location (describe):			
Line 1 In field west of building 1-06-2 and ≈ 45' east of west boundary of Line 1.			
Located By:	Map	GPS	Other:

25

Photo Reference: Roll 6 Photo 8

Item	Yes	No	Comment/Description
Lock inplace?		✓	not Locked
Well clearly labelled?			
Well Number:		✓	
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" sq Aluminum
Concrete pad inplace?	✓		could have settled
Bumper posts in place?	✓		Fence posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC 2" sticks up ≈ 7" above surfna casing		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAN-40 ~~GZ-6~~ RAN 5-7-97 Date Inspected: 5-7-97

Inspected By: RAN / JM Time Inspected: 1550

Well Location (describe):			
Line 1 In field west of building 1-03-2 and 2			
100' east of west boundary of Line 1.			
Located By:	(Map)	GPS	Other:

Photo Reference: 25 Roll 5 Photo 9* + 10

* Photo 9 is misidentified as GZ6

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless
Well clearly labelled?			
Well Number:		✓	
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" sq aluminum
Concrete pad inplace?	✓		
Bumper posts in place?	✓		Fence posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC J-Plug top		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW 41 Date Inspected: 5-7-97
Inspected By: RAW/JM Time Inspected: 1554

Well Location (describe):			
Line 1 In field southwest of building 1-50 and 3x east of west boundary of Line 1			
Located By:	Map	GPS	Other:

25

Photo Reference: Roll 6 Photo 11

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless
Well clearly labelled?			
Well Number:		✓	
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" sq. Aluminum
Concrete pad inplace?	✓		Pad could have settled
Bumper posts in place?	✓		Fence posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC Inner casing is pushing on surface cas.		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW 42 Date Inspected: 5-7-97

Inspected By: RAW/JM Time Inspected: 1609

Well Location (describe):			
Line 1 In field west of building 1-06-1 and ≈ 45' East of west boundary of Line 1			
Located By:	Map	GPS	Other:

Photo Reference: Roll 6 Photo 12

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless
Well clearly labelled?			
Well Number:		✓	
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" Sq Aluminum
Concrete pad inplace?	✓		
Bumper posts in place?	✓		Fence posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

Appears to be in wrong location according to JAYCOR MAP.

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935

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW 43 Date Inspected: 5-7-97

Inspected By: RAW/JM Time Inspected: 1645

Well Location (describe):			
Line 1 Approximately 20' feet east of west property boundary and northeast of building 1-100-2			
Located By:	Map	GPS	Other:

Photo Reference: Roll 6 – Photo 15

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	RAW 5-7-97
Surface casing inplace?	✓		6" sq Aluminum
Concrete pad inplace?	✓		
Bumper posts in place?	✓		Fence posts
Survey mark present?		✓	
Standing or Ponded water around well?	✓		Poorly drained soils
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

832

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JRW44 Date Inspected: 5-7-97

Inspected By: RKW/JM Time Inspected: 1640

Well Location (describe):			
Line Approximately 25' east of west property boundary			
and southwest of building 1-100-2			
Located By:	Map 25	GPS	Other:

Photo Reference: Roll 6 Photo 14

Item	Yes	No	Comment/Description
Lock inplace?		✓	~~[illegible]~~ SUVFACE casing open
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	6" PVC 5-7-97
Surface casing inplace?	✓		4" sq Aluminum not Locked
Concrete pad inplace?	✓		may have settled
Bumper posts in place?	✓		Fence posts
Survey mark present?		✓	
Standing or Ponded water around well?	✓	✓	RKW 5-7-97 poorly drained area
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC		Sticks up above surface casing, see all photo

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAN 45 Date Inspected: 5-7-97

Inspected By: RAN / JM Time Inspected: 1635

Well Location (describe):			
Line 1 Southwest of building 1-18			
Located By:	Map	GPS	Other:

25

Photo Reference: Roll 6 Photo 13

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4"sq Aluminum
Concrete pad inplace?	✓		
Bumper posts in place?	✓		Fence posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC w/ well wizard pump		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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2 4 r

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW 46 Date Inspected: 5-7-97

Inspected By: RAW/JM Time Inspected: 1655

Well Location (describe):			
Line 1 In field ≈ 45' from west boundary of Line 1			
Located By:	(Map)	GPS	Other:

2-

Photo Reference: Roll 6 Photo 16

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" sq. aluminum
Concrete pad inplace?	✓		could have settled
Bumper posts in place?	✓		Fence posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC w/ dedicated well wizard p.		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW 47 Date Inspected: 5-7-97

Inspected By: RAW / JM Time Inspected: 1715

Well Location (describe):			
Line 1 In field so west of 1-82-2			
Located By:	Map	GPS	Other:

Photo Reference: Roll 5 Photo 18

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" sq Aluminum
Concrete pad inplace?	✓		
Bumper posts in place?	✓		Fence posts
Survey mark present?		✓	
Standing or Ponded water around well?	✓		North-south trending drainage ditch ≈ 20' west of well
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC w/ dedicated well wizard pump		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAN-48 Date Inspected: 5-7-97

Inspected By: RAW/JM Time Inspected: 1707

Well Location (describe):			
Line 1 - In field north of building 1-14			
Located By:	Map	GPS	Other:

25

Photo Reference: Roll 6 Photo 17

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" Sq Aluminum
Concrete pad inplace?	✓		
Bumper posts in place?	✓		Fence fair RAW 5-7-97
Survey mark present?	✓	✓	
Standing or Ponded water around well?	✓	✓ RAW 5-7-97	Could have standing water in heavy rain.
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC dedicated well wizard pump		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW 50 Date Inspected: 5-7-97

Inspected By: Time Inspected: 1730

Well Location (describe):
Line 1 In field west of H92-8

Located By:	Map	GPS	Other:

Photo Reference: Roll 6 Photo 19

Item	Yes	No	Comment/Description
Lock inplace?	✓		Padlock
Well clearly labelled?			
Well Number:			
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" sch. Aluminum
Concrete pad inplace?	✓		
Bumper posts in place?	✓		Fence posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Dedicated well wizard pump		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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244

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW 51 Date Inspected: 5-7-97

Inspected By: RAW/JM Time Inspected: 1750

Well Location (describe):			
Line 1 - North of building 1-70-1			
Located By:	Map	GPS	Other:

25

Photo Reference: Roll 6 Photo 22

Item	Yes	No	Comment/Description
Lock inplace?		✓	Stainless Not locked
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" ⌀ sq. Aluminum
Concrete pad inplace?	✓		
Bumper posts in place?	✓		Fence posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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245

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW 52 Date Inspected: 5-7-97

Inspected By: RAW/JM Time Inspected: 1747

Well Location (describe):			
Line 1 - In field west of 1-82-18			
Located By:	(Map)	GPS	Other:

25

Photo Reference: Roll 5 Photo 21

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" Aluminum
Concrete pad inplace?	✓		
Bumper posts in place?	✓		Fence posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC w/ Dedicated well wizard pump		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAN-53 Date Inspected: 5-6-97

Inspected By: RAW/JM Time Inspected: ~~5~~ 1725

RAW 5-7-97

Well Location (describe):			
Line 3 - East of 3-140-6			
Located By:	(Map)	GPS	Other:

23

Photo Reference: Roll 6 Photo 3

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" painted steel (gray)
Concrete pad inplace?	✓		
Bumper posts in place?	✓		Fence posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

Jan 4

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

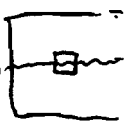
Well Number: JAW 54 Date Inspected: 5-7-97

Inspected By: RAW/JWI Time Inspected: 1440

Well Location (describe):			
Line 3 In field east of building 3-82-9			
Located By:	(Map) 23	GPS	Other:

Photo Reference: Roll 5 Photo 4

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" sq painted grey steel
Concrete pad inplace?	✓		
Bumper posts in place?	✓		Fence posts
Survey mark present?		✓	
Standing or Ponded water around well?	✓		water south of well ~~Ring, an~~ west ~~to~~ east from building
Evidence of collision damage?		✓	
Evidence of frost heaving?	✓		Concrete pad is uplifted and cracked from north east to south edge.
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC w/ dedicated well wizard		



Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

3

005

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW 55 Date Inspected: 5-7-97

Inspected By: [illegible] Time Inspected: 1447

Well Location (describe):			
Line 3 In field South East of building 3-05-2			
Located By:	(Map)	GPS	Other:

Photo Reference: 23 Roll 5 Photo 5

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" sq painted grey steel
Concrete pad inplace?	✓		
Bumper posts in place?	✓		Fence posts
Survey mark present?		✓	
Standing or Ponded water around well?			~2-3' east NW trending drainage ditch w/ about 2' of water
Evidence of collision damage?		✓	
Evidence of frost heaving? RAW 5-7-97	✓	✗	Could be a little displacement by frost heaving
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: IAW ~~54~~ 56 RAW 5-7-97 Date Inspected: 5-7-97

Inspected By: RAW / JM Time Inspected: 1455

Well Location (describe):			
Line 3 Infield east of Building 3-05-2			
Located By:	(Map)	GPS	Other:

23

Photo Reference: Roll 5 Photo 6

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" sq. steel painted Grey
Concrete pad inplace?	✓		
Bumper posts in place?	✓		Fence posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?	✓		≈ 3" of displacement
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC w/ Dedicated well wizard		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

207

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-57 Date Inspected: 5-6-97

Inspected By: RAW/JM Time Inspected: 1700

Well Location (describe):			
Line ~~2~~ 3 RAW - In field west of building 3-05-2			
Located By:	Map	GPS	Other:

Photo Reference: Roll 6 Photo 2 RAW 23

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" steel painted grey
Concrete pad inplace?	✓		
Bumper posts in place?	✓		Fence posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?	RAW	✓	
Evidence of frost heaving?	✓	~~✓~~	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-58 Date Inspected: 5/13/97

Inspected By: H. Nigg Time Inspected: 1310

Well Location (describe):			
Fire Training Pit: Northeast Section			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 4, Photo 23

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:			
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-59 Date Inspected: 5/13/97

Inspected By: H. Nuffian Time Inspected: 13:20

Well Location (describe):			
Fire Training Pit, Northeast Section			
Located By:	Map ✓ 17	GPS	Other:

Photo Reference: Roll 4, Photo 24

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:			
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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3

IEF

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-60 Date Inspected: 5/13/99

Inspected By: H. Manjian Time Inspected: 12 30

Well Location (describe):			
Fire Training Pit: S. Centerline			
Located By:	Map ✓	GPS	Other:

17

Photo Reference: Roll 4, Photo 18

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:			
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-61 Date Inspected: 5/13/97
Inspected By: H. Najjar Time Inspected: 1240

Well Location (describe):			
Fire Training Pit			
Located By:	Map ✓ 17	GPS	Other:

Photo Reference: Roll 4, Photo 19

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-62 Date Inspected: 5/13/97
Inspected By: H. Wajjk Time Inspected: 12:45

Well Location (describe):			
Fire Training Pit, Central			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 4, photo 26

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-63 Date Inspected: 5/13/97

Inspected By: H. Meyer Time Inspected: 12 50

Well Location (describe):			
Fire Training Pit			
Located By:	Map ✓	GPS	Other:

17

Photo Reference: Roll 4, Photo 21

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:			
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	UNKnown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-64 Date Inspected: 5/13/97

Inspected By: Hoss Nagjian Time Inspected: 14 45

Well Location (describe):			
Explosive Disposal Area: outside Fence in NE Area			
Located By:	Map ✓ B	GPS	Other:

Photo Reference: Roll 4, Photo 30

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	2" S.S
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-65 Date Inspected: 5-12-97
Inspected By: KAK, HNP Time Inspected: 1406

Well Location (describe):			
IDA — Central Section — W of Shell			
Bins — E of Fence			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8 PHOTO 11

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Bolt
Well clearly labelled?	✓		Paint on Riser
Well Number:	✓		JAW-65
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3 FT Riser, 4" SQ
Concrete pad inplace?	✓		2X2 FT
Bumper posts in place?	✓		3 Driven Iron Fence Posts
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-68 Date Inspected: 5/7/97

Inspected By: Hoss Nagji Time Inspected: 15:36

Well Location (describe):			
West Burn Pads			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 3, Photo 24

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?		✓	
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?		✓	standing steel rack
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2 PVC / Pump Equipped		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW 69 Date Inspected: 5/13/97

Inspected By: [illegible] Time Inspected: 1300

Well Location (describe):			
Fire Training Pit, N. Central			
Located By:	Map ✓	GPS	Other:

17

Photo Reference: Roll 4, Photo 22

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):	1	✓	
Depth(s):		✓	
Installed By:		✓	
Other:			
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW 70 Date Inspected: 5-6-97

Inspected By: RAW/JM Time Inspected: 1540 1540

Well Location (describe):			
Line 2 - In field northwest of 2-70-2			
Located By:	(Map)	GPS	Other:

Photo Reference: 24 ROLL 5 Photo 7

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" Alum
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Not Evaluated		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-71 Date Inspected: 5-6-97
Inspected By: RAN/JM Time Inspected: 1530

Line 2	Well Location (describe):		
In field west of building 2-70-2.			
Located By:	Map	GPS	Other:

Photo Reference: 24 R0115 Photo 6

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" ALUM
Concrete pad inplace?	✓		
Bumper posts in place?	✓		metal stakes
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	not evaluated		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-72 Date Inspected: 5-6-97
Inspected By: RAW/JM Time Inspected: 1610

Well Location (describe):			
Line 2 - In field Northwest of building 2-05-1			
Located By:	Map	GPS	Other:

Photo Reference: 24 Roll 5 Photo 16

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless
Well clearly labelled?			
Well Number:	✓	RAW	
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" Aluminum
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	not evaluated		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-73 Date Inspected: 5-6-97

Inspected By: Time Inspected: 1615

Well Location (describe):			
Line 2 In field west of building 2-70-1			
Located By:	(Map)	GPS	Other:

24

Photo Reference: Roll 5 Photo 11

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" aluminum
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC w/ Dedicated well wizard pump		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-74 Date Inspected: 5-6-97

Inspected By: RAW/JM Time Inspected: 1600

Well Location (describe):			
Line 2 In field east of building 2-05-1			
Located By:	(Map)	GPS	Other:

24

Photo Reference: ROLL 5 Photo 9

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless
Well clearly labelled?			
Well Number:	✓ RAW	~~✓~~	
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" Aluminum
Concrete pad inplace?	✓		pad is crack on SW corner
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Not Evaluated		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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22C

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW 75 Date Inspected: 5-6-97

Inspected By: RAW / JM Time Inspected: 1555

Well Location (describe):			
Line 2 - In field East of building 2-05-2			
Located By:	(Map)	GPS	Other:

24

Photo Reference: Roll 5 Photo 8

Item	Yes	No	Comment/Description
Lock inplace?	✓		cap not locked down well wizard cap exposed
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" Alum.
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC w/ dedicated well wizard pumps		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-76 Date Inspected: 5-9-97

Inspected By: KAK, HMP Time Inspected: 1148

Next to G-24	Well Location (describe): West Bank Creek		
Directly W of Bridge across Brush Creek			
Bridge is located SW of Substation SOO-169-1			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 3 PHOTO 29

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Best
Well clearly labelled?		✓	NO NUMBER
Well Number:			
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		NOSEK 3FT, 4" SQ
Concrete pad inplace?	✓		3X3 FT, mud cover
Bumper posts in place?	✓		3 Driven fence Metal
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

203 6

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-77 Date Inspected: 5-6-97

Inspected By: RAW | JM Time Inspected: 1655

Well Location (describe):			
Line 3 In field west of building 3-05-1			
Located By:	Map	GPS	Other:

23

Photo Reference: Roll 6 Photo 1

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless
Well clearly labelled?		RAW	
Well Number:	✓	✓	
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	4" steel Painted Grey
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		Fence posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	RAW ~~not evaluated~~		PVC

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW 78 Date Inspected: 5/13/97

Inspected By: H. Nagjar Time Inspected: 1800

Well Location (describe):			
Line 800 North of 'L' Road Just South of wells JAW 42 and JAW 43.			
Located By:	Map ✓	GPS	Other:

22

Photo Reference: Roll 4, Photo 36

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:			
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	2" S.S.
Type of inner casing?	unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-79 Date Inspected: 5/13/97
Inspected By: H. Najjy Time Inspected: 18:12

Well Location (describe):			
Line 800 : located by JAW-78			
Located By:	Map ✓ 22	GPS	Other:

Photo Reference: Roll 4, Photo 36

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:			
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	2" S.S.
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-80 Date Inspected: 5/13/97

Inspected By: Hoss Najjar Time Inspected: 1220

Well Location (describe):			
Fire Training Pit, S. Control			
Located By:	Map ✓ 17	GPS	Other:

Photo Reference: Roll 4, Photo 17

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓*	✓	~~✓* Casing is in place~~ Broken concrete pad
Concrete pad inplace?		✓	BROKEN
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC ?		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

SW

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-601 Date Inspected: 5-8-97
Inspected By: KAK Time Inspected: 0955

Well Location (describe): Outside Fence			
LTNE 1 - SW of S end of 1-19 Buildings			
SW Bank of Creek along Contractors Dirt Road			
Located By:	Map 25	GPS	Other: S of SL-81

Photo Reference: ROLL 6, PHOTO 28

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless BEST
Well clearly labelled?	✓		Paint on Riser
Well Number:	✓		JAW-601
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		Corrosion Resistant, 5X5" SQ
Concrete pad inplace?	✓		3X3' w/ wood forms
Bumper posts in place?	✓		3 concrete
Survey mark present?		✓	
Standing or Ponded water around well?		✓	Barrels for Purge Water ? (13)
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	Seems New
Evidence of casing degradation?		✓	
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

* LOCATION IN CONTRACTOR WORK AREA

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-602 Date Inspected: 5-7-97
Inspected By: RAW/JM Time Inspected: 1735

Well Location (describe):
Line 1- West of building 1-82-8

Located By:	Map	GPS	Other:

Photo Reference: Roll 5 Photo 20

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" sq Aluminum
Concrete pad inplace?	✓		
Bumper posts in place?	✓		3 ϕ steel posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC ≈ 4"		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

19 drums in vicinity of well

J48

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW 603 Date Inspected: 5-7-97
Inspected By: RAW/JM Time Inspected: 1761

Well Location (describe):			
Line 1 North of building 1-70-1			
Located By:	Map	GPS	Other:

Photo Reference: Roll 5 Photo 22

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" sq. Aluminum
Concrete pad inplace?	✓		
Bumper posts in place?	✓		3Ø steel posts
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	not evaluated		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-604 Date Inspected: 5-13-97
Inspected By: KAK Time Inspected: 1429

Well Location (describe):			
LINE 4B - South Central at Terminus			
of Road system in Site			
Located By:	Map	GPS	Other:

Photo Reference: Fig E-1 ROLL 9 PHOTO 9
Taken NW

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Bist
Well clearly labelled?	✓		Paint on Riser
Well Number:	✓		JAW-604
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3FT Riser, 4X4" SQ
Concrete pad inplace?	✓		3x3FT
Bumper posts in place?	✓		3 Concrete
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-605 Date Inspected: 5/13/97

Inspected By: HOSS NAJJAR Time Inspected: 810

Well Location (describe):			
LINE 4A - Southeast Corner			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 4, Photo 11

Item	Yes	No	Comment/Description
Lock inplace?	✓		Best
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-606 Date Inspected: 5-13-97
Inspected By: KAK Time Inspected: 1459

Pair w/ 609	Well Location (describe):		
LINE 5A - SE			
Located By:	Map	GPS	Other:

Fig F-1

Photo Reference: ROLL 9 PHOTO 12
Taken SE

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Best
Well clearly labelled?	✓		Paint on Riser
Well Number:	✓		JAW-606
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3FT Riser, 4x4" SQ
Concrete pad inplace?	✓		3x3 FT
Bumper posts in place?	✓		3 Concrete
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-607 Date Inspected: 5-13-97

Inspected By: KAK Time Inspected: 1452

Pair w/ 608	Well Location (describe):		
LINE 5B - SE			
Located By:	Map (Fig P-2)	GPS	Other:

Photo Reference: ROLL 9 PHOTO 11

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless Bcst
Well clearly labelled?	✓		Paint on Riser
Well Number:	✓		JAW-607
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3 FT Riser, 4X4" SQ
Concrete pad inplace?	✓		3X3 FT
Bumper posts in place?	✓		3 Concrete
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-608 Date Inspected: 5-13-97

Inspected By: KAK Time Inspected: 1445

Pair w/ 607	Well Location (describe):		
LINE SB- NW			
Located By:	Map	GPS	Other:

Fig. P-2

Photo Reference: ROLL 9 PHOTO 10
taken South

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless Best
Well clearly labelled?	✓		Paint on Riser (s)
Well Number:	✓		JAW-608
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3FT Riser, 4X4" SQ
Concrete pad inplace?	✓		3X3 FT
Bumper posts in place?	✓		3 Concrete
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-609 Date Inspected: 5-13-97
Inspected By: KAK Time Inspected: 1505

Pair w/ 606	Well Location (describe):		
LINE SA - SE			
Located By:	Map	GPS	Other:

Fig. F-1

Photo Reference: ROLL 9 PHOTO 13
Taken SE

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Bcst
Well clearly labelled?	✓		Paint on Riser
Well Number:	✓		JAW-609
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3 FT Riser, 4X4" SQ
Concrete pad inplace?	✓		3X3 FT
Bumper posts in place?	✓		3 Concrete
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: JAW-610 Date Inspected: 5-6-97
Inspected By: RW / JM Time Inspected: 9:00

Well Location (describe):			
Line 9, North of Building 9-82-10			
Located By:	Map ✓	GPS	Other:

Photo Reference: 9 Roll 2, Photo 27

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless steel
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" square
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC. W/ well wizard		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: JAW-611 Date Inspected: 5-2-97

Inspected By: Joe Mark Time Inspected: 14:31

Well Location (describe):			
On the east side of the road that runs on the east side of Building 9-EW-E			
Located By:	Map ✓	GPS	Other:

9

Photo Reference: Roll 2, Photo 23

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" Square
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	NC ?		

Well Appears: *Usable* [✓] *Unusable* [ ] *Cannot Evaluate* [ ]

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: JAW - 612 Date Inspected: 5-2-97

Inspected By: Joe Mark Time Inspected: 14:23

Well Location (describe):			
Line 9 Southeasterly of Building 9-58			
Located By:	Map ✓ 9	GPS	Other:

Photo Reference: Roll 2, Photo 22

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless steel
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" square
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC ?		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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12-2

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-614 Date Inspected: 5/13/97

Inspected By: Hintegjian Time Inspected: 14:05

Well Location (describe):			
Explosive Disposal area: SEW corner			
15' W. of EDA-3			
Located By:	*Map*	*GPS*	*Other:*

Photo Reference: Roll 4, Photo 25

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:			
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-615 Date Inspected: 5/13/97
Inspected By: Hoss Najjar Time Inspected: 9 25

Well Location (describe):
Pesticide Pit.
Just South of Road I at Intersection
bY F Road. (JAW 615/616/617) Same General area (~100 apart)

Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 4, Photo 12

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW616 Date Inspected: 5/13/97

Inspected By: Hoss Najjar Time Inspected: 930

Well Location (describe):			
Pesticide Pit ; ≈ 100 N. of JAW ~~#~~ 615 (JAW-615)			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 4, Photo 13

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW 617 Date Inspected: 5/13/97

Inspected By: Hoss Najjar Time Inspected: 930

Well Location (describe):			
Pesticide Pite : ≈100 to the East of JAW-616			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 4, Photo 14

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-618 Date Inspected: 5/9/97
Inspected By: R. Nerenberg Time Inspected: 1345

Well Location (describe):			
Firing Area, north portion			
Located By:	Map	GPS	Other:

Photo Reference: Roll 4, Photo 9

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless, "Best"
Well clearly labelled?	✓		
Well Number:	✓		Painted on casing
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4"x4" steel
Concrete pad inplace?	✓		
Bumper posts in place?	✓		steel tubes
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	4" PVC (w/ pneumatic pump)		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-619 Date Inspected: 5/9/97

Inspected By: R. Nerenberg Time Inspected: 13:35

Well Location (describe):			
Firing Area, north portion			
Located By:	(Map)	GPS	Other:

Photo Reference: Roll 4, Photo 7

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless "Best"
Well clearly labelled?	✓		Painted on side of casing
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4"x4" steel
Concrete pad inplace?	✓		
Bumper posts in place?	✓		Steel tubes
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	Rusted
Type of inner casing?	4" PVC (w/ pneumatic pump)		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-620 Date Inspected: 5/7/97

Inspected By: Hoss Najjar Time Inspected: 1230

Well Location (describe):			
BOX CHIPPER DISPOSAL AREA			
Located By:	*Map*	*GPS*	*Other:*

Photo Reference: Roll #3, Photo #17

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC w/ Pump's Equip		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAOU-621 Date Inspected: 5/7/97

Inspected By: Hoss Nagja Time Inspected: 1205

Well Location (describe):			
Box Chipper Disposal Area			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 3, Photo #15

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		Stainless S.
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC w/ Pump's Equip		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-622 Date Inspected: 5/7/92

Inspected By: Hess Najjar Time Inspected: 12 00

Well Location (describe):			
Box chipper Disposal Pit.			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll #3, Photo # 16

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC int. Pump's Equip.		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-623 Date Inspected: 5-14-97

Inspected By: KAK Time Inspected: 0900

Well Location (describe):			
Hazardous Waste Storage Area - Near Plant Entrance			
W side of Road A - SW Corner of Building			
Located By:	Map (General)	GPS	Other: Driving Survey

Photo Reference: ROLL 9 PHOTO 19 taken NE

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Best
Well clearly labelled?	✓		Paint on Riser
Well Number:	✓		JAW-623
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3 FT Riser, 4X4" SQ
Concrete pad inplace?	✓		3X3 FT
Bumper posts in place?	✓		3 Concrete
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-624 Date Inspected: 5-14-97

Inspected By: KAK Time Inspected: 0903

Well Location (describe):			
Hazardous Waste Storage Area - Near Plant Entrance			
W side of Road A - N side of Building			
Located By:	Map	GPS	Other: Driving Survey

General

Photo Reference: ROLL 9 PHOTO 20

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Best
Well clearly labelled?	✓		Paint on Riser
Well Number:	✓		JAW-624
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3 FT Riser, 4X4" SQ
Concrete pad inplace?	✓		3X3 FT
Bumper posts in place?	✓		3 Concrete
Survey mark present?			
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW 625 Date Inspected: 5/7/97

Inspected By: HOSS NAJJAR Time Inspected: 915

Well Location (describe):			
North Burn Pad, grass area			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 3, Photo 7 ~~48~~ 18 (746)

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC with pump's equipment		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAW-626 Date Inspected: 5/7/97

Inspected By: Hoss Nuffer Time Inspected: 950

Well Location (describe):			
N. Burn Pit area inside grass area			
Located By:	Map ✓	GPS	Other:

18

Photo Reference: Roll 3, Photo 13

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC with Pump Equipment		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JACU 627 Date Inspected: 5/7/97

Inspected By: Hoss Wright Time Inspected: 10:05

Well Location (describe):			
N. Burn Pad area, inside grass			
Located By:	Map ✓	GPS	Other:

18

Photo Reference: Roll 3, Photo 14

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	4" with pump Equip.		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: JAZ-629 Date Inspected: 5/16/97

Inspected By: H. [illegible] Time Inspected: 1100

Well Location (describe):			
K Road and Spring Creek, North west section			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 3, Photo 33

Item	Yes	No	Comment/Description
Lock inplace?		✓	
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		2" S.S.
Concrete pad inplace?		✓	
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: MW-1-91 Date Inspected: 4/30/94
Inspected By: RW Time Inspected: 1:30

Well Location (describe):			
Flyash Landfill, northeast side, center			
Located By:	(Map)	GPS	Other:

Photo Reference: See Fig. 4 Roll 2, Photo 3

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Lock
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		Cast iron, slip-on alum. lid.
Concrete pad inplace?		✓	
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: MW1-92 Date Inspected: 5 [illegible]/97

Inspected By: Hess Naylor Time Inspected: 940

Well Location (describe):			
N. Burn Pond area, inside grass			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 3, Photo 12 (18)

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?	✓*	✓*	Estimated within the map
Well Number:		✓	" " " "
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?		✓	
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC		

Well Appears: *Usable* ✓ *Unusable* [ ] *Cannot Evaluate* [ ]

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: MW-2-91 Date Inspected: 4/30/97
Inspected By: A. Nerenberg Time Inspected: 1:30

Well Location (describe):			
Flyash Landfill, north side, center.			
Located By:	Map	GPS	Other:

Photo Reference: See Fig 4 Roll 2, Photo 3

Item	Yes	No	Comment/Description
Lock inplace?	/		Stainless lock
Well clearly labelled?	/		
Well Number:	/		
Date(s):		/	
Depth(s):		/	
Installed By:		/	
Other:			
Surface casing inplace?	/		Cast-iron, sump-cover shaped
Concrete pad inplace?		/	
Bumper posts in place?		/	
Survey mark present?		/	
Standing or Ponded water around well?		/	
Evidence of collision damage?		/	
Evidence of frost heaving?		/	
Evidence of well subsidence?		/	
Evidence of casing degradation?		/	
Type of inner casing?	Unknown		

Well Appears: *Usable* [ ] *Unusable* [/] *Cannot Evaluate* [ ]

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: MW 2-92 Date Inspected: 5/7/97
Inspected By: Hess Naffin Time Inspected: 9:40

Well Location (describe):			
N. Burn Pad: NW of MW 1-92			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 3, Photo 18

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?		✓	estimated within the Map location
Well Number:		✓	" " " " "
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓*	✓	yes
Concrete pad inplace?		✓	
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: MW 3-91 Date Inspected: 5/2/97
Inspected By: Joe Mark Time Inspected: 11:57

Well Location (describe):			
South side of Flyash landfill			
Located By:	Map ✓ 4	GPS	Other:

Photo Reference: Roll 2 Photo 15

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		cast iron w/ aluminum cap
Concrete pad inplace?		✓	Concrete, no "pad"
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?	✓		East side of concrete
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: MW3-92 Date Inspected: 5/7/97

Inspected By: Hoss Niggier Time Inspected: 931

Well Location (describe):			
≈ 25' N. of CWP well at N. Burn Pad area			
grass area			
Located By:	Map ✓	GPS	Other:

18

Photo Reference: roll 3, photo 10

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?		✓	estimated within map location
Well Number:		✓	" " " "
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?		✓	
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	* rusted
Type of inner casing?	2" PVC		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: MW4-91 Date Inspected: 5-2-97
Inspected By: Joe Mark Time Inspected: 11:48

Well Location (describe):			
South side of fly ash landfill			
Located By:	Map	GPS	Other:

Photo Reference: Roll 2, Photo 13

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		Cast iron w/ aluminum cap
Concrete pad inplace?		✓	
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: MW5-91 Date Inspected: 5/2/97
Inspected By: Joe Mark Time Inspected: 11:45

Well Location (describe):			
South side of Fly ash Landfill.			
Located By:	Map ✓ 4	GPS	Other:

Photo Reference: Roll 2, Photo 12

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		4" round, steel
Concrete pad inplace?	~~✓~~	✓	concrete, no pad
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?	✓		
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: MW6-91 Date Inspected: 5-2-97
Inspected By: Joe Mark Time Inspected: 11:35

Well Location (describe):			
South side of Flyash Landfill. Near Soil cover			
Located By:	Map ✓ 4	GPS	Other:

Photo Reference: Roll 3, Photo 10

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		Cast Iron w/ Aluminum Cap
Concrete pad inplace?		✓	Concrete but no "pad"
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?	✓		SE portion of well
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ☑ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: 1-94 Date Inspected: 5-8-97

Inspected By: KAK, HNP Time Inspected: 1533

Well Location (describe):			
FUEL STATON - Northbound Lane on Texas Ave.			
35' FT N of fire Hydraut, APPROX 15' W of Fence			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 7

Item	Yes	No	Comment/Description
Lock inplace?		✓	Flush Mount, NO Flush-Mount Cover
Well clearly labelled?		✓	NO NUMBER
Well Number:			
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?		✓	COVER + CASE MISSING
Concrete pad inplace?	✓		~~NO~~ PVC BENT
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC 2", NO CAP		

Well Appears: *Usable* [ ] *Unusable* [✓] *Cannot Evaluate* [ ]

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: 2-94 Date Inspected: 5-8-97

Inspected By: KAK, HNP Time Inspected: 1536

Well Location (describe):			
FUEL STATION- Northbound Lane, Texas Ave			
APPROX. 18' S of Power Pole, APPROX. 15' W of Fence			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 8

Item	Yes	No	Comment/Description
Lock inplace?		✓	Flush Mount, NO TOP
Well clearly labelled?		✓	NO NUMBER
Well Number:			
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?		✓	COVER + CASE MISSING
Concrete pad inplace?	✓		PVC Bent
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC, NO PLUG		

Well Appears: *Usable* [ ] *Unusable* [✓] *Cannot Evaluate* [ ]

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: 3-94 Date Inspected: 5-8-97
Inspected By: KAK, HNP Time Inspected: 1428

Well Location (describe):			
FUEL STATION — APPROX 10 FT W of Concrete			
and 20 FT N of Pump 3 Diesel			
Located By:	Map	GPS	Other:

Photo Reference: Roll 6, PHOTO 33

Item	Yes	No	Comment/Description
Lock inplace?		✓	Flush Mounted, 3 Bolts
Well clearly labelled?		✓	NO NUMBER
Well Number:			
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		
Concrete pad inplace?		✓	
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing? UNKNOWN	Flush Mounted, 3 Bolts		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: 4-94 Date Inspected: 5-8-97

Inspected By: KAK, HNP Time Inspected: 1518

Well Location (describe):			
FUEL STATION - APPROX. 35' N of 6-94			
APPROX. 35' SE of Gas Pump 1			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 4

Item	Yes	No	Comment/Description
Lock inplace?		✓	Flush Mount, NO COVER
Well clearly labelled?		✓	NO NUMBER
Well Number:			
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?		✓	NO TOP COVER / CASE
Concrete pad inplace?	✓		SIDES of CASING BENT
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?	✓		In Hole surrounding Inner case
Evidence of collision damage?	✓	*	BENT CASING
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC, Expandable Plug, Loose		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

* NO COVER

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: 5-94 Date Inspected: 5-8-97

Inspected By: KAK, HNP Time Inspected: 1448

Well Location (describe):			
FUEL STATION - 40 FT W of BLDG 500-129			
Northern - Most Walk-In Door			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 6, PHOTO 36

Item	Yes	No	Comment/Description
Lock inplace?		✓	Flush Mount, 3 Bolts
Well clearly labelled?		✓	NO NUMBER
Well Number:			
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: 6-94 Date Inspected: 5-8-97

Inspected By: KAK, HNP Time Inspected: 1510

Well Location (describe):			
FUEL STATION - APPROX. 45 W of S-94 and			
APPROX. 35' S of 4-94			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 3

Item	Yes	No	Comment/Description
Lock inplace?		✓	Flush Mount, 3 Bolts
Well clearly labelled?		✓	NO NUMBER
Well Number:			
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?		✓	Top Plate + CASE is Removable
Concrete pad inplace?	✓		
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?	✓	✗	water between inner + outer case
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC, Expandable Plug		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: R01-PZ-96 Date Inspected: 5-8-97

Inspected By: KAK Time Inspected: 1030

Enter at S End of I-19 Buildings	Well Location (describe): Between 2 Fences		
LINE 1 — Between Fences in Small			
Creek draw NW of I-19 Buildings			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 6, PHOTO 30

Item	Yes	No	Comment/Description
Lock inplace?		✓	
Well clearly labelled?		✓	
Well Number:			
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		PVC Pipe Riser only
Concrete pad inplace?		✓	
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	Creek to NE (Small)
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	1 1/2" PVC, Male Threaded Plug		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

* Drive to this location between Fences

HARZA ENVIRONMENTAL SERVICES, INC.

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: ROZ-PE-29 Date Inspected: 5-6-97

Inspected By: RAW/JM Time Inspected: 1630

Well Location (describe):			
Line 2 In field west of road ~~[illegible]~~ ? and south-west			
of building 2-06-2.			
Located By:	(Map)	GPS	Other:

Photo Reference: 24 Roll 5 Photo 12

Item	Yes	No	Comment/Description
Lock inplace?		✓	
Well clearly labelled?		✓	
Well Number:		✓	
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?		✓	
Concrete pad inplace?		✓	
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC		well cap was st. We reinstalled.

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: R10-PZ-01 Date Inspected: 5-6-97
Inspected By: RW/JM Time Inspected: 9:07

Well Location (describe):			
Line 9 just Northeast of the powerstation, and SW of building 9-58			
Located By:	Map ✓ 9	GPS	Other:

Photo Reference: Roll 2 Photo 28

Item	Yes	No	Comment/Description
Lock inplace?		✓	
Well clearly labelled?		✓	
Well Number:		✓	
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?		✓	
Concrete pad inplace?		✓	
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC - 1" diameter		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

HARZA *Consulting Engineers and Scientists*

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HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: R10 - P2 - 02 Date Inspected: 5-6-97
Inspected By: Rol Jm Time Inspected: 9:05

Well Location (describe):			
Line 9 North and slightly east of the power substation			
Located By:	Map ✓ 9	GPS	Other:

Photo Reference: Roll 2, Photo 29

Item	Yes	No	Comment/Description
Lock inplace?		✓	
Well clearly labelled?		✓	
Well Number:		✓	
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?		✓	
Concrete pad inplace?		✓	
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC 1" diameter		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

HARZA *Consulting Engineers and Scientists*

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: R10-PZ-03 Date Inspected: 5/16/97
Inspected By: H. Nojiguy Time Inspected: 1315

Well Location (describe):			
About 25' E. of Blg 9-58, Just East of over pipe line. / the pipe is ≈ 6" high			
Located By:	Map ✓ 9	GPS	Other:

Photo Reference: Roll 3, Photo 32

Item	Yes	No	Comment/Description
Lock inplace?		✓	
Well clearly labelled?		✓	
Well Number:		✓	
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?		✓	
Concrete pad inplace?		✓	
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	1" PVC		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: SL-81 Date Inspected: 5-8-97
Inspected By: KAK Time Inspected: 0948

Well Location (describe): Outside Fence
LINE 1 - 1' SW of S end of 1-19 Buildings
SW Bank of Creek along Contractor's Dirt Rd.
Located By: Map GPS Other: N of JAW-601

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Photo Reference: ROLL 6, PHOTO 27

Item	Yes	No	Comment/Description
Lock inplace?		✓	NO LOCK
Well clearly labelled?		✓	LABELED PARTIALLY WITH "JAW-" ~~3FT RISER~~
Well Number:		✓	
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		Galvanized, Aluminum or Stainless ?? 3 FT RISER, 4" SQUAR
Concrete pad inplace?	✓		5X5' w/ wood forms
Bumper posts in place?	✓		Driven Metal Fence Posts (3)
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC, End Cap		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

* LOCATION IN CONTRACTOR WORK AREA

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: SL-91 Date Inspected: 5-8-97
Inspected By: KAK Time Inspected: 0918

Well Location (describe): outside fence
LINE 1 - SW Bank of Water Extraction Pit
in Creek (APPROX. 100 FT N of Concrete Slabs)

Located By:	Map	GPS	Other:

Photo Reference: ROLL 6, PHOTO 26

Item	Yes	No	Comment/Description
Lock inplace?		✓	
Well clearly labelled?		✓	
Well Number:		✓	
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?		✓	PVC Pipe Alone w/ cap
Concrete pad inplace?	✓	~~✓~~	BROKEN Away from casing
Bumper posts in place?	✓		Driven Metal Fence Posts
Survey mark present?		✓	
Standing or Ponded water around well?	✓		
Evidence of collision damage?		✓	
Evidence of frost heaving?	✓	X	Broken concrete may be from frost heaving
Evidence of well subsidence?		✓	Pipe still solid
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC, End cap		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

* LOCATION IN CONTRACTOR WORK AREA

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-1 Date Inspected: 5-12-97

Inspected By: KAK, HNP Time Inspected: 1435

Well Location (describe):			
TDA - N. central, W of T-6			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8 PHOTO 16

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless Best
Well clearly labelled?	✓		Sign Facing S
Well Number:	✓		T-1
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		2 FT Riser, 5x5" SQ
Concrete pad inplace?	✓		2x2 FT
Bumper posts in place?	✓		3 Brown Pipes
Survey mark present?		✓	
Standing or Ponded water around well?		✓	1 Barell
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?	✓		HEAVY RUST
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-3 Date Inspected: 5-12-97

Inspected By: KAK, MNP Time Inspected: 1544

Well Location (describe):			
IDA - Central			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 26

Item	Yes	No	Comment/Description
Lock inplace?		✓	NO LOCK OPEN
Well clearly labelled?		✓	NO LABEL
Well Number:			
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		BENT, UNCOVERED
Concrete pad inplace?		✓	NO PAD
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?	✓		water Between outer - Inner
Evidence of collision damage?	✓		
Evidence of frost heaving?	✓		
Evidence of well subsidence?	✓		
Evidence of casing degradation?	✓		
Type of inner casing?	4" PVC, NO CAP		

Well Appears: *Usable* [ ] *Unusable* [✓] *Cannot Evaluate* [ ]

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-4 Date Inspected: 5-12-97

Inspected By: KAK, HNP Time Inspected: 1449

Well Location (describe):			
IDA - NW Corner (S. of T-5)			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 18

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Bolt
Well clearly labelled?	✓		Sign Bent over
Well Number:	✓		T-4
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3 FT Riser, 5x5" SQ
Concrete pad inplace?			UNKNOWN - COVERED
Bumper posts in place?	✓		3 Brown Pipes
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?			HEAVY RUST
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-5 Date Inspected: 5-12-97

Inspected By: KAX, HNP Time Inspected: 1444

Well Location (describe):			
IDA — NW corner (S. of GP-4)			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 17

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless Best
Well clearly labelled?	✓		sign facing E
Well Number:	✓		T-5
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3 FT Riser, 5X5" SQ
Concrete pad inplace?	✓		3X3 FT
Bumper posts in place?	✓		3 Brown Metal Pipes
Survey mark present?	✓		Elev. 707.38
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?	✓		HEAVY RUST
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

* E of lined yard area

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-6 Date Inspected: 5-12-97

Inspected By: KAK, HNP Time Inspected: 1432

Well Location (describe):			
IDA - N, Central, (E of T-1)			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 16

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Best
Well clearly labelled?	✓		Sign Facing S
Well Number:	✓		T-6
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		2 1/2 FT Riser, 5X5" SQ
Concrete pad inplace?	✓		2X2 FT
Bumper posts in place?	✓		3 Brass Pipe
Survey mark present?	✓		ELEV. 711.24 ON CONCRETE
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?	✓		HEAVY RUST
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-7 Date Inspected: 5-12-97

Inspected By: KAK, HNP Time Inspected: 1540

Well Location (describe):			
IDA - Central			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8 PHOTO 26

Item	Yes	No	Comment/Description
Lock inplace?		✓	NO LOCK
Well clearly labelled?	✓		Sign Facing E
Well Number:	✓		T-7
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3 FT RTSER culvert Pipe, FLAT TOP
Concrete pad inplace?	✓		3x3 FT
Bumper posts in place?	✓		3 Brown Pipes
Survey mark present?	✓		Elev. ?
Standing or Ponded water around well?	✓		Between Outer + Inner Casing
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?	✓		Maybe inside Casing (PRO LOCK)
Evidence of casing degradation?		✓	
Type of inner casing?	2" PVC, NO CAP		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-8 Date Inspected: 5-12-97

Inspected By: KAK, HNP Time Inspected: 1528

Well Location (describe):			
IDA- Central			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 24

Item	Yes	No	Comment/Description
Lock inplace?		✓	NO LOCK
Well clearly labelled?	✓		Sign Facing E
Well Number:	✓		T-8
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		3FT RISER, 4X4" SQ
Concrete pad inplace?	✓		3X3 FT
Bumper posts in place?	✓		3 Brown Pipes
Survey mark present?	✓		Elev. 706.10
Standing or Ponded water around well?		✓	
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?	✓		GROUT OR CONCRETE HAS BEEN POURED IN PRO COVER
Type of inner casing?	2" PVC, AND RISER PIPE COVERED W/ GROUT		NO COVER

Well Appears: *Usable* ☐ *Unusable* ☐ *Cannot Evaluate* ✓

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-9 Date Inspected: 5-12-97
Inspected By: KAK, HNP Time Inspected: 1453

Well Location (describe):			
IDA - Cross road (Dirt Roads) - E of Pond			
Pump Station (NW Corner of Site)			
Located By:	Map	GPS	Other:

Photo Reference: ROLL 8, PHOTO 19+20

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Bolt
Well clearly labelled?	✓		Bent sign facing N
Well Number:	✓		T-9
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?	✓		1 1/2 FT Box, 5x5 SQ
Concrete pad inplace?			UNKNOWN - COVERED
Bumper posts in place?	✓		3 Brown Pipes
Survey mark present?		✓	
Standing or Ponded water around well?			
Evidence of collision damage?			
Evidence of frost heaving?			
Evidence of well subsidence?			
Evidence of casing degradation?	✓		HEAVY RUST
Type of inner casing?	UNKNOWN		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-10 Date Inspected: 5-6-97
Inspected By: Jim Time Inspected: 12:00

Well Location (describe):			
Line 6, North side of stampipe on the North (outside) of the fence on the north side of Line 6 In cluster c/T 10-T12			
Located By:	Map ✓ 6	GPS	Other:

Photo Reference: Roll 5, Photo 6

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless steel
Well clearly labelled?	✓		
Well Number:		✓	
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" square steel
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		E: 722.82 X= 2624823 Y= 302407
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-11 Date Inspected: 5-6-97

Inspected By: EAW/JM Time Inspected: 12:00

Well Location (describe):			
North of north fence line of Line 6 (100')			
Located By:	(Map)	GPS	Other:

6

Photo Reference: Roll 5 Photo 6

Item	Yes	No	Comment/Description
Lock inplace?	✓		steel (Best)
Well clearly labelled?			
T-11 *Well Number:*	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" steel Painted orange (Faded)
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		Elev: 722.64 X 2624814 Y = 302407
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	not evaluated		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T12 Date Inspected: 5-6-97
Inspected By: JM Time Inspected: 12:05

~~Line 6, North~~ si	Well Location (describe):		
Line 6, North side of steam pipe on the (outside) north			
of the fence on the north side of Line 6. In clust w/T 10 OUT"			
Located By:	Map	GPS	Other:

Photo Reference: Roll 5, photo 6

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" square, steel
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		E 723.08 X:2621819 y= 302400
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-13 Date Inspected: 5-6-97

Inspected By: JM Time Inspected:

Well Location (describe):			
Line 6. North of building 6-33 In circle with T 14 and T 15			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 5, Photo 4

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless stel
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" square, stel
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		E=717.67 x=2625348, y=3020171
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-14 Date Inspected: 5-6 97

Inspected By: JM Time Inspected:

Well Location (describe):			
Line 6, North of Building 6-33. In cluster with T15 and T16			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 5, Photo 4

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" square steel
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		E=717.53 x=2625341 y=302071
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-15 Date Inspected: 5-6-97
Inspected By: JJM Time Inspected:

Well Location (describe):			
Line 6. North side of Building 6-33 In cluster with ~~DS~~ JJM T14 and T13			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 5, Photo 4

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless steel
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" square steel
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		E=717.57 X=2625551 Y=30[illegible]71
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-16 Date Inspected: 5-6-97
Inspected By: RAW/JM Time Inspected: 11:15

Well Location (describe):			
Line 6 - southeast of building 6-35 (≈100 ft)			
Inclusive w/ T-17 + T-18			
Located By:	Map	GPS	Other:

6

Photo Reference: Roll 5 Photo 3

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless (Best)
Well clearly labelled?			
T-16 Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		ELEV 715.62 X 2625340 Y=301859
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Not evaluated		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-17 Date Inspected: 5-6-97

Inspected By: RAW/JM Time Inspected: 11:05

Well Location (describe):			
Line 6 Southeast of building 6-35 (400 ft)			
In cluster w/ T-16 + T-17			
Located By:	Map	GPS	Other:

6

Photo Reference: Roll 5 Photo 3

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless (Best)
Well clearly labelled?			
T-17 Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" steel painted orange (FADON)
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		ELEV. 715.75 X=2625338 Y=301866
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Not evaluated		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-18 Date Inspected: 5-6-97

Inspected By: RAW/JM Time Inspected: 11:10

Well Location (describe):			
Line - Southeast of building 6-35 (≈100 ft)			
In cluster w/ T-16 + T-17			
Located By:	Map	GPS	Other:

Photo Reference: Roll 5 Photo 3

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless (Best)
Well clearly labelled?			
T-18 Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" steel painted orange (Faded)
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		Elev. 715.42 X=2625345 Y=301865
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Not evaluated		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-19 Date Inspected: 5-6-97

Inspected By: JM Time Inspected:

Well Location (describe):			
~~Sa~~ on Line 6, South of building 6-68. In			
Cluster with T20 and T21			
Located By:	Map 6	GPS	Other:

Photo Reference: Roll 5 Photo 1

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" square steel
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		E = 714.84 X = 265091 Y = 301234
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-20 Date Inspected: 5-6-97

Inspected By: JM Time Inspected:

Well Location (describe):			
Line 6 South of building 6-68. In cluster with T19 and T21			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 5, Photo ~~5~~ 6 1

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" square steel
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		E 714.72 X=2625084, Y=301233
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-21 Date Inspected: 5-6-97

Inspected By: JN Time Inspected:

Well Location (describe):			
Line 6. South of building 6-68. In cluster with T19 + T20			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 5, Photo 6 JN

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:			
Surface casing inplace?	✓		6" Square steel
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		E = 714.97 X = 262 5080 Y = 301225
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-22 Date Inspected: 5-6-97

Inspected By: RAW / JM Time Inspected: 10:35

Well Location (describe):			
Line 6 - In field across road and south of building 6-82-25			
In cluster w/ T-23 + T-24			
Located By:	(Map)	GPS	Other:

6

Photo Reference: Roll 2 Photo 37

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless (Best)
Well clearly labelled?			
T-22 Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" steel - painted orange (Faded)
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		Elevation 713.66 X 2624878 Y = 301231
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Not evaluated		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-23 Date Inspected: 5-6-97
Inspected By: Ron / Jim Time Inspected: 10:40

Well Location (describe):			
Line 6 - In field across road south of building 6-62-25			
In cluster w/ T-22 + T T 24			
Located By:	(Map)	GPS	Other:

Photo Reference: 6 Roll 2 Photo 37

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless (Best)
Well clearly labelled?			
T-23 *Well Number:*	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" steel - painted orange (FRECR)
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		ELEV: 713.44 X=2624871 Y=301231
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Not evaluated		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-24 Date Inspected: 5-6-97
Inspected By: RPW / JM Time Inspected: 10:44

Well Location (describe):			
Line 6 In field area: road south of building 6-82-25			
In cluster w/ T-22 + T-23			
Located By:	(Map)	GPS	Other:

6

Photo Reference: Roll 2 Photo 37

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless (Best)
Well clearly labelled?			
T-24 Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" steel-painted orange (Faded)
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		BGU. 713.04 X 206.4674 Y = 30.224
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	not evaluated		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-25 Date Inspected: 5-6-97

Inspected By: Jim Time Inspected:

Well Location (describe):			
Line 6, South of Building 6-82-18. In cluster w/ T-26 + T-27			
Located By:	Map ✓	GPS	Other:

Photo Reference: 6 Roll 2, Photo 36

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" Square steel
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		E=713.3 X=2624588 Y=301211
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-26 Date Inspected: 5-6-97

Inspected By: JM Time Inspected:

Well Location (describe):			
Line 6 South of Building 6-82-18 In chain with T-25 and T-27			
Located By:	Map ✓	GPS	Other:

6

Photo Reference: Roll 2, Photo 36

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" square steel
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		E= 713.45 X=2624581 Y=301211
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-27 Date Inspected: 5-6-97

Inspected By: Jm Time Inspected:

Well Location (describe):			
Line 6 South of building 6-82-18, In cluster with T-25 and T-26			
Located By:	Map ✓	GPS	Other:

Photo Reference: 6 Roll 2, Photo 36

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" Square steel
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		E-713.60 X=2624586 Y=30 203
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-28 Date Inspected: 5-6-97

Inspected By: RAW/JM Time Inspected: 10:20

Well Location (describe):			
Line 6 In field across Road and south of building 6-B2-15			
In cluster w/ T-29 + T30			
Located By:	(Map)	GPS	Other:

Photo Reference: 6 Roll 2 Photo 34

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless Chest
Well clearly labelled?			
T-28 Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" steel painted orange (faded)
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		BLCV 713.75 X=2634309 Y=301218
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Not Evaluated		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-29 Date Inspected: 5-6-97

Inspected By: RAW / JM Time Inspected: 10:28

Well Location (describe):			
Line 6 - In field across road and south of building 6-B-15			
In cluster w/ T-28 + T30			
Located By:	(Map)	GPS	Other:

6

Photo Reference: Roll 2 Photo 30

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless Chest
Well clearly labelled?			
T-29 *Well Number:*	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" steel painted orange (faded)
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		ELEV: 713 ft. X 2624391 Y=30:218
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Not Evaluated		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-30 Date Inspected: 5-6-97

Inspected By: Time Inspected: 10:30

Well Location (describe):			
Line 6 In field across road and south of building 6-82-15			
In cluster w/ T-28 + T 29			
Located By:	(Map) 6	GPS	Other:

Photo Reference: Roll 2 Photo 34

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless (Best)
Well clearly labelled?			
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" steel painted orange (PACED)
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		GLW: 713.95 X 2624396 Y= 301210
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Not evaluated		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-31 Date Inspected: 5-6-97

Inspected By: JM / RW Time Inspected:

Well Location (describe):			
South of building 6-82-5 in Lu 6 In cluster with T-32 and T-31			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 2, Photo 32

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless steel
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" Square
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		E= 713.38 x=2624015, y=301217
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-32 Date Inspected: 5-6-97

Inspected By: JM/RW Time Inspected:

Well Location (describe):			
Line 6, South of Building 6 Ex-5. In cluster with ~~T-32~~, T-31, and T-33			
Located By:	Map ✓	GPS	Other:

Photo Reference: 6 Roll 2 Photo 31

Item	Yes	No	Comment/Description
Lock inplace?	✓		
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" square
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		Elevation - 712.94. X=2624606 Y=301217
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

80

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-33 Date Inspected: 5-6-97

Inspected By: Jim Rio Time Inspected:

Well Location (describe):			
Line 6 South of Building 6-825 In cluster with T-31 and T-32			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 2, Photo 33

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" Sylon
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		E= 713.59 X=2624041 Y= 301218
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Unknown		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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90

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-34 Date Inspected: 5-6-97

Inspected By: RAW / JM Time Inspected: 1000

Well Location (describe):
In field across road from building 6-18-A (south of building) Is in a cluster w/ T-35 + T-36
Located By: Map 6 / GPS / Other:

Photo Reference: Roll 2 Photo ~~29~~ 30 RAW

Item	Yes	No	Comment/Description
Lock inplace?	✓		STAINLESS (Best)
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		6" STEEL - painted orange (faded)
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		EUSV 712.92 July 1982 X=2623748 y=301144
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Not evaluated		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

91

WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-35 Date Inspected: 5-6-97
Inspected By: RAW / JM Time Inspected: 10:03

Well Location (describe):
In field access road from 6-18-1 (South of building) Is in a cluster w/
w/ T-34 + T-36

Located By:	Map	GPS	Other:

Photo Reference: Roll 2 Photo ~~29~~ 30 RAW

Item	Yes	No	Comment/Description
Lock inplace?	✓		Stainless ~~Ss~~ (Best)
Well clearly labelled?	✓		
Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?			6" steel - painted orange (rusted)
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		ELEV: 712.34 X = 2623743 Y = 30:143
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Not evaluated		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IAAAP

Well Number: T-36 Date Inspected: 5-6-97
Inspected By: RAW / JM Time Inspected: 10:13

Well Location (describe):			
In field across road from and south of building 6-10-1. Is in a cluster w/ T-34 + T-35			
Located By:	Map	GPS	Other:

6

Photo Reference: Roll 2 Photo 30

Item	Yes	No	Comment/Description
Lock inplace?	✓		stainless (Best)
Well clearly labelled?	✓		
T-36 Well Number:	✓		
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?	✓		5" steel - painted orange (FAIR)
Concrete pad inplace?	✓		
Bumper posts in place?	✓		
Survey mark present?	✓		ELEV: 712.66 X = 2623747 Y = 301138
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	Not evaluated		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

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WELL INSPECTION FORM
Iowa Army Ammunition Plant

Designated by Harza as NWP-5

Well Number: Unnumbered Piezometer Date Inspected: 5-2-97

Inspected By: Joe Mark Time Inspected: 10:46

Well Location (describe):			
Northwest corner of the fly ash landfill. This is the southern most piezometer of the group of 3			
Located By:	Map ✓ 4	GPS	Other:

Photo Reference: Roll 2 Photo 5

Item	Yes	No	Comment/Description
Lock inplace?		✓	
Well clearly labelled?		✓	
Well Number:		✓	
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		—	
Surface casing inplace?		✓	No protective casing
Concrete pad inplace?		✓	No pad
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC No Protective Casing		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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17466

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
Iowa Army Ammunition Plant

Designated by Harza as MWP-C

Well Number: Unknown Piezometer Date Inspected: 5-2-97

Inspected By: Jim Mark Time Inspected: 10:46

Well Location (describe):			
Northwest corner of the fly ash landfill. This is the middle (north to south) piezometer of the group of 3			
Located By:	Map ✓ 4	GPS	Other:

Photo Reference: Roll 2, Photo 5

Item	Yes	No	Comment/Description
Lock inplace?		✓	
Well clearly labelled?		✓	
Well Number:		✓	
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		—	
Surface casing inplace?		✓	No protective casing
Concrete pad inplace?		✓	No pad.
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC. No protective casing		

Well Appears: *Usable* ☑ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: Designated by Harza as NWP-N Unknown Piezometer Date Inspected: 5-2-97

Inspected By: Joe Mark Time Inspected: 10:46

Well Location (describe):			
Northwest corner of the fly ash landfill. This is the			
northern most of the group of 3			
Located By:	Map ✓ 4	GPS	Other:

Photo Reference: Roll 2, Photo 5

Item	Yes	No	Comment/Description
Lock inplace?		✓	
Well clearly labelled?		✓	
Well Number:		✓	
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		—	
Surface casing inplace?		✓	No piezometer
Concrete pad inplace?		✓	No pad
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC, No protective casing		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: Designated Sig Hole of SWP-5 UN Numbered Piezometer Date Inspected: 5-2-97

Inspected By: Joe Mark Time Inspected: 11:12

Well Location (describe):			
Southwest corner of the flyash Landfill. This is the Southern most of the group of 3			
Located By:	Map ✓ 4	GPS	Other:

Photo Reference: Roll 2, Photo 8

Item	Yes	No	Comment/Description
Lock inplace?		✓	
Well clearly labelled?		✓	
Well Number:		✓	
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?		✓	No protecting
Concrete pad inplace?		✓	No pad
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?	✓		Concrete is cracked
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC, No protective Casing		

Well Appears: *Usable* ☑ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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WELL INSPECTION FORM
Iowa Army Ammunition Plant

Designated by Harza as SWP-C

Well Number: Unnumbered piezometer Date Inspected: 5-20-97

Inspected By: Joe Mark Time Inspected: 11:12

Well Location (describe):			
Southwest corner of the fly ash landfill. This is the middle (South to North) of the group of 3			
Located By:	Map ✓	GPS	Other:

Photo Reference: Roll 2, Photo 8

Item	Yes	No	Comment/Description
Lock inplace?		✓	
Well clearly labelled?		✓	
Well Number:		✓	
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?		✓	no processing
Concrete pad inplace?		✓	no pad.
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC, no protective casing		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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SW

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WELL INSPECTION FORM
Iowa Army Ammunition Plant

Well Number: Designated by Harza as IAIP-N Unnumbered piezometer Date Inspected: 5-2-97

Inspected By: Joe Mark Time Inspected: 11:12

Well Location (describe):			
Southwest corner of the fly ash landfill. This is the northern most of the group of 3.			
Located By:	Map ✓ 4	GPS	Other:

Photo Reference: Roll 2, Photo 8

Item	Yes	No	Comment/Description
Lock inplace?		✓	
Well clearly labelled?		✓	
Well Number:		✓	
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?		✓	
Concrete pad inplace?		✓	
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?		✓	
Evidence of well subsidence?		✓	
Evidence of casing degradation?	✓		Cap is missing
Type of inner casing? ~~PVC~~, un	PVC, No protective casing		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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SE
1/1

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
Iowa Army Ammunition Plant

Designated by Harza as SEP-E, SEP-C, and SEP-W

Well Number: unnumbered Group of Piezometers Date Inspected: 5/2/97

Inspected By: Joe Mark Time Inspected: 12:07

Well Location (describe):			
Southeast corner of the Fly Ash Load Cell Lined up west to east			
Located By:	Map ✓ 4	GPS	Other:

Photo Reference: Roll 2, Photo 17

Item	Yes	No	Comment/Description
Lock inplace?		✓	
Well clearly labelled?		✓	
Well Number:		✓	
Date(s):		✓	
Depth(s):		✓	
Installed By:		✓	
Other:		✓	
Surface casing inplace?		✓	
Concrete pad inplace?		✓	
Bumper posts in place?		✓	
Survey mark present?		✓	
Standing or Ponded water around well?		✓	
Evidence of collision damage?		✓	
Evidence of frost heaving?	✓		Middle and East piezometer have broken concrete
Evidence of well subsidence?		✓	
Evidence of casing degradation?		✓	
Type of inner casing?	PVC, no protective casing		

Well Appears: *Usable* ✓ *Unusable* ☐ *Cannot Evaluate* ☐

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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23472

HARZA ENVIRONMENTAL SERVICES, INC.

WELL INSPECTION FORM
Iowa Army Ammunition Plant

Designated by Harza as NEP-E, NEP-C, and NEP-W

Well Number: None - Cluster of 3 unnamed piezometers Date Inspected: 4/30/97

Inspected By: R Nerenberg Time Inspected: 1:10 pm

Well Location (describe):			
Northeast corner of Flyash landfill.			
Located By:	Map	GPS	Other:

See Fig. 4

Photo Reference: Roll 2, Photo 1

Item	Yes	No	Comment/Description
Lock inplace?		/	
Well clearly labelled?		/	
Well Number:			
Date(s):			
Depth(s):			
Installed By:			
Other:			
Surface casing inplace?		/	No casing
Concrete pad inplace?		/	concrete seal on top
Bumper posts in place?		/	
Survey mark present?		/	bike flag
Standing or Ponded water around well?		/	
Evidence of collision damage?		/	
Evidence of frost heaving?		/	
Evidence of well subsidence?		/	
Evidence of casing degradation?	/		severely degraded, appears burnt.
Type of inner casing?	PVC		

Well Appears: *Usable* [ ] *Unusable* [/] *Cannot Evaluate* [ ]

Figure 4-2
WELL INSPECTION FORM
SITE GROUNDWATER INVESTIGATION
IOWA ARMY AMMUNITION PLANT
Middletown, Iowa

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APPENDIX J
ANALYTICAL DATA SUMMARY

J-1 Harza (1997) Data

J-2 Mason & Hanger (Second Cycle FY97) Data

J-3 JAYCOR (1996) Data

APPENDIX J
ANALYTICAL DATA SUMMARY

J-1 Harza (1997) Data

EXPLOSIVES DETEC IN GROUNDWATER

Sample ID	1,3,5-Trinitrobenzene	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-Dinitrotoluene	2-Nitrotoluene	3-Nitrotoluene	4-Amino-2,6-Dinitrotoluene	4-Nitrotoluene	RDX	Nitrobenzene	HMX	Tetryl	Units	TOTAL EXPLOSIVES
GROUNDWATER																
Proposed PRG	1.8	1	2	5	5	NA	370	370	NA	370	2	3.4	400	NA	ug/L	
Source (1)	PRG	HAL	HAL	10-4CR	10-4CR		PRG	PRG		PRG	HAL	PRG	HAL			
H06 A 01 04 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	0
H06 B 01 04 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	0
H06 C 01 04 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	0
H06 D 01 04 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	0
H06 E 01 04 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	0
H06 F 01 04 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	0
H06 G 01 04 00	<1.3	4.0	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	4
H06 JAW620 01 03 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	2.8	<1.3	<1.3	<1.3	ug/L	2.8
H06 JAW621 01 03 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	0
H06 JAW622 01 03 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	0
H10 A 01 03 00	<13.0	<13.0	<13.0	7.8 J	<13.0	20.0	<13.0	<13.0	14.0	<13.0	1200	<13.0	220	<13.0	ug/L	1461.8
H10 B 01 03 00	<1.3	<1.3	<1.3	<1.3	<1.3	8.1	<1.3	<1.3	5.9	<1.3	250	<1.3	82.0	<1.3	ug/L	346
H12 A 01 03 00	<1.3	1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	0.46 J	<1.3	<1.3	<1.3	ug/L	1.76
H12 B 01 03 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	4.9	<1.3	1.2 J	<1.3	ug/L	6.1
H12 C 01 03 00	<1.3	0.46 J	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	1.6	<1.3	<1.3	<1.3	<1.3	ug/L	2.06
H12 D 01 03 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	0
H12 E 01 03 00	<1.3	0.95 J	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	0.95
H12 G 01 03 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	0
H12 I 01 03 00	<13.0	<13.0	<13.0	<13.0	<13.0	130	<13.0	<13.0	74	<13.0	5200	<13.0	470	<13.0	ug/L	5874
H12 JAW70 01 03 00	<13.0	<13.0	<13.0	<13.0	<13.0	21.0	<13.0	<13.0	23.0	<13.0	1200	<13.0	130	<13.0	ug/L	1374
H12 JAW71 01 03 00	<1.3	2.4	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	9.3	<1.3	2.6	<1.3	ug/L	14.3
H12 JAW72 01 03 00	<13.0	<13.0	<13.0	<13.0	<13.0	30.0	<13.0	<13.0	19.0	<13.0	1600	<13.0	140	<13.0	ug/L	1789
H12 JAW73 01 03 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	190	<1.3	4.7	<1.3	ug/L	194.7
H13 B 01 03 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	0.56 J	<1.3	<1.3	<1.3	<1.3	ug/L	0.56
H13 D 01 03 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	1.6	<1.3	<1.3	ug/L	1.6
H13 E 01 03 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	0
H13 F 01 03 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	0
H13 G54 01 03 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	2.8	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	2.8
H13 G55 01 03 00	<1.3	0.43 J	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	2.2	<1.3	<1.3	<1.3	ug/L	2.63
H13 I 01 03 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	0
H16 A 01 03 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	2.9	<1.3	<1.3	<1.3	<1.3	4.0	<1.3	2.1	ug/L	9
H16 B 01 03 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	0
H16 C 01 03 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	0
H16 D 01 03 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	0
H16 E 01 03 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	0
H16 I 01 03 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	2.2	<1.3	<1.3	<1.3	0.47 J	3.8	<1.3	1.3	ug/L	7.77

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EXPLOSIVES DETECTED IN GROUNDWATER

Sample ID	1,3,5-Trinitrobenzene	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-Dinitrotoluene	2-Nitrotoluene	3-Nitrotoluene	4-Amino-2,6-Dinitrotoluene	4-Nitrotoluene	RDX	Nitrobenzene	HMX	Tetryl	Units	TOTAL EXPLOSIVES
H16 JAW53 01 03 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	0
H16 JAW54 01 03 00	<1.3	<1.3	<1.3	10.0	<1.3	87.0	<1.3	<1.3	26.0 J	<1.3	1500	<1.3	210	<1.3	ug/L	1833
H16 JAW55 01 03 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	0.87 J	<1.3	3.9	<1.3	ug/L	4.77

VOCs DETECTED IN GROUNDWATER

Sample ID	Units	Benzene	n-Butylbenzene	sec-Butylbenzene	Methylene Chloride	Toluene	Isopropyl Benzene	n-Propylbenzene	Chloroform	Chlorobenzene	1,1-Dichloroethane	1,1-Dichloroethene	cis-1,1-Dichloroethene	Trichloroethene	1,3,5-Trimethylbenzene	1,1,2-Trichlorotrifluoroethane
GROUNDWATER																
Proposed PRG	ug/L	5	NA	61	5	1000	NA	NA	100	100	790	7	70	5	2.4	59000
Source (1)		MCL		PRG	MCL	MCL			MCL	MCL	PRG	MCL	MCL	MCL	PRG	PRG
H10 A	ug/L															
H10 B	ug/L				10.4 B											
H11 A3	ug/L					3 B										
H11 B4	ug/L		2	12		3 B	3	1			8	8	20	6	2	280
H11 C1	ug/L					3.1 B										60
H11 C1	ug/L															130
H11 C2	ug/L	2								93			3			15
H11 D1	ug/L															11
H11 E1	ug/L															
H11 F1	ug/L															220000
H11 F10	ug/L					33 B										2500
H11 F12	ug/L					75 B										2300
H11 F4	ug/L					2000 B										36000
H11 F5	ug/L					2000 B										69000
H11 F7	ug/L					2000 B										270000
H11 F9	ug/L															11000
H12 A	ug/L				7.2 B											
H12 B	ug/L															
H12 C	ug/L				4.6 JB											
H12 D	ug/L					5.2										
H12 E	ug/L				21.7 B											
H12 G	ug/L				5.5 B											
H12 I	ug/L				3.1									8.6		
H12 JAW70	ug/L				3.3											
H12 JAW71	ug/L				4.3											
H12 JAW72	ug/L				5.2									7.7		
H12 JAW73	ug/L				4.4											
H16 A	ug/L				6.7 B											
H16 B	ug/L															
H16 C	ug/L															
H16 D	ug/L															

VOCs DETECTED IN GROUNDWATER

Sample ID	Units	Benzene	n-Butylbenzene	sec-Butylbenzene	Methylene Chloride	Toluene	Isopropyl Benzene	n-Propylbenzene	Chloroform	Chlorobenzene	1,1-Dichloroethane	1,1-Dichloroethene	csi-1,1-Dichloroethene	Trichloroethene	1,3,5-Trimethylbenzene	1,1,2-Trichlorotrifluoroethan
H16 E	ug/L				0.58 JB											
H16 I	ug/L				1.4 JB											
H16 JAW53	ug/L				7.4											
H16 JAW54	ug/L				8.1				1.9							
H16 JAW55	ug/L				0.41 J											

SVOCs DETECTED IN GROUNDWATER

Sample ID					Units	Butylbenzylphthalate		Bis(2-ethylhexyl)phthalate		TOTAL SVOCs
GROUNDWATER										
Proposed PRG						NA		6		
Source (1)								MCL		
H06	A	01	04	00	ug/L					0
H06	B	01	04	00	ug/L					0
H06	C	01	04	00	ug/L					0
H06	D	01	04	00	ug/L					0
H06	E	01	04	00	ug/L					0
H06	F	01	04	00	ug/L					0
H06	G	01	04	00	ug/L					0
H06	JAW620	01	03	00	ug/L			76.7		76.7
H06	JAW621	01	03	00	ug/L			70.8		70.8
H06	JAW622	01	03	00	ug/L			26.4		26.4
H10	A	01	03	00	ug/L					0
H10	B	01	03	00	ug/L					0
H12	A	01	03	00	ug/L	2.7	J			2.7
H12	B	01	03	00	ug/L	0.78	J	3.4	J	4.18
H12	C	01	03	00	ug/L					0
H12	D	01	03	00	ug/L	2.2	J	4.2	J	6.4
H12	E	01	03	00	ug/L			6.8	J	6.8
H12	G	01	03	00	ug/L					0
H12	I	01	03	00	ug/L			16.1		16.1
H12	JAW70	01	03	00	ug/L			5	J	5
H12	JAW71	01	03	00	ug/L			4.3	J	4.3
H12	JAW72	01	03	00	ug/L			6.7	J	6.7
H12	JAW73	01	03	00	ug/L			7.7	J	7.7
H16	A	01	03	00	ug/L	3.3	J	10.9		14.2
H16	B	01	03	00	ug/L					0
H16	C	01	03	00	ug/L					0
H16	D	01	03	00	ug/L					0
H16	E	01	03	00	ug/L					0
H16	I	01	03	00	ug/L	2.6	J	5.6	J	8.2
H16	JAW53	01	03	00	ug/L			5.2	J	5.2
H16	JAW54	01	03	00	ug/L					0
H16	JAW55	01	03	00	ug/L			6.4	J	6.4

TAL METALS IN GROUNDWATER (DISSOLVED)

Sample ID	Units	ALUMINUM	ANTIMONY	ARSENIC	BARIUM	BERYLLIUM	CADMIUM	CALCIUM	CHROMIUM	COBALT	COPPER	IRON	LEAD	MAGNESIUM	MANGANESE	MERCURY	NICKEL
Proposed PRG	mg/L	37	0.003	0.05	2	0.004	0.005	600	0.1	NA	1.3	6	0.015	150	1.7	0.002	0.1
Source		PRG	HAL	MCL	MCL	MCL	MCL	RDA	MCL		MCL	RDA	MCL	RDA	PRG	MCL	HAL
GROUNDWATER (Dissolved)																	
H10 A 01 03 00	mg/L	ND	ND	ND	0.11	ND	ND	65	ND	ND	ND	ND	ND	28.8	0.03	ND	ND
H10 B 01 03 00	mg/L	ND	ND	ND	0.15	ND	ND	52.6	ND	ND	ND	ND	ND	22.9	0.1	ND	ND
H12 A 01 03 00	mg/L	ND	ND	ND	0.14	ND	ND	63.4	ND	ND	ND	ND	ND	25	0.044	ND	ND
H12 B 01 03 00	mg/L	ND	ND	ND	0.13	ND	ND	53.1	ND	ND	ND	ND	ND	22.5	0.078	ND	ND
H12 C 01 03 00	mg/L	ND	ND	0.016	0.44	ND	ND	97.7	ND	ND	ND	ND	ND	35.1	0.059	ND	ND
H12 D 01 03 00	mg/L	ND	ND	0.001	0.2	ND	ND	90.3	ND	ND	ND	0.066	ND	37.7	0.11	ND	0.022
H12 E 01 03 00	mg/L	0.17	ND	ND	0.064	ND	ND	56.4	ND	ND	ND	0.17	ND	25.2	0.0067	ND	ND
H12 G 01 03 00	mg/L	ND	ND	ND	0.11	ND	ND	87.8	ND	ND	ND	ND	ND	37.4	0.12	ND	ND
H12 I 01 03 00	mg/L	ND	ND	ND	0.07	ND	ND	54.1	ND	ND	ND	ND	ND	24.3	0.029	ND	ND
H12 JAW70 01 03 00	mg/L	ND	ND	ND	0.082	ND	ND	68.3	ND	ND	ND	ND	ND	31.3	ND	ND	ND
H12 JAW71 01 03 00	mg/L	ND	ND	ND	0.067	ND	ND	63.4	ND	ND	ND	ND	ND	24	ND	ND	ND
H12 JAW72 01 03 00	mg/L	ND	ND	ND	0.071	ND	ND	54.6	ND	ND	ND	ND	ND	24.6	0.028	ND	ND
H12 JAW73 01 03 00	mg/L	ND	ND	ND	0.063	ND	ND	60.4	ND	ND	ND	ND	ND	27	ND	ND	ND
H13 B 01 03 00	mg/L	ND	ND	ND	0.08	ND	ND	47.2	ND	ND	ND	1.5	ND	43.9	0.31	ND	ND
H13 D 01 03 00	mg/L	ND	ND	0.0036	0.67	ND	ND	125	ND	ND	ND	ND	ND	52.1	0.098	ND	ND
H13 E 01 03 00	mg/L	ND	ND	0.00053	0.06	ND	ND	259	ND	ND	ND	0.89	ND	98.6	0.27	ND	ND
H13 F 01 03 00	mg/L	ND	ND	0.0012	0.35	ND	ND	112	ND	ND	ND	ND	ND	42.1	0.14	ND	ND
H13 G54 01 03 00	mg/L	ND	ND	0.00062	0.12	ND	ND	80.1	ND	ND	ND	ND	ND	45.9	0.0092	ND	ND
H13 G55 01 03 00	mg/L	ND	ND	0.00068	0.04	ND	ND	225	ND	ND	ND	0.28	ND	76.7	1.3	ND	ND
H13 I 01 03 00	mg/L	ND	ND	0.00065	0.12	ND	ND	79.5	ND	ND	ND	ND	ND	45.6	0.008	ND	ND
H16 A 01 03 00	mg/L	ND	ND	ND	0.36	ND	ND	101	ND	ND	ND	1.6	ND	35.2	0.088	ND	ND
H16 B 01 03 00	mg/L	2.1	ND	0.00059	0.12	ND	ND	68.2	ND	ND	ND	1.4	ND	26.3	0.19	ND	ND
H16 C 01 03 00	mg/L	ND	ND	ND	0.14	ND	ND	56.8	ND	ND	ND	ND	ND	20.8	0.13	ND	ND
H16 D 01 03 00	mg/L	ND	ND	ND	0.087	ND	ND	59.3	ND	ND	ND	ND	ND	21.6	0.12	ND	ND
H16 E 01 03 00	mg/L	ND	ND	ND	0.26	ND	ND	113	ND	ND	ND	ND	ND	38.5	0.57	ND	ND
H16 I 01 03 00	mg/L	ND	ND	ND	0.35	ND	ND	100	ND	ND	ND	1.4	ND	35	0.079	ND	ND
H16 JAW53 01 03 00	mg/L	ND	ND	0.00055	0.1	ND	ND	61.7	ND	ND	ND	ND	ND	22.2	0.38	ND	ND
H16 JAW54 01 03 00	mg/L	ND	ND	ND	0.091	ND	ND	53.3	ND	ND	ND	ND	ND	22.2	0.0086	ND	ND
H16 JAW55 01 03 00	mg/L	ND	ND	0.00065	0.1	ND	ND	62.4	ND	ND	ND	ND	ND	20.9	0.19	ND	ND

TAL METALS IN GROUNDWATER (DISSOLVED)

Sample ID	Units	POTASSIUM	SELENIUM	SILVER	SODIUM	THALLIUM	VANADIUM	ZINC	CYANIDE (TOTAL)
Proposed PRG	mg/L	2925	0.05	0.1	5000	0.0005	0.26	2	0.2
Source		RDA	MCL	HAL	RDA	MCL	PRG	HAL	HAL
GROUNDWATER (Dissolved)									
H10 A 01 03 00	mg/L	ND	ND	ND	13.5	ND	ND	ND	ND
H10 B 01 03 00	mg/L	ND	ND	ND	43.9	ND	ND	0.048	ND
H12 A 01 03 00	mg/L	ND	0.015	ND	14.5	ND	ND	0.19	ND
H12 B 01 03 00	mg/L	ND	0.0018	ND	12.2	ND	ND	0.083	ND
H12 C 01 03 00	mg/L	ND	ND	ND	37.8	ND	ND	0.68	ND
H12 D 01 03 00	mg/L	1.6	ND	ND	30.3	ND	ND	0.15	ND
H12 E 01 03 00	mg/L	1.8	0.0013	ND	7.2	ND	ND	0.11	ND
H12 G 01 03 00	mg/L	ND	0.00088	ND	16.1	ND	ND	0.0072	ND
H12 I 01 03 00	mg/L	ND	ND	ND	11.9	ND	ND	0.017	ND
H12 JAW70 01 03 00	mg/L	ND	ND	ND	13.2	ND	ND	ND	ND
H12 JAW71 01 03 00	mg/L	ND	ND	ND	24.6	ND	ND	ND	ND
H12 JAW72 01 03 00	mg/L	ND	ND	ND	12.3	ND	ND	0.011	0.012
H12 JAW73 01 03 00	mg/L	ND	ND	ND	13.1	ND	ND	ND	ND
H13 B 01 03 00	mg/L	ND	ND	ND	6.3	ND	ND	0.058	ND
H13 D 01 03 00	mg/L	4.5	ND	ND	50.7	ND	ND	ND	ND
H13 E 01 03 00	mg/L	2.4	ND	ND	23.5	ND	ND	ND	ND
H13 F 01 03 00	mg/L	2.4	ND	ND	26.7	ND	ND	ND	ND
H13 G54 01 03 00	mg/L	1.5	ND	ND	15.7	ND	ND	0.01	ND
H13 G55 01 03 00	mg/L	1.8	ND	ND	28.5	ND	ND	ND	ND
H13 I 01 03 00	mg/L	1.5	0.00079	ND	15.6	ND	0.0088	ND	ND
H16 A 01 03 00	mg/L	1.7	ND	ND	48.3	ND	ND	0.08	ND
H16 B 01 03 00	mg/L	ND	0.0013	ND	16.4	ND	ND	ND	ND
H16 C 01 03 00	mg/L	ND	ND	ND	19.1	ND	ND	0.0073	ND
H16 D 01 03 00	mg/L	ND	0.00062	ND	15.2	ND	ND	0.011	ND
H16 E 01 03 00	mg/L	1.8	ND	ND	30.9	ND	ND	ND	ND
H16 I 01 03 00	mg/L	1.5	ND	ND	49.8	ND	ND	0.073	ND
H16 JAW53 01 03 00	mg/L	1.7	ND	ND	14.2	ND	ND	ND	ND
H16 JAW54 01 03 00	mg/L	ND	0.0011	ND	22.4	ND	ND	ND	ND
H16 JAW55 01 03 00	mg/L	ND	ND	ND	15.3	ND	ND	ND	ND

TAL METALS IN GROUNDWATER (TOTAL)

Sample ID	Units	ALUMINUM	ANTIMONY	ARSENIC	BARIUM	BERYLLIUM	CADMIUM	CALCIUM	CHROMIUM	COBALT	COPPER	IRON	LEAD	MAGNESIUM	MANGANESE	MERCURY	NICKEL
Proposed PRG	mg/L	37	0.003	0.05	2	0.004	0.005	600	0.1	NA	1.3	6	0.015	150	1.7	0.002	0.1
Source		PRG	HAL	MCL	MCL	MCL	MCL	RDA	MCL		MCL	RDA	MCL	RDA	PRG	MCL	HAL
GROUNDWATER (Total)																	
H10 A 01 03 00	mg/L	ND	ND	ND	0.11	ND	ND	62.4	ND	ND	ND	0.064	ND	27.6	0.03	ND	ND
H10 B 01 03 00	mg/L	7.9	ND	0.003	0.21	ND	ND	67.1	0.063	0.009	0.013	16.8	0.0072	27.6	0.39	ND	0.51
H12 A 01 03 00	mg/L	0.49	ND	ND	0.085	ND	ND	55.2	0.0081	ND	ND	1	0.001	22.1	0.047	ND	ND
H12 B 01 03 00	mg/L	0.12	ND	0.00056	0.12	ND	ND	48.3	ND	ND	ND	0.18	ND	20.5	0.073	ND	ND
H12 C 01 03 00	mg/L	0.12	ND	0.014	0.42	ND	ND	92.2	ND	ND	ND	0.3	ND	32.9	0.067	ND	ND
H12 D 01 03 00	mg/L	1.7	ND	0.0028	0.21	ND	ND	108	0.087	ND	ND	5	0.0036	38.2	0.22	ND	0.08
H12 E 01 03 00	mg/L	ND	ND	ND	0.065	ND	ND	60.7	ND	ND	ND	ND	ND	27.1	ND	ND	ND
H12 G 01 03 00	mg/L	0.58	ND	0.00063	0.11	ND	ND	83.3	0.0052	ND	ND	1.4	ND	35.1	0.16	ND	ND
H12 I 01 03 00	mg/L	ND	ND	ND	0.069	ND	ND	50.6	ND	ND	ND	0.14	ND	22.5	0.041	ND	0.026
H12 JAW70 01 03 00	mg/L	ND	ND	ND	0.078	ND	ND	63.2	ND	ND	ND	ND	ND	28.8	ND	ND	ND
H12 JAW71 01 03 00	mg/L	0.63	ND	0.00096	0.078	ND	ND	59.1	ND	ND	ND	1.4	0.002	22.2	0.13	ND	ND
H12 JAW72 01 03 00	mg/L	ND	ND	ND	0.069	ND	ND	50.6	ND	ND	ND	ND	0.001	22.5	0.088	ND	ND
H12 JAW73 01 03 00	mg/L	0.39	ND	ND	0.07	ND	ND	58	ND	ND	0.013	0.93	0.0012	25.9	0.09	ND	0.024
H13 B 01 03 00	mg/L	ND	ND	ND	0.077	ND	ND	43.4	0.005	0.0054	ND	1.7	ND	40.3	0.3	ND	ND
H13 D 01 03 00	mg/L	0.083	ND	0.0044	0.64	ND	ND	117	ND	ND	ND	0.91	ND	47.8	0.1	ND	ND
H13 E 01 03 00	mg/L	0.051	ND	ND	0.059	ND	ND	250	ND	ND	ND	1.2	ND	93.5	0.25	ND	ND
H13 F 01 03 00	mg/L	7	ND	0.0056	0.39	ND	ND	111	0.024	0.0091	0.02	20.7	0.0074	42	0.35	ND	0.026
H13 G54 01 03 00	mg/L	ND	ND	0.001	0.13	ND	ND	74.5	ND	ND	ND	0.19	0.0022	41.6	0.13	ND	ND
H13 G55 01 03 00	mg/L	0.052	ND	0.0015	0.047	ND	ND	270	0.0084	0.011	ND	1.4	ND	94.2	3.7	ND	ND
H13 I 01 03 00	mg/L	ND	ND	0.00096	0.13	ND	ND	74.1	ND	ND	0.013	0.24	0.0012	41.7	0.12	ND	0.021
H16 A 01 03 00	mg/L	0.08	ND	ND	0.36	ND	ND	96.2	0.0077	ND	ND	2.2	ND	32.8	0.091	ND	ND
H16 B 01 03 00	mg/L	8.1	ND	0.0037	0.2	ND	ND	79.7	0.076	0.098	0.016	17.6	0.0076	28.7	0.44	ND	0.068
H16 C 01 03 00	mg/L	0.79	ND	0.00052	0.14	ND	ND	55.2	0.018	ND	ND	2.2	0.0021	20.2	0.16	ND	ND
H16 D 01 03 00	mg/L	ND	ND	ND	0.087	ND	ND	56	ND	ND	ND	0.13	0.0016	20.5	0.11	ND	ND
H16 E 01 03 00	mg/L	0.057	ND	ND	0.25	ND	ND	106	ND	ND	ND	0.18	0.0011	35.4	0.54	ND	ND
H16 I 01 03 00	mg/L	ND	ND	0.00071	0.34	ND	ND	92.6	0.0056	ND	ND	2.1	0.0018	31.7	0.08	ND	ND
H16 JAW53 01 03 00	mg/L	0.1	ND	0.00078	0.099	ND	ND	56.8	ND	ND	ND	0.27	ND	20.4	0.41	ND	ND
H16 JAW54 01 03 00	mg/L	ND	ND	ND	0.087	ND	ND	49	ND	ND	ND	ND	ND	20.3	0.01	ND	ND
H16 JAW55 01 03 00	mg/L	ND	ND	0.00079	0.099	ND	ND	59	ND	ND	ND	0.075	ND	19.5	0.16	ND	ND

TAL METALS IN GROUNDWATER (TOTAL)

Sample ID	Units	POTASSIUM	SELENIUM	SILVER	SODIUM	THALLIUM	VANADIUM	ZINC	CYANIDE (TOTAL)
Proposed PRG	mg/L	2925	0.05	0.1	5000	0.0005	0.26	2	0.2
Source		RDA	MCL	HAL	RDA	MCL	PRG	HAL	HAL
GROUNDWATER (Total)									
H10 A 01 03 00	mg/L	ND	ND	ND	13	ND	ND	ND	0.011
H10 B 01 03 00	mg/L	2.9	ND	ND	40.7	ND	0.022	0.1	ND
H12 A 01 03 00	mg/L	ND	0.001	ND	11.1	ND	ND	0.069	ND
H12 B 01 03 00	mg/L	ND	0.0013	ND	11.2	ND	ND	0.09	ND
H12 C 01 03 00	mg/L	ND	ND	ND	38.2	ND	ND	0.83	ND
H12 D 01 03 00	mg/L	1.6	ND	ND	24.9	ND	0.0057	0.13	ND
H12 E 01 03 00	mg/L	ND	0.0016	ND	8.2	ND	ND	0.065	ND
H12 G 01 03 00	mg/L	ND	0.00057	ND	14.7	ND	ND	0.029	ND
H12 I 01 03 00	mg/L	ND	ND	ND	11.9	ND	ND	0.016	ND
H12 JAW70 01 03 00	mg/L	ND	ND	ND	11.9	ND	ND	ND	0.015
H12 JAW71 01 03 00	mg/L	ND	0.00052	ND	23.9	ND	ND	0.08	ND
H12 JAW72 01 03 00	mg/L	ND	ND	ND	10.6	ND	ND	ND	0.014
H12 JAW73 01 03 00	mg/L	ND	ND	ND	12.3	ND	ND	0.04	ND
H13 B 01 03 00	mg/L	ND	ND	ND	6.1	ND	ND	0.028	ND
H13 D 01 03 00	mg/L	3.8	ND	ND	45.8	ND	ND	0.0073	ND
H13 E 01 03 00	mg/L	2	ND	ND	22	ND	ND	ND	ND
H13 F 01 03 00	mg/L	3.1	0.00053	ND	24.6	ND	0.032	0.06	ND
H13 G54 01 03 00	mg/L	ND	ND	ND	14.2	ND	ND	0.035	ND
H13 G55 01 03 00	mg/L	3.3	ND	ND	34.4	ND	ND	0.013	ND
H13 I 01 03 00	mg/L	1.7	ND	ND	14.7	ND	0.087	ND	ND
H16 A 01 03 00	mg/L	1.7	ND	ND	44.6	ND	ND	0.12	ND
H16 B 01 03 00	mg/L	2.5	0.0011	ND	16.9	ND	0.025	0.052	ND
H16 C 01 03 00	mg/L	1.9	ND	ND	18.3	ND	ND	0.023	ND
H16 D 01 03 00	mg/L	ND	ND	ND	14.7	ND	ND	ND	ND
H16 E 01 03 00	mg/L	1.8	ND	ND	28.4	ND	ND	0.025	ND
H16 I 01 03 00	mg/L	1.8	ND	ND	43.1	ND	ND	0.56	ND
H16 JAW53 01 03 00	mg/L	ND	ND	ND	13.1	ND	ND	0.0075	ND
H16 JAW54 01 03 00	mg/L	ND	0.0011	ND	20.7	ND	ND	ND	ND
H16 JAW55 01 03 00	mg/L	1.8	ND	ND	14.9	ND	ND	0.055	ND

WATER QUALITY PARAMETERS IN GROUNDWATER

Sample ID	Alkalinity	Chloride	Nitrate-Nitrite	pH (pH units)	Total Dissolved Solids	Total Suspended Solids	Sulfate	Sulfide, Total	Total Organic Carbon	Units
GROUNDWATER										
H12 A 01 03 00	237	ND	ND	7.4	295	28.4	27.6	ND	ND	mg/L
H12 B 01 03 00	195	1	ND	7.2	266	ND	44.6	ND	ND	mg/L
H12 C 01 03 00	473	1.5	ND	7.7	484	84.3	8.2	ND	6.7	mg/L
H12 D 01 03 00	745	3	ND	7.3	462	1320	9.5	ND	3.7	mg/L
H12 E 01 03 00	252	2.2	ND	7.1	292	8.5	21.3	ND	ND	mg/L
H12 G 01 03 00	317	5.3	ND	7.8	444	131	73.5	ND	ND	mg/L
H12 I 01 03 00	206	1.9	ND	7.5	261	ND	31.1	ND	ND	mg/L
H12 JAW71 01 03 00	242	2.8	ND	7.7	290	33.5	34.8	ND	ND	mg/L
H12 JAW72 01 03 00	211	1.9	ND	7.2	245	ND	30.2	ND	1.5	mg/L
H12 JAW73 01 03 00	201	20.1	ND	7.5	284	10.1	40.7	ND	ND	mg/L
H13 B 01 03 00	297	1.1	ND	7.8	284	5.4	6.1	ND	1	mg/L
H13 D 01 03 00	521	4.4	ND	7.9	611	11	87.3	ND	3.1	mg/L
H13 E 01 03 00	581	4.5	ND	7.4	1300	7.1	186	ND	1.3	mg/L
H13 F 01 03 00	453	3.4	ND	7.1	520	180	45.8	ND	4.6	mg/L
H13 G54 01 03 00	373	5.6	ND	7.4	385	1.9	22.3	ND	ND	mg/L
H13 G55 01 03 00	508	8.4	ND	6.7	1710	12.8	401	ND	ND	mg/L
H13 I 01 03 00	373	5.6	ND	7.4	368	ND	22.3	ND	1	mg/L
H16 A 01 03 00	501	1.5	ND	7.6	461	8.6	ND	ND	3.7	mg/L
H16 B 01 03 00	329	1.9	ND	7.4	334	469	21.2	ND	ND	mg/L
H16 C 01 03 00	259	1.3	ND	7.5	245	60.8	4.9	ND	1.3	mg/L
H16 D 01 03 00	224	ND	ND	7.5	238	3.1	29.1	ND	ND	mg/L
H16 E 01 03 00	481	1.2	ND	7.5	481	ND	21.9	ND	ND	mg/L
H16 I 01 03 00	506	1.4	ND	7.6	459	5.4	ND	ND	4.1	mg/L
H16 JAW53 01 03 00	262	3.3	ND	7	263	ND	6.1	ND	ND	mg/L
H16 JAW54 01 03 00	206	10	ND	7.1	248	ND	37.3	ND	ND	mg/L
H16 JAW55 01 03 00	252	1.9	ND	7.5	286	ND	22	ND	1.1	mg/L

EXPLOSIVES DETE IN SURFACE WATER

Sample ID	1,3,5-Trinitrobenzene	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-Dinitrotoluene	2-Nitrotoluene	3-Nitrotoluene	4-Amino-2,6-Dinitrotoluene	4-Nitrotoluene	RDX	Nitrobenzene	HMX	Tetryl	Units	TOTAL EXPLOSIVES
SURFACE WATER																
H07 A 01 06 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	0
H07 B 01 06 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	0.72 J	<1.3	<1.3	<1.3	ug/L	0.72
H07 C 01 06 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	0.51 J	<1.3	<1.3	<1.3	ug/L	0.51
H07 D 01 06 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	0
H07 E 01 06 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	9.3	<1.3	23.0	<1.3	ug/L	32.3
H07 F 01 06 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	5.2	<1.3	5.0	<1.3	ug/L	10.2
H07 G 01 06 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	0
H07 H 01 06 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	3.0	<1.3	1.6	<1.3	ug/L	4.6
H07 I 01 06 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	3.4	<1.3	1.9	<1.3	ug/L	5.3
H07 J 01 06 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	5.3	<1.3	1.5	<1.3	ug/L	6.8
H07 K 01 06 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	1.7	<1.3	0.97 J	<1.3	ug/L	2.67
H07 L 01 06 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	6.2	<1.3	1.7	<1.3	ug/L	7.9
H07 M 01 06 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	6.2	<1.3	1.7	<1.3	ug/L	7.9
H07 N 01 06 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	0
H07 O 01 06 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	0
H07 P 01 06 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	ug/L	0
H07 Q 01 06 00	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	7.8	<1.3	1.6	<1.3	ug/L	9.4

VOCs DETECTED IN SURFACE WATER

Sample ID	Units	Methylene Chloride	TOTAL VOCs
SURFACE WATER			
H07 A 01 06 00	ug/L	7.4 B	7.4
H07 B 01 06 00	ug/L	12.1 B	12.1
H07 C 01 06 00	ug/L	8.3 B	8.3
H07 D 01 06 00	ug/L		0
H07 E 01 06 00	ug/L	4.5 B	4.5
H07 F 01 06 00	ug/L	12.4 B	12.4
H07 G 01 06 00	ug/L	11.6 B	11.6
H07 H 01 06 00	ug/L	11.7 B	11.7
H07 I 01 06 00	ug/L	10.4 B	10.4
H07 J 01 06 00	ug/L	11.3 B	11.3
H07 K 01 06 00	ug/L	8.8 B	8.8
H07 L 01 06 00	ug/L		0
H07 M 01 06 00	ug/L		0
H07 N 01 06 00	ug/L	9.7 B	9.7
H07 O 01 06 00	ug/L		0
H07 P 01 06 00	ug/L	3.1 JB	3.1
H07 Q 01 06 00	ug/L	7.9 B	7.9

SVOCs DETECTED IN SURFACE WATER

Sample ID					Units		
SURFACE WATER							
H07	A	01	06	00	ug/L	NONE DETECTED	
H07	B	01	06	00	ug/L		
H07	C	01	06	00	ug/L		
H07	D	01	06	00	ug/L		
H07	E	01	06	00	ug/L		
H07	F	01	06	00	ug/L		
H07	G	01	06	00	ug/L		
H07	H	01	06	00	ug/L		
H07	I	01	06	00	ug/L		
H07	J	01	06	00	ug/L		
H07	K	01	06	00	ug/L		
H07	L	01	06	00	ug/L		
H07	M	01	06	00	ug/L		
H07	N	01	06	00	ug/L		
H07	O	01	06	00	ug/L		
H07	P	01	06	00	ug/L		
H07	Q	01	06	00	ug/L		

TAL METALS IN SURFACE WATER (TOTAL)

Sample ID	Units	ALUMINUM	ANTIMONY	ARSENIC	BARIUM	BERYLLIUM	CADMIUM	CALCIUM	CHROMIUM	COBALT	COPPER	IRON	LEAD	MAGNESIUM	MANGANESE	MERCURY	NICKEL
SURFACE WATER (TOTAL)																	
H07 A 01 06 00	mg/L	0.078	ND	0.0013	0.16	ND	ND	62.2	ND	ND	ND	0.23	ND	21.6	0.13	ND	ND
H07 B 01 06 00	mg/L	0.073	ND	0.0017	0.14	ND	ND	59.7	ND	ND	ND	0.21	ND	22.1	0.1	ND	ND
H07 C 01 06 00	mg/L	ND	ND	0.0017	0.14	ND	ND	61.2	ND	ND	ND	0.19	ND	22.2	0.076	ND	ND
H07 D 01 06 00	mg/L	0.18	ND	0.0016	0.12	ND	ND	57.7	ND	ND	ND	0.33	ND	20.3	0.081	ND	ND
H07 E 01 06 00	mg/L	0.19	ND	0.00088	0.12	ND	ND	52.3	ND	ND	ND	0.36	0.0013	19.4	0.061	ND	ND
H07 F 01 06 00	mg/L	0.14	ND	0.00087	0.11	ND	ND	51	ND	ND	ND	0.32	0.0014	19.3	0.071	ND	ND
H07 G 01 06 00	mg/L	0.52	ND	0.00092	0.12	ND	ND	53.3	ND	ND	ND	0.77	0.002	21	0.12	ND	ND
H07 H 01 06 00	mg/L	0.45	ND	0.00093	0.12	ND	ND	51	ND	ND	ND	0.68	0.0017	19.4	0.08	ND	ND
H07 I 01 06 00	mg/L	1.2	ND	0.0013	0.15	ND	ND	51.4	ND	ND	ND	1.9	0.003	19.1	0.25	ND	ND
H07 J 01 06 00	mg/L	0.38	ND	0.00079	0.11	ND	ND	50.2	ND	ND	ND	0.63	ND	18.2	0.08	ND	ND
H07 K 01 06 00	mg/L	0.094	ND	0.0012	0.11	ND	ND	54.4	ND	ND	ND	0.15	ND	19.9	0.035	ND	ND
H07 L 01 06 00	mg/L	0.093	ND	0.0012	0.11	ND	ND	52.1	ND	ND	ND	0.24	ND	18.5	0.028	ND	ND
H07 M 01 06 00	mg/L	0.16	ND	0.0012	0.11	ND	ND	51.7	ND	ND	ND	0.3	ND	18	0.037	ND	ND
H07 N 01 06 00	mg/L	0.085	ND	0.00079	0.073	ND	ND	39.5	ND	ND	ND	0.14	0.001	17.7	0.034	ND	ND
H07 O 01 06 00	mg/L	0.16	ND	0.0011	0.094	ND	ND	42.5	ND	ND	ND	0.3	ND	17	0.082	ND	ND
H07 P 01 06 00	mg/L	0.056	ND	0.00067	0.059	ND	ND	75.4	ND	ND	ND	ND	ND	27.3	0.018	ND	ND
H07 Q 01 06 00	mg/L	0.13	ND	ND	0.067	ND	ND	67.8	ND	ND	ND	0.13	ND	20.2	0.03	ND	ND

TAL METALS IN SURFACE WATER (TOTAL)

Sample ID	Units	POTASSIUM	SELENIUM	SILVER	SODIUM	THALLIUM	VANADIUM	ZINC	CYANIDE (TOTAL)
SURFACE WATER (TOTAL)									
H07 A 01 06 00	mg/L	4	ND	ND	34.2	ND	ND	ND	ND
H07 B 01 06 00	mg/L	3.7	ND	ND	28.2	ND	ND	0.0051	0.011
H07 C 01 06 00	mg/L	3.2	ND	ND	24.4	ND	ND	ND	ND
H07 D 01 06 00	mg/L	4	0.0012	ND	26	ND	ND	0.0075	ND
H07 E 01 06 00	mg/L	ND	ND	ND	25.5	ND	ND	ND	ND
H07 F 01 06 00	mg/L	ND	ND	ND	12.6	ND	ND	ND	ND
H07 G 01 06 00	mg/L	ND	ND	ND	13.7	ND	ND	ND	ND
H07 H 01 06 00	mg/L	2	0.00094	ND	12.3	ND	ND	0.0097	ND
H07 I 01 06 00	mg/L	2.3	0.0011	ND	12.1	ND	0.0057	0.015	ND
H07 J 01 06 00	mg/L	1.9	0.0012	ND	13.7	ND	ND	0.015	ND
H07 K 01 06 00	mg/L	2.3	0.0014	ND	18.7	ND	ND	0.0091	ND
H07 L 01 06 00	mg/L	ND	0.00093	ND	10.6	ND	ND	0.012	ND
H07 M 01 06 00	mg/L	2	0.00091	ND	10.1	ND	ND	0.0051	ND
H07 N 01 06 00	mg/L	2.9	0.0009	ND	11.6	ND	ND	0.0067	ND
H07 O 01 06 00	mg/L	2.2	0.0012	ND	11.6	ND	ND	0.01	ND
H07 P 01 06 00	mg/L	ND	ND	ND	4.3	ND	ND	ND	ND
H07 Q 01 06 00	mg/L	3.3	ND	ND	15.6	ND	ND	ND	ND

EXPLOSIVES DETECTED IN SEDIMENT

Sample ID	1,3,5-Trinitrobenzene	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-Dinitrotoluene	2-Nitrotoluene	3-Nitrotoluene	4-Amino-2,6-Dinitrotoluene	4-Nitrotoluene	RDX	Nitrobenzene	HMX	Tetryl	Units	TOTAL EXPLOSIVES
SEDIMENT																
H07 A1 01 05 01	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 B1 01 05 01	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 B1 02 05 03	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 C1 01 05 01	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 C1 02 05 03	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 D1 01 05 01	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 E1 01 05 01	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 E1 02 05 03	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 E2 01 05 01	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	470 J	<1000	<900	<900	ug/kg	470
H07 F1 01 05 01	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	400 J	<1000	<900	<900	ug/kg	400
H07 F2 01 05 01	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	310 J	<1000	<900	<900	ug/kg	310
H07 G1 01 05 01	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 G2 01 05 01	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 H1 01 05 01	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 H1 02 05 03	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 H2 01 05 01	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	330 J	<1000	<900	<900	ug/kg	330
H07 I1 01 05 01	<1000	<900	7300	800 J	<900	7000	<900	<1100	2000	<900	9900	<1000	1900	<900	ug/kg	28900
H07 I1 02 05 03	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 I2 01 05 01	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	460 J	<1000	1900	<900	ug/kg	2360
H07 J1 01 05 01	<1000	<900	760 J	<1000	<900	<900	<900	<1100	660 J	<900	470 J	<1000	<900	<900	ug/kg	1890
H07 J1 02 05 03	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 J2 01 05 01	<1000	<900	600 J	<1000	<900	1700	<900	<1100	790 J	<900	1400	<1000	<900	<900	ug/kg	4490
H07 K1 01 05 01	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 K1 01 05 03	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 K2 02 05 01	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 L1 01 05 01	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 L2 01 05 01	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 L2 02 05 2.7	<1290	<1160	<1290	<1290	<1160	<1160	<1160	<1420	<1160	<1160	<1160	<1290	<1160	<1160	ug/kg	0
H07 M1 01 05 01	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 M1 02 05 03	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 M1 03 05 4.5	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 M2 01 05 01	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 N1 01 05 01	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 O1 01 05 01	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 O1 02 05 03	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 O1 03 05 4.5	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 P1 01 05 01	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0
H07 Q1 01 05 01	<1000	<900	<1000	<1000	<900	<900	<900	<1100	<900	<900	<900	<1000	<900	<900	ug/kg	0

VOCs DETECTED IN SEDIMENT

Sample ID	Units	Methylene Chloride	Toluene	TOTAL VOCs
SEDIMENT				
H07 A1 01 05 01	ug/kg	10.1 B		10.1
H07 B1 01 05 01	ug/kg	8.7 B		8.7
H07 C1 01 05 01	ug/kg	6.5 B		6.5
H07 D1 01 05 01	ug/kg	7.6 B		7.6
H07 E1 01 05 01	ug/kg	7.9 B		7.9
H07 F1 01 05 01	ug/kg	8.3 B		8.3
H07 G1 01 05 01	ug/kg	8.7 B		8.7
H07 H1 01 05 01	ug/kg	18.8 B		18.8
H07 I1 01 05 01	ug/kg	7.2 B		7.2
H07 J1 01 05 01	ug/kg	16.7 B		16.7
H07 K1 01 05 01	ug/kg	13.3 B	2.8 J	16.1
H07 L1 01 05 01	ug/kg	6 JB	3.1 J	9.1
H07 M1 01 05 01	ug/kg	9.5 B	2.8 J	12.3
H07 N1 01 05 01	ug/kg	14 B		14
H07 O1 01 05 01	ug/kg	5.9 JB		5.9
H07 P1 01 05 01	ug/kg	6.1		6.1
H07 Q1 01 05 01	ug/kg	12.7 B		12.7

SVOCs DETECTED IN SEDIMENT

Sample ID					Units	4-Methylphenol		Butylbenzylphthalate		Phenanthrene		Anthracene		Pyrene		Benzo(a)anthracene		Chrysene		Benzo(a)pyrene		TOTAL SVOCs
SEDIMENT																						
H07	A1	01	05	01	ug/kg			293	J													293
H07	B1	01	05	01	ug/kg																	0
H07	C1	01	05	01	ug/kg																	0
H07	D1	01	05	01	ug/kg																	0
H07	E1	01	05	01	ug/kg																	0
H07	F1	01	05	01	ug/kg																	0
H07	G1	01	05	01	ug/kg																	0
H07	H1	01	05	01	ug/kg																	0
H07	I1	01	05	01	ug/kg					64.3	J	64.9	J	139	J	47.8	J	57.2	J	64.6	J	437.8
H07	J1	01	05	01	ug/kg																	0
H07	K1	01	05	01	ug/kg																	0
H07	L1	01	05	01	ug/kg	62.1	J															62.1
H07	M1	01	05	01	ug/kg																	0
H07	N1	01	05	01	ug/kg																	0
H07	O1	01	05	01	ug/kg																	0
H07	P1	01	05	01	ug/L																	0
H07	Q1	01	05	01	ug/kg																	0

TAL METALS IN SEDIMENT

Sample ID	Units	ALUMINUM	ANTIMONY	ARSENIC	BARIUM	BERYLLIUM	CADMIUM	CALCIUM	CHROMIUM	COBALT	COPPER	IRON	LEAD	MAGNESIUM	MANGANESE	MERCURY	NICKEL
SEDIMENT																	0.51
H07 A1 01 05 01	mg/kg	3210	ND	5.6	189	0.33	ND	7590	6.5	5.4	9.4	7770	14.9	2200	495	ND	11.9
H07 B1 01 05 01	mg/kg	751	ND	1.4	68.2	ND	ND	2500	2.1	2.4	ND	3070	4.4	532	138	ND	4.1
H07 B1 02 05 03	mg/kg	1940	ND	1.8	113	0.34	ND	7960	4.5	5.3	5.4	7740	6.4	1640	296	ND	10.5
H07 C1 01 05 01	mg/kg	815	ND	4.7	109	0.23	ND	9050	2.9	12.1	3.2	7940	6.3	1560	1520	ND	10.7
H07 C1 02 05 01	mg/kg	807	ND	5	58.2	0.17	ND	4320	5.7	4.6	2.4	8240	5.4	895	247	ND	9
H07 D1 01 05 01	mg/kg	2780	ND	1.4	124	0.3	ND	5700	5.8	5.3	9.1	6170	8.9	1850	289	ND	8.7
H07 E1 01 05 01	mg/kg	2050	5.9	30.8	128	0.6	ND	2250	13.7	16.8	8	26100	18.1	726	906	ND	15.1
H07 E1 02 05 03	mg/kg	1730	ND	0.43	24.2	0.18	ND	664	4.9	1.5	4.2	1850	4.4	495	12.6	ND	8.8
H07 E2 01 05 01	mg/kg	2130	ND	14.4	144	0.39	ND	3130	7.5	11.1	6.4	11400	14.7	1130	882	ND	12.3
H07 F1 01 05 01	mg/kg	1910	ND	11.4	99.8	0.34	ND	1500	7.7	6	4.7	12100	17.2	643	423	ND	8.6
H07 F2 01 05 01	mg/kg	1310	ND	9.5	96.8	0.25	ND	1890	12.3	7.3	16.1	10900	13.6	820	626	ND	8.6
H07 G1 01 05 01	mg/kg	3860	ND	3.9	90.9	0.37	ND	4670	6.7	4.5	7.4	9710	9.6	1150	321	ND	10.8
H07 G2 01 05 01	mg/kg	4970	ND	8.8	128	0.5	ND	3890	7.5	5.5	9.4	11600	12.3	1520	429	ND	24.9
H07 H1 01 05 01	mg/kg	1920	ND	7.1	182	0.35	1.3	3460	10.7	15.6	3.9	11400	9.6	1260	1590	ND	10
H07 H1 02 05 03	mg/kg	2890	4.1	6.4	45	0.34	ND	32000	6.4	7.3	9.7	15800	8	8060	324	ND	14.3
H07 H2 01 05 01	mg/kg	3740	2.8	5.7	99.9	0.44	ND	4310	12	6.6	7.4	12000	9.5	1370	401	ND	9.6
H07 I1 01 05 01	mg/kg	1290	ND	4.3	567	0.26	ND	2020	41.5	3.7	6.7	6030	8.9	961	191	ND	5.3
H07 I1 02 05 03	mg/kg	10000	ND	3.9	169	0.77	ND	2650	17.7	12.6	9.5	14400	22.7	1440	218	ND	12.2
H07 I2 01 05 01	mg/kg	858	ND	2.1	84.4	0.2	ND	1270	10.7	3.9	2.3	5270	5.3	467	368	ND	4
H07 J1 01 05 01	mg/kg	3650	ND	5.2	130	0.47	ND	5040	12.7	7.4	7	12000	10.9	1120	526	ND	9.1
H07 J1 02 05 03	mg/kg	5790	2.9	3.6	62.4	0.67	ND	16000	11.4	10.5	14.9	13500	9.7	3190	307	ND	22.9
H07 J2 01 05 01	mg/kg	3200	ND	13.8	123	0.44	ND	5340	20.8	5.8	7.2	9870	19.8	1510	616	ND	8
H07 K1 01 05 01	mg/kg	1570	ND	1.9	67.1	0.21	ND	2510	5.8	3.3	2.9	5240	8.2	593	204	ND	4.1
H07 K1 02 05 03	mg/kg	4030	4.2	4.2	39.8	0.52	ND	23600	7.2	6	11.9	14200	7.7	4860	276	ND	16.6
H07 K2 01 05 01	mg/kg	1800	ND	5.4	109	0.3	ND	4080	9.2	6.8	4.3	8660	10.3	677	489	ND	6.9
H07 L1 01 05 01	mg/kg	2250	3.5	6.7	71.2	0.25	ND	25400	5.7	8.7	3.6	9510	3.3	3620	429	ND	13.3
H07 L2 01 05 01	mg/kg	927	2.5	3	41	0.23	ND	13400	6.2	5	2	5980	4.2	3150	350	ND	6
H07 L2 02 05 2.7	mg/kg	6580	4.8	3.6	93.6	0.75	ND	6330	10.7	7	15.2	13300	8.4	2540	428	ND	16.8
H07 M1 01 05 01	mg/kg	1420	2.8	4.1	79.6	0.22	ND	33900	7.7	10.3	2.5	8130	4.2	2000	881	ND	9.6
H07 M1 02 05 03	mg/kg	911	2.4	5.6	58.1	0.2	ND	21600	6	5.3	1.7	5340	5.8	1750	365	ND	6
H07 M1 03 05 4.5	mg/kg	1180	3.5	7.3	53.7	0.18	ND	20800	14	4.8	2.3	6660	5.1	2370	302	ND	9.5
H07 M2 01 05 01	mg/kg	936	2.9	7.9	61.1	0.21	ND	24400	4.9	8.7	2.5	6630	5.5	4150	831	ND	7.4

TAL METALS IN SEDIMENT

Sample ID	Units	ALUMINUM	ANTIMONY	ARSENIC	BARIUM	BERYLLIUM	CADMIUM	CALCIUM	CHROMIUM	COBALT	COPPER	IRON	LEAD	MAGNESIUM	MANGANESE	MERCURY	NICKEL
H07 N1 01 05 01	mg/kg	3830	ND	4.2	78.6	0.43	ND	9910	6.7	5.4	7.9	8790	8.5	2470	524	ND	10.5
H07 O1 01 05 01	mg/kg	2370	3	5	60.2	0.27	ND	6110	9.2	6.1	5.2	9880	8.2	1530	353	ND	10.4
H07 O1 02 05 03	mg/kg	1630	3.2	2.9	28.6	0.23	ND	10500	5.8	4.3	3.1	8730	5.5	2130	221	ND	7.6
H07 O1 03 05 4.5	mg/kg	1720	2.4	3.7	34	0.21	ND	3700	7	5.8	2.5	8240	4.7	1560	242	ND	9.2
H07 P1 01 05 01	mg/kg	4160	12	23.1	345	0.92	0.81	29900	10.3	36.1	11.7	30200	32.6	5620	3870	ND	42
H07 Q1 01 05 01	mg/kg	866	ND	5.4	39.3	0.21	ND	14900	3.3	5.3	1.7	7240	10.2	1660	512	ND	6.1

TAL METALS IN SEDIMENT

Sample ID	Units	POTASSIUM	SELENIUM	SILVER	SODIUM	THALLIUM	VANADIUM	ZINC	CYANIDE (TOTAL)
SEDIMENT									
H07 A1 01 05 01	mg/kg	271	0.42	0.92	122	ND	12.2	28.7	ND
H07 B1 01 05 01	mg/kg	ND	ND	ND	87.2	ND	4.5	8.1	ND
H07 B1 02 05 03	mg/kg	ND	0.12	ND	99.7	ND	13.7	22.6	ND
H07 C1 01 05 01	mg/kg	ND	0.093	ND	92.7	0.14	11.2	14.6	ND
H07 C1 02 05 01	mg/kg	ND	0.11	ND	97.5	ND	8.7	12.9	ND
H07 D1 01 05 01	mg/kg	470	ND	0.87	111	ND	10.8	27.9	ND
H07 E1 01 05 01	mg/kg	ND	0.25	1.2	92.2	ND	30.4	27.1	ND
H07 E1 02 05 03	mg/kg	ND	0.4	ND	75.8	ND	6.5	11.9	ND
H07 E2 01 05 01	mg/kg	ND	0.18	0.84	88.2	0.14	16.7	24.1	ND
H07 F1 01 05 01	mg/kg	ND	0.18	ND	81.3	ND	16.3	21.5	ND
H07 F2 01 05 01	mg/kg	ND	0.13	1.8	92.3	ND	11.3	19.2	ND
H07 G1 01 05 01	mg/kg	330	0.16	ND	101	ND	13	29.8	ND
H07 G2 01 05 01	mg/kg	344	0.18	ND	115	0.13	15	36.3	ND
H07 H1 01 05 01	mg/kg	ND	0.14	ND	80.1	ND	15.9	22.6	ND
H07 H1 02 05 03	mg/kg	386	0.47	ND	137	ND	11.3	31.8	ND
H07 H2 01 05 01	mg/kg	299	0.26	0.9	96.3	ND	16	29.3	ND
H07 I1 01 05 01	mg/kg	ND	0.19	6.8	79.8	ND	8.7	23.5	ND
H07 I1 02 05 03	mg/kg	372	0.26	0.82	96.8	0.14	25.3	21	ND
H07 I2 01 05 01	mg/kg	ND	ND	0.78	70.4	ND	7	13.8	ND
H07 J1 01 05 01	mg/kg	ND	0.16	0.64	92.4	ND	16.5	32.1	ND
H07 J1 02 05 03	mg/kg	814	0.53	ND	99.7	ND	16.5	42.6	ND
H07 J2 01 05 01	mg/kg	214	0.3	4.2	107	ND	14.1	29.1	ND
H07 K1 01 05 01	mg/kg	ND	0.084	ND	75.1	ND	8.1	15.4	ND
H07 K1 02 05 03	mg/kg	636	0.25	ND	117	0.18	13.5	33.7	ND
H07 K2 01 05 01	mg/kg	ND	0.11	0.77	85.3	ND	12.8	21.1	ND
H07 L1 01 05 01	mg/kg	622	ND	0.65	79.8	0.12	9.8	46	ND
H07 L2 01 05 01	mg/kg	ND	ND	ND	73.9	ND	9.3	13.9	ND
H07 L2 02 05 2.7	mg/kg	571	0.16	0.75	110	ND	21	29.5	ND
H07 M1 01 05 01	mg/kg	ND	ND	ND	71.5	ND	9.9	13.8	ND
H07 M1 02 05 03	mg/kg	ND	ND	ND	91.1	ND	7.9	10.6	ND
H07 M1 03 05 4.5	mg/kg	174	ND	0.69	89.7	ND	8.2	14.3	ND
H07 M2 01 05 01	mg/kg	229	ND	ND	86.2	ND	9.9	185	ND

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TAL METALS IN SEDIMENT

Sample ID					Units	POTASSIUM	SELENIUM	SILVER	SODIUM	THALLIUM	VANADIUM	ZINC	CYANIDE (TOTAL)
H07	N1	01	05	01	mg/kg	408	0.25	ND	124	ND	12.6	27.9	ND
H07	O1	01	05	01	mg/kg	378	0.088	ND	67.6	0.13	11.3	22.1	ND
H07	O1	02	05	03	mg/kg	179	ND	0.61	83.1	ND	9.6	19.5	ND
H07	O1	03	05	4.5	mg/kg	ND	ND	ND	67.9	ND	9.6	18.5	ND
H07	P1	01	05	01	mg/kg	573	ND	1.2	99.2	ND	38.6	69.6	ND
H07	Q1	01	05	01	mg/kg	ND	0.12	ND	89.8	ND	8.9	10.5	ND

VOCs DETECTED IN SOIL

Sample ID	Units	n-Butylbenzene	sec-Butylbenzene	Methylene Chloride	Toluene	Ethylbenzene	Isopropyl Benzene	4-Isopropyl Toluene	Naphthalene	n-Propylbenzene	Chlorobenzene	1,1-Dichloroethene	1,2-Dichlorobenzene	1,4-Dichlorobenzene	1,1,1-Trichloroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	1,1,2-Trichlorotrifluoroethane	1,2-Dichlorotrifluoroethane	TOTAL VOCs
SOIL																				
H11 A1 01 01 00	mg/kg																	0.25 B		0
H11 A1 02 01 04	mg/kg																			0
H11 A2 01 01 00	mg/kg																	0.15 B		0
H11 A2 02 01 04	mg/kg																	0.063		0
H11 A3 01 01 00	mg/kg																	0.43		0
H11 A3 02 01 04	mg/kg																			0
H11 B1 01 01 00	mg/kg																	0.96		0
H11 B1 02 01 04	mg/kg	1.4	1.4			0.87	0.69	0.63	3.7	1.2							0.63			7.09
H11 B2 02 01 04	mg/kg	1.3	1.9			0.37	0.85	0.87	8.9	1.5										12.49
H11 B2 01 01 00	mg/kg																	0.24		0
H11 B3 01 01 00	mg/kg																	0.43		0
H11 B3 02 01 04	mg/kg																			0
H11 B4 01 01 00	mg/kg																	2.3		0
H11 B4 02 01 05	mg/kg	2.2	2			1.4	1	0.95	7	1.7						0.55	4			12.05
H11 B4 03 01 10	mg/kg											0.004						0.054 B		0.004
H11 B5 01 01 03	mg/kg																	0.025 B		0
H11 B5 02 01 08	mg/kg				0.003 B													0.025 B		0.003
H11 B6 01 01 03	mg/kg				0.004 B													0.059 B		0.004
H11 B6 02 01 08	mg/kg				0.003 B													0.03 B		0.003
H11 B7 01 01 03	mg/kg																			0
H11 B7 02 01 08	mg/kg				0.004 B															0.004
H11 B8 01 01 03	mg/kg				0.003 B															0.003
H11 B8 02 01 08	mg/kg				0.004 B															0.004
H11 C1 01 01 00	mg/kg																	0.13		0
H11 C1 02 01 10	mg/kg					0.004												0.054		0.004
H11 C1 03 01 25	mg/kg																	0.66		0
H11 C1 04 01 33	mg/kg																	0.12		0
H11 C2 01 01 00	mg/kg																	0.33		0
H11 C2 02 01 04	mg/kg			0.016 B							0.008		0.041	0.007				1.6		0.072
H11 C2 03 01 10	mg/kg										0.021							0.073		0.021
H11 C6 01 01 05	mg/kg																			0
H11 D1 01 01 00	mg/kg																	0.6		0
H11 D1 02 01 05	mg/kg															0.03		0.19		0
H11 D1 03 01 13	mg/kg																			0
H11 E1 01 01 00	mg/kg																	1		0
H11 E1 02 01 05	mg/kg																	0.18		0
H11 E1 03 01 10	mg/kg																	0.31		0
H11 E2 01 01 00	mg/kg																	0.47		0
H11 E2 02 01 04	mg/kg	0.15	0.013					0.021		0.008						0.028		3.6		0.029
H11 F1 01 01 00	mg/kg																	0.42		0
H11 F1 02 01 05	mg/kg																	15		0
H11 F1 03 01 13	mg/kg																	9000		0
H11 F1 04 01 23	mg/kg																	280		0
H11 F1 05 01 33	mg/kg																	3.2		0
H11 F10 01 01 03	mg/kg				0.007 B															0.007
H11 F10 02 01 13	mg/kg																	1 E		0
H11 F11 01 01 03	mg/kg				0.003 B													0.11		0.003
H11 F11 02 01 15	mg/kg				1.7 B													6200		1.7
H11 F12 01 01 03	mg/kg				0.004 B													0.11		0.004

VOCs DETECTED IN SOIL

Sample ID	Units	n-Butylbenzene	sec-Butylbenzene	Methylene Chloride	Toluene	Ethylbenzene	Isopropyl Benzene	4-Isopropyl Toluene	Naphthalene	n-Propylbenzene	Chlorobenzene	1,1-Dichloroethene	1,2-Dichlorobenzene	1,4-Dichlorobenzene	1,1,1-Trichloroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	1,1,2-Trichlorotrifluoroethane	1,2-Dichlorotrifluoroethane	TOTAL VOCs
H11 F12 02 01 13	mg/kg				0.01 B													78		0.01
H11 F13 01 01 03	mg/kg				0.004 B															0.004
H11 F14 01 01 03	mg/kg				0.004 B													0.037		0.004
H11 F2 01 01 00	mg/kg																	0.16		0
H11 F2 02 01 05	mg/kg																	9		0
H11 F2 03 01 13	mg/kg																	4000		0
H11 F2 04 01 23	mg/kg																	1.7		0
H11 F2 05 01 33	mg/kg																	3.1		0
H11 F3 01 01 00	mg/kg																	0.3		0
H11 F3 02 01 05	mg/kg																	1.4		0
H11 F3 03 01 13	mg/kg																	6.3		0
H11 F3 04 01 23	mg/kg																	34		0
H11 F3 05 01 32	mg/kg			6.6 B														3900		6.6
H11 F3 06 01 36	mg/kg			2.7 B														26		2.7
H11 F4 01 01 00	mg/kg																	0.4		0
H11 F4 02 01 05	mg/kg																	1	0.093	0
H11 F4 03 01 13	mg/kg																	910		0
H11 F4 04 01 15	mg/kg																	2000		0
H11 F4 05 01 23	mg/kg																	0.091 B		0
H11 F4 06 01 33	mg/kg																	0.79		0
H11 F5 01 01 00	mg/kg																	0.27		0
H11 F5 02 01 05	mg/kg																	0.44		0
H11 F5 03 01 13	mg/kg																	29		0
H11 F5 04 01 23	mg/kg																	1.4		0
H11 F5 05 01 33	mg/kg																	5.9		0
H11 F6 01 01 00	mg/kg																	0.73		0
H11 F6 02 01 04	mg/kg																	0.11		0
H11 F7 01 01 00	mg/kg																	1.5		0
H11 F7 02 01 05	mg/kg																	0.99		0
H11 F7 03 01 13	mg/kg																	110		0
H11 F7 04 01 20	mg/kg																	620		0
H11 F7 05 01 33	mg/kg																	27		0
H11 F8 01 01 00	mg/kg																	620		0
H11 F8 02 01 05	mg/kg														0.025			27		0
H11 F8 03 01 13	mg/kg																	0.39		0
H11 F8 04 01 23	mg/kg																	0.068		0
H11 F8 05 01 33	mg/kg																	4.9		0
H11 F9 01 01 03	mg/kg				0.014 B													0.017		0.014
H11 F9 02 01 13	mg/kg				0.4 B													4.5		0.4

APPENDIX J
ANALYTICAL DATA SUMMARY

J-2 Mason & Hanger (Second Cycle FY97) Data

Table 2. Summary Groundwater Monitoring Results for Explosives, by Well Field - FY97 Second Cycle

Nitroaromatics and Nitramines Analysis											
Sample date:			8/28/97	8/28/97	8/28/97	8/28/97	8/28/97	8/28/97	9/8/97	9/9/97	8/28/97
			JAW-43	JAW-44	JAW-45	JAW-46	JAW-47	JAW-48	JAW-50	JAW-51	JAW-52
LINE-1	MDL	HA	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
HMX	0.16	400	ND	ND	0.19	ND	ND	ND	2.6	ND	ND
1,3,5-TNB	0.15	1**	ND	ND	ND	ND	ND	ND	0.82	ND	ND
RDX	0.11	2	ND	ND	0.44	ND	ND	ND	36	0.17	ND
1,3-DNB	0.13	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-TNT	0.16	2**	0.27	ND	ND	ND	0.29	0.18	ND	ND	ND
Tetryl	0.16	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND
NB	0.16	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DNT	0.12	100*	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-DNT	0.18	40 *	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-NT	0.31	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND

Nitroaromatics and Nitramines Analysis						TB-1	FB-1	TB-2	FB-2
Sample date:			8/28/97	8/28/97	8/28/97	8/28/97	8/28/97	9/8/97	9/8/97
			JAW-601	JAW-602	JAW-603	8894	8895	8980	8981
LINE-1 cont'd	MDL	HA	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
HMX	0.16	400	ND	ND	ND	ND	ND	ND	ND
1,3,5-TNB	0.11	1**	ND	ND	ND	ND	ND	ND	ND
RDX	0.15	2	ND	ND	ND	ND	ND	ND	ND
1,3-DNB	0.13	1	ND	ND	ND	ND	ND	ND	ND
2,4,6-TNT	0.16	2**	ND	ND	0.30	ND	ND	ND	ND
Tetryl	0.16	NA	ND	ND	ND	ND	ND	ND	ND
NB	0.16	NA	ND	ND	ND	ND	ND	ND	ND
2,4-DNT	0.12	100*	ND	ND	ND	ND	ND	ND	ND
2,6-DNT	0.18	40 *	ND	ND	ND	ND	ND	ND	ND
2-NT	0.31	NA	ND	ND	ND	ND	ND	ND	ND

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Table 2. Summary Groundwater Monitoring Results for Explosives, by Well Field - FY97 Second Cycle

Nitroaromatics and Nitramines Analysis									TB-1	FB-1
Sample date:			8/6/97	8/6/97	8/6/97	8/6/97	8/6/97	8/6/97	8/6/97	8/6/97
			JAW-70	JAW-71	JAW-72	JAW-73	JAW-74	JAW-75	8544	8545
LINE-2	MDL	HA	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
HMX	0.16	400	270[D]	10	250[D]	31	0.28	ND	ND	ND
1,3,5-TNB	0.11	1**	9.3	0.83	13	3.8	ND	ND	ND	ND
RDX	0.15	2	2000[D]	19	2700[D]	120[D]	0.47	ND	ND	ND
1,3-DNB	0.13	1	ND	ND	0.45	ND	ND	ND	ND	ND
2,4,6-TNT	0.16	2**	0.30	0.33	0.32	0.21	0.16	ND	0.16	0.17
Tetryl	0.16	NA	ND	ND	ND	ND	ND	ND	ND	ND
NB	0.16	NA	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DNT	0.12	100*	0.65	ND	6.3	ND	ND	ND	ND	ND
2,6-DNT	0.18	40 *	0.31	ND	0.94	ND	ND	ND	ND	ND
2-NT	0.31	NA	0.46	ND	ND	ND	ND	ND	ND	ND

Nitroaromatics and Nitramines Analysis									TB-1	FB-1
Sample date:			8/7/97	8/7/97	8/7/97	8/7/97	8/7/97	8/7/97	8/7/97	8/7/97
			JAW-53	JAW-54	JAW-55	JAW-56	JAW-57	JAW-77	8570	8571
LINE-3	MDL	HA	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
HMX	0.16	400	ND	190[D]	3.9[S]	ND	ND	ND	ND	ND
1,3,5-TNB	0.11	1**	ND	14	ND	ND	ND	ND	ND	ND
RDX	0.15	2	ND	1700[D]	1.5	ND	ND	ND	ND	ND
1,3-DNB	0.13	1	ND	0.16	ND	ND	ND	ND	ND	ND
2,4,6-TNT	0.16	2**	ND	1.2	ND	ND	ND	0.16	0.17	ND
Tetryl	0.16	NA	ND	ND	ND	ND	ND	ND	ND	ND
NB	0.16	NA	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DNT	0.12	100*	ND	4.8	ND	ND	ND	ND	ND	ND
2,6-DNT	0.18	40 *	ND	0.35	ND	ND	ND	ND	ND	ND
2-NT	0.31	NA	ND	ND	ND	ND	ND	ND	ND	ND

D = Reduced injection; extract concentration too high for calibration curve.
S = Quantification tentative; peak on shoulder of interfering peak.

Table 2. Summary Groundwater Monitoring Results for Explosives, by Well Field - FY97 Second Cycle

Nitroaromatics and Nitramines Analysis											TB-1	FB-1
Sample date:			8/14/97	8/14/97	8/14/97	8/14/97	8/14/97	8/14/97	8/14/97	8/14/97	8/14/97	8/14/97
			JAW-15	**JAW-16**	**JAW-17**	**JAW-18**	**JAW-19**	**JAW-20**	**JAW-21**	**JAW-22**	8655	8656
LINE-3A	**MDL**	**HA**	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
HMX	0.16	400	4.3	ND	6.7	ND	ND	0.23	0.75	7.0	ND	ND
1,3,5-TNB	0.11	1**	0.46[U]	ND	0.63	ND	ND	ND	0.26	1.2	ND	ND
RDX	0.15	2	36	ND	10	ND	ND	0.67	19	48	ND	ND
1,3-DNB	0.13	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-TNT	0.16	2**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetryl	0.16	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NB	0.16	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DNT	0.12	100*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-DNT	0.18	40 *	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-NT	0.31	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Nitroaromatics and Nitramines Analysis									TB-1	FB-1
Sample date:			7/31/97	7/31/97	7/31/97	7/31/97	7/31/97	7/31/97	7/31/97	7/31/97
			JAW-29	**JAW-30**	**JAW-31**	**JAW-610**	**JAW-611**	**JAW-612**	8476	8477
LINE-9	**MDL**	**HA**	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
HMX	0.16	400	ND	ND	0.56	ND	ND	ND	ND	ND
1,3,5-TNB	0.11	1**	ND	ND	ND	ND	ND	ND	ND	ND
RDX	0.15	2	ND	ND	ND	ND	0.36	0.28	ND	ND
1,3-DNB	0.13	1	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-TNT	0.16	2**	0.72	0.37	0.61	0.90	0.34	0.23	ND	ND
Tetryl	0.16	NA	ND	ND	ND	ND	ND	ND	ND	ND
NB	0.16	NA	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DNT	0.12	100*	ND	ND	ND	ND	ND	ND	ND	ND
2,6-DNT	0.18	40 *	ND	ND	ND	ND	ND	ND	ND	ND
2-NT	0.31	NA	ND	ND	ND	ND	ND	ND	ND	ND

U = Not confirmed on secondary column.

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Table 2. Summary Groundwater Monitoring Results for Explosives, by Well Field - FY97 Second Cycle

Nitroaromatics and Nitramines Analysis											
Sample date:			7/29/97	8/21/97	7/29/97	7/29/97	7/29/97	TB-1 7/29/97	FB-1 7/29/97	TB-2 8/21/97	FB-2 8/21/97
W. BURN PAD	**MDL** (ppb)	**HA** (ppb)	**G-30** Conc. (ppb)	**JAW-23** Conc. (ppb)	**JAW-24** Conc. (ppb)	**JAW-25** Conc. (ppb)	**JAW-68** Conc. (ppb)	8420 Conc. (ppb)	8421 Conc. (ppb)	8797 Conc. (ppb)	8806 Conc. (ppb)
HMX	0.16	400	ND	720[D]	0.73	59[D]	33	ND	ND	ND	0.17
1,3,5-TNB	0.11	1**	ND	66	ND	2.1	ND	ND	ND	ND	ND
RDX	0.15	2	0.22	6900[D]	4.3	81[D]	0.35	ND	ND	ND	ND
1,3-DNB	0.13	1	ND	0.13	0.21	ND	ND	ND	ND	ND	ND
2,4,6-TNT	0.16	2**	0.81	15	1.0	0.32	0.45	ND	ND	ND	ND
Tetryl	0.16	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND
NB	0.16	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DNT	0.12	100*	ND	0.91	0.56	ND	ND	ND	ND	ND	ND
2,6-DNT	0.18	40 *	ND	0.67	1.1	ND	ND	ND	ND	ND	ND
2-NT	0.31	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND

Nitroaromatics and Nitramines Analysis												
Sample Date:			7/16/97	7/15/97	7/16/97	7/16/97	7/15/97	7/16/97	7/15/97	7/15/97	7/15/97	7/15/97
EXPL. DISP. AREA	**MDL** (ppb)	**HA** (ppb)	**EDA-01** Conc. (ppb)	**EDA-02** Conc. (ppb)	**EDA-03** Conc. (ppb)	**EDA-04** Conc. (ppb)	**G-29** Conc. (ppb)	**JAW-04** Conc. (ppb)	**JAW-05** Conc. (ppb)	**JAW-06** Conc. (ppb)	**JAW-07** Conc. (ppb)	**JAW-64** Conc. (ppb)
HMX	0.16	400	ND	8.2[S]	3.3[S]	76[S]	1.4	ND	0.17	19[S]	0.20	ND
1,3,5-TNB	0.11	1**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RDX	0.15	2	ND	77	4.0[U]	19	5.5	0.21	0.28	0.87	0.24	0.40
1,3-DNB	0.13	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-TNT	0.16	2**	ND	ND	1.0	ND	ND	ND	ND	ND	ND	ND
Tetryl	0.16	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NB	0.16	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DNT	0.12	100*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-DNT	0.18	40 *	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-NT	0.31	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

D = Reduced injection; extract concentration too high for calibration curve.
U = Not confirmed on secondary column.
S = Quantification tentative; peak on shoulder of interfering peak.

Table 2. Summary Groundwater Monitoring Results for Explosives, by Well Field - FY97 Second Cycle

continued ...				TB-1	FB-1	TB-2	FB-2
Sample Date:			7/16/97	7/15/97	7/15/97	7/16/97	7/16/97
EXPL. DISP.			**JAW-614**	8197	8198	8219	8220
AREA	**MDL**	**HA**	Conc.	Conc.	Conc.	Conc.	Conc.
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
HMX	0.16	400	2.6[S]	18	ND	ND	0.19
1,3,5-TNB	0.11	1**	ND	ND	ND	ND	ND
RDX	0.15	2	3.4	0.61	ND	ND	ND
1,3-DNB	0.13	1	ND	ND	ND	ND	ND
2,4,6-TNT	0.16	2**	ND	ND	ND	ND	ND
Tetryl	0.16	NA	ND	ND	ND	ND	ND
NB	0.16	NA	ND	ND	ND	ND	ND
2,4-DNT	0.12	100*	ND	ND	ND	ND	ND
2,6-DNT	0.18	40 *	ND	ND	ND	ND	ND
2-NT	0.31	NA	ND	ND	ND	ND	ND

Nitroaromatics and Nitramines Analysis										**TB-1**	**FB-1**
Sample date:			8/26/97	8/26/97	8/26/97	8/26/97	8/25/97	8/26/97	8/26/97	8/26/97	8/26/97
			DA-01	**DA-02**	**G-09**	**G-10**	**G-11**	**JAW-01**	**JAW-02**	8857	8858
DEMO. AREA	**MDL**	**HA**	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
HMX	0.16	400	1.4	0.99	0.24	0.70	D	0.96	ND	ND	ND
1,3,5-TNB	0.11	1**	ND	0.15	ND	0.14	R	0.16	0.15	ND	ND
RDX	0.15	2	2.5	8.5	0.94	6.2	Y	6.6	1.5	ND	ND
1,3-DNB	0.13	1	ND	ND	ND	ND		ND	0.14	ND	ND
2,4,6-TNT	0.16	2**	ND	ND	1.1	ND	W	ND	ND	ND	ND
Tetryl	0.16	NA	ND	ND	ND	ND	E	ND	ND	ND	ND
NB	0.16	NA	ND	ND	ND	ND	L	ND	ND	ND	ND
2,4-DNT	0.12	100*	ND	ND	ND	ND	L	ND	ND	ND	ND
2,6-DNT	0.18	40 *	ND	ND	ND	ND		ND	ND	ND	ND
2-NT	0.31	NA	ND	ND	ND	ND		ND	ND	ND	ND

S = Quantification tentative; peak on shoulder of interfering peak.

Table 2. Summary Groundwater Monitoring Results for Explosives, by Well Field - FY97 Second Cycle

Nitroaromatics and Nitramines Analysis						TB-1	FB-1	TB-2	FB-2
Sample date:			8/21/97	7/17/97	7/17/97	7/17/97	7/17/97	8/21/97	8/21/97
BOX CHIPPER			**JAW-620**	**JAW-621**	**JAW-622**	8243	8244	8797	8806
DISPOSAL	**MDL**	**HA**	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.
PIT	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
HMX	0.16	400	ND	ND	ND	ND	ND	ND	0.17
1,3,5-TNB	0.11	1**	ND	ND	ND	ND	ND	ND	ND
RDX	0.15	2	0.42	0.16	0.15	ND	ND	ND	ND
1,3-DNB	0.13	1	ND	ND	ND	ND	ND	ND	ND
2,4,6-TNT	0.16	2**	ND	0.35	0.23	ND	ND	ND	ND
Tetryl	0.16	NA	ND	ND	ND	ND	ND	ND	ND
NB	0.16	NA	ND	ND	ND	ND	ND	ND	ND
2,4-DNT	0.12	100*	ND	ND	ND	ND	ND	ND	ND
2,6-DNT	0.18	40 *	ND	ND	ND	ND	ND	ND	ND
2-NT	0.31	NA	ND	ND	ND	ND	ND	ND	ND

Nitroaromatics and Nitramines Analysis										TB-1	FB-1
Sample date:			7/22/97	7/22/97	7/22/97	7/22/97	7/22/97	7/22/97	7/22/97	7/22/97	7/22/97
N. BURN			**JAW-11**	**JAW-12**	**JAW-13**	**JAW-14**	**JAW-625**	**JAW-626**	**JAW-627**	8280	8281
PAD	**MDL**	**HA**	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
HMX	0.16	400	ND	D	ND	0.20	4.9	14[S]	4.9[S]	ND	ND
1,3,5-TNB	0.11	1**	ND	R	ND	ND	0.13	ND	0.28	ND	ND
RDX	0.15	2	ND	Y	ND	1.3	5.6	0.54	9.4	ND	ND
1,3-DNB	0.13	1	ND		ND	ND	ND	ND	ND	ND	ND
2,4,6-TNT	0.16	2**	0.17	W	0.28	ND	0.42	0.23	0.15	ND	ND
Tetryl	0.16	NA	ND	E	ND	ND	ND	ND	ND	ND	ND
NB	0.16	NA	ND	L	ND	ND	ND	ND	ND	ND	ND
2,4-DNT	0.12	100*	ND	L	ND	ND	ND	ND	ND	ND	ND
2,6-DNT	0.18	40 *	ND		ND	ND	ND	0.66	0.60	ND	ND
2-NT	0.31	NA	ND		ND	ND	ND	ND	0.46	ND	ND

S = Quantification tentative; peak on shoulder of interfering peak.

Table 2. Summary Groundwater Monitoring Results for Explosives, by Well Field - FY97 Second Cycle

Nitroaromatics and Nitramines Analysis												
Sample date:			8/19/97	8/19/97	8/19/97	8/21/97	8/21/97	8/21/97	8/19/97	8/21/97	8/21/97	8/19/97
			G-03	**G-12**	**G-21**	**G-22**	**G-23**	**G-24**	**G-25**	**G-26**	**G-27**	**G-28**
BOUNDARY	**MDL**	**HA**	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
HMX	0.16	400	ND	ND	0.24	0.26	ND	1.8	0.17	ND	ND	0.30
1,3,5-TNB	0.11	1**	ND	ND	ND	ND	ND	ND	ND	0.12	ND	ND
RDX	0.15	2	ND	ND	0.16[U]	2.3	0.74	3.4	0.23[U]	0.74	0.72	ND
1,3-DNB	0.13	1	ND	ND	ND	ND	ND	ND	ND	0.21	ND	ND
2,4,6-TNT	0.16	2**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetryl	0.16	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NB	0.16	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DNT	0.12	100*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-DNT	0.18	40 *	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-NT	0.31	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

continued ...						**TB-1**	**FB-1**	**TB-2**	**FB-2**
Sample date:			8/19/97	8/21/97	8/21/97	8/19/97	8/19/97	8/21/97	8/21/97
			G-31	**G-53**	**JAW-76**	8711	8712	8797	8798
BOUNDARY	**MDL**	**HA**	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
HMX	0.16	400	ND	0.16[U]	ND	ND	ND	ND	ND
1,3,5-TNB	0.11	1**	ND	ND	ND	ND	ND	ND	ND
RDX	0.15	2	ND	1.6	0.63	ND	ND	ND	ND
1,3-DNB	0.13	1	ND	ND	ND	ND	ND	ND	ND
2,4,6-TNT	0.16	2**	ND	ND	ND	ND	ND	ND	ND
Tetryl	0.16	NA	ND	ND	ND	ND	ND	ND	ND
NB	0.16	NA	ND	ND	ND	ND	ND	ND	ND
2,4-DNT	0.12	100*	ND	ND	ND	ND	ND	ND	ND
2,6-DNT	0.18	40 *	ND	ND	ND	ND	ND	ND	ND
2-NT	0.31	NA	ND	ND	ND	ND	ND	ND	ND

U = Not confirmed on secondary column.

Table 2. Summary Groundwater Monitoring Results for Explosives, by Well Field - FY97 Second Cycle

Nitroaromatics and Nitramines Analysis							TB-1
Sample date:			8/7/97	8/7/97	8/7/97	8/7/97	8/7/97
BRUSH			**BC97-1**	**BC97-2**	**BC97-3**	**BC97-4**	8570
CREEK	**MDL**	**HA**	Conc.	Conc.	Conc.	Conc.	Conc.
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
HMX	0.16	400	1.4	2.7	1.6	2.3	ND
1,3,5-TNB	0.11	1**	ND	ND	ND	ND	ND
RDX	0.15	2	2.8	10	3.1	3.1	ND
1,3-DNB	0.13	1	ND	ND	ND	ND	ND
2,4,6-TNT	0.16	2**	0.18	0.16	0.28	0.19	0.17
Tetryl	0.16	NA	ND	ND	ND	ND	ND
NB	0.16	NA	0.40	ND	ND	ND	ND
2,4-DNT	0.12	100*	ND	ND	ND	ND	ND
2,6-DNT	0.18	40 *	ND	ND	ND	ND	ND
2-NT	0.31	NA	ND	ND	ND	ND	ND

HMX is: Octahydro-1,3,5,7-tetrazocine
RDX is: Hexahydro-1,3,5-trinitro-1,3,5-triazine
TNB is: Trinitrobenzene
DNB is: Dinitrobenzene
NT is: Nitrotoluene
TNT is: Trinitrotoluene
NB is: Nitrobenzene
DNT is: Dinitrotoluene

Conc. is: concentration
ppb is: parts per billion
NA is: not applicable under current drinking water regulations and health advisories

MDL is: Method Detection Limit
ND is: Not Detected

HA is: Health Advisory

* DWEL is: Drinking Water Equivalent Level
** U.S. AEC is: Level of Concern, HA

Table 8. Volatile Concentrations Exceeding MCLs, HAs, RBCs, (and MDLs) - FY97 Second Cycle

Well Field Code ->			E	N		G					
Well ID ->			JAW-604	FB-1	JAW-6	JAW-29	JAW-30	JAW-31	JAW-610	JAW-611	JAW-612
Sample date			7/31/97	7/15/97	7/15/97	7/31/97	7/31/97	7/31/97	7/31/97	7/31/97	7/31/97
Dilution factor:	MCL	1									
	[RBC]	MDL									
Analytes	(ppb)	(ppb)	(ppb)								
Acetone	3700	9	13	23	ND	1100	1200	2600	24	750	130
Methylene chloride	[4.1]	6.4	7.3	ND	15	ND	* ND	ND	ND	8.5	6.9
Toluene	1000	1.7	ND	ND	ND	ND	ND	3	ND	ND	ND
Trichloroethene	5	3	ND	ND	8.0	ND	ND	ND	ND	ND	ND

E = Line 4A/4B
G = Line 9
J = Fire Training Pit
N = Explosive Disposal Area

(Table 8 cont'd)

Well Field Code ->			J						J	
Well ID ->			JAW-58	JAW-59	JAW-60	JAW-61	JAW-62	JAW-80		JAW-69
Sample date			7/23/97	7/23/97	7/24/97	7/24/97	7/24/97	7/24/97		7/23/97
Dilution factor:	MCL	1							100	
	[RBC]	MDL							MDL	
Analytes	(ppb)	(ppb)							(ppb)	
Acetone	3700	9	ND	ND	ND	ND	ND	ND	900	57000
Benzene	5	1	ND	ND	29	ND	ND	ND	100	ND
2-Butanone (MEK)	1900	10	ND	ND	ND	ND	ND	ND	1000	6300
Chloroform	100	2.5	ND	ND	6.9	ND	ND	ND	250	ND
1,1-Dichloroethane	[810]	2.5	14	4.8	110	ND	ND	ND	250	3400
1,1-Dichloroethene	7	3.2	790	140	440	21	ND	15	320	3300
1,2-Dichloroethane	5	2.5	ND	ND	29	ND	ND	ND	250	ND
cis-1,2-Dichloroethene	70	2.4	ND	ND	62	ND	ND	ND	240	19000
4-Methyl-2-pentanone (MIBK)	[2900]	12	ND	ND	ND	ND	ND	ND	1200	14000
Tetrachloroethene	5	1.9	8.9	5.4	3.2	36	ND	ND	190	ND
Toluene	1000	1.7	ND	ND	ND	ND	ND	ND	170	20000
1,1,1-Trichloroethane	200	2.5	1800	180	230	37	2.6	28	250	5500
1,1,2-Trichloroethane	5	2.8	10	ND	4.4	ND	ND	ND	280	ND
Trichloroethene	5	3	ND	ND	110	16	ND	ND	300	ND

Note: Some samples required dilution. All reporting limits and results are corrected for dilution.
(ppb) = parts per billion
MDL = Method detection limit

MCL = Maximum Contaminant Level
RBC = Risk Based Concentration, EPA Region III
* No MCL, HA, or RBC found

Table 9. Semivolatile Concentrations Exceeding MCLs, HAs, (and MDLs) - FY97 Second Cycle

	HA	MDL											MDL	
	[RBC]													
Well Field Code ->			E	N										J
Well ID ->			JAW-604	FB-1	G-29	JAW-4	JAW-5	JAW-6	JAW-64	JAW-614	EDA-1	EDA-3		JAW-69
Sample Date			7/31/97	7/15/97	7/15/97	7/16/97	7/15/97	7/15/97	7/15/97	7/16/97	7/16/97	7/16/97		7/23/97
Analytes	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
bis(2-Ethylhexyl)phthalate	[4.8]	2	3.8	4	3.6	16	3.4	3.7	60	3.6	2.7	2.2	40	ND
Benzoic Acid	[1500]	30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	600	54
2-Methylnaphthalene	NA	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	68
2-Methylphenol	[1800]	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	40	130
3/4-Methylphenol	NA	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	40	220
Naphthalene	*20	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	100
Phenol	*400	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	40	310

(Table 9 cont'd)

	HA	MDL															
	[RBC]																
Well Field Code ->			G			F				J							
Well ID ->			JAW-29	JAW-30	JAW-31	TB-1	JAW-606	JAW-607	JAW-608	FB-1	JAW-58	JAW-59	JAW-60	JAW-61	JAW-62	JAW-63	JAW-80
Sample Date			7/31/97	7/31/97	7/31/97	8/5/97	8/5/97	8/5/97	8/5/97	7/23/97	7/23/97	7/23/97	7/24/97	7/24/97	7/24/97	7/24/97	7/24/97
Analytes	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
bis(2-Ethylhexyl)phthalate	[4.8]	2	2.4	2.1	2.5	10	3	3	4.6	3.1	3.5	10	3.8	9.2	7.3	6.0	4.8

Note: Some samples required dilution. All reporting limits and results are corrected for dilution.

Note: Bis(2-ethylhexyl)phthalate is a constituent of vacuum pump oil, and is a common laboratory contaminant.

HA = Health Advisory * (in this case, life time)

RBC = Risk Based Concentration, EPA Region III

MDL = Method detection limit

E = Line 4A/4B

F = Line 5A/5B

G = Line 9

Table 4. Summary Groundwater Monitoring Results for Inorganics, by Well Field - FY97 Second Cycle

Inorganic Analysis Sample date: LINE-1	MDL (ppb)	MCL (ppb)	8/28/97 JAW-43 Conc. (ppb)	8/28/97 JAW-44 Conc. (ppb)	8/28/97 JAW-45 Conc. (ppb)	8/28/97 JAW-46 Conc. (ppb)	8/28/97 JAW-47 Conc. (ppb)	8/28/97 JAW 48 Conc. (ppb)	8/28/97 JAW-50 Conc. (ppb)	8/28/97 JAW-51 Conc. (ppb)	8/28/97 JAW-52 Conc. (ppb)
Silver	0.32	100***	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	0.76	50	ND	ND	ND	ND	ND	21	ND	ND	ND
Barium	0.33	2000	93	67	56	94	130	500	ND	ND	89
Cadmium	0.48	5	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	0.23	100	17	14	16	12	15	31	ND	ND	24
Lead	0.13	15*	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	1.2	50	ND	ND	ND	ND	ND	ND	ND	ND	15
Mercury	0.020	2	ND	ND	ND	ND	ND	ND	ND	ND	ND

continued... Sample date: LINE-1	MDL (ppb)	MCL (ppb)	8/28/97 JAW-601 Conc. (ppb)	8/28/97 JAW-602 Conc. (ppb)	8/28/97 JAW-603 Conc. (ppb)	TB-1 8/28/97 8894 Conc (ppb)	FB-1 8/28/97 8895 Conc (ppb)
Silver	0.32	100***	ND	ND	ND	ND	ND
Arsenic	0.76	50	ND	14	ND	ND	ND
Barium	0.33	2000	500	430	130	ND	ND
Cadmium	0.48	5	ND	ND	ND	ND	ND
Chromium	0.23	100	31	76	31	ND	ND
Lead	0.13	15*	ND	ND	ND	ND	ND
Selenium	1.2	50	ND	ND	ND	ND	ND
Mercury	0.020	2	ND	ND	ND	ND	ND

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Table 4. Summary Groundwater Monitoring Results for Inorganics, by Well Field - FY97 Second Cycle

Inorganic Analysis									TB-1	FB-1
Sample date:			8/6/97	8/6/97	8/6/97	8/6/97	8/6/97	8/6/97	8/6/97	8/6/97
			JAW-70	JAW-71	JAW-72	JAW-73	JAW-74	JAW 75	8544	8545
LINE-2	MDL	MCL	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc	Conc
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
Silver	0.32	100***	ND	ND	ND	ND	ND	0.57	ND	ND
Arsenic	0.76	50	ND	ND	ND	ND	ND	ND	ND	ND
Barium	0.33	2000	81	72	72	79	110	76	ND	ND
Cadmium	0.48	5	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	0.23	100	3.2	2.2	2.6	2.0	2.7	3.6	ND	ND
Lead	0.13	15*	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	1.2	50	ND	ND	ND	ND	6.4	3.0	ND	ND
Mercury	0.020	2	ND	ND	ND	0.028	0.040	ND	ND	0.20

Inorganic Analysis									TB-1	FB-1
Sample date:			8/7/97	8/7/97	8/7/97	8/7/97	8/7/97	8/7/97	8/7/97	8/8/97
			JAW-53	JAW-54	JAW-55	JAW-56	JAW-57	JAW 77	8570	8571
LINE-3	MDL	MCL	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc	Conc
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
Silver	0.32	100***	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	0.76	50	ND	ND	ND	ND	ND	ND	ND	ND
Barium	0.33	2000	110	93	95	59	96	50	ND	ND
Cadmium	0.48	5	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	0.23	100	2.7	6.3	6.7	1.7	4.2	1.4	ND	ND
Lead	0.13	15*	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	1.2	50	ND	1.9	ND	ND	ND	ND	1.2	ND
Mercury	0.020	2	0.025	ND	ND	ND	ND	ND	ND	0.020

Table 4. Summary Groundwater Monitoring Results for Inorganics, by Well Field - FY97 Second Cycle

Inorganic Analysis											TB-1	FB-1
Sample date:			8/14/97	8/14/97	8/14/97	8/14/97	8/14/97	8/14/97	8/14/97	8/14/97	8/14/97	8/14/97
			JAW-15	JAW-16	JAW-17	JAW-18	JAW-19	JAW 20	JAW-21	JAW 22	8655	8656
LINE-3a	MDL	MCL	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.		Conc	Conc
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
Silver	0.32	100***	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	0.76	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	0.33	2000	96	330	100	390	100	320	70	110	ND	ND
Cadmium	0.48	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	0.23	100	3.6	4.3	3.6	5.9	4.4	4.5	3.1	6.2	ND	ND
Lead	0.13	15*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	1.2	50	5.5	ND	ND	3.5	2.5	2.5	2.6	2.6	ND	ND
Mercury	0.020	2	ND	ND	0.025	0.021	0.021	ND	ND	ND	0.021	ND

Inorganic Analysis					TB-1	FB-1
Sample date:			7/31/97	7/31/97	7/31/97	7/31/97
LINES-4a & 4b			JAW-604	JAW-605	8476	8458
	MDL	MCL	Conc.	Conc.	Conc	Conc
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
Silver	0.32	100***	ND	ND	ND	ND
Arsenic	0.76	50	ND	ND	ND	ND
Barium	0.33	2000	83	130	ND	ND
Cadmium	0.48	5	ND	ND	ND	ND
Chromium	0.23	100	ND	6.7	ND	ND
Lead	0.13	15*	ND	ND	ND	ND
Selenium	1.2	50	ND	ND	ND	ND
Mercury	0.020	2	ND	ND	ND	ND

LT2

Table 4. Summary Groundwater Monitoring Results for Inorganics, by Well Field - FY97 Second Cycle

Inorganic Analysis							TB-1	FB-1
Sample date:			8/5/97	8/5/97	8/5/97	8/5/97	8/5/97	8/5/97
LINES-5a & 5b			JAW-606	JAW-607	JAW-608	JAW-609	8516	8517
	MDL	MCL	Conc.	Conc.	Conc.	Conc.	Conc	Conc
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
Silver	0.32	100***	ND	ND	ND	ND	ND	ND
Arsenic	0.76	50	0.95	ND	ND	ND	ND	ND
Barium	0.33	2000	110	170	76	460	ND	ND
Cadmium	0.48	5	ND	ND	ND	ND	ND	ND
Chromium	0.23	100	3.0	2.5	1.3	26	ND	ND
Lead	0.13	15*	ND	ND	ND	ND	ND	ND
Selenium	1.2	50	ND	2.0	ND	ND	ND	ND
Mercury	0.020	2	ND	ND	ND	ND	ND	ND

Inorganic Analysis									TB-1	FB-1
Sample date:			7/31/97	7/31/97	7/31/97	7/31/97	7/31/97	7/31/97	7/31/97	7/31/97
			JAW-29	JAW-30	JAW-31	JAW-610	JAW-611	JAW-612	8476	8477
LINE-9	MDL	MCL	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc	Conc
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
Silver	0.32	100***	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	0.76	50	ND	ND	ND	ND	ND	ND	ND	ND
Barium	0.33	2000	53	94	99	91	57	110	ND	ND
Cadmium	0.48	5	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	0.23	100	5.1	3.6	3.5	2.8	3.5	6.0	ND	ND
Lead	0.13	15*	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	1.2	50	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	0.020	2	ND	ND	ND	ND	ND	ND	ND	ND

Table 4. Summary Groundwater Monitoring Results for Inorganics, by Well Field - FY97 Second Cycle

Inorganic Analysis										TB-1	FB-1
Sample date:			7/22/97	7/22/97	7/22/97	7/22/97	7/22/97	7/22/97	7/22/97	7/22/97	7/22/97
NORTH			JAW-11	JAW-12	JAW-13	JAW-14	JAW-625	JAW-626	JAW-627	8280	8281
BURN PAD	MDL	MCL	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc	Conc
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
Silver	0.32	100***	ND	D	ND	ND	ND	ND	ND	ND	ND
Arsenic	0.76	50	ND	R	ND	ND	ND	ND	ND	ND	ND
Barium	0.33	2000	72	Y	88	87	68	270	230	ND	ND
Cadmium	0.48	5	ND		ND	ND	ND	ND	ND	ND	ND
Chromium	0.23	100	5.1	W	4.9	3.5	5.2	11	9.5	ND	ND
Lead	0.13	15*	ND	E	ND	ND	0.30	1.2	1.5	0.26	ND
Selenium	1.2	50	1.7	L	ND	ND	1.3	ND	ND	ND	ND
Mercury	0.020	2	0.032	L	ND	0.064	0.069	0.047	0.028	ND	ND

Inorganic Analysis								TB-1	FB-1
Sample date:			7/29/97	7/29/97	7/29/97	7/29/97	7/29/97	7/29/97	7/29/97
WEST			G-30	JAW-23	JAW-24	JAW-25	JAW-68	8420	8421
BURN PAD	MDL	MCL	Conc.	Conc.	Conc.	Conc.	Conc.	Conc	Conc
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
Silver	0.32	100***	ND	ND	ND	ND	ND	ND	ND
Arsenic	0.76	50	ND	ND	45	ND	ND	ND	1.0
Barium	0.33	2000	57	2200	1500	38	57	ND	ND
Cadmium	0.48	5	ND	67	51	19	ND	ND	ND
Chromium	0.23	100	9.2	ND	ND	ND	5.6	ND	ND
Lead	0.13	15*	ND	76	54	20	ND	ND	ND
Selenium	1.2	50	ND	ND	31	ND	ND	ND	ND
Mercury	0.020	2	ND	0.098	ND	0.047	ND	ND	ND

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Table 4. Summary Groundwater Monitoring Results for Inorganics, by Well Field - FY97 Second Cycle

Inorganic Analysis											TB-1	FB-1
Sample date:			7/23/97	7/23/97	7/24/97	7/24/97	7/24/97	7/24/97	7/23/97	7/24/97	7/23/97	7/23/97
FIRE TRAINING			JAW-58	JAW-59	JAW-60	JAW-61	JAW-62	JAW-63	JAW-69	JAW 80	8339	8340
PIT	MDL	MCL	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc	Conc
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
Silver	0.32	100***	ND	ND	ND	ND	ND	ND	ND	4.7	ND	ND
Arsenic	0.76	50	0.93	ND	6.8	3.9	ND	ND	5.3	ND	ND	ND
Barium	0.33	2000	86	100	210	65	62	73	670	180	ND	ND
Cadmium	0.48	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	0.23	100	3.8	4.9	5.6	1.9	2.7	4.2	38	3.9	ND	ND
Lead	0.13	15*	ND	ND	ND	ND	ND	ND	0.43	5.3	ND	ND
Selenium	1.2	50	1.9	ND	ND	ND	2.6	ND	5.0	ND	ND	1.2
Mercury	0.020	2	ND	ND	0.027	0.048	ND	ND	0.029	ND	0.022	ND

continued...			TB-2	FB-2
Sample date:			7/24/97	7/24/97
FIRE TRAINING			8362	8363
PIT	MDL	MCL	Conc	Conc
	(ppb)	(ppb)	(ppb)	(ppb)
Silver	0.32	100***	ND	ND
Arsenic	0.76	50	ND	ND
Barium	0.33	2000	ND	ND
Cadmium	0.48	5	ND	ND
Chromium	0.23	100	5.1	1.4
Lead	0.13	15*	ND	ND
Selenium	1.2	50	ND	ND
Mercury	0.020	2	ND	ND

Table 4. Summary Groundwater Monitoring Results for Inorganics, by Well Field - FY97 Second Cycle

Inorganic Analysis						TB-1	FB-1
Sample date:			7/28/97	7/28/97	7/28/97	7/28/97	7/28/97
PESTICIDE			JAW-615	JAW-616	JAW-617	8394	8395
PIT	MDL	MCL	Conc.	Conc.	Conc.	Conc	Conc
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
Silver	0.32	100***	ND	ND	1.1	ND	ND
Arsenic	0.76	50	0.79	0.88	ND	0.81	ND
Barium	0.33	2000	100	120	110	ND	ND
Cadmium	0.48	5	ND	ND	ND	ND	ND
Chromium	0.23	100	ND	6.0	5.2	ND	ND
Lead	0.13	15*	ND	ND	ND	ND	ND
Selenium	1.2	50	ND	1.9	4.1	ND	ND
Mercury	0.020	2	ND	ND	0.17	ND	ND

Inorganic Analysis						TB-1	FB-1
Sample date:			7/28/97	7/28/97	7/28/97	7/28/97	7/28/97
CONSTRUCTION			JAW-08	JAW-09	JAW-10	8394	8388
DEBRIS	MDL	MCL	Conc.	Conc.	Conc.	Conc	Conc
LANDFILL	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
Silver	0.32	100***	ND	ND	ND	ND	ND
Arsenic	0.76	50	ND	ND	ND	0.81	ND
Barium	0.33	2000	94	84	87	ND	ND
Cadmium	0.48	5	ND	ND	ND	ND	ND
Chromium	0.23	100	12	14	19	ND	ND
Lead	0.13	15*	ND	ND	ND	ND	ND
Selenium	1.2	50	2.6	ND	ND	ND	ND
Mercury	0.020	2	ND	ND	ND	ND	ND

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Table 4. Summary Groundwater Monitoring Results for Inorganics, by Well Field - FY97 Second Cycle

Inorganic Analysis											TB-1	FB-1
Sample date:			8/12/97	8/12/97	8/12/97	8/12/97	8/12/97	8/12/97	8/12/97	8/12/97	8/12/97	8/12/97
			JAW-32	JAW-33	JAW-34	JAW-35	JAW-36	JAW-37	JAW-618	JAW-619	8616	8617
FIRING SITE	MDL (ppb)	MCL (ppb)	Conc. (ppb)	Conc. (ppb)	Conc. (ppb)	Conc. (ppb)	Conc. (ppb)	Conc. (ppb)	Conc. (ppb)	Conc. (ppb)	Conc. (ppb)	Conc. (ppb)
Silver	0.32	100***	ND	D	ND	ND	ND	D	ND	ND	ND	ND
Arsenic	0.76	50	ND	R	ND	ND	ND	R	ND	1.4	ND	ND
Barium	0.33	2000	70	Y	37	110	50	Y	330	160	ND	ND
Cadmium	0.48	5	ND		ND	ND	ND		ND	ND	ND	ND
Chromium	0.23	100	9.7	W	32	3.2	10	W	46	29	ND	ND
Lead	0.13	15*	ND	E	ND	ND	ND	E	ND	ND	ND	ND
Selenium	1.2	50	ND	L	ND	ND	ND	L	ND	ND	ND	ND
Mercury	0.020	2	ND	L	ND	ND	ND	L	ND	ND	ND	ND

Inorganic Analysis											
Sample date:			7/16/97	7/15/97	7/16/97	7/16/97	7/15/97	7/16/97	7/15/97	7/15/97	7/15/97
EXPLOSIVE			EDA-01	EDA-02	EDA-03	EDA-04	G-29	JAW-04	JAW-05	JAW-06	JAW-07
DISPOSAL AREA	MDL (ppb)	MCL (ppb)	Conc. (ppb)	Conc. (ppb)	Conc. (ppb)	Conc. (ppb)	Conc. (ppb)	Conc. (ppb)	Conc. (ppb)	Conc. (ppb)	Conc. (ppb)
Silver	0.32	100***	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	0.76	50	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	0.33	2000	68	100	98	60	72	64	84	140	79
Cadmium	0.48	5	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	0.23	100	9.8	16	8.9	12	7.2	8.2	9.4	12	11
Lead	0.13	15*	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	1.2	50	ND	ND	ND	1.5	ND	2.5	ND	ND	1.4
Mercury	0.020	2	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 4. Summary Groundwater Monitoring Results for Inorganics, by Well Field - FY97 Second Cycle

continued...					TB-1	FB-1	TB-2	FB-2
Sample date:			7/15/97	7/16/97	7/15/97	7/15/97	7/16/97	7/16/97
EXPLOSIVE			**JAW-64**	**JAW-614**	8197	8198	8219	8220
DISPOSAL	**MDL**	**MCL**	Conc.	Conc.	Conc	Conc	Conc	Conc
AREA	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
Silver	0.32	100***	ND	ND	ND	ND	ND	ND
Arsenic	0.76	50	ND	ND	ND	ND	ND	ND
Barium	0.33	2000	79	120	ND	ND	ND	ND
Cadmium	0.48	5	ND	ND	ND	ND	ND	ND
Chromium	0.23	100	8.5	8.0	ND	ND	ND	ND
Lead	0.13	15*	ND	ND	ND	ND	ND	ND
Selenium	1.2	50	ND	1.3	ND	ND	ND	ND
Mercury	0.020	2	ND	ND	ND	0.022	ND	0.021

Inorganic Analysis										TB-1	FB-1
Sample date:			8/26/97	8/26/97	8/26/97	8/26/97	8/26/97	8/26/97	8/26/97	8/26/97	8/26/97
DEMOLITION			**DA-01**	**DA-02**	**G-09**	**G-10**	**G-11**	**JAW-01**	**JAW-02**	8857	8858
AREA	**MDL**	**MCL**	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc	Conc
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
Silver	0.32	100***	ND	ND	ND	ND	D	ND	ND	ND	0.43
Arsenic	0.76	50	ND	ND	ND	ND	R	ND	ND	ND	ND
Barium	0.33	2000	98	94	180	59	Y	150	170	ND	ND
Cadmium	0.48	5	ND	ND	ND	ND		ND	ND	ND	ND
Chromium	0.23	100	37	28	22	22	W	31	40	1.5	ND
Lead	0.13	15*	ND	ND	ND	ND	E	ND	ND	ND	ND
Selenium	1.2	50	ND	1.5	3.4	ND	L	1.2	ND	ND	ND
Mercury	0.020	2	ND	ND	ND	ND	L	ND	ND	0.062	ND

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Table 4. Summary Groundwater Monitoring Results for Inorganics, by Well Field - FY97 Second Cycle

Inorganic Analysis						TB-2	FB-2
Sample date:			7/17/97	7/17/97	7/17/97	7/17/97	7/17/97
BOX CHIPPER			JAW-620	JAW-621	JAW-622	8243	8244
DISPOSAL	MDL	MCL	Conc.	Conc.	Conc.	Conc	Conc
PIT	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
Silver	0.32	100***	ND	ND	ND	ND	ND
Arsenic	0.76	50	ND	ND	ND	ND	ND
Barium	0.33	2000	76	78	69	ND	ND
Cadmium	0.48	5	ND	ND	ND	ND	ND
Chromium	0.23	100	3.9	2.4	2.9	ND	ND
Lead	0.13	15*	0.30	ND	ND	ND	ND
Selenium	1.2	50	4.3	2.4	7.8	ND	ND
Mercury	0.020	2	0.078	0.069	0.073	0.073	0.073

Inorganic Analysis					TB-1	FB-1
Sample date:			8/5/97	8/5/97	8/5/97	8/5/97
BLDG 600-86			JAW-623	JAW-624	8516	8524
SEPTIC	MDL	MCL	Conc.	Conc.	Conc	Conc
SYSTEM	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
Silver	0.32	100***	ND	ND	ND	ND
Arsenic	0.76	50	ND	ND	ND	ND
Barium	0.33	2000	120	86	ND	ND
Cadmium	0.48	5	ND	ND	ND	ND
Chromium	0.23	100	16	7.8	ND	0.86
Lead	0.13	15*	ND	ND	ND	ND
Selenium	1.2	50	ND	ND	ND	ND
Mercury	0.020	2	0.098	0.038	ND	ND

Table 4. Summary Groundwater Monitoring Results for Inorganics, by Well Field - FY97 Second Cycle

Inorganic Analysis Sample date: BOUNDARY	MDL (ppb)	MCL (ppb)	8/19/97 G-03 Conc. (ppb)	8/19/97 G-12 Conc. (ppb)	8/19/97 G-21 Conc. (ppb)	8/21/97 G-22 Conc. (ppb)	8/21/97 G-23 Conc. (ppb)	8/21/97 G-24 Conc. (ppb)	8/19/97 G-25 Conc. (ppb)	8/21/97 G-26 Conc. (ppb)	8/21/97 G-27 Conc. (ppb)
Silver	0.32	100***	ND	ND	5.1	ND	ND	ND	ND	ND	ND
Arsenic	0.76	50	ND	ND	ND	ND	ND	ND	19	29	ND
Barium	0.33	2000	300	96	110	110	91	80	27	360	120
Cadmium	0.48	5	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	0.23	100	31	27	26	14	21	23	41	28	27
Lead	0.13	15*	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	1.2	50	ND	ND	ND	ND	2.1	ND	ND	ND	ND
Mercury	0.020	2	ND	ND	0.022	ND	ND	ND	0.074	ND	0.028

continued... Sample date: BOUNDARY	MDL (ppb)	MCL (ppb)	8/19/97 G-28 Conc. (ppb)	8/19/97 G-31 Conc. (ppb)	8/21/97 G-53 Conc. (ppb)	8/21/97 JAW-76 Conc. (ppb)	TB-1 8/19/97 8711 Conc (ppb)	FB-1 8/19/97 8712 Conc (ppb)	TB-2 8/21/97 8797 Conc (ppb)	FB-2 8/21/97 8798 Conc (ppb)
Silver	0.32	100***	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	0.76	50	ND	ND	ND	ND	ND	ND	ND	ND
Barium	0.33	2000	74	140	210	43	ND	ND	ND	ND
Cadmium	0.48	5	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	0.23	100	24	33	23	28	ND	ND	0.67	ND
Lead	0.13	15*	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	1.2	50	ND	3.1	ND	ND	ND	ND	ND	ND
Mercury	0.020	2	ND	ND	0.043	ND	ND	ND	ND	ND

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Table 4. Summary Groundwater Monitoring Results for Inorganics, by Well Field - FY97 Second Cycle

ND = not detected at or above MDL

MDL = Method Detection Limit

MCL = Maximum Contaminant Level

SMCL = Secondary Maximum Contaminant Levels

HA = Health Advisory

ppb = parts per billion

Note: all samples were filtered in the field

* Lead (at tap) Action Level is 15 ppb

** Chromium (total) MCL is 100 ppb

*** Silver SMCL, Nov. 1995 & Lifetime HA

APPENDIX J
ANALYTICAL DATA SUMMARY

J-3 JAYCOR (1996) Data

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WELL NO.	DATE	EXPLOSIVES (ug/L)								
		1,3,5-trinitrobenzene	1,3-dinitrobenzene	2,4,6-trinitrotoluene	2,4-dinitrotoluene	2,6-dinitrotoluene	HMX	Nitrobenzene	RDX	TOTAL
DA- 1	04-26-95	ND	ND	ND	ND	ND	5.03	ND	ND	5.03
DA- 2	05-03-95	ND	ND	ND	ND	ND	ND	ND	13.7	13.7
DM- 3	07-25-92	ND	ND	ND	ND	ND	ND	ND	ND	0
DM- 4	07-27-92	ND	ND	ND	ND	ND	ND	ND	ND	0
DM- 6	07-27-92	ND	ND	ND	ND	ND	ND	ND	ND	0
DM- 8	07-27-92	ND	ND	ND	ND	ND	ND	ND	ND	0
DM- 9	07-27-92	ND	ND	ND	ND	ND	ND	ND	ND	0
DM- 10	07-27-92	ND	ND	ND	ND	ND	ND	ND	ND	0
EDA- 1	04-19-93	ND	ND	ND	ND	ND	ND	ND	ND	0
EDA- 2	04-19-93	ND	ND	ND	ND	ND	9.35	ND	62.9	72.25
EDA- 3	04-16-93	ND	ND	ND	ND	ND	ND	ND	4.71	4.71
EDA- 4	04-16-93	ND	ND	ND	ND	ND	51.2	ND	7.9	59.1
G- 1	07-29-92	ND	ND	ND	ND	ND	ND	ND	ND	0
G- 2	07-27-92	NA	NA	NA	ND	ND	NA	ND	NA	0
G- 3	08-05-92	ND	ND	ND	ND	ND	ND	ND	ND	0
G- 4	04-19-93	ND	ND	ND	ND	ND	ND	ND	ND	0
G- 5	04-27-93	ND	ND	ND	ND	ND	ND	ND	ND	0
G- 6	04-19-93	ND	ND	ND	ND	ND	ND	ND	ND	0
G- 7	04-19-93	ND	ND	ND	ND	ND	ND	ND	ND	0
G- 8	08-07-92	ND	ND	ND	ND	ND	ND	ND	ND	0
G- 9	05-05-93	ND	ND	ND	ND	ND	ND	ND	1.44	1.44
G- 10	05-03-95	ND	ND	ND	ND	ND	ND	ND	11.2	11.2
G- 12	07-27-92	ND	ND	ND	ND	ND	ND	ND	ND	0
G- 14	10-07-92	ND	ND	ND	ND	ND	ND	ND	ND	0
G- 15	10-92	ND	ND	0.751	ND	ND	230	ND	970	1200.8
G- 16	07-26-96	ND	ND	ND	ND	ND	ND	ND	ND	0
G- 17	10-08-92	ND	ND	ND	ND	ND	ND	ND	4.58	4.58
G- 18	10-08-92	190	110	2200	95	75	1100	ND	8600	12370
G- 19	10-08-92	63	110	2000	140	96	980	ND	8400	11789
G- 20	10-07-92	2600	72	470	96	ND	1700	170	13000	18108
G- 21	08-11-92	ND	ND	ND	ND	ND	ND	ND	ND	0
G- 22	07-29-92	ND	ND	ND	0.255	ND	ND	ND	ND	0.255
G- 23	08-11-92	ND	ND	ND	ND	ND	ND	ND	ND	0
G- 25	08-07-92	ND	ND	ND	7.12	ND	ND	ND	ND	7.12
G- 26	08-11-92	ND	ND	ND	1.35	ND	ND	ND	ND	1.35
G- 27	08-05-92	ND	ND	ND	ND	ND	ND	ND	ND	0
G- 28	07-24-92	ND	ND	ND	ND	ND	ND	ND	ND	0
G- 29	04-19-93	ND	ND	ND	ND	ND	ND	ND	ND	0
G- 30	04-19-93	ND	ND	ND	ND	ND	3.29	ND	9.89	13.18
G- 31	08-11-92	ND	ND	ND	ND	ND	ND	ND	ND	0
G- 41	10-08-92	ND	ND	ND	ND	ND	2.56	ND	12.5	15.06
G- 42	10-13-92	ND	ND	ND	ND	ND	ND	ND	ND	0
G- 43	10-09-92	ND	ND	ND	ND	ND	ND	ND	ND	0
G- 44	10-11-92	ND	ND	ND	ND	ND	ND	ND	ND	0
G- 45	10-09-92	ND	ND	ND	ND	ND	ND	ND	ND	0
G- 46	10-13-92	ND	ND	ND	ND	ND	ND	ND	ND	0
G- 47	10-09-92	ND	ND	ND	ND	ND	ND	ND	1.62	1.62
G- 48	10-09-92	ND	ND	ND	ND	ND	ND	ND	ND	0

WELL NO.	DATE	EXPLOSIVES (ug/L)								
		1,3,5-trinitrobenzene	1,3-dinitrobenzene	2,4,6-trinitrotoluene	2,4-dinitrotoluene	2,6-dinitrotoluene	HMX	Nitrobenzene	RDX	TOTAL
G- 49	07-23-92	ND	ND	ND	ND	ND	3.23	ND	12.4	15.63
G- 51	10-07-92	ND	ND	ND	ND	ND	ND	ND	ND	0
G- 52	07-24-92	ND	ND	ND	ND	ND	ND	ND	ND	0
G- 53	07-23-92	ND	ND	ND	ND	ND	ND	ND	ND	0
G- 56	10-11-92	ND	ND	ND	ND	ND	ND	ND	45.6	45.6
G- 57	10-11-92	ND	ND	ND	ND	0.313	10.6	ND	470	480.91
G- 58	10-11-92	ND	1.05	ND	ND	5.03	109	1.1	1500	1616.2
GZ- 1	10-07-92	ND	ND	ND	ND	ND	ND	ND	ND	0
GZ- 2	10-08-92	ND	ND	ND	ND	ND	ND	ND	ND	0
GZ- 3	10-06-92	ND	ND	ND	ND	ND	ND	ND	ND	0
GZ- 6	05-02-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 1	04-26-95	ND	ND	ND	ND	ND	ND	ND	5.64	5.64
JAW- 2	05-03-95	ND	ND	ND	ND	ND	2.02	ND	ND	2.02
JAW- 4	05-14-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 5	05-13-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 6	05-13-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 7	05-13-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 8	05-19-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 9	05-19-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 10	05-19-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 11	04-07-95	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 12	04-08-95	NA	NA	NA	NA	NA	NA	NA	NA	0
JAW- 13	05-05-95	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 14	04-06-95	1.05	ND	ND	ND	ND	ND	ND	2	3.05
JAW- 15	05-14-93	ND	ND	ND	ND	ND	2.11	ND	39.7	41.81
JAW- 16	05-19-93	ND	ND	ND	ND	ND	ND	ND	1.64	1.64
JAW- 17	05-14-93	ND	ND	ND	ND	ND	3.31	ND	18.7	22.01
JAW- 18	05-14-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 19	05-14-93	ND	ND	ND	ND	ND	ND	ND	3.09	3.09
JAW- 20	05-14-93	ND	ND	ND	ND	ND	ND	ND	22.3	22.3
JAW- 21	05-14-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 22	05-14-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 23	05-05-95	2.6	ND	2.17	0.474	ND	11.2	ND	61.4	77.844
JAW- 24	05-05-95	ND	ND	ND	ND	ND	2.14	ND	ND	2.14
JAW- 25	05-04-95	ND	ND	ND	ND	ND	15.5	ND	26.8	42.3
JAW- 26	05-14-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 27	05-14-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 28	05-14-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 29	05-19-95	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 30	05-17-95	ND	ND	ND	38	11	ND	ND	ND	49
JAW- 31	05-19-95	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 32	05-25-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 33	05-25-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 34	05-25-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 38	05-12-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 39	05-12-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 40	05-12-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 41	05-19-93	ND	ND	ND	ND	ND	ND	ND	ND	0

WELL NO.	DATE	EXPLOSIVES (ug/L)								
		1,3,5-trinitrobenzene	1,3-dinitrobenzene	2,4,6-trinitrotoluene	2,4-dinitrotoluene	2,6-dinitrotoluene	HMX	Nitrobenzene	RDX	TOTAL
JAW- 42	05-14-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 43	05-19-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 44	05-12-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 45	05-12-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 46	05-12-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 47	05-14-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 48	05-14-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 50	05-14-93	ND	ND	ND	ND	ND	1.49	ND	37.4	38.89
JAW- 51	05-14-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 52	05-14-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 53	05-19-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 54	05-19-93	ND	ND	ND	ND	ND	190	20.6	2100	2310.6
JAW- 55	05-19-93	ND	ND	ND	ND	ND	7.97	ND	6.89	14.86
JAW- 56	05-19-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 57	05-19-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 58	04-30-93	NA	NA	NA	ND	ND	NA	ND	NA	0
JAW- 59	04-30-93	NA	NA	NA	ND	ND	NA	ND	NA	0
JAW- 60	04-30-93	NA	NA	NA	ND	ND	NA	ND	NA	0
JAW- 61	04-30-93	NA	NA	NA	ND	ND	NA	ND	NA	0
JAW- 62	04-30-93	NA	NA	NA	ND	ND	NA	ND	NA	0
JAW- 63	04-30-93	NA	NA	NA	ND	ND	NA	ND	NA	0
JAW- 65	05-14-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 66	05-14-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 67	05-14-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 68	05-04-95	ND	ND	ND	ND	ND	53.9	ND	ND	53.9
JAW- 69	04-30-93	NA	NA	NA	ND	ND	NA	ND	NA	0
JAW- 70	05-12-93	ND	ND	ND	0.518	ND	230	4.33	760	994.85
JAW- 71	05-12-93	ND	ND	ND	ND	ND	10.8	ND	41.8	52.6
JAW- 72	05-12-93	ND	ND	ND	3.96	ND	140	20.8	1600	1764.8
JAW- 73	05-14-93	ND	ND	ND	ND	ND	8.68	ND	190	198.68
JAW- 74	05-12-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 75	05-19-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 76	05-11-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 77	05-19-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 78	05-14-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 79	05-14-93	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 80	05-14-93	NA	NA	NA	ND	ND	NA	ND	NA	0
JAW- 601	06-02-95	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 602	05-19-95	ND	ND	ND	ND	0.0829	ND	3.14	ND	3.2229
JAW- 603	06-03-95	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 604	05-17-95	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 605	05-16-95	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 606	05-05-95	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 607	05-04-95	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 608	05-04-95	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 609	05-09-95	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 610	05-18-95	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 611	05-17-95	ND	ND	ND	ND	ND	ND	ND	ND	0

WELL NO.	DATE	EXPLOSIVES (ug/L)								
		1,3,5-trinitrobenzene	1,3-dinitrobenzene	2,4,6-trinitrotoluene	2,4-dinitrotoluene	2,6-dinitrotoluene	HMX	Nitrobenzene	RDX	TOTAL
JAW- 612	05-18-95	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 615	05-09-95	NA	NA	NA	NA	NA	NA	NA	NA	0
JAW- 618	05-09-95	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 619	05-18-95	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 620	05-07-95	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 621	05-07-95	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 622	05-07-95	ND	ND	ND	ND	ND	ND	ND	ND	0
JAW- 625	05-08-95	ND	ND	ND	ND	ND	8.31	ND	4.47	12.78
JAW- 626	05-08-95	ND	ND	ND	ND	ND	11.2	ND	3.55	14.75
JAW- 627	05-08-95	ND	ND	ND	ND	ND	1.71	ND	5.26	6.97
SL- 81	04-27-93	ND	ND	ND	ND	ND	3.41	ND	ND	3.41
SL- 91	04-27-93	ND	ND	ND	ND	ND	ND	ND	ND	0
T- 1	05-02-95	ND	ND	ND	ND	ND	ND	ND	ND	0
T- 6	05-02-95	ND	ND	ND	ND	ND	ND	ND	ND	0
T- 25	08-12-93	ND	ND	ND	ND	ND	ND	ND	ND	0
T- 28	08-12-93	ND	ND	ND	ND	ND	ND	ND	ND	0

B = ANALYTE FOUND IN METHOD BLANK

NA = NOT ANALYZED

ND = NOT DETECTED

APPENDIX K
FIELD LABORATORY ANALYTICAL DATA

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LABORATORY ANALYTICAL REPORT FOR ORGANICS

VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/4/97
Date received : 6/5/97
Date analyzed : 6/5,6,7/97
Date reported : 6/7/97
Report # : 10D007.RPT
Lab. ID # : 10D007

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : mg/Kg
Matrix : Soil

Field ID #			H11F4030113	H11F4040115	H11F4050123	H11F4060133	H11F6010100	H11F6020104	H11DUP0801
Lab ID #			10D007-02	10D007-03	10D007-04	10D007-05	10D007-06	10D007-07	10D007-09
Dilution Factor			100	100	2	1	1	1	1 / 400*
Compound		RL	83.1 %SOLID	81.3 %SOLID	82.3 %SOLID	87.3 %SOLID	80.4 %SOLID	74.5 %SOLID	82.5 %SOLID
Benzene		0.002	ND	ND	ND	ND	ND	ND	ND
Bromobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane		0.005	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane		0.002	ND	ND	ND	ND	ND	ND	ND
Bromoform		0.002	ND	ND	ND	ND	ND	ND	ND
Bromomethane		0.002	ND	ND	ND	ND	ND	ND	ND
n-Butyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
sec-Butyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
tert-Butyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride		0.001	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene		0.002	ND	ND	ND	ND	ND	ND	ND
Chloroethane		0.002	ND	ND	ND	ND	ND	ND	ND
Chloroform		0.002	ND	ND	ND	ND	ND	ND	ND
Chloromethane		0.002	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene		0.005	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene		0.005	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane		0.002	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane		0.005	ND	ND	ND	ND	ND	ND	ND
Dibromomethane		0.005	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane		0.001	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane		0.002	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane		0.002	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene		0.001	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane		0.002	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene		0.005	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene		0.002	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene		0.002	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene		0.001	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene		0.005	ND	ND	ND	ND	ND	ND	ND
Isopropyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
4-Isopropyl toluene		0.005	ND	ND	ND	ND	ND	ND	ND
Methylene chloride		0.005	ND	ND	ND	ND	ND	ND	ND
Naphthalene		0.005	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene		0.005	ND	ND	ND	ND	ND	ND	ND
Styrene		0.002	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane		0.005	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane		0.003	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
Toluene		0.002	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane		0.001	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane		0.001	ND	ND	ND	ND	ND	ND	ND
Trichloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane		0.001	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride		0.003	ND	ND	ND	ND	ND	ND	ND
total-Xylenes		0.005	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichlorotrifluoroethane		0.01	910	2000	0.091 B	0.79	0.73	0.11	3400*
1,2-Dichlorotrifluoroethane		0.01	ND	ND	ND	ND	ND	ND	ND
SURROGATE	AMOUNT	ACP %	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	%Recovery
Dibromofluoromethane	50	80%-120	113%	110%	115%	114%	120%	118%	117% / *113%
Toluene-d8	50	85%-110	107%	106%	107%	107%	102%	106%	105% / *107%
4-Bromofluorobenzene	50	80%-120	98%	98%	102%	98%	89%	96%	95% / *104%

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

JUL 23 1997
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LABORATORY ANALYTICAL REPORT FOR ORGANICS
VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/4/97
Date received : 6/4/97
Date analyzed : 6/5,6,7/97
Date reported : 6/7/97
Report # : 10D005.RPT
Lab. ID # : 10D005

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : mg/Kg
Matrix : Soil

Field ID #			H11DUP0301	H11B4010100				
Lab ID #			10D007-10	10D007-11				
Dilution Factor			1	1				
Compound	RL		75 %SOLID	78.8 %SOLID				
Benzene	0.002		ND	ND				
Bromobenzene	0.005		ND	ND				
Bromochloromethane	0.005		ND	ND				
Bromodichloromethane	0.002		ND	ND				
Bromoform	0.002		ND	ND				
Bromomethane	0.002		ND	ND				
n-Butyl benzene	0.005		ND	ND				
sec-Butyl benzene	0.005		ND	ND				
tert-Butyl benzene	0.005		ND	ND				
Carbon tetrachloride	0.001		ND	ND				
Chlorobenzene	0.002		ND	ND				
Chloroethane	0.002		ND	ND				
Chloroform	0.002		ND	ND				
Chloromethane	0.002		ND	ND				
2-Chlorotoluene	0.005		ND	ND				
4-Chlorotoluene	0.005		ND	ND				
1,2-Dibromo-3-chloropropane	0.005		ND	ND				
Dibromochloromethane	0.002		ND	ND				
1,2-Dibromoethane	0.005		ND	ND				
Dibromomethane	0.005		ND	ND				
1,2-Dichlorobenzene	0.005		ND	ND				
1,3-Dichlorobenzene	0.005		ND	ND				
1,4-Dichlorobenzene	0.005		ND	ND				
Dichlorodifluoromethane	0.001		ND	ND				
1,1-Dichloroethane	0.002		ND	ND				
1,2-Dichloroethane	0.002		ND	ND				
1,1-Dichloroethene	0.002		ND	ND				
cis-1,2-Dichloroethene	0.002		ND	ND				
trans-1,2-Dichloroethene	0.001		ND	ND				
1,2-Dichloroprepane	0.002		ND	ND				
1,3-Dichloropropane	0.005		ND	ND				
2,2-Dichloropropane	0.005		ND	ND				
1,1-Dichloropropene	0.005		ND	ND				
cis-1,3-Dichloropropene	0.002		ND	ND				
trans-1,3-Dichloropropene	0.002		ND	ND				
Ethyl benzene	0.001		ND	ND				
Hexachlorobutadiene	0.005		ND	ND				
Isopropyl benzene	0.005		ND	ND				
4-Isopropyl toluene	0.005		ND	ND				
Methylene chloride	0.005		ND	ND				
Naphthalene	0.005		ND	ND				
n-Propylbenzene	0.005		ND	ND				
Styrene	0.002		ND	ND				
1,1,1,2-Tetrachloroethane	0.005		ND	ND				
1,1,2,2-Tetrachloroethane	0.003		ND	ND				
Tetrachloroethene	0.002		ND	ND				
Toluene	0.002		ND	ND				
1,2,3-Trichlorobenzene	0.005		ND	ND				
1,2,4-Trichlorobenzene	0.005		ND	ND				
1,1,1-Trichloroethane	0.001		ND	ND				
1,1,2-Trichloroethane	0.001		ND	ND				
Trichloroethene	0.002		ND	ND				
Trichlorofluoromethane	0.001		ND	ND				
1,2,3-Trichloropropane	0.005		ND	ND				
1,2,4-Trimethyl benzene	0.005		ND	ND				
1,3,5-Trimethyl benzene	0.005		ND	ND				
Vinyl chloride	0.003		ND	ND				
total-Xylenes	0.005		ND	ND				
1,1,2-Trichlorotrifluoroethane	0.01		0.16	2.3				
1,2-Dichlorotrifluoroethane	0.01		ND	ND				
SURROGATE	AMOUNT	ACP %	%Recovery	%Recovery				
Dibromofluoromethane	50	80%-120	118%	110%				
Toluene-d8	50	85%-110	107%	107%				
4-Bromofluorobenzene	50	80%-120	96%	98%				

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

JUL 23 1997
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LABORATORY ANALYTICAL REPORT FOR ORGANICS

VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/4/97
Date received : 6/4/97
Date analyzed : 6/9/97
Date reported : 6/9/97
Report # : 10D005.RPT
Lab. ID # : 10D005

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : ug/l
Matrix : Water

Field ID #			H11F4010406	H11DUP0104				
Lab ID #			10D007-01	10D007-08				
Dilution Factor			1000	1000				
Compound		RL						
Benzene		1	ND	ND				
Bromobenzene		1	ND	ND				
Bromochloromethane		1	ND	ND				
Bromodichloromethane		1	ND	ND				
Bromoform		2	ND	ND				
Bromomethane		1	ND	ND				
n-Butyl benzene		1	ND	ND				
sec-Butyl benzene		1	ND	ND				
tert-Butyl benzene		1	ND	ND				
Carbon tetrachloride		1	ND	ND				
Chlorobenzene		1	ND	ND				
Chloroethane		1	ND	ND				
Chloroform		1	ND	ND				
Chloromethane		2	ND	ND				
2-Chlorotoluene		1	ND	ND				
4-Chlorotoluene		1	ND	ND				
1,2-Dibromo-3-chloropropane		5	ND	ND				
Dibromochloromethane		1	ND	ND				
1,2-Dibromoethane		2	ND	ND				
Dibromomethane		1	ND	ND				
1,2-Dichlorobenzene		1	ND	ND				
1,3-Dichlorobenzene		1	ND	ND				
1,4-Dichlorobenzene		1	ND	ND				
Dichlorodifluoromethane		1	ND	ND				
1,1-Dichloroethane		1	ND	ND				
1,2-Dichloroethane		1	ND	ND				
1,1-Dichloroethene		1	ND	ND				
cis-1,2-Dichloroethene		1	ND	ND				
trans-1,2-Dichloroethene		1	ND	ND				
1,2-Dichloropropane		1	ND	ND				
1,3-Dichloropropane		1	ND	ND				
2,2-Dichloropropane		1	ND	ND				
1,1-Dichloropropene		1	ND	ND				
cis-1,3-Dichloropropene		1	ND	ND				
trans-1,3-Dichloropropene		1	ND	ND				
Ethyl benzene		1	ND	ND				
Hexachlorobutadiene		1	ND	ND				
Isopropyl benzene		1	ND	ND				
4-Isopropyl toluene		1	ND	ND				
Methylene chloride		1	ND	ND				
Naphthalene		5	ND	ND				
n-Propylbenzene		1	ND	ND				
Styrene		1	ND	ND				
1,1,1,2-Tetrachloroethane		1	ND	ND				
1,1,2,2-Tetrachloroethane		2	ND	ND				
Tetrachloroethene		1	ND	ND				
Toluene		1	2000 B	4.5 B				
1,2,3-Trichlorobenzene		2	ND	ND				
1,2,4-Trichlorobenzene		1	ND	ND				
1,1,1-Trichloroethane		1	ND	ND				
1,1,2-Trichloroethane		1	ND	ND				
Trichloroethene		1	ND	ND				
Trichlorofluoromethane		1	ND	ND				
1,2,3-Trichloropropane		1	ND	ND				
1,2,4-Trimethyl benzene		1	ND	ND				
1,3,5-Trimethyl benzene		1	ND	ND				
Vinyl chloride		2	ND	ND				
total-Xylenes		2	ND	ND				
1,1,2-Trichlorotrifluoroethane		10	36000	18000				
1,2-Dichlorotrifluoroethane		1	ND	ND				
SURROGATE	AMOUNT	ACP %	%Recovery	%Recovery				
Dibromofluoromethane	50	80%-120	118%	105%				
Toluene-d8	50	85%-110	110%	98%				
4-Bromofluorobenzene	50	80%-120	102%	91%				

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

JUL 23 1997
Date

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LABORATORY ANALYTICAL REPORT FOR ORGANICS
VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA #260

Date sampled : 6/2/97, 6/3/97
Date received : 6/3/97
Date analyzed : 6/9/97
Date reported : 6/9/97
Report # : 10D002.RPT
Lab. ID # : 10D002

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : ug/l
Matrix : Water

Field ID #			H11D1010400					
Lab ID #			10D004-08					
Dilution Factor			1					
Compound		RL						
Benzene		1	ND					
Bromobenzene		1	ND					
Bromochloromethane		1	ND					
Bromodichloromethane		1	ND					
Bromoform		2	ND					
Bromomethane		1	ND					
n-Butyl benzene		1	ND					
sec-Butyl benzene		1	ND					
tert-Butyl benzene		1	ND					
Carbon tetrachloride		1	ND					
Chlorobenzene		1	ND					
Chloroethane		1	ND					
Chloroform		1	ND					
Chloromethane		2	ND					
2-Chlorotoluene		1	ND					
4-Chlorotoluene		1	ND					
1,2-Dibromo-3-chloropropane		5	ND					
Dibromochloromethane		1	ND					
1,2-Dibromoethane		2	ND					
Dibromomethane		1	ND					
1,2-Dichlorobenzene		1	ND					
1,3-Dichlorobenzene		1	ND					
1,4-Dichlorobenzene		1	ND					
Dichlorodifluoromethane		1	ND					
1,1-Dichloroethane		1	ND					
1,2-Dichloroethane		1	ND					
1,1-Dichloroethene		1	ND					
cis-1,2-Dichloroethene		1	ND					
trans-1,2-Dichloroethene		1	ND					
1,2-Dichloropropane		1	ND					
1,3-Dichloropropane		1	ND					
2,2-Dichloropropane		1	ND					
1,1-Dichloropropene		1	ND					
cis-1,3-Dichloropropene		1	ND					
trans-1,3-Dichloropropene		1	ND					
Ethyl benzene		1	ND					
Hexachlorobutadiene		1	ND					
Isopropyl benzene		1	ND					
4-Isopropyl toluene		1	ND					
Methylene chloride		1	ND					
Naphthalene		5	ND					
n-Propylbenzene		1	ND					
Styrene		1	ND					
1,1,1,2-Tetrachloroethane		1	ND					
1,1,2,2-Tetrachloroethane		2	ND					
Tetrachloroethene		1	ND					
Toluene		1	ND					
1,2,3-Trichlorobenzene		2	ND					
1,2,4-Trichlorobenzene		1	ND					
1,1,1-Trichloroethane		1	ND					
1,1,2-Trichloroethane		1	ND					
Trichloroethene		1	ND					
Trichlorofluoromethane		1	ND					
1,2,3-Trichloropropane		1	ND					
1,2,4-Trimethyl benzene		1	ND					
1,3,5-Trimethyl benzene		1	ND					
Vinyl chloride		2	ND					
total-Xylenes		2	ND					
1,1,2-Trichlorotrifluoroethane		10	11					
1,2-Dichlorotrifluoroethane		1	ND					
SURROGATE	AMOUNT	ACP %	%Recovery					
Dibromofluoromethane	50	80%-120	120%					
Toluene-d8	50	85%-110	112%					
4-Bromofluorobenzene	50	80%-120	105%					

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

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LABORATORY ANALYTICAL REPORT FOR ORGANICS
VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/2/97, 6/3/97
Date received : 6/3/97
Date analyzed : 6/5,6,7/97
Date reported : 6/7/97
Report # : 10D004.RPT
Lab. ID # : 10D004

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : mg/Kg
Matrix : Soil

Field ID #		H11F2030113	H11F2040123	H11F2050133	H11D1010100	H11D1020105	H11D1030113	H11DUP0601
Lab ID #		10D004-01	10D004-02	10D004-03	10D004-04	10D004-05	10D004-06	10D004-07
Dilution Factor		500	2.5	2.5	1	1	1	1
Compound	RL	93.0 %SOLID	94.2 %SOLID	99.0 %SOLID	91.5 %SOLID	74.1 %SOLID	78.5 %SOLID	75.9 %SOLID
Benzene	0.002	ND	ND	ND	ND	ND	ND	ND
Bromobenzene	0.005	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane	0.005	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	0.002	ND	ND	ND	ND	ND	ND	ND
Bromoform	0.002	ND	ND	ND	ND	ND	ND	ND
Bromomethane	0.002	ND	ND	ND	ND	ND	ND	ND
n-Butyl benzene	0.005	ND	ND	ND	ND	ND	ND	ND
sec-Butyl benzene	0.005	ND	ND	ND	ND	ND	ND	ND
tert-Butyl benzene	0.005	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	0.001	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	0.002	ND	ND	ND	ND	ND	ND	ND
Chloroethane	0.002	ND	ND	ND	ND	ND	ND	ND
Chloroform	0.002	ND	ND	ND	ND	ND	ND	ND
Chloromethane	0.002	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	0.005	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	0.005	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	0.005	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	0.002	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	0.005	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	0.005	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	0.005	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	0.005	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	0.005	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	0.001	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	0.002	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.002	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	0.002	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	0.002	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	0.001	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	0.002	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	0.005	ND	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	0.005	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	0.005	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	0.002	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	0.002	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	0.001	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	0.005	ND	ND	ND	ND	ND	ND	ND
Isopropyl benzene	0.005	ND	ND	ND	ND	ND	ND	ND
4-Isopropyltoluene	0.005	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	0.005	ND	ND	ND	ND	ND	ND	ND
Naphthalene	0.005	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	0.005	ND	ND	ND	ND	ND	ND	ND
Styrene	0.002	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	0.005	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.003	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	0.002	ND	ND	ND	ND	ND	ND	ND
Toluene	0.002	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	0.005	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	0.005	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	0.001	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	0.001	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	0.002	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	0.001	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	0.005	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	0.005	ND	ND	ND	ND	0.03	ND	ND
1,3,5-Trimethyl benzene	0.005	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	0.003	ND	ND	ND	ND	ND	ND	ND
total-Xylenes	0.005	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichlorotrifluoroethane	0.01	4000	1.7	3.1	0.6	0.19	ND	ND
1,2-Dichlorotrifluoroethane	0.01	ND	ND	ND	ND	ND	ND	ND
SURROGATE	AMOUNT / ACP %	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
Dibromofluoromethane	50 / 80%-120	116%	118%	113%	108%	112%	115%	114%
Toluene-d8	50 / 85%-110	108%	107%	106%	107%	106%	107%	105%
4-Bromofluorobenzene	50 / 80%-120	102%	97%	97%	100%	95%	95%	92%

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

JUL 24 1997
Date

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LABORATORY ANALYTICAL REPORT FOR ORGANICS

VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/4/97
Date received : 6/4/97
Date analyzed : 6/6/97
Date reported : 6/6/97
Report # : 10D005.RPT
Lab. ID # : 10D005

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : mg/Kg
Matrix : Soil

Field ID #			H11E1010100	H11E1020105	H11E1030110	H11DUP0901	H11C1010100	H11C1020110	H11DUP0401
Lab ID #			10D005-01	10D005-02	10D005-03	10D005-04	10D005-06	10D005-07	10D005-08
Dilution Factor			1	1	1	1	1	1	1
Compound		RL	94.3 %SOILD	77.4 %SOILD	81.7 %SOILD	80.1 %SOILD	95.0 %SOILD	77.9 %SOILD	77.1 %SOILD
Benzene		0.002	ND	ND	ND	ND	ND	ND	ND
Bromobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane		0.005	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane		0.002	ND	ND	ND	ND	ND	ND	ND
Bromoform		0.002	ND	ND	ND	ND	ND	ND	ND
Bromomethane		0.002	ND	ND	ND	ND	ND	ND	ND
n-Butyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
sec-Butyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
tert-Butyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride		0.001	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene		0.002	ND	ND	ND	ND	ND	ND	ND
Chloroethane		0.002	ND	ND	ND	ND	ND	ND	ND
Chloroform		0.002	ND	ND	ND	ND	ND	ND	ND
Chloromethane		0.002	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene		0.005	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene		0.005	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane		0.002	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane		0.005	ND	ND	ND	ND	ND	ND	ND
Dibromomethane		0.005	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane		0.001	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane		0.002	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane		0.002	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene		0.001	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane		0.002	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene		0.005	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene		0.002	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene		0.002	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene		0.001	ND	ND	ND	ND	ND	0.004	ND
Hexachlorobutadiene		0.005	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene		0.005	ND	ND	ND	ND	ND	ND	ND
4-Isopropyl toluene		0.005	ND	ND	ND	ND	ND	ND	ND
Methylene chloride		0.005	ND	ND	ND	ND	ND	ND	ND
Naphthalene		0.005	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene		0.005	ND	ND	ND	ND	ND	ND	ND
Styrene		0.002	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane		0.005	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane		0.003	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
Toluene		0.002	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane		0.001	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane		0.001	ND	ND	ND	ND	ND	ND	ND
Trichloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane		0.001	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride		0.003	ND	ND	ND	ND	ND	ND	ND
total-Xylenes		0.005	ND	ND	ND	ND	ND	0.054	0.017
1,1,2-Trichlorotrifluoroethane		0.01	1	0.18	0.31	0.35	0.13	ND	0.3
1,2-Dichlorotrifluoroethane		0.01	ND	ND	ND	ND	ND	ND	ND
SURROGATE	AMOUNT	ACP %	%Recovery	%Recovery	%Recovery	%Recovery	%Recovery	%Recovery	%Recovery
Dibromofluoromethane	50	80%-120	110%	115%	115%	118%	114%	114%	115%
Toluene-d8	50	85%-110	106%	108%	107%	108%	105%	108%	107%
4-Bromofluorobenzene	50	80%-120	100%	100%	99%	99%	100%	100%	100%

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

JUL 23 1997
Date

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LABORATORY ANALYTICAL REPORT FOR ORGANICS

VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA #260

Date sampled : 6/4/97
Date received : 6/4/97
Date analyzed : 6/6/97
Date reported : 6/6/97
Report # : 10D005.RPT
Lab. ID # : 10D005

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : mg/Kg
Matrix : Soil

Field ID #			H11C1030125	H11C1040133				
Lab ID #			10D005-10	10D005-12				
Dilution Factor			1	1				
Compound		RL	54.4 %SOLID	54.2 %SOLID				
Benzene		0.002	ND	ND				
Bromobenzene		0.005	ND	ND				
Bromochloromethane		0.005	ND	ND				
Bromodichloromethane		0.002	ND	ND				
Bromoform		0.002	ND	ND				
Bromomethane		0.002	ND	ND				
n-Butyl benzene		0.005	ND	ND				
sec-Butyl benzene		0.005	ND	ND				
tert-Butyl benzene		0.005	ND	ND				
Carbon tetrachloride		0.001	ND	ND				
Chlorobenzene		0.002	ND	ND				
Chloroethane		0.002	ND	ND				
Chloroform		0.002	ND	ND				
Chloromethane		0.002	ND	ND				
2-Chlorotoluene		0.005	ND	ND				
4-Chlorotoluene		0.005	ND	ND				
1,2-Dibromo-3-chloropropane		0.005	ND	ND				
Dibromochloromethane		0.002	ND	ND				
1,2-Dibromoethane		0.005	ND	ND				
Dibromomethane		0.005	ND	ND				
1,2-Dichlorobenzene		0.005	ND	ND				
1,3-Dichlorobenzene		0.005	ND	ND				
1,4-Dichlorobenzene		0.005	ND	ND				
Dichlorodifluoromethane		0.001	ND	ND				
1,1-Dichloroethane		0.002	ND	ND				
1,2-Dichloroethane		0.002	ND	ND				
1,1-Dichloroethene		0.002	ND	ND				
cis-1,2-Dichloroethene		0.002	ND	ND				
trans-1,2-Dichloroethene		0.001	ND	ND				
1,2-Dichloropropane		0.002	ND	ND				
1,3-Dichloropropane		0.005	ND	ND				
2,2-Dichloropropane		0.005	ND	ND				
1,1-Dichloropropene		0.005	ND	ND				
cis-1,3-Dichloropropene		0.002	ND	ND				
trans-1,3-Dichloropropene		0.002	ND	ND				
Ethylbenzene		0.001	ND	ND				
Hexachlorobutadiene		0.005	ND	ND				
Isopropyl benzene		0.005	ND	ND				
4-Isopropyl toluene		0.005	ND	ND				
Methylene chloride		0.005	ND	ND				
Naphthalene		0.005	ND	ND				
n-propylbenzene		0.005	ND	ND				
Styrene		0.002	ND	ND				
1,1,1,2-Tetrachloroethane		0.005	ND	ND				
1,1,2,2-Tetrachloroethane		0.003	ND	ND				
Tetrachloroethene		0.002	ND	ND				
Toluene		0.002	ND	ND				
1,2,3-Trichlorobenzene		0.005	ND	ND				
1,2,4-Trichlorobenzene		0.005	ND	ND				
1,1,1-Trichloroethane		0.001	ND	ND				
1,1,2-Trichloroethane		0.001	ND	ND				
Trichloroethene		0.002	ND	ND				
Trichlorofluoromethane		0.001	ND	ND				
1,2,3-Trichloropropane		0.005	ND	ND				
1,2,4-Trimethyl benzene		0.005	ND	ND				
1,3,5-Trimethyl benzene		0.005	ND	ND				
Vinyl chloride		0.003	ND	ND				
total-Xylenes		0.005	ND	ND				
1,1,2-Trichlorotrifluoroethane		0.01	0.66	0.12				
1,2-Dichlorotrifluoroethane		0.01	ND	ND				
SURROGATE	AMOUNT	ACP %	%Recovery	%Recovery				
Dibromofluoromethane	50	80%-120	119%	112%				
Toluene-d8	50	85%-110	107%	108%				
4-Bromofluorobenzene	50	80%-120	101%	98%				

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

JUL 23 1997
Date

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LABORATORY ANALYTICAL REPORT FOR ORGANICS

VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA #260

Date sampled : 6/4/97
Date received : 6/4/97
Date analyzed : 6/9/97
Date reported : 6/9/97
Report # : 10D005.RPT
Lab. ID # : 10D005

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644N
Units : ug/l
Matrix : Water

Field ID #			H11E1010401	H11C1010400	H11C1020400			
Lab ID #			10D005-05	10D005-09	10D005-11			
Dilution Factor			1	2.5	1			
Compound	RL							
Benzene	1		ND	ND	ND			
Bromobenzene	1		ND	ND	ND			
Bromochloromethane	1		ND	ND	ND			
Bromodichloromethane	1		ND	ND	ND			
Bromoform	2		ND	ND	ND			
Bromomethane	1		ND	ND	ND			
n-Butyl benzene	1		ND	ND	ND			
sec-Butyl benzene	1		ND	ND	ND			
tert-Butyl benzene	1		ND	ND	ND			
Carbon tetrachloride	1		ND	ND	ND			
Chlorobenzene	1		ND	ND	ND			
Chloroethane	1		ND	ND	ND			
Chloroform	1		ND	ND	ND			
Chloromethane	2		ND	ND	ND			
2-Chlorotoluene	1		ND	ND	ND			
4-Chlorotoluene	1		ND	ND	ND			
1,2-Dibromo-3-chloropropane	5		ND	ND	ND			
Dibromochloromethane	1		ND	ND	ND			
1,2-Dibromoethane	2		ND	ND	ND			
Dibromomethane	1		ND	ND	ND			
1,2-Dichlorobenzene	1		ND	ND	ND			
1,3-Dichlorobenzene	1		ND	ND	ND			
1,4-Dichlorobenzene	1		ND	ND	ND			
Dichlorodifluoromethane	1		ND	ND	ND			
1,1-Dichloroethane	1		ND	ND	ND			
1,2-Dichloroethane	1		ND	ND	ND			
1,1-Dichloroethene	1		ND	ND	ND			
cis-1,2-Dichloroethene	1		ND	ND	ND			
trans-1,2-Dichloroethene	1		ND	ND	ND			
1,2-Dichloropropane	1		ND	ND	ND			
1,3-Dichloropropane	1		ND	ND	ND			
2,2-Dichloropropane	1		ND	ND	ND			
1,1-Dichloropropene	1		ND	ND	ND			
cis-1,3-Dichloropropene	1		ND	ND	ND			
trans-1,3-Dichloropropene	1		ND	ND	ND			
Ethyl benzene	1		ND	ND	ND			
Hexachlorobutadiene	5		ND	ND	ND			
Isopropyl benzene	1		ND	ND	ND			
4-Isopropyl toluene	1		ND	ND	ND			
Methylene chloride	1		ND	ND	ND			
Naphthalene	5		ND	ND	ND			
n-Propylbenzene	1		ND	ND	ND			
Styrene	1		ND	ND	ND			
1,1,1,2-Tetrachloroethane	1		ND	ND	ND			
1,1,2,2-Tetrachloroethane	2		ND	ND	ND			
Tetrachloroethene	1		ND	ND	ND			
Toluene	1		ND	3.1 B	ND			
1,2,3-Trichlorobenzene	2		ND	ND	ND			
1,2,4-Trichlorobenzene	1		ND	ND	ND			
1,1,1-Trichloroethane	1		ND	ND	ND			
1,1,2-Trichloroethane	1		ND	ND	ND			
Trichloroethene	1		ND	ND	ND			
Trichlorofluoromethane	1		ND	ND	ND			
1,2,3-Trichloropropane	1		ND	ND	ND			
1,2,4-Trimethyl benzene	1		ND	ND	ND			
1,3,5-Trimethyl benzene	1		ND	ND	ND			
Vinyl chloride	2		ND	ND	ND			
total-Xylenes	2		ND	9	2			
1,1,2-Trichlorotrifluoroethane	10		ND	60	130			
1,2-Dichlorotrifluoroethane	1		ND	ND	ND			
SURROGATE	AMOUNT	ACP %	%Recovery	%Recovery	%Recovery			
Dibromofluoromethane	50	80%-120	114%	114%	114%			
Toluene-d8	50	85%-110	105%	109%	107%			
4-Bromofluorobenzene	50	80%-120	98%	100%	99%			

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

JUL 23 1997
Date

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LABORATORY ANALYTICAL REPORT FOR ORGANICS

VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/5/97
Date received : 6/5/97
Date analyzed : 6/6,7/97
Date reported : 6/7/97
Report # : 10D006.RPT
Lab. ID # : 10D006

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : mg/Kg
Matrix : Soil

Field ID #			H11C2010100	H11C2020104	H11DUP0701	H11C2030110		
Lab ID #			10D006-01	10D006-02	10D006-03	10D006-04		
Dilution Factor			1	1	1	1		
Compound		RL	91.7 %SOLID	73.4 %SOLID	74.0 %SOLID	72.2 %SOLID		
Benzene		0.002	ND	ND	ND	ND		
Bromobenzene		0.005	ND	ND	ND	ND		
Bromochloromethane		0.005	ND	ND	ND	ND		
Bromodichloromethane		0.002	ND	ND	ND	ND		
Bromoform		0.002	ND	ND	ND	ND		
Bromomethane		0.002	ND	ND	ND	ND		
n-Butyl benzene		0.005	ND	ND	ND	ND		
sec-Butyl benzene		0.005	ND	ND	ND	ND		
tert-Butyl benzene		0.005	ND	ND	ND	ND		
Carbon tetrachloride		0.001	ND	ND	ND	ND		
Chlorobenzene		0.002	ND	0.008	0.009	0.021		
Chloroethane		0.002	ND	ND	ND	ND		
Chloroform		0.002	ND	ND	ND	ND		
Chloromethane		0.002	ND	ND	ND	ND		
2-Chlorotoluene		0.005	ND	ND	ND	ND		
4-Chlorotoluene		0.005	ND	ND	ND	ND		
1,2-Dibromo-3-chloropropane		0.005	ND	ND	ND	ND		
Dibromochloromethane		0.002	ND	ND	ND	ND		
1,2-Dibromoethane		0.005	ND	ND	ND	ND		
Dibromomethane		0.005	ND	ND	ND	ND		
1,2-Dichlorobenzene		0.005	ND	0.041	0.049	ND		
1,3-Dichlorobenzene		0.005	ND	ND	ND	ND		
1,4-Dichlorobenzene		0.005	ND	0.007	0.008	ND		
Dichlorodifluoromethane		0.001	ND	ND	ND	ND		
1,1-Dichloroethane		0.002	ND	ND	ND	ND		
1,2-Dichloroethane		0.002	ND	ND	ND	ND		
1,1-Dichloroethene		0.002	ND	ND	ND	ND		
cis-1,2-Dichloroethene		0.002	ND	ND	ND	ND		
trans-1,2-Dichloroethene		0.001	ND	ND	ND	ND		
1,2-Dichloropropane		0.002	ND	ND	ND	ND		
1,3-Dichloropropane		0.005	ND	ND	ND	ND		
2,2-Dichloropropane		0.005	ND	ND	ND	ND		
1,1-Dichloropropene		0.005	ND	ND	ND	ND		
cis-1,3-Dichloropropene		0.002	ND	ND	ND	ND		
trans-1,3-Dichloropropene		0.002	ND	ND	ND	ND		
Ethyl benzene		0.001	ND	ND	ND	ND		
Hexachlorobutadiene		0.005	ND	ND	ND	ND		
Isopropyl benzene		0.005	ND	ND	ND	ND		
4-Isopropyl toluene		0.005	ND	ND	ND	ND		
Methylene chloride		0.005	ND	0.016 B	ND	ND		
Naphthalene		0.005	ND	ND	ND	ND		
n-Propylbenzene		0.005	ND	ND	ND	ND		
Styrene		0.002	ND	ND	ND	ND		
1,1,1,2-Tetrachloroethane		0.005	ND	ND	ND	ND		
1,1,2,2-Tetrachloroethane		0.003	ND	ND	ND	ND		
Tetrachloroethene		0.002	ND	ND	ND	ND		
Toluene		0.002	ND	ND	ND	ND		
1,2,3-Trichlorobenzene		0.005	ND	ND	ND	ND		
1,2,4-Trichlorobenzene		0.005	ND	ND	ND	ND		
1,1,1-Trichloroethane		0.001	ND	ND	ND	ND		
1,1,2-Trichloroethane		0.001	ND	ND	ND	ND		
Trichloroethene		0.002	ND	ND	ND	ND		
Trichlorofluoromethane		0.001	ND	ND	ND	ND		
1,2,3-Trichloropropane		0.005	ND	ND	ND	ND		
1,2,4-Trimethyl benzene		0.005	ND	ND	ND	ND		
1,3,5-Trimethyl benzene		0.005	ND	ND	ND	ND		
Vinyl chloride		0.003	ND	ND	ND	ND		
Total-Xylenes		0.005	ND	ND	ND	ND		
1,1,2-Trichlorotrifluoroethane		0.01	0.33	1.6	0.12	0.073		
1,2-Dichlorotrifluoroethane		0.01	ND	ND	ND	ND		
SURROGATE	AMOUNT	ACP %	%Recovery	%Recovery	%Recovery	%Recovery		
Dibromofluoromethane	50	80%-120	111%	111%	112%	115%		
Toluene-d8	50	85%-110	103%	99%	98%	106%		
4-Bromofluorobenzene	50	80%-120	98%	86%	86%	99%		

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

JUL 23 1997
Date

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LABORATORY ANALYTICAL REPORT FOR ORGANICS

VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/10/97, 6/11/97
Date received : 6/11/97
Date analyzed : 6/11/97
Date reported : 6/12/97
Report # : 10D012.RPT
Lab. ID # : 10D012

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : mg/Kg
Matrix : Soil

Field ID #			H11F9010103	H11F1010103	H11F10020113	H11F11010103		
Lab ID #			10D012-01	10D012-02	10D012-05	10D012-06		
Dilution Factor			1	1	1	1 / 2.5*		
Compound		RL						
Benzene		0.002	ND	ND	ND	ND		
Bromobenzene		0.005	ND	ND	ND	ND		
Bromochloromethane		0.005	ND	ND	ND	ND		
Bromodichloromethane		0.002	ND	ND	ND	ND		
Bromoform		0.002	ND	ND	ND	ND		
Bromomethane		0.002	ND	ND	ND	ND		
n-Butyl benzene		0.005	ND	ND	ND	ND		
sec-Butyl benzene		0.005	ND	ND	ND	ND		
tert-Butyl benzene		0.005	ND	ND	ND	ND		
Carbon tetrachloride		0.001	ND	ND	ND	ND		
Chlorobenzene		0.002	ND	ND	ND	ND		
Chloroethane		0.002	ND	ND	ND	ND		
Chloroform		0.002	ND	ND	ND	ND		
Chloromethane		0.002	ND	ND	ND	ND		
2-Chlorotoluene		0.005	ND	ND	ND	ND		
4-Chlorotoluene		0.005	ND	ND	ND	ND		
1,2-Dibromo-3-chloropropane		0.005	ND	ND	ND	ND		
Dibromochloromethane		0.002	ND	ND	ND	ND		
1,2-Dibromoethane		0.005	ND	ND	ND	ND		
Dibromomethane		0.005	ND	ND	ND	ND		
1,2-Dichlorobenzene		0.005	ND	ND	ND	ND		
1,3-Dichlorobenzene		0.005	ND	ND	ND	ND		
1,4-Dichlorobenzene		0.005	ND	ND	ND	ND		
Dichlorodifluoromethane		0.001	ND	ND	ND	ND		
1,1-Dichloroethane		0.002	ND	ND	ND	ND		
1,2-Dichloroethane		0.002	ND	ND	ND	ND		
1,1-Dichloroethene		0.002	ND	ND	ND	ND		
cis-1,2-Dichloroethene		0.002	ND	ND	ND	ND		
trans-1,2-Dichloroethene		0.001	ND	ND	ND	ND		
1,2-Dichloropropane		0.002	ND	ND	ND	ND		
1,3-Dichloropropane		0.005	ND	ND	ND	ND		
2,2-Dichloropropane		0.005	ND	ND	ND	ND		
1,1-Dichloropropene		0.005	ND	ND	ND	ND		
cis-1,3-Dichloropropene		0.002	ND	ND	ND	ND		
trans-1,3-Dichloropropene		0.002	ND	ND	ND	ND		
Ethyl benzene		0.001	ND	ND	ND	ND		
Hexachlorobutadiene		0.005	ND	ND	ND	ND		
Isopropyl benzene		0.005	ND	ND	ND	ND		
4-Isopropyl toluene		0.005	ND	ND	ND	ND		
Methylene chloride		0.005	ND	ND	ND	ND		
Naphthalene		0.005	ND	ND	ND	ND		
n-Propylbenzene		0.005	ND	ND	ND	ND		
Styrene		0.002	ND	ND	ND	ND		
1,1,1,2-Tetrachloroethane		0.005	ND	ND	ND	ND		
1,1,2,2-Tetrachloroethane		0.003	ND	ND	ND	ND		
Tetrachloroethene		0.002	ND	ND	ND	ND		
Toluene		0.002	**0.014 B**	**0.007 B**	ND	**0.003 B**		
1,2,3-Trichlorobenzene		0.005	ND	ND	ND	ND		
1,2,4-Trichlorobenzene		0.005	ND	ND	ND	ND		
1,1,1-Trichloroethane		0.001	ND	ND	ND	ND		
1,1,2-Trichloroethane		0.001	ND	ND	ND	ND		
Trichloroethene		0.002	ND	ND	ND	ND		
Trichlorofluoromethane		0.001	ND	ND	ND	ND		
1,2,3-Trichloropropane		0.005	ND	ND	ND	ND		
1,2,4-Trimethyl benzene		0.005	ND	ND	ND	ND		
1,3,5-Trimethyl benzene		0.005	ND	ND	ND	ND		
Vinyl chloride		0.003	ND	ND	ND	ND		
total-Xylenes		0.005	ND	ND	ND	ND		
1,1,2-Trichlorotrifluoroethane		0.01	**0.017**	ND	**1.0 E**	**0.11***		
SURROGATE	AMOUNT	ACP %	% Recovery	% Recovery	% Recovery	% Recovery		
Dibromofluoromethane	50	80%-120	96%	98%	102%	101% / *100%		
Toluene-d8	50	85%-110	107%	102%	101%	101% / *102%		
4-Bromofluorobenzene	50	80%-120	100%	101%	100%	100% / *101%		

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
E - Estimated value
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

JUL 22 1997
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LABORATORY ANALYTICAL REPORT FOR ORGANICS
VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/11/97
Date received : 6/11/97
Date analyzed : 6/11/97
Date reported : 6/12/97
Report # : 10D012.RPT
Lab. ID # : 10D012

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : ug/l
Matrix : Water

Field ID #			H11F9010405	H11F10010405				
Lab ID #			10D012-03	10D012-04				
Dilution Factor			200	25				
Compound	RL							
Benzene	1		ND	ND				
Bromobenzene	1		ND	ND				
Bromochloromethane	1		ND	ND				
Bromodichloromethane	1		ND	ND				
Bromoform	2		ND	ND				
Bromomethane	1		ND	ND				
n-Butyl benzene	1		ND	ND				
sec-Butyl benzene	1		ND	ND				
tert-Butyl benzene	1		ND	ND				
Carbon tetrachloride	1		ND	ND				
Chlorobenzene	1		ND	ND				
Chloroethane	1		ND	ND				
Chloroform	1		ND	ND				
Chloromethane	2		ND	ND				
2-Chlorotoluene	1		ND	ND				
4-Chlorotoluene	1		ND	ND				
1,2-Dibromo-3-chloropropane	5		ND	ND				
Dibromochloromethane	1		ND	ND				
1,2-Dibromoethane	2		ND	ND				
Dibromomethane	1		ND	ND				
1,2-Dichlorobenzene	1		ND	ND				
1,3-Dichlorobenzene	1		ND	ND				
1,4-Dichlorobenzene	1		ND	ND				
Dichlorodifluoromethane	1		ND	ND				
1,1-Dichloroethane	1		ND	ND				
1,2-Dichloroethane	1		ND	ND				
1,1-Dichloroethene	1		ND	ND				
cis-1,2-Dichloroethene	1		ND	ND				
trans-1,2-Dichloroethene	1		ND	ND				
1,2-Dichloropropane	1		ND	ND				
1,3-Dichloropropane	1		ND	ND				
2,2-Dichloropropane	1		ND	ND				
1,1-Dichloropropene	1		ND	ND				
cis-1,3-Dichloropropene	1		ND	ND				
trans-1,3-Dichloropropene	1		ND	ND				
Ethyl benzene	1		ND	ND				
Hexachlorobutadiene	1		ND	ND				
Isopropyl benzene	1		ND	ND				
4-Isopropyl toluene	1		ND	ND				
Methylene chloride	1		ND	ND				
Naphthalene	5		ND	ND				
n-Propylbenzene	1		ND	ND				
Styrene	1		ND	ND				
1,1,1,2-Tetrachloroethane	1		ND	ND				
1,1,2,2-Tetrachloroethane	2		ND	ND				
Tetrachloroethene	1		ND	ND				
Toluene	1		ND	33 B				
1,2,3-Trichlorobenzene	2		ND	ND				
1,2,4-Trichlorobenzene	1		ND	ND				
1,1,1-Trichloroethane	1		ND	ND				
1,1,2-Trichloroethane	1		ND	ND				
Trichloroethene	1		ND	ND				
Trichlorofluoromethane	1		ND	ND				
1,2,3-Trichloropropane	1		ND	ND				
1,2,4-Trimethyl benzene	1		ND	ND				
1,3,5-Trimethyl benzene	1		ND	ND				
Vinyl chloride	2		ND	ND				
total-Xylenes	2		ND	ND				
1,1,2-Trichlorotrifluoroethane	10		11000	2500				
SURROGATE	AMOUNT	ACP %	%Recovery	%Recovery				
Dibromofluoromethane	50	80%-120	100%	100%				
Toluene-d8	50	85%-110	101%	101%				
4-Bromofluorobenzene	50	80%-120	100%	101%				

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

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Date

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LABORATORY ANALYTICAL REPORT FOR ORGANICS

VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/2/97, 6/3/97
Date received : 6/3/97
Date analyzed : 6/5,6,7/97
Date reported : 6/7/97
Report # : 10D001.RPT
Lab. ID # : 10D001

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : mg/Kg
Matrix : Soil

Field ID #			H11F3010100	H11F3020105	H11F3030113	H11F3040123	H11F3050132	H11F3060136	H11F5010100
Lab ID #			10D001-01	10D001-02	10D001-03	10D001-04	10D001-05	10D001-06	10D001-07
Dilution Factor			1	1	1	100	200	100	1
Compound		RL	81.1 %SOLID	78.3 %SOLID	81.6 %SOLID	82.1 %SOLID	89.2 %SOLID	88 %SOLID	79.1 %SOLID
Benzene		0.002	ND	ND	ND	ND	ND	ND	ND
Bromobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane		0.005	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane		0.002	ND	ND	ND	ND	ND	ND	ND
Bromoform		0.002	ND	ND	ND	ND	ND	ND	ND
Bromomethane		0.002	ND	ND	ND	ND	ND	ND	ND
n-Butyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
sec-Butyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
tert-Butyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride		0.001	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene		0.002	ND	ND	ND	ND	ND	ND	ND
Chloroethane		0.002	ND	ND	ND	ND	ND	ND	ND
Chloroform		0.002	ND	ND	ND	ND	ND	ND	ND
Chloromethane		0.002	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene		0.005	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene		0.005	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane		0.002	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane		0.005	ND	ND	ND	ND	ND	ND	ND
Dibromomethane		0.005	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane		0.001	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane		0.002	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane		0.002	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene		0.001	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane		0.002	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene		0.005	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene		0.002	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene		0.002	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene		0.001	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene		0.005	ND	ND	ND	ND	ND	ND	ND
Isopropyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
4-Isopropyl toluene		0.005	ND	ND	ND	ND	ND	ND	ND
Methylene chloride		0.005	ND	ND	ND	ND	**6.6 B**	**2.7 B**	ND
Naphthalene		0.005	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene		0.005	ND	ND	ND	ND	ND	ND	ND
Styrene		0.002	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane		0.005	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane		0.003	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
Toluene		0.002	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane		0.001	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane		0.001	ND	ND	ND	ND	ND	ND	ND
Trichloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane		0.001	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride		0.003	ND	ND	ND	ND	ND	ND	ND
total-Xylenes		0.005	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichlorotrifluoroethane		0.01	**0.3**	**1.4**	**6.3**	**34**	**3900**	**26**	**0.27**
SURROGATE	AMOUNT	ACP %	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
Dibromofluoromethane	50	80%-120	114%	108%	111%	116%	107%	111%	115%
Toluene-d8	50	85%-110	107%	106%	106%	107%	107%	106%	102%
4-Bromofluorobenzene	50	80%-120	93%	96%	97%	102%	96%	98%	91%

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

JUL 23 1997
Date

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LABORATORY ANALYTICAL REPORT FOR ORGANICS
VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/2/97, 6/3/97
Date received : 6/3/97
Date analyzed : 6/5,6,7/97
Date reported : 6/7/97
Report # : 10D001.RPT
Lab. ID # : 10D001

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : mg/Kg
Matrix : Soil

Field ID #			H11F5020105	H11F5030113	H11F5040123	H11F5050133		
Lab ID #			10D001-08	10D001-09	10D001-10	10D001-11		
Dilution Factor			1	40	1	1		
Compound		RL	75.6 %SOLID	82.6 %SOLID	83.0 %SOLID	85.8 %SOLID		
Benzene		0.002	ND	ND	ND	ND		
Bromobenzene		0.005	ND	ND	ND	ND		
Bromochloromethane		0.005	ND	ND	ND	ND		
Bromodichloromethane		0.002	ND	ND	ND	ND		
Bromoform		0.002	ND	ND	ND	ND		
Bromomethane		0.002	ND	ND	ND	ND		
n-Butyl benzene		0.005	ND	ND	ND	ND		
sec-Butyl benzene		0.005	ND	ND	ND	ND		
tert-Butyl benzene		0.005	ND	ND	ND	ND		
Carbon tetrachloride		0.001	ND	ND	ND	ND		
Chlorobenzene		0.002	ND	ND	ND	ND		
Chloroethane		0.002	ND	ND	ND	ND		
Chloroform		0.002	ND	ND	ND	ND		
Chloromethane		0.002	ND	ND	ND	ND		
2-Chlorotoluene		0.005	ND	ND	ND	ND		
4-Chlorotoluene		0.005	ND	ND	ND	ND		
1,2-Dibromo-3-chloropropane		0.005	ND	ND	ND	ND		
Dibromochloromethane		0.002	ND	ND	ND	ND		
1,2-Dibromoethane		0.005	ND	ND	ND	ND		
Dibromomethane		0.005	ND	ND	ND	ND		
1,2-Dichlorobenzene		0.005	ND	ND	ND	ND		
1,3-Dichlorobenzene		0.005	ND	ND	ND	ND		
1,4-Dichlorobenzene		0.005	ND	ND	ND	ND		
Dichlorodifluoromethane		0.001	ND	ND	ND	ND		
1,1-Dichloroethane		0.002	ND	ND	ND	ND		
1,2-Dichloroethane		0.002	ND	ND	ND	ND		
1,1-Dichloroethene		0.002	ND	ND	ND	ND		
cis-1,2-Dichloroethene		0.002	ND	ND	ND	ND		
trans-1,2-Dichloroethene		0.001	ND	ND	ND	ND		
1,2-Dichloropropane		0.002	ND	ND	ND	ND		
1,3-Dichloropropane		0.005	ND	ND	ND	ND		
2,2-Dichloropropane		0.005	ND	ND	ND	ND		
1,1-Dichloropropene		0.005	ND	ND	ND	ND		
cis-1,3-Dichloropropene		0.002	ND	ND	ND	ND		
trans-1,3-Dichloropropene		0.002	ND	ND	ND	ND		
Ethyl benzene		0.001	ND	ND	ND	ND		
Hexachlorobutadiene		0.005	ND	ND	ND	ND		
Isopropyl benzene		0.005	ND	ND	ND	ND		
4-Isopropyl toluene		0.005	ND	ND	ND	ND		
Methylene chloride		0.005	ND	ND	ND	ND		
Naphthalene		0.005	ND	ND	ND	ND		
n-Propylbenzene		0.005	ND	ND	ND	ND		
Styrene		0.002	ND	ND	ND	ND		
1,1,1,2-Tetrachloroethane		0.005	ND	ND	ND	ND		
1,1,2,2-Tetrachloroethane		0.003	ND	ND	ND	ND		
Tetrachloroethene		0.002	ND	ND	ND	ND		
Toluene		0.002	ND	ND	ND	ND		
1,2,3-Trichlorobenzene		0.005	ND	ND	ND	ND		
1,2,4-Trichlorobenzene		0.005	ND	ND	ND	ND		
1,1,1-Trichloroethane		0.001	ND	ND	ND	ND		
1,1,2-Trichloroethane		0.001	ND	ND	ND	ND		
Trichloroethene		0.002	ND	ND	ND	ND		
Trichlorofluoromethane		0.001	ND	ND	ND	ND		
1,2,3-Trichloropropane		0.005	ND	ND	ND	ND		
1,2,4-Trimethyl benzene		0.005	ND	ND	ND	ND		
1,3,5-Trimethyl benzene		0.005	ND	ND	ND	ND		
Vinyl chloride		0.003	ND	ND	ND	ND		
total-Xylenes		0.005	ND	ND	ND	ND		
1,1,2-Trichlorotrifluoroethane		0.01	0.44	29	1.4	5.9		
SURROGATE	AMOUNT	ACP %	% Recovery	% Recovery	% Recovery	% Recovery		
Dibromofluoromethane	50	80%-120	114%	115%	107%	113%		
Toluene-d8	50	85%-110	106%	108%	107%	108%		
4-Bromofluorobenzene	50	80%-120	97%	103%	98%	98%		

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

JUL 23 1997
Date

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LABORATORY ANALYTICAL REPORT FOR ORGANICS

VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/2/97, 6/3/97
Date received : 6/3/97
Date analyzed : 6/9/97
Date reported : 6/9/97
Report # : 10D001.RPT
Lab. ID # : 10D001

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : ug/l
Matrix : Water

Field ID #			H11F50010408					
Lab ID #			10D001-12					
Dilution Factor			1000					
Compound	RL							
Benzene	1		ND					
Bromobenzene	1		ND					
Bromochloromethane	1		ND					
Bromodichloromethane	1		ND					
Bromoform	2		ND					
Bromomethane	1		ND					
n-Butyl benzene	1		ND					
sec-Butyl benzene	1		ND					
tert-Butyl benzene	1		ND					
Carbon tetrachloride	1		ND					
Chlorobenzene	1		ND					
Chloroethane	1		ND					
Chloroform	1		ND					
Chloromethane	2		ND					
2-Chlorotoluene	1		ND					
4-Chlorotoluene	1		ND					
1,2-Dibromo-3-chloropropane	5		ND					
Dibromochloromethane	1		ND					
1,2-Dibromoethane	2		ND					
Dibromomethane	1		ND					
1,2-Dichlorobenzene	1		ND					
1,3-Dichlorobenzene	1		ND					
1,4-Dichlorobenzene	1		ND					
Dichlorodifluoromethane	1		ND					
1,1-Dichloroethane	1		ND					
1,2-Dichloroethane	1		ND					
1,1-Dichloroethene	1		ND					
cis-1,2-Dichloroethene	1		ND					
trans-1,2-Dichloroethene	1		ND					
1,2-Dichloropropane	1		ND					
1,3-Dichloropropane	1		ND					
2,2-Dichloropropane	1		ND					
1,1-Dichloropropene	1		ND					
cis-1,3-Dichloropropene	1		ND					
trans-1,3-Dichloropropene	1		ND					
Ethyl benzene	1		ND					
Hexachlorobutadiene	1		ND					
Isopropyl benzene	1		ND					
4-Isopropyl toluene	1		ND					
Methylene chloride	1		ND					
Naphthalene	5		ND					
n-Propylbenzene	1		ND					
Styrene	1		ND					
1,1,1,2-Tetrachloroethane	1		ND					
1,1,2,2-Tetrachloroethane	2		ND					
Tetrachloroethene	1		ND					
Toluene	1		2000 B					
1,2,3-Trichlorobenzene	2		ND					
1,2,4-Trichlorobenzene	1		ND					
1,1,1-Trichloroethane	1		ND					
1,1,2-Trichloroethane	1		ND					
Trichloroethene	1		ND					
Trichlorofluoromethane	1		ND					
1,2,3-Trichloropropane	1		ND					
1,2,4-Trimethyl benzene	1		ND					
1,3,5-Trimethyl benzene	1		ND					
Vinyl chloride	2		ND					
total-Xylenes	2		ND					
1,1,2-Trichlorotrifluoroethane	10		69000					
SURROGATE	AMOUNT	ACP %	%Recovery					
Dibromofluoromethane	50	80%-120	110%					
Toluene-d8	50	85%-110	103%					
4-Bromofluorobenzene	50	80%-120	96%					

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

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Date

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LABORATORY ANALYTICAL REPORT FOR ORGANICS

VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/2/97, 6/3/97
Date received : 6/3/97
Date analyzed : 6/5,6,7/97
Date reported : 6/7/97
Report # : 10D002.RPT
Lab. ID # : 10D002

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 56-44V
Units : mg/Kg
Matrix : Soil

Field ID #			H11DUP1001	H11DUP0501	H11F1010100	H11F1020105	H11F1030113	H11F1040123	H11F1050133
Lab ID #			10D002-01	10D002-02	10D002-03	10D002-04	10D002-05	10D002-06	10D002-07
Dilution Factor			1 / 400*	500	1	100	25000	400	1
Compound		RL	89.4 %SOLID	81.5 %SOLID	78.9 %SOLID	75.6 %SOLID	83.4 %SOLID	92.2 %SOLID	98.2 %SOLID
Benzene		0.002	ND	ND	ND	ND	ND	ND	ND
Bromobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane		0.005	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane		0.002	ND	ND	ND	ND	ND	ND	ND
Bromoform		0.002	ND	ND	ND	ND	ND	ND	ND
Bromomethane		0.002	ND	ND	ND	ND	ND	ND	ND
n-Butyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
sec-Butyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
tert-Butyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride		0.001	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene		0.002	ND	ND	ND	ND	ND	ND	ND
Chloroethane		0.002	ND	ND	ND	ND	ND	ND	ND
Chloroform		0.002	ND	ND	ND	ND	ND	ND	ND
Chloromethane		0.002	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene		0.005	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene		0.005	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane		0.002	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane		0.005	ND	ND	ND	ND	ND	ND	ND
Dibromomethane		0.005	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane		0.001	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane		0.002	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane		0.002	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene		0.001	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane		0.002	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene		0.005	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene		0.002	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene		0.002	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene		0.001	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene		0.005	ND	ND	ND	ND	ND	ND	ND
Isopropyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
4-Isopropyl toluene		0.005	ND	ND	ND	ND	ND	ND	ND
Methylene chloride		0.005	ND	ND	ND	ND	ND	8 B	ND
Naphthalene		0.005	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene		0.005	ND	ND	ND	ND	ND	ND	ND
Styrene		0.002	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane		0.005	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane		0.003	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
Toluene		0.002	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane		0.001	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane		0.001	ND	ND	ND	ND	ND	ND	ND
Trichloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
Trichlorotrifluoromethane		0.001	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride		0.003	ND	ND	ND	ND	ND	ND	ND
total-Xylenes		0.005	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichlorotrifluoroethane		0.01	1200*	110	0.42	15	9000	280	3.2
1,2-Dichlorotrifluoroethane		0.01	ND	ND	ND	ND	ND	ND	ND
SURROGATE	AMOUNT	ACP %	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
Dibromofluoromethane	50	80%-120	117% / *111%	118%	113%	115%	107%	110%	113%
Toluene-d8	50	85%-110	105% / *107%	108%	106%	107%	105%	106%	106%
4-Bromofluorobenzene	50	80%-120	94% / *103%	102%	95%	101%	97%	99%	101%

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

JUL 24 1997
Date

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LABORATORY ANALYTICAL REPORT FOR ORGANICS

VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/2/97, 6/3/97
Date received : 6/3/97
Date analyzed : 6/5,6,7/97
Date reported : 6/7/97
Report # : 10D002.RPT
Lab. ID # : 10D002

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : mg/Kg
Matrix : Soil

Field ID #		H11F7010100	H11F7020105	H11F7030113			
Lab ID #		10D002-09	10D002-10	10D002-11			
Dilution Factor		1	1	50			
Compound	RL	77.7 %SOLID	76.5 %SOLID	84.6 %SOLID			
Benzene	0.002	ND	ND	ND			
Bromobenzene	0.005	ND	ND	ND			
Bromochloromethane	0.005	ND	ND	ND			
Bromodichloromethane	0.002	ND	ND	ND			
Bromoform	0.002	ND	ND	ND			
Bromomethane	0.002	ND	ND	ND			
n-Butyl benzene	0.005	ND	ND	ND			
sec-Butyl benzene	0.005	ND	ND	ND			
tert-Butyl benzene	0.005	ND	ND	ND			
Carbon tetrachloride	0.001	ND	ND	ND			
Chlorobenzene	0.002	ND	ND	ND			
Chloroethane	0.002	ND	ND	ND			
Chloroform	0.002	ND	ND	ND			
Chloromethane	0.002	ND	ND	ND			
2-Chlorotoluene	0.005	ND	ND	ND			
4-Chlorotoluene	0.005	ND	ND	ND			
1,2-Dibromo-3-chloropropane	0.005	ND	ND	ND			
Dibromochloromethane	0.002	ND	ND	ND			
1,2-Dibromoethane	0.005	ND	ND	ND			
Dibromomethane	0.005	ND	ND	ND			
1,2-Dichlorobenzene	0.005	ND	ND	ND			
1,3-Dichlorobenzene	0.005	ND	ND	ND			
1,4-Dichlorobenzene	0.005	ND	ND	ND			
Dichlorodifluoromethane	0.001	ND	ND	ND			
1,1-Dichloroethane	0.002	ND	ND	ND			
1,2-Dichloroethane	0.002	ND	ND	ND			
1,1-Dichloroethene	0.002	ND	ND	ND			
cis-1,2-Dichloroethene	0.002	ND	ND	ND			
trans-1,2-Dichloroethene	0.001	ND	ND	ND			
1,2-Dichloropropane	0.002	ND	ND	ND			
1,3-Dichloropropane	0.005	ND	ND	ND			
2,2-Dichloropropane	0.005	ND	ND	ND			
1,1-Dichloropropene	0.005	ND	ND	ND			
cis-1,3-Dichloropropene	0.002	ND	ND	ND			
trans-1,3-Dichloropropene	0.002	ND	ND	ND			
Ethyl benzene	0.001	ND	ND	ND			
Hexachlorobutadiene	0.005	ND	ND	ND			
Isopropyl benzene	0.005	ND	ND	ND			
4-Isopropyl toluene	0.005	ND	ND	ND			
Methylene chloride	0.005	ND	ND	ND			
Naphthalene	0.005	ND	ND	ND			
n-Propylbenzene	0.005	ND	ND	ND			
Styrene	0.002	ND	ND	ND			
1,1,1,2-Tetrachloroethane	0.005	ND	ND	ND			
1,1,2,2-Tetrachloroethane	0.003	ND	ND	ND			
Tetrachloroethene	0.002	ND	ND	ND			
Toluene	0.002	ND	ND	ND			
1,2,3-Trichlorobenzene	0.005	ND	ND	ND			
1,2,4-Trichlorobenzene	0.005	ND	ND	ND			
1,1,1-Trichloroethane	0.001	ND	ND	ND			
1,1,2-Trichloroethane	0.001	ND	ND	ND			
Trichloroethene	0.002	ND	ND	ND			
Trichlorofluoromethane	0.001	ND	ND	ND			
1,2,3-Trichloropropane	0.005	ND	ND	ND			
1,2,4-Trimethyl benzene	0.005	ND	ND	ND			
1,3,5-Trimethyl benzene	0.005	ND	ND	ND			
Vinyl chloride	0.003	ND	ND	ND			
total-Xylenes	0.005	ND	ND	ND			
1,1,2-Trichlorotrifluoroethane	0.01	1.5	0.99	110			
1,2-Dichlorotrifluoroethane	0.01	ND	ND	ND			
SURROGATE	AMOUNT	ACP %	% Recovery	% Recovery	% Recovery		
Dibromofluoromethane	50	80%-120	115%	110%	117%		
Toluene-d8	50	85%-110	105%	107%	109%		
4-Bromofluorobenzene	50	80%-120	94%	100%	103%		

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

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Laboratory Director

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LABORATORY ANALYTICAL REPORT FOR ORGANICS
VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA #260

Date sampled : 6/2/97, 6/3/97
Date received : 6/3/97
Date analyzed : 6/10/97
Date reported : 6/10/97
Report # : 10D002.RPT
Lab. ID # : 10D002

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : ug/l
Matrix : Water

Field ID #		H11F1010406					
Lab ID #		10D002-08					
Dilution Factor		2500					
Compound	RL						
Benzene	1	ND					
Bromobenzene	1	ND					
Bromochloromethane	1	ND					
Bromodichloromethane	1	ND					
Bromoform	2	ND					
Bromomethane	1	ND					
n-Butyl benzene	1	ND					
sec-Butyl benzene	1	ND					
tert-Butyl benzene	1	ND					
Carbon tetrachloride	1	ND					
Chlorobenzene	1	ND					
Chloroethane	1	ND					
Chloroform	1	ND					
Chloromethane	2	ND					
2-Chlorotoluene	1	ND					
4-Chlorotoluene	1	ND					
1,2-Dibromo-3-chloropropane	5	ND					
Dibromochloromethane	1	ND					
1,2-Dibromoethane	2	ND					
Dibromomethane	1	ND					
1,2-Dichlorobenzene	1	ND					
1,3-Dichlorobenzene	1	ND					
1,4-Dichlorobenzene	1	ND					
Dichlorodifluoromethane	1	ND					
1,1-Dichloroethane	1	ND					
1,2-Dichloroethane	1	ND					
1,1-Dichloroethene	1	ND					
cis-1,2-Dichloroethene	1	ND					
trans-1,2-Dichloroethene	1	ND					
1,2-Dichloropropane	1	ND					
1,3-Dichloropropane	1	ND					
2,2-Dichloropropane	1	ND					
1,1-Dichloropropene	1	ND					
cis-1,3-Dichloropropene	1	ND					
trans-1,3-Dichloropropene	1	ND					
Ethyl benzene	1	ND					
Hexachlorobutadiene	1	ND					
Isopropyl benzene	1	ND					
4-Isopropyl toluene	1	ND					
Methylene chloride	1	ND					
Naphthalene	5	ND					
n-Propylbenzene	1	ND					
Styrene	1	ND					
1,1,1,2-Tetrachloroethane	1	ND					
1,1,2,2-Tetrachloroethane	2	ND					
Tetrachloroethene	1	ND					
Toluene	1	ND					
1,2,3-Trichlorobenzene	2	ND					
1,2,4-Trichlorobenzene	1	ND					
1,1,1-Trichloroethane	1	ND					
1,1,2-Trichloroethane	1	ND					
Trichloroethene	1	ND					
Trichlorofluoromethane	1	ND					
1,2,3-Trichloropropane	1	ND					
1,2,4-Trimethyl benzene	1	ND					
1,3,5-Trimethyl benzene	1	ND					
Vinyl chloride	2	ND					
total-Xylenes	2	ND					
1,1,2-Trichlorotrifluoroethane	10	220000					
1,2-Dichlorotrifluoroethane	1	ND					
SURROGATE	AMOUNT	ACP %	%Recovery				
Dibromofluoromethane	50	80%-120	111%				
Toluene-d8	50	85%-110	108%				
4-Bromofluorobenzene	50	80%-120	101%				

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

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LABORATORY ANALYTICAL REPORT FOR ORGANICS

VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/4/97
Date received : 6/5/97
Date analyzed : 6/6,7/97
Date reported : 6/7/97
Report # : 10D008.RPT
Lab. ID # : 10D008

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : mg/Kg
Matrix : Soil

Field ID #			H11B4020105	H11B1010100	H11B1020104	H11DUP0101		
Lab ID #			10D008-01	10D008-02	10D008-03	10D008-04		
Dilution Factor			40	1	40	100		
Compound		RL	80.2 %SOLID	80.2 %SOLID	78.0 %SOLID	76.8 %SOLID		
Benzene		0.002	ND	ND	ND	ND		
Bromobenzene		0.005	ND	ND	ND	ND		
Bromochloromethane		0.005	ND	ND	ND	ND		
Bromodichloromethane		0.002	ND	ND	ND	ND		
Bromoform		0.002	ND	ND	ND	ND		
Bromomethane		0.002	ND	ND	ND	ND		
n-Butylbenzene		0.005	2.2	ND	1.4	2.2		
sec-Butylbenzene		0.005	2	ND	1.4	2.2		
tert-Butylbenzene		0.005	ND	ND	ND	ND		
Carbon tetrachloride		0.001	ND	ND	ND	ND		
Chlorobenzene		0.002	ND	ND	ND	ND		
Chloroethane		0.002	ND	ND	ND	ND		
Chloroform		0.002	ND	ND	ND	ND		
Chloromethane		0.002	ND	ND	ND	ND		
2-Chlorotoluene		0.005	ND	ND	ND	ND		
4-Chlorotoluene		0.005	ND	ND	ND	ND		
1,2-Dibromo-3-chloropropane		0.005	ND	ND	ND	ND		
Dibromochloromethane		0.002	ND	ND	ND	ND		
1,2-Dibromoethane		0.005	ND	ND	ND	ND		
Dibromomethane		0.005	ND	ND	ND	ND		
1,2-Dichlorobenzene		0.005	ND	ND	ND	ND		
1,3-Dichlorobenzene		0.005	ND	ND	ND	ND		
1,4-Dichlorobenzene		0.005	ND	ND	ND	ND		
Dichlorodifluoromethane		0.001	ND	ND	ND	ND		
1,1-Dichloroethane		0.002	ND	ND	ND	ND		
1,2-Dichloroethane		0.002	ND	ND	ND	ND		
1,1-Dichloroethene		0.002	ND	ND	ND	ND		
cis-1,2-Dichloroethene		0.002	ND	ND	ND	ND		
trans-1,2-Dichloroethene		0.001	ND	ND	ND	ND		
1,2-Dichloropropane		0.002	ND	ND	ND	ND		
1,3-Dichloropropane		0.005	ND	ND	ND	ND		
2,2-Dichloropropane		0.005	ND	ND	ND	ND		
1,1-Dichloropropene		0.005	ND	ND	ND	ND		
cis-1,3-Dichloropropene		0.002	ND	ND	ND	ND		
trans-1,3-Dichloropropene		0.002	ND	ND	ND	ND		
Ethylbenzene		0.001	1.4	ND	0.87	1.1		
Hexachlorobutadiene		0.005	ND	ND	ND	ND		
Isopropylbenzene		0.005	1	ND	0.69	1.1		
4-Isopropyltoluene		0.005	0.95	ND	0.63	1.1		
Methylene chloride		0.005	ND	ND	ND	ND		
Naphthalene		0.005	7	ND	3.7	5.5		
n-Propylbenzene		0.005	1.7	ND	1.2	2.1		
Styrene		0.002	ND	ND	ND	ND		
1,1,1,2-Tetrachloroethane		0.005	ND	ND	ND	ND		
1,1,2,2-Tetrachloroethane		0.003	ND	ND	ND	ND		
Tetrachloroethene		0.002	ND	ND	ND	ND		
Toluene		0.002	ND	ND	ND	ND		
1,2,3-Trichlorobenzene		0.005	ND	ND	ND	ND		
1,2,4-Trichlorobenzene		0.005	ND	ND	ND	ND		
1,1,1-Trichloroethane		0.001	ND	ND	ND	ND		
1,1,2-Trichloroethane		0.001	ND	ND	ND	ND		
Trichloroethene		0.002	ND	ND	ND	ND		
Trichlorofluoromethane		0.001	ND	ND	ND	ND		
1,2,3-Trichloropropane		0.005	ND	ND	ND	ND		
1,2,4-Trimethylbenzene		0.005	0.55	ND	ND	ND		
1,3,5-Trimethylbenzene		0.005	4	ND	0.63	1.1		
Vinyl chloride		0.003	ND	ND	ND	ND		
total-Xylenes		0.005	ND	ND	ND	ND		
1,1,2-Trichlorotrifluoroethane		0.01	ND	0.96	ND	ND		
1,2-Dichlorotrifluoroethane		0.01	ND	ND	ND	ND		
SURROGATE	AMOUNT	ACP %	% Recovery	% Recovery	% Recovery	% Recovery		
Dibromofluoromethane	50	80%-120	112%	113%	111%	120%		
Toluene-d8	50	85%-110	108%	107%	107%	108%		
4-Bromofluorobenzene	50	80%-120	100%	101%	97%	101%		

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

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Laboratory Director

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LABORATORY ANALYTICAL REPORT FOR ORGANICS

VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/5/97
Date received : 6/5/97
Date analyzed : 6/5,6,7/97
Date reported : 6/7/97
Report # : 10D009.RPT
Lab. ID # : 10D009

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : mg/Kg
Matrix : Soil

Field ID #			H11E2010100	H11A1010100	H11A2010100	H11B4030110	H11A1020104
Lab ID #			10D009-08	10D009-09	10D009-10	10D009-11	10D009-12
Dilution Factor			1	1	1	1	1
Compound		RL	92.9 %SOLID	79.1 %SOLID	79.3 %SOLID	80 %SOLID	78.8 %SOLID
Benzene		0.002	ND	ND	ND	ND	ND
Bromobenzene		0.005	ND	ND	ND	ND	ND
Bromochloromethane		0.005	ND	ND	ND	ND	ND
Bromodichloromethane		0.002	ND	ND	ND	ND	ND
Bromoform		0.002	ND	ND	ND	ND	ND
Bromomethane		0.002	ND	ND	ND	ND	ND
n-Butyl benzene		0.005	ND	ND	ND	ND	ND
sec-Butyl benzene		0.005	ND	ND	ND	ND	ND
tert-Butyl benzene		0.005	ND	ND	ND	ND	ND
Carbon tetrachloride		0.001	ND	ND	ND	ND	ND
Chlorobenzene		0.002	ND	ND	ND	ND	ND
Chloroethane		0.002	ND	ND	ND	ND	ND
Chloroform		0.002	ND	ND	ND	ND	ND
Chloromethane		0.002	ND	ND	ND	ND	ND
2-Chlorotoluene		0.005	ND	ND	ND	ND	ND
4-Chlorotoluene		0.005	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane		0.005	ND	ND	ND	ND	ND
Dibromochloromethane		0.002	ND	ND	ND	ND	ND
1,2-Dibromoethane		0.005	ND	ND	ND	ND	ND
Dibromomethane		0.005	ND	ND	ND	ND	ND
1,2-Dichlorobenzene		0.005	ND	ND	ND	ND	ND
1,3-Dichlorobenzene		0.005	ND	ND	ND	ND	ND
1,4-Dichlorobenzene		0.005	ND	ND	ND	ND	ND
Dichlorodifluoromethane		0.001	ND	ND	ND	ND	ND
1,1-Dichloroethane		0.002	ND	ND	ND	ND	ND
1,2-Dichloroethane		0.002	ND	ND	ND	ND	ND
1,1-Dichloroethene		0.002	ND	ND	ND	0.004	ND
cis-1,2-Dichloroethene		0.002	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene		0.001	ND	ND	ND	ND	ND
1,2-Dichloropropane		0.002	ND	ND	ND	ND	ND
1,3-Dichloropropane		0.005	ND	ND	ND	ND	ND
2,2-Dichloropropane		0.005	ND	ND	ND	ND	ND
1,1-Dichloropropene		0.005	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene		0.002	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene		0.002	ND	ND	ND	ND	ND
Ethyl benzene		0.001	ND	ND	ND	ND	ND
Hexachlorobutadiene		0.005	ND	ND	ND	ND	ND
Isopropyl benzene		0.005	ND	ND	ND	ND	ND
4-Isopropyl toluene		0.005	ND	ND	ND	ND	ND
Methylene chloride		0.005	ND	ND	ND	ND	ND
Naphthalene		0.005	ND	ND	ND	ND	ND
n-Propylbenzene		0.005	ND	ND	ND	ND	ND
Styrene		0.002	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane		0.005	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane		0.003	ND	ND	ND	ND	ND
Tetrachloroethene		0.002	ND	ND	ND	ND	ND
Toluene		0.002	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene		0.005	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene		0.005	ND	ND	ND	ND	ND
1,1,1-Trichloroethane		0.001	ND	ND	ND	ND	ND
1,1,2-Trichloroethane		0.001	ND	ND	ND	ND	ND
Trichloroethene		0.002	ND	ND	ND	ND	ND
Trichlorofluoromethane		0.001	ND	ND	ND	ND	ND
1,2,3-Trichloropropane		0.005	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene		0.005	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene		0.005	ND	ND	ND	ND	ND
Vinyl chloride		0.003	ND	ND	ND	ND	ND
total-Xylenes		0.005	ND	ND	ND	ND	ND
1,1,2-Trichlorotrifluoroethane		0.01	0.47	0.25 B	0.15 B	0.054 B	ND
1,2-Dichlorotrifluoroethane		0.01	ND	ND	ND	ND	ND
SURROGATE	AMOUNT	ACP %	%Recovery	%Recovery	%Recovery	%Recovery	%Recovery
Dibromofluoromethane	50	80%-120	116%	112%	120%	114%	121%
Toluene-d8	50	85%-110	104%	99%	106%	108%	107%
4-Bromofluorobenzene	50	80%-120	95%	96%	98%	99%	101%

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

JUL 23 1997
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LABORATORY ANALYTICAL REPORT FOR ORGANICS

VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA #260

Date sampled : 6/5/97
Date received : 6/5/97
Date analyzed : 6/5,6,7/97
Date reported : 6/7/97
Report # : 10D009.RPT
Lab. ID # : 10D009

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : mg/Kg
Matrix : Soil

Field ID #			H11B3010100	H11B2020104	H11B3020104	H11E2020104	H11A2020104	H11DUP0201	H11A3010100
Lab ID #			10D009-01	10D009-02	10D009-03	10D009-04	10D009-05	10D009-06	10D009-07
Dilution Factor			1	40	1	1	1	1	1
Compound		RL	79.1 %SOLID	75.5 %SOLID	75.4 %SOLID	74.7 %SOLID	77.5 %SOLID	81.2 %SOLID	74.6 %SOLID
Benzene		0.002	ND	ND	ND	ND	ND	ND	ND
Bromobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane		0.005	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane		0.002	ND	ND	ND	ND	ND	ND	ND
Bromoform		0.002	ND	ND	ND	ND	ND	ND	ND
Bromomethane		0.002	ND	ND	ND	ND	ND	ND	ND
n-Butyl benzene		0.005	ND	1.3	ND	0.15	ND	ND	ND
sec-Butyl benzene		0.005	ND	1.9	ND	0.013	ND	ND	ND
tert-Butyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride		0.001	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene		0.002	ND	ND	ND	ND	ND	ND	ND
Chloroethane		0.002	ND	ND	ND	ND	ND	ND	ND
Chloroform		0.002	ND	ND	ND	ND	ND	ND	ND
Chloromethane		0.002	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene		0.005	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene		0.005	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane		0.002	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane		0.005	ND	ND	ND	ND	ND	ND	ND
Dibromomethane		0.005	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane		0.001	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloromethane		0.002	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane		0.002	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene		0.001	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane		0.002	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene		0.005	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene		0.002	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene		0.002	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene		0.001	ND	0.37	ND	ND	ND	ND	ND
Hexachlorobutadiene		0.005	ND	ND	ND	ND	ND	ND	ND
Isopropyl benzene		0.005	ND	0.85	ND	ND	ND	ND	ND
4-Isopropyl toluene		0.005	ND	0.87	ND	0.021	ND	ND	ND
Methylene chloride		0.005	ND	ND	ND	ND	ND	ND	ND
Napithalene		0.005	ND	8.9	ND	ND	ND	ND	ND
n-Propylbenzene		0.005	ND	1.5	ND	0.008	ND	ND	ND
Styrene		0.002	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane		0.005	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane		0.003	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
Toluene		0.002	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane		0.001	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane		0.001	ND	ND	ND	ND	ND	ND	ND
Trichloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane		0.001	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene		0.005	ND	ND	ND	0.028	ND	ND	ND
1,3,5-Trimethyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride		0.003	ND	ND	ND	ND	ND	ND	ND
total-Xylenes		0.005	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichlorotrifluoroethane		0.01	0.43	ND	ND	3.6	0.063	0.2	0.43
1,2-Dichlorotrifluoroethane		0.01	ND	ND	ND	ND	ND	ND	ND
SURROGATE	AMOUNT	ACP %	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
Dibromofluoromethane	50	80%-120	116%	108%	116%	119%	114%	113%	113%
Toluene-d8	50	85%-110	105%	108%	107%	106%	108%	105%	90%
4-Bromofluorobenzene	50	80%-120	97%	98%	104%	92%	100%	94%	100%

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

JUL 23 1997
Date

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LABORATORY ANALYTICAL REPORT FOR ORGANICS

VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/5/97
Date received : 6/5/97
Date analyzed : 6/9,10/97
Date reported : 6/10/97
Report # : 10D010.RPT
Lab. ID # : 10D010

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5444V
Units : ug/l
Matrix : Water

Field ID #			H11F7010417	H11A3010407	H11B4010404	H11DUP0204	H11RB0101
Lab ID #			10D010-03	10D010-04	10D010-05	10D010-06	10D010-07
Dilution Factor			2500	1	5 / 1*	2500	1
Compound		RL					
Benzene		1	ND	ND	ND	ND	ND
Bromobenzene		1	ND	ND	ND	ND	ND
Bromochloromethane		1	ND	ND	ND	ND	ND
Bromodichloromethane		1	ND	ND	ND	ND	ND
Bromoform		2	ND	ND	ND	ND	ND
Bromomethane		1	ND	ND	ND	ND	ND
n-Butyl benzene		1	ND	ND	2 *	ND	ND
sec-Butyl benzene		1	ND	ND	12 *	ND	ND
tert-Butyl benzene		1	ND	ND	ND	ND	ND
Carbon tetrachloride		1	ND	ND	ND	ND	ND
Chlorobenzene		1	ND	ND	ND	ND	ND
Chloroethane		1	ND	ND	ND	ND	ND
Chloroform		1	ND	ND	ND	ND	3
Chloromethane		2	ND	ND	ND	ND	ND
2-Chlorotoluene		1	ND	ND	ND	ND	ND
4-Chlorotoluene		1	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane		5	ND	ND	ND	ND	ND
Dibromochloromethane		1	ND	ND	ND	ND	ND
1,2-Dibromoethane		2	ND	ND	ND	ND	ND
Dibromomethane		1	ND	ND	ND	ND	ND
1,2-Dichlorobenzene		1	ND	ND	ND	ND	ND
1,3-Dichlorobenzene		1	ND	ND	ND	ND	ND
1,4-Dichlorobenzene		1	ND	ND	ND	ND	ND
Dichlorodifluoromethane		1	ND	ND	ND	ND	ND
1,1-Dichloroethane		1	ND	ND	8 *	ND	ND
1,2-Dichloroethane		1	ND	ND	ND	ND	ND
1,1-Dichloroethene		1	ND	ND	8 *	ND	ND
cis-1,2-Dichloroethene		1	ND	ND	20 *	ND	ND
trans-1,2-Dichloroethene		1	ND	ND	ND	ND	ND
1,2-Dichloropropane		1	ND	ND	ND	ND	ND
1,3-Dichloropropane		1	ND	ND	ND	ND	ND
2,2-Dichloropropane		1	ND	ND	ND	ND	ND
1,1-Dichloropropene		1	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene		1	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene		1	ND	ND	ND	ND	ND
Ethyl benzene		1	ND	ND	ND	ND	ND
Hexachlorobutadiene		1	ND	ND	ND	ND	ND
Isopropyl benzene		1	ND	ND	3 *	ND	ND
4-Isopropyl toluene		1	ND	ND	ND	ND	ND
Methylene chloride		1	ND	ND	ND	ND	ND
Napithalene		5	ND	ND	ND	ND	ND
n-Propylbenzene		1	ND	ND	1 *	ND	ND
Styrene		1	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane		1	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane		2	ND	ND	ND	ND	ND
Tetrachloroethene		1	ND	ND	ND	ND	ND
Toluene		1	2000 B	3 B	3 B	ND	ND
1,2,3-Trichlorobenzene		2	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene		1	ND	ND	ND	ND	ND
1,1,1-Trichloroethane		1	ND	ND	ND	ND	ND
1,1,2-Trichloroethane		1	ND	ND	ND	ND	ND
Trichloroethene		1	ND	ND	6 *	ND	ND
Trichlorofluoromethane		1	ND	ND	ND	ND	ND
1,2,3-Trichloropropane		1	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene		1	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene		1	ND	ND	2 *	ND	ND
Vinyl chloride		2	ND	ND	ND	ND	ND
total-Xylenes		2	ND	ND	ND	ND	ND
1,1,2-Trichlorotrifluoroethane		10	270000	ND	280	180000	ND
1,2-Dichlorotrifluoroethane		1	ND	ND	ND	ND	ND
SURROGATE	AMOUNT	ACP %	%Recovery	%Recovery	%Recovery	%Recovery	%Recovery
Dibromofluoromethane	50	80%-120	113%	108%	117% / *105%	104%	118%
Toluene-d8	50	85%-110	108%	99%	109% / *103%	100%	109%
4-Bromofluorobenzene	50	80%-120	103%	93%	102% / *98%	97%	102%

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

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LABORATORY ANALYTICAL REPORT FOR ORGANICS
VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/5/97
Date received : 6/5/97
Date analyzed : 6/7/97
Date reported : 6/7/97
Report # : 10D010.RPT
Lab. ID # : 10D010

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : mg/Kg
Matrix : Soil

Field ID #			H11A3020104	H1182010100				
Lab ID #			10D010-01	10D010-02				
Dilution Factor			1	1				
Compound		RL	77.9 %SOLID	79.4 %SOLID				
Benzene		0.002	ND	ND				
Bromobenzene		0.005	ND	ND				
Bromochloromethane		0.005	ND	ND				
Bromodichloromethane		0.002	ND	ND				
Bromoform		0.002	ND	ND				
Bromomethane		0.002	ND	ND				
n-Butylbenzene		0.005	ND	ND				
sec-Butylbenzene		0.005	ND	ND				
tert-Butylbenzene		0.005	ND	ND				
Carbon tetrachloride		0.001	ND	ND				
Chlorobenzene		0.002	ND	ND				
Chloroethane		0.002	ND	ND				
Chloroform		0.002	ND	ND				
Chloromethane		0.002	ND	ND				
2-Chlorotoluene		0.005	ND	ND				
4-Chlorotoluene		0.005	ND	ND				
1,2-Dibromo-3-chloropropane		0.005	ND	ND				
Dibromochloromethane		0.002	ND	ND				
1,2-Dibromoethane		0.005	ND	ND				
Dibromomethane		0.005	ND	ND				
1,2-Dichlorobenzene		0.005	ND	ND				
1,3-Dichlorobenzene		0.005	ND	ND				
1,4-Dichlorobenzene		0.005	ND	ND				
Dichlorodifluoromethane		0.001	ND	ND				
1,1-Dichloroethane		0.002	ND	ND				
1,2-Dichloroethane		0.002	ND	ND				
1,1-Dichloroethene		0.002	ND	ND				
cis-1,2-Dichloroethene		0.002	ND	ND				
trans-1,2-Dichloroethene		0.001	ND	ND				
1,2-Dichloropropane		0.002	ND	ND				
1,3-Dichloropropane		0.005	ND	ND				
2,2-Dichloropropane		0.005	ND	ND				
1,1-Dichloropropene		0.005	ND	ND				
cis-1,3-Dichloropropene		0.002	ND	ND				
trans-1,3-Dichloropropene		0.002	ND	ND				
Ethylbenzene		0.001	ND	ND				
Hexachlorobutadiene		0.005	ND	ND				
Isopropylbenzene		0.005	ND	ND				
4-Isopropyltoluene		0.005	ND	ND				
Methylene chloride		0.005	ND	ND				
Naphthalene		0.005	ND	ND				
n-Propylbenzene		0.005	ND	ND				
Styrene		0.002	ND	ND				
1,1,1,2-Tetrachloroethane		0.005	ND	ND				
1,1,2,2-Tetrachloroethane		0.003	ND	ND				
Tetrachloroethene		0.002	ND	ND				
Toluene		0.002	ND	ND				
1,2,3-Trichlorobenzene		0.005	ND	ND				
1,2,4-Trichlorobenzene		0.005	ND	ND				
1,1,1-Trichloroethane		0.001	ND	ND				
1,1,2-Trichloroethane		0.001	ND	ND				
Trichloroethene		0.002	ND	ND				
Trichlorofluoromethane		0.001	ND	ND				
1,2,3-Trichloropropane		0.005	ND	ND				
1,2,4-Trimethylbenzene		0.005	ND	ND				
1,3,5-Trimethylbenzene		0.005	ND	ND				
Vinyl chloride		0.003	ND	ND				
total-Xylenes		0.005	ND	ND				
1,1,2-Trichlorotrifluoroethane		0.01	ND	0.24				
1,2-Dichlorotrifluoroethane		0.01	ND	ND				
SURROGATE	AMOUNT	ACP %	%Recovery	%Recovery				
Dibromofluoromethane	50	80%-120	113%	115%				
Toluene-d8	50	85%-110	107%	98%				
4-Bromofluorobenzene	50	80%-120	104%	98%				

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
POL - Practical Quantitation Limit - Multiply RL by the DF to obtain the POL for a specific sample
B - Contamination present in method blank

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Laboratory Director

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LABORATORY ANALYTICAL REPORT FOR ORGANICS

VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/9/97
Date received : 6/9/97
Date analyzed : 6/9/97
Date reported : 6/10/97
Report # : 10D011.RPT
Lab. ID # : 10D011

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : ug/l
Matrix : Water

Field ID #			H07C2010400				
Lab ID #			10D011-01				
Dilution Factor			1				
Compound		RL					
Benzene		1	2				
Bromobenzene		1	ND				
Bromochloromethane		1	ND				
Bromodichloromethane		1	ND				
Bromoform		2	ND				
Bromomethane		1	ND				
n-Butyl benzene		1	ND				
sec-Butyl benzene		1	ND				
tert-Butyl benzene		1	ND				
Carbon tetrachloride		1	ND				
Chlorobenzene		1	93				
Chloroethane		1	ND				
Chloroform		1	ND				
Chloromethane		2	ND				
2-Chlorotoluene		1	ND				
4-Chlorotoluene		1	ND				
1,2-Dibromo-3-chloropropane		5	ND				
Dibromochloromethane		1	ND				
1,2-Dibromoethane		2	ND				
Dibromomethane		1	ND				
1,2-Dichlorobenzene		1	ND				
1,3-Dichlorobenzene		1	ND				
1,4-Dichlorobenzene		1	ND				
Dichlorodifluoromethane		1	ND				
1,1-Dichloroethane		1	ND				
1,2-Dichloroethane		1	ND				
1,1-Dichloroethene		1	ND				
cis-1,2-Dichloroethene		1	3				
trans-1,2-Dichloroethene		1	ND				
1,2-Dichloropropane		1	ND				
1,3-Dichloropropane		1	ND				
2,2-Dichloropropane		1	ND				
1,1-Dichloropropene		1	ND				
cis-1,3-Dichloropropene		1	ND				
trans-1,3-Dichloropropene		1	ND				
Ethyl benzene		1	ND				
Hexachlorobutadiene		1	ND				
Isopropyl benzene		1	ND				
4-Isopropyl toluene		1	ND				
Methylene chloride		1	ND				
Naphthalene		5	ND				
n-Propyl benzene		1	ND				
Styrene		1	ND				
1,1,1,2-Tetrachloroethane		1	ND				
1,1,2,2-Tetrachloroethane		2	ND				
Tetrachloroethene		1	ND				
Toluene		1	ND				
1,2,3-Trichlorobenzene		2	ND				
1,2,4-Trichlorobenzene		1	ND				
1,1,1-Trichloroethane		1	ND				
1,1,2-Trichloroethane		1	ND				
Trichloroethene		1	ND				
Trichlorofluoromethane		1	ND				
1,2,3-Trichloropropane		1	ND				
1,2,4-Trimethyl benzene		1	ND				
1,3,5-Trimethyl benzene		1	ND				
Vinyl chloride		2	ND				
total-Xylenes		2	ND				
1,1,2-Trichlorotrifluoroethane		10	15				
1,2-Dichlorotrifluoroethane		1	ND				
SURROGATE	AMOUNT	ACP %	%Recovery				
Dibromofluoromethane	50	80%-120	118%				
Toluene-d8	50	85%-110	110%				
4-Bromofluorobenzene	50	80%-120	102%				

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

JUL 23 1997
Date

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LABORATORY ANALYTICAL REPORT FOR ORGANICS

VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/10/97, 6/11/97
Date received : 6/11/97
Date analyzed : 6/11/97
Date reported : 6/12/97
Report # : 10D012.RPT
Lab. ID # : 10D012

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : mg/Kg
Matrix : Soil

Field ID #		H11F9010103	H11F1010103	H11F10020113	H11F11010103
Lab ID #		10D012-01	10D012-02	10D012-05	10D012-06
Dilution Factor		1	1	1	1 / 2.5*
Compound	RL				
Benzene	0.002	ND	ND	ND	ND
Bromobenzene	0.005	ND	ND	ND	ND
Bromochloromethane	0.005	ND	ND	ND	ND
Bromodichloromethane	0.002	ND	ND	ND	ND
Bromoform	0.002	ND	ND	ND	ND
Bromomethane	0.002	ND	ND	ND	ND
n-Butylbenzene	0.005	ND	ND	ND	ND
sec-Butylbenzene	0.005	ND	ND	ND	ND
tert-Butylbenzene	0.005	ND	ND	ND	ND
Carbon tetrachloride	0.001	ND	ND	ND	ND
Chlorobenzene	0.002	ND	ND	ND	ND
Chloroethane	0.002	ND	ND	ND	ND
Chloroform	0.002	ND	ND	ND	ND
Chloromethane	0.002	ND	ND	ND	ND
2-Chlorotoluene	0.005	ND	ND	ND	ND
4-Chlorotoluene	0.005	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	0.005	ND	ND	ND	ND
Dibromochloromethane	0.002	ND	ND	ND	ND
1,2-Dibromoethane	0.005	ND	ND	ND	ND
Dibromomethane	0.005	ND	ND	ND	ND
1,2-Dichlorobenzene	0.005	ND	ND	ND	ND
1,3-Dichlorobenzene	0.005	ND	ND	ND	ND
1,4-Dichlorobenzene	0.005	ND	ND	ND	ND
Dichlorodifluoromethane	0.001	ND	ND	ND	ND
1,1-Dichloroethane	0.002	ND	ND	ND	ND
1,2-Dichloroethane	0.002	ND	ND	ND	ND
1,1-Dichloroethene	0.002	ND	ND	ND	ND
cis-1,2-Dichloroethene	0.002	ND	ND	ND	ND
trans-1,2-Dichloroethene	0.001	ND	ND	ND	ND
1,2-Dichloropropane	0.002	ND	ND	ND	ND
1,3-Dichloropropane	0.005	ND	ND	ND	ND
2,2-Dichloropropane	0.005	ND	ND	ND	ND
1,1-Dichloropropene	0.005	ND	ND	ND	ND
cis-1,3-Dichloropropene	0.002	ND	ND	ND	ND
trans-1,3-Dichloropropene	0.002	ND	ND	ND	ND
Ethylbenzene	0.001	ND	ND	ND	ND
Hexachlorobutadiene	0.005	ND	ND	ND	ND
Isopropylbenzene	0.005	ND	ND	ND	ND
4-Isopropyltoluene	0.005	ND	ND	ND	ND
Methylene chloride	0.005	ND	ND	ND	ND
Naphthalene	0.005	ND	ND	ND	ND
n-Propylbenzene	0.005	ND	ND	ND	ND
Styrene	0.002	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	0.005	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.003	ND	ND	ND	ND
Tetrachloroethene	0.002	ND	ND	ND	ND
Toluene	0.002	0.014 B	0.007 B	ND	0.003 B
1,2,3-Trichlorobenzene	0.005	ND	ND	ND	ND
1,2,4-Trichlorobenzene	0.005	ND	ND	ND	ND
1,1,1-Trichloroethane	0.001	ND	ND	ND	ND
1,1,2-Trichloroethane	0.001	ND	ND	ND	ND
Trichloroethene	0.002	ND	ND	ND	ND
Trichlorofluoromethane	0.001	ND	ND	ND	ND
1,2,3-Trichloropropane	0.005	ND	ND	ND	ND
1,2,4-Trimethylbenzene	0.005	ND	ND	ND	ND
1,3,5-Trimethylbenzene	0.005	ND	ND	ND	ND
Vinyl chloride	0.003	ND	ND	ND	ND
total-Xylenes	0.005	ND	ND	ND	ND
1,1,2-Trichlorotrifluoroethane	0.01	0.017	ND	1.0 E	0.11*
SURROGATE	AMOUNT	ACP %	% Recovery	% Recovery	% Recovery	% Recovery
Dibromofluoromethane	50	80%-120	96%	98%	102%	101% / *100%
Toluene-d8	50	85%-110	107%	102%	101%	101% / *102%
4-Bromofluorobenzene	50	80%-120	100%	101%	100%	100% / *101%

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
E - Estimated value
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

JUL 22 1997
Date

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LABORATORY ANALYTICAL REPORT FOR ORGANICS
VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/11/97
Date received : 6/11/97
Date analyzed : 6/11/97
Date reported : 6/12/97
Report # : 10D012.RPT
Lab. ID # : 10D012

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : ug/l
Matrix : Water

Field ID #		H11F9010405	H11F10010405				
Lab ID #		10D012-03	10D012-04				
Dilution Factor		200	25				
Compound	RL						
Benzene	1	ND	ND				
Bromobenzene	1	ND	ND				
Bromochloromethane	1	ND	ND				
Bromodichloromethane	1	ND	ND				
Bromoform	2	ND	ND				
Bromomethane	1	ND	ND				
n-Butyl benzene	1	ND	ND				
sec-Butyl benzene	1	ND	ND				
tert-Butyl benzene	1	ND	ND				
Carbon tetrachloride	1	ND	ND				
Chlorobenzene	1	ND	ND				
Chloroethane	1	ND	ND				
Chloroform	1	ND	ND				
Chloromethane	2	ND	ND				
2-Chlorotoluene	1	ND	ND				
4-Chlorotoluene	1	ND	ND				
1,2-Dibromo-3-chloropropane	5	ND	ND				
Dibromochloromethane	1	ND	ND				
1,2-Dibromoethane	2	ND	ND				
Dibromomethane	1	ND	ND				
1,2-Dichlorobenzene	1	ND	ND				
1,3-Dichlorobenzene	1	ND	ND				
1,4-Dichlorobenzene	1	ND	ND				
Dichlorodifluoromethane	1	ND	ND				
1,1-Dichloroethane	1	ND	ND				
1,2-Dichloroethane	1	ND	ND				
1,1-Dichloroethene	1	ND	ND				
cis-1,2-Dichloroethene	1	ND	ND				
trans-1,2-Dichloroethene	1	ND	ND				
1,2-Dichloropropane	1	ND	ND				
1,3-Dichloropropane	1	ND	ND				
2,2-Dichloropropane	1	ND	ND				
1,1-Dichloropropene	1	ND	ND				
cis-1,3-Dichloropropene	1	ND	ND				
trans-1,3-Dichloropropene	1	ND	ND				
Ethyl benzene	1	ND	ND				
Hexachlorobutadiene	1	ND	ND				
Isopropyl benzene	1	ND	ND				
4-Isopropyl toluene	1	ND	ND				
Methylene chloride	1	ND	ND				
Naphthalene	5	ND	ND				
n-Propylbenzene	1	ND	ND				
Styrene	1	ND	ND				
1,1,1,2-Tetrachloroethane	1	ND	ND				
1,1,2,2-Tetrachloroethane	2	ND	ND				
Tetrachloroethene	1	ND	ND				
Toluene	1	ND	33 B				
1,2,3-Trichlorobenzene	2	ND	ND				
1,2,4-Trichlorobenzene	1	ND	ND				
1,1,1-Trichloroethane	1	ND	ND				
1,1,2-Trichloroethane	1	ND	ND				
Trichloroethene	1	ND	ND				
Trichlorofluoromethane	1	ND	ND				
1,2,3-Trichloropropane	1	ND	ND				
1,2,4-Trimethyl benzene	1	ND	ND				
1,3,5-Trimethyl benzene	1	ND	ND				
Vinyl chloride	2	ND	ND				
total-Xylenes	2	ND	ND				
1,1,2-Trichlorotrifluoroethane	10	11000	2500				
SURROGATE	AMOUNT	ACP %	%Recovery	%Recovery			
Dibromofluoromethane	50	80%-120	100%	100%			
Toluene-d8	50	85%-110	101%	101%			
4-Bromofluorobenzene	50	80%-120	100%	101%			

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

JUL 22 1997
Date

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LABORATORY ANALYTICAL REPORT FOR ORGANICS

VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/11/97
Date received : 6/11/97
Date analyzed : 6/11/97
Date reported : 6/12/97
Report # : 10D013.RPT
Lab. ID # : 10D013

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : ug/l
Matrix : Water

Field ID #		H11F12010406	LINE-TB				
Lab ID #		10D013-03	10D013-09				
Dilution Factor		50	1				
Compound	RL						
Benzene	1	ND	ND				
Bromobenzene	1	ND	ND				
Bromochloromethane	1	ND	ND				
Bromodichloromethane	1	ND	ND				
Bromoform	2	ND	ND				
Bromomethane	1	ND	ND				
n-Butylbenzene	1	ND	ND				
sec-Butylbenzene	1	ND	ND				
tert-Butylbenzene	1	ND	ND				
Carbon tetrachloride	1	ND	ND				
Chlorobenzene	1	ND	ND				
Chloroethane	1	ND	ND				
Chloroform	1	ND	ND				
Chloromethane	2	ND	ND				
2-Chlorotoluene	1	ND	ND				
4-Chlorotoluene	1	ND	ND				
1,2-Dibromo-3-chloropropane	5	ND	ND				
Dibromochloromethane	1	ND	ND				
1,2-Dibromoethane	2	ND	ND				
Dibromomethane	1	ND	ND				
1,2-Dichlorobenzene	1	ND	ND				
1,3-Dichlorobenzene	1	ND	ND				
1,4-Dichlorobenzene	1	ND	ND				
Dichlorodifluoromethane	1	ND	ND				
1,1-Dichloroethane	1	ND	ND				
1,2-Dichloroethane	1	ND	ND				
1,1-Dichloroethene	1	ND	ND				
cis-1,2-Dichloroethene	1	ND	ND				
trans-1,2-Dichloroethene	1	ND	ND				
1,2-Dichloropropane	1	ND	ND				
1,3-Dichloropropane	1	ND	ND				
2,2-Dichloropropane	1	ND	ND				
1,1-Dichloropropene	1	ND	ND				
cis-1,3-Dichloropropene	1	ND	ND				
trans-1,3-Dichloropropene	1	ND	ND				
Ethylbenzene	1	ND	ND				
Hexachlorobutadiene	1	ND	ND				
Isopropylbenzene	1	ND	ND				
4-Isopropyltoluene	1	ND	ND				
Methylene chloride	1	ND	ND				
Naphthalene	5	ND	ND				
n-Propylbenzene	1	ND	ND				
Styrene	1	ND	ND				
1,1,1,2-Tetrachloroethane	1	ND	ND				
1,1,2,2-Tetrachloroethane	2	ND	ND				
Tetrachloroethene	1	ND	ND				
Toluene	1	75 B	ND				
1,2,3-Trichlorobenzene	2	ND	ND				
1,2,4-Trichlorobenzene	1	ND	ND				
1,1,1-Trichloroethane	1	ND	ND				
1,1,2-Trichloroethane	1	ND	ND				
Trichloroethene	1	ND	ND				
Trichlorofluoromethane	1	ND	ND				
1,2,3-Trichloropropane	1	ND	ND				
1,2,4-Trimethylbenzene	1	ND	ND				
1,3,5-Trimethylbenzene	1	ND	ND				
Vinyl chloride	2	ND	ND				
total-Xylenes	2	ND	ND				
1,1,2-Trichlorotrifluoroethane	10	2300	ND				
SURROGATE AMOUNT	ACP %	%Recovery	%Recovery				
Dibromofluoromethane 50	80%-120	100%	90%				
Toluene-d8 50	85%-110	101%	99%				
4-Bromofluorobenzene 50	80%-120	100%	89%				

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

JUL 23 1997
Date

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LABORATORY ANALYTICAL REPORT FOR ORGANICS

VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/11/97
Date received : 6/11/97
Date analyzed : 6/11/97, 6/12/97
Date reported : 6/13/97
Report # : 10D013.RPT
Lab. ID # : 10D013

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : mg/Kg
Matrix : Soil

11792 45283

Field ID #			H11F9020113	H11F12010103	H11F12020113	H11F13010103	H11F11020115	H11F14010103	H11DUP1101
Lab ID #			10D013-01	10D013-02	10D013-04	10D013-05	10D013-06	10D013-07	10D013-08
Dilution Factor			100	1	2.5/ *500	1	500 / *100000	1	500 / *10000
Compound		RL	82.5 %SOLID	74.4 %SOLID	82.1 %SOLID	77.4 %SOLID	78.7 %SOLID	75.1 %SOLID	79.8 %SOLID
Benzene		0.002	ND	ND	ND	ND	ND	ND	ND
Bromobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane		0.005	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane		0.002	ND	ND	ND	ND	ND	ND	ND
Bromoform		0.002	ND	ND	ND	ND	ND	ND	ND
Bromomethane		0.002	ND	ND	ND	ND	ND	ND	ND
n-Butyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
sec-Butyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
tert-Butyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride		0.001	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene		0.002	ND	ND	ND	ND	ND	ND	ND
Chloroethane		0.002	ND	ND	ND	ND	ND	ND	ND
Chloroform		0.002	ND	ND	ND	ND	ND	ND	ND
Chloromethane		0.002	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene		0.005	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene		0.005	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane		0.002	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane		0.005	ND	ND	ND	ND	ND	ND	ND
Dibromomethane		0.005	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane		0.001	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloromethane		0.002	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane		0.002	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene		0.001	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane		0.002	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene		0.005	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene		0.002	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene		0.002	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene		0.001	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene		0.005	ND	ND	ND	ND	ND	ND	ND
Isopropyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
4-Isopropyl toluene		0.005	ND	ND	ND	ND	ND	ND	ND
Methylene chloride		0.005	ND	ND	ND	ND	ND	ND	ND
Naphthalene		0.005	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene		0.005	ND	ND	ND	ND	ND	ND	ND
Styrene		0.002	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane		0.005	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane		0.003	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
Toluene		0.002	**0.4 B**	**0.004 B**	**0.010 B**	**0.004 B**	**1.7 B**	**0.004 B**	**1.8 B**
1,2,3-Trichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane		0.001	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane		0.001	ND	ND	ND	ND	ND	ND	ND
Trichloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane		0.001	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride		0.003	ND	ND	ND	ND	ND	ND	ND
total-Xylenes		0.005	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichlorotrifluoroethane		0.01	**4.5**	**0.11**	**78***	ND	**6200***	**0.037**	**1200***
SURROGATE	AMOUNT	ACP %	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
Dibromofluoromethane	50	80%-120	107%	105%	100% / *99%	104%	104% / *100%	105%	104% / *101%
Toluene-d8	50	85%-110	96%	101%	101% / *99%	99%	97% / *100%	100%	98% / *99%
4-Bromofluorobenzene	50	80%-120	99%	99%	101% / *103%	100%	99% / *100%	97%	100% / *104%

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

JUL 23 1997
Date

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LABORATORY ANALYTICAL REPORT FOR ORGANICS

VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/13/97
Date received : 6/13/97
Date analyzed : 6/13/97
Date reported : 6/13/97
Report # : 10D015.RPT
Lab. ID # : 10D015

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : mg/Kg
Matrix : Soil

Field ID #			H11B7010103	H11B7020108	H11B8010103	H11B8020108	H11B6010103	H11B6020108	H11B5010103
Lab ID #			10D015-01	10D015-02	10D015-03	10D015-04	10D015-05	10D015-06	10D015-07
Dilution Factor			1	1	1	1	1	1	1
Compound		RL	78.7 %SOLID	78.3 %SOLID	76.3 %SOLID	76.9 %SOLID	79.4 %SOLID	81.2 %SOLID	78.6 %SOLID
Benzene		0.002	ND	ND	ND	ND	ND	ND	ND
Bromobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane		0.005	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane		0.002	ND	ND	ND	ND	ND	ND	ND
Bromoform		0.002	ND	ND	ND	ND	ND	ND	ND
Bromomethane		0.002	ND	ND	ND	ND	ND	ND	ND
n-Butyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
sec-Butyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
tert-Butyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride		0.001	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene		0.002	ND	ND	ND	ND	ND	ND	ND
Chloroethane		0.002	ND	ND	ND	ND	ND	ND	ND
Chloroform		0.002	ND	ND	ND	ND	ND	ND	ND
Chloromethane		0.002	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene		0.005	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene		0.005	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane		0.002	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane		0.005	ND	ND	ND	ND	ND	ND	ND
Dibromomethane		0.005	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane		0.001	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane		0.002	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane		0.002	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene		0.001	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane		0.002	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene		0.005	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene		0.002	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene		0.002	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene		0.001	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene		0.005	ND	ND	ND	ND	ND	ND	ND
Isopropyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
4-Isopropyl toluene		0.005	ND	ND	ND	ND	ND	ND	ND
Methylene chloride		0.005	ND	ND	ND	ND	ND	ND	ND
Naphthalene		0.005	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene		0.005	ND	ND	ND	ND	ND	ND	ND
Styrene		0.002	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane		0.005	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane		0.003	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
Toluene		0.002	ND	0.004 B	0.003 B	0.004 B	0.004 B	0.003 B	ND
1,2,3-Trichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane		0.001	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane		0.001	ND	ND	ND	ND	ND	ND	ND
Trichloroethene		0.002	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane		0.001	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane		0.005	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene		0.005	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride		0.003	ND	ND	ND	ND	ND	ND	ND
total-Xylenes		0.005	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichlorotrifluoroethane		0.01	ND	ND	ND	ND	0.059 B	0.030 B	0.025 B
SURROGATE	AMOUNT	ACP %	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
Dibromofluoromethane	50	80%-120	99%	101%	102%	103%	98%	100%	104%
Toluene-d8	50	85%-110	102%	100%	101%	99%	101%	100%	98%
4-Bromofluorobenzene	50	80%-120	102%	102%	101%	101%	100%	101%	100%

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

Gavin Voigt
Laboratory Director

JUL 23 1997
Date

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LABORATORY ANALYTICAL REPORT FOR ORGANICS
VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/13/97
Date received : 6/13/97
Date analyzed : 6/13/97
Date reported : 6/13/97
Report # : 10D015.RPT
Lab. ID # : 10D015

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : mg/Kg
Matrix : Soil

Field ID #			H11B5020108	H11DUP1201				
Lab ID #			10D015-08	10D015-09				
Dilution Factor			1	1				
Compound		RL	79.6 %SOLID	77.3 %SOLID				
Benzene		0.002	ND	ND				
Bromobenzene		0.005	ND	ND				
Bromochloromethane		0.005	ND	ND				
Bromodichloromethane		0.002	ND	ND				
Bromoform		0.002	ND	ND				
Bromomethane		0.002	ND	ND				
n-Butyl benzene		0.005	ND	ND				
sec-Butyl benzene		0.005	ND	ND				
tert-Butyl benzene		0.005	ND	ND				
Carbon tetrachloride		0.001	ND	ND				
Chlorobenzene		0.002	ND	ND				
Chloroethane		0.002	ND	ND				
Chloroform		0.002	ND	ND				
Chloromethane		0.002	ND	ND				
2-Chlorotoluene		0.005	ND	ND				
4-Chlorotoluene		0.005	ND	ND				
1,2-Dibromo-3-chloropropane		0.005	ND	ND				
Dibromochloromethane		0.002	ND	ND				
1,2-Dibromoethane		0.005	ND	ND				
Dibromomethane		0.005	ND	ND				
1,2-Dichlorobenzene		0.005	ND	ND				
1,3-Dichlorobenzene		0.005	ND	ND				
1,4-Dichlorobenzene		0.005	ND	ND				
Dichlorodifluoromethane		0.001	ND	ND				
1,1-Dichloroethane		0.002	ND	ND				
1,2-Dichloroethane		0.002	ND	ND				
1,1-Dichloroethene		0.002	ND	ND				
cis-1,2-Dichloroethene		0.002	ND	ND				
trans-1,2-Dichloroethene		0.001	ND	ND				
1,2-Dichloropropane		0.002	ND	ND				
1,3-Dichloropropane		0.005	ND	ND				
2,2-Dichloropropane		0.005	ND	ND				
1,1-Dichloropropene		0.005	ND	ND				
cis-1,3-Dichloropropene		0.002	ND	ND				
trans-1,3-Dichloropropene		0.002	ND	ND				
Ethyl benzene		0.001	ND	ND				
Hexachlorobutadiene		0.005	ND	ND				
Isopropyl benzene		0.005	ND	ND				
4-Isopropyl toluene		0.005	ND	ND				
Methylene chloride		0.005	ND	ND				
Naphthalene		0.005	ND	ND				
n-Propylbenzene		0.005	ND	ND				
Styrene		0.002	ND	ND				
1,1,1,2-Tetrachloroethane		0.005	ND	ND				
1,1,2,2-Tetrachloroethane		0.003	ND	ND				
Tetrachloroethene		0.002	ND	ND				
Toluene		0.002	0.003 B	ND				
1,2,3-Trichlorobenzene		0.005	ND	ND				
1,2,4-Trichlorobenzene		0.005	ND	ND				
1,1,1-Trichloroethane		0.001	ND	ND				
1,1,2-Trichloroethane		0.001	ND	ND				
Trichloroethene		0.002	ND	ND				
Trichlorofluoromethane		0.001	ND	ND				
1,2,3-Trichloropropane		0.005	ND	ND				
1,2,4-Trimethyl benzene		0.005	ND	ND				
1,3,5-Trimethyl benzene		0.005	ND	ND				
Vinyl chloride		0.003	ND	ND				
total-Xylenes		0.005	ND	ND				
1,1,2-Trichlorotrifluoroethane		0.01	0.025 B	0.038 B				
SURROGATE	AMOUNT	ACP %	% Recovery	% Recovery				
Dibromofluoromethane	50	80%-120	102%	104%				
Toluene-d8	50	85%-110	99%	99%				
4-Bromofluorobenzene	50	80%-120	101%	98%				

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

JUL 23 1997
Date

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LABORATORY ANALYTICAL REPORT FOR ORGANICS

VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/13/97
Date received : 6/13/97
Date analyzed : 6/13/97
Date reported : 6/14/97
Report # : 10D015.RPT
Lab. ID # : 10D015

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : ug/l
Matrix : Water

Field ID #			H11RB-PW					
Lab ID #			10D015-10					
Dilution Factor			1					
Compound		RL						
Benzene		1	ND					
Bromobenzene		1	ND					
Bromochloromethane		1	ND					
Bromodichloromethane		1	ND					
Bromoform		2	ND					
Bromomethane		1	ND					
n-Butyl benzene		1	ND					
sec-Butyl benzene		1	ND					
tert-Butyl benzene		1	ND					
Carbon tetrachloride		1	ND					
Chlorobenzene		1	ND					
Chloroethane		1	ND					
Chloroform		1	ND					
Chloromethane		2	ND					
2-Chlorotoluene		1	ND					
4-Chlorotoluene		1	ND					
1,2-Dibromo-3-chloropropane		5	ND					
Dibromochloromethane		1	ND					
1,2-Dibromoethane		2	ND					
Dibromomethane		1	ND					
1,2-Dichlorobenzene		1	ND					
1,3-Dichlorobenzene		1	ND					
1,4-Dichlorobenzene		1	ND					
Dichlorodifluoromethane		1	ND					
1,1-Dichloroethane		1	ND					
1,2-Dichloroethane		1	ND					
1,1-Dichloroethene		1	ND					
cis-1,2-Dichloroethene		1	ND					
trans-1,2-Dichloroethene		1	ND					
1,2-Dichloropropane		1	ND					
1,3-Dichloropropane		1	ND					
2,2-Dichloropropane		1	ND					
1,1-Dichloropropene		1	ND					
cis-1,3-Dichloropropene		1	ND					
trans-1,3-Dichloropropene		1	ND					
Ethyl benzene		1	ND					
Hexachlorobutadiene		1	ND					
Isopropyl benzene		1	ND					
4-Isopropyl toluene		1	ND					
Methylene chloride		1	ND					
Naphthalene		5	ND					
n-Propylbenzene		1	ND					
Styrene		1	ND					
1,1,1,2-Tetrachloroethane		1	ND					
1,1,2,2-Tetrachloroethane		2	ND					
Tetrachloroethene		1	ND					
Toluene		1	ND					
1,2,3-Trichlorobenzene		2	ND					
1,2,4-Trichlorobenzene		1	ND					
1,1,1-Trichloroethane		1	ND					
1,1,2-Trichloroethane		1	ND					
Trichloroethene		1	ND					
Trichlorofluoromethane		1	ND					
1,2,3-Trichloropropane		1	ND					
1,2,4-Trimethyl benzene		1	ND					
1,3,5-Trimethyl benzene		1	ND					
Vinyl chloride		2	ND					
total-Xylenes		2	ND					
1,1,2-Trichlorotrifluoroethane		10	ND					
SURROGATE	AMOUNT	ACP %	%Recovery					
Dibromofluoromethane	50	80%-120	86%					
Toluene-d8	50	85%-110	85%					
4-Bromofluorobenzene	50	80%-120	82%					

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

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LABORATORY ANALYTICAL REPORT FOR ORGANICS
VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/14/97
Date received : 6/16/97
Date analyzed : 6/16/97
Date reported : 6/16/97
Report # : 10D016.RPT
Lab. ID # : 10D016

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : mg/Kg
Matrix : Soil

Field ID #		H11C6010105					
Lab ID #		10D016-01					
Dilution Factor		1					
Compound	RL						
Benzene	0.002	ND					
Bromobenzene	0.005	ND					
Bromochloromethane	0.005	ND					
Bromodichloromethane	0.002	ND					
Bromoform	0.002	ND					
Bromomethane	0.002	ND					
n-Butyl benzene	0.005	ND					
sec-Butyl benzene	0.005	ND					
tert-Butyl benzene	0.005	ND					
Carbon tetrachloride	0.001	ND					
Chlorobenzene	0.002	ND					
Chloroethane	0.002	ND					
Chloroform	0.002	ND					
Chloromethane	0.002	ND					
2-Chlorotoluene	0.005	ND					
4-Chlorotoluene	0.005	ND					
1,2-Dibromo-3-chloropropane	0.005	ND					
Dibromochloromethane	0.002	ND					
1,2-Dibromoethane	0.005	ND					
Dibromomethane	0.005	ND					
1,2-Dichlorobenzene	0.005	ND					
1,3-Dichlorobenzene	0.005	ND					
1,4-Dichlorobenzene	0.005	ND					
Dichlorodifluoromethane	0.001	ND					
1,1-Dichloroethane	0.002	ND					
1,2-Dichloroethane	0.002	ND					
1,1-Dichloroethene	0.002	ND					
cis-1,2-Dichloroethene	0.002	ND					
trans-1,2-Dichloroethene	0.001	ND					
1,2-Dichloropropane	0.002	ND					
1,3-Dichloropropane	0.005	ND					
2,2-Dichloropropane	0.005	ND					
1,1-Dichloropropene	0.005	ND					
cis-1,3-Dichloropropene	0.002	ND					
trans-1,3-Dichloropropene	0.002	ND					
Ethyl benzene	0.001	ND					
Hexachlorobutadiene	0.005	ND					
Isopropyl benzene	0.005	ND					
4-Isopropyl toluene	0.005	ND					
Methylene chloride	0.005	ND					
Naphthalene	0.005	ND					
n-Propylbenzene	0.005	ND					
Styrene	0.002	ND					
1,1,1,2-Tetrachloroethane	0.005	ND					
1,1,2,2-Tetrachloroethane	0.003	ND					
Tetrachloroethene	0.002	ND					
Toluene	0.002	ND					
1,2,3-Trichlorobenzene	0.005	ND					
1,2,4-Trichlorobenzene	0.005	ND					
1,1,1-Trichloroethane	0.001	ND					
1,1,2-Trichloroethane	0.001	ND					
Trichloroethene	0.002	ND					
Trichlorofluoromethane	0.001	ND					
1,2,3-Trichloropropane	0.005	ND					
1,2,4-Trimethyl benzene	0.005	ND					
1,3,5-Trimethyl benzene	0.005	ND					
Vinyl chloride	0.003	ND					
total-Xylenes	0.005	ND					
1,1,2-Trichlorotrifluoroethane	0.01	ND					
SURROGATE	AMOUNT	ACP %	% Recovery				
Dibromofluoromethane	50	80%-120	83%				
Toluene-d8	50	85%-110	85%				
4-Bromofluorobenzene	50	80%-120	82%				

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
E - Estimated value
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

JUL 23 1997
Date

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LABORATORY ANALYTICAL REPORT FOR ORGANICS
VOLATILE ORGANIC COMPOUNDS BY GC/MS EPA 8260

Date sampled : 6/16/97
Date received : 6/16/97
Date analyzed : 6/16/97
Date reported : 6/16/97
Report # : 10D016.RPT
Lab. ID # : 10D016

Project Mgr : Robert Kewer
Client : Harza Environmental Services
Project : IAAAP
Project #: 5644V
Units : ug/l
Matrix : Water

Field ID #			H11C4010300	H11C3010300	H11C6010300			
Lab ID #			10D016-02	10D016-03	10D016-04			
Dilution Factor			1	1	1			
Compound		RL						
Benzene		1	ND	ND	ND			
Bromobenzene		1	ND	ND	ND			
Bromochloromethane		1	ND	ND	ND			
Bromodichloromethane		1	ND	ND	ND			
Bromoform		2	ND	ND	ND			
Bromomethane		1	ND	ND	ND			
n-Butyl benzene		1	ND	ND	ND			
sec-Butyl benzene		1	ND	ND	ND			
tert-Butyl benzene		1	ND	ND	ND			
Carbon tetrachloride		1	ND	ND	ND			
Chlorobenzene		1	ND	ND	ND			
Chloroethane		1	ND	ND	ND			
Chloroform		1	ND	ND	ND			
Chloromethane		2	ND	ND	ND			
2-Chlorotoluene		1	ND	ND	ND			
4-Chlorotoluene		1	ND	ND	ND			
1,2-Dibromo-3-chloropropane		5	ND	ND	ND			
Dibromochloromethane		1	ND	ND	ND			
1,2-Dibromoethane		2	ND	ND	ND			
Dibromomethane		1	ND	ND	ND			
1,2-Dichlorobenzene		1	ND	ND	ND			
1,3-Dichlorobenzene		1	ND	ND	ND			
1,4-Dichlorobenzene		1	ND	ND	ND			
Dichlorodifluoromethane		1	ND	ND	ND			
1,1-Dichloroethane		1	ND	ND	ND			
1,2-Dichloroethane		1	ND	ND	ND			
1,1-Dichloroethene		1	ND	ND	ND			
cis-1,2-Dichloroethene		1	ND	ND	ND			
trans-1,2-Dichloroethene		1	ND	ND	ND			
1,2-Dichloropropane		1	ND	ND	ND			
1,3-Dichloropropane		1	ND	ND	ND			
2,2-Dichloropropane		1	ND	ND	ND			
1,1-Dichloropropene		1	ND	ND	ND			
cis-1,3-Dichloropropene		1	ND	ND	ND			
trans-1,3-Dichloropropene		1	ND	ND	ND			
Ethyl benzene		1	ND	ND	ND			
Hexachlorobutadiene		1	ND	ND	ND			
Isopropyl benzene		1	ND	ND	ND			
4-Isopropyl toluene		1	ND	ND	ND			
Methylene chloride		1	ND	ND	ND			
Naphthalene		5	ND	ND	ND			
n-Propylbenzene		1	ND	ND	ND			
Styrene		1	ND	ND	ND			
1,1,1,2-Tetrachloroethane		1	ND	ND	ND			
1,1,2,2-Tetrachloroethane		2	ND	ND	ND			
Tetrachloroethene		1	ND	ND	ND			
Toluene		1	ND	ND	ND			
1,2,3-Trichlorobenzene		2	ND	ND	ND			
1,2,4-Trichlorobenzene		1	ND	ND	ND			
1,1,1-Trichloroethane		1	ND	ND	ND			
1,1,2-Trichloroethane		1	ND	ND	ND			
Trichloroethene		1	ND	ND	ND			
Trichlorofluoromethane		1	ND	ND	ND			
1,2,3-Trichloropropane		1	ND	ND	ND			
1,2,4-Trimethyl benzene		1	ND	ND	ND			
1,3,5-Trimethyl benzene		1	ND	ND	ND			
Vinyl chloride		2	ND	ND	ND			
total-Xylenes		2	ND	ND	ND			
1,1,2-Trichlorotrifluoroethane		10	ND	ND	ND			
SURROGATE	AMOUNT	ACP %	%Recovery	%Recovery	%Recovery			
Dibromofluoromethane	50	80%-120	85%	100%	82%			
Toluene-d8	50	85%-110	86%	97%	86%			
4-Bromofluorobenzene	50	80%-120	90%	98%	92%			

Notes : ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
mg/Kg - Milligrams per Kilogram (PPM)
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
B - Contamination present in method blank

Gareth Voigt
Laboratory Director

JUL 23 1997
Date

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APPENDIX L
FIXED LABORATORY ANALYTICAL DATA

L-1 Task 6. Ammunition Box Chipper Disposal Area

L-2 Task 7. Surface Water & Sediment Sampling, Site Drainages

L-3 Task 10. Pumping Test, Line 2

L-4 Task 12. Additional Groundwater Data, Line 2

L-5 Task 13. Groundwater Data, Downstream Reach, Brush Creek

L-6 Task 16. Additional Groundwater Data, Line 3

APPENDIX L
FIXED LABORATORY ANALYTICAL DATA

L-1 Task 6. Ammunition Box Chipper Disposal Area

562

SEMI-VOLATILE ORGANIC COMPOUNDS
(Method 8270)

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-06-A-01-04-00	ARDL Lab No.:	300567-09
Desc/Location:	6-A TASK 6	Lab Filename:	
Sample Date:	06/17/1997	Received Date:	06/21/1997
Sample Time:	0815	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-06-A-01-04-00	ARDL Lab No.:	300567-09 (cont'd)
Desc/Location:	6-A TASK 6	Lab Filename:	
Sample Date:	06/17/1997	Received Date:	06/21/1997
Sample Time:	0815	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-06-A-01-04-00	ARDL Lab No.:	300567-09 (cont'd)
Desc/Location:	6-A TASK 6	Lab Filename:	
Sample Date:	06/17/1997	Received Date:	06/21/1997
Sample Time:	0815	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	70%
2-FLUOROPHENOL	21-110	28%
D5 NITROBENZENE	35-114	71%
2,4,6-TRIBROMOPHENOL	10-123	41%
D5 PHENOL	10-94	21%
D14 TERPHENYL	33-141	67%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-06-A-01-04-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300567 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300567-09

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1589

Level: (low/med) LOW Date Received: 6/21/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/24/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 7/01/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	7.83	11.	JB
2.	Unknown	8.43	8.	JB
3.	Unknown	16.97	5.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-06-B-01-04-00	ARDL Lab No.:	300567-11
Desc/Location:	6-B TASK 6	Lab Filename:	
Sample Date:	06/18/1997	Received Date:	06/21/1997
Sample Time:	1800	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-06-B-01-04-00	ARDL Lab No.:	300567-11 (cont'd)
Desc/Location:	6-B TASK 6	Lab Filename:	
Sample Date:	06/18/1997	Received Date:	06/21/1997
Sample Time:	1800	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-06-B-01-04-00	ARDL Lab No.:	300567-11 (cont'd)
Desc/Location:	6-B TASK 6	Lab Filename:	
Sample Date:	06/18/1997	Received Date:	06/21/1997
Sample Time:	1800	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	78%
2-FLUOROPHENOL	21-110	31%
D5 NITROBENZENE	35-114	66%
2,4,6-TRIBROMOPHENOL	10-123	67%
D5 PHENOL	10-94	24%
D14 TERPHENYL	33-141	75%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-06-B-01-04-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300567 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300567-11

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1591

Level: (low/med) LOW Date Received: 6/21/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/24/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 7/01/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.8

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	7.83	6.	JB
2.		Unknown	8.44	4.	JB
3.					
4.					
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-06-C-01-04-00	ARDL Lab No.:	300567-13
Desc/Location:	6-C TASK 6	Lab Filename:	
Sample Date:	06/18/1997	Received Date:	06/21/1997
Sample Time:	1230	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-06-C-01-04-00	ARDL Lab No.:	300567-13 (cont'd)
Desc/Location:	6-C TASK 6	Lab Filename:	
Sample Date:	06/18/1997	Received Date:	06/21/1997
Sample Time:	1230	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-06-C-01-04-00	ARDL Lab No.:	300567-13 (cont'd)
Desc/Location:	6-C TASK 6	Lab Filename:	
Sample Date:	06/18/1997	Received Date:	06/21/1997
Sample Time:	1230	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	66%
2-FLUOROPHENOL	21-110	28%
D5 NITROBENZENE	35-114	61%
2,4,6-TRIBROMOPHENOL	10-123	58%
D5 PHENOL	10-94	22%
D14 TERPHENYL	33-141	70%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-06-C-01-04-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300567 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300567-13

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1593

Level: (low/med) LOW Date Received: 6/21/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/24/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 7/01/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.7

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	7.83	5.	JB
2.					
3.					
4.					
5.					
6.					
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-06-D-01-04-00	ARDL Lab No.:	300567-08
Desc/Location:	6-D TASK 6	Lab Filename:	
Sample Date:	06/18/1997	Received Date:	06/21/1997
Sample Time:	1830	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-06-D-01-04-00	ARDL Lab No.:	300567-08 (cont'd)
Desc/Location:	6-D TASK 6	Lab Filename:	
Sample Date:	06/18/1997	Received Date:	06/21/1997
Sample Time:	1830	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-06-D-01-04-00	ARDL Lab No.:	300567-08 (cont'd)
Desc/Location:	6-D TASK 6	Lab Filename:	
Sample Date:	06/18/1997	Received Date:	06/21/1997
Sample Time:	1830	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	72%
2-FLUOROPHENOL	21-110	29%
D5 NITROBENZENE	35-114	67%
2,4,6-TRIBROMOPHENOL	10-123	54%
D5 PHENOL	10-94	23%
D14 TERPHENYL	33-141	68%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-06-D-01-04-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300567 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300567-08

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1588

Level: (low/med) LOW Date Received: 6/21/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/24/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 7/01/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.5

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	7.83	9.	JB
2.		Unknown	8.43	8.	JB
3.					
4.					
5.					
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-06-E-01-04-00	ARDL Lab No.:	300567-10
Desc/Location:	6-E TASK 6	Lab Filename:	
Sample Date:	06/18/1997	Received Date:	06/21/1997
Sample Time:	1845	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-06-E-01-04-00	ARDL Lab No.:	300567-10 (cont'd)
Desc/Location:	6-E TASK 6	Lab Filename:	
Sample Date:	06/18/1997	Received Date:	06/21/1997
Sample Time:	1845	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-06-E-01-04-00	ARDL Lab No.:	300567-10 (cont'd)
Desc/Location:	6-E TASK 6	Lab Filename:	
Sample Date:	06/18/1997	Received Date:	06/21/1997
Sample Time:	1845	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	75%
2-FLUOROPHENOL	21-110	32%
D5 NITROBENZENE	35-114	70%
2,4,6-TRIBROMOPHENOL	10-123	55%
D5 PHENOL	10-94	25%
D14 TERPHENYL	33-141	75%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-06-E-01-04-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300567 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300567-10

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1590

Level: (low/med) LOW Date Received: 6/21/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/24/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 7/01/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.6

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	7.83	10.	JB
2.	Unknown	8.43	8.	JB
3.				
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: SW3510

Field ID:	H-06-F-01-04-00	ARDL Lab No.:	300567-06 (cont'd)
Desc/Location:	6-F TASK 6	Lab Filename:	
Sample Date:	06/18/1997	Received Date:	06/21/1997
Sample Time:	1422	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2320
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: SW3510

Field ID:	H-06-F-01-04-00	ARDL Lab No.:	300567-06 (cont'd)
Desc/Location:	6-F TASK 6	Lab Filename:	
Sample Date:	06/18/1997	Received Date:	06/21/1997
Sample Time:	1422	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2320
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	75%
2-FLUOROPHENOL	21-110	43%
D5 NITROBENZENE	35-114	71%
2,4,6-TRIBROMOPHENOL	10-123	90%
D5 PHENOL	10-94	29%
D14 TERPHENYL	33-141	75%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-06-F-01-04-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300567 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300567-06

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1584

Level: (low/med) LOW Date Received: 6/21/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/24/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 7/01/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.6

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	7.84	15.	JB
2.		Unknown	8.44	9.	JB
3.					
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-06-G-01-04-00	ARDL Lab No.:	300567-12
Desc/Location:	6-G TASK 6	Lab Filename:	
Sample Date:	06/18/1997	Received Date:	06/21/1997
Sample Time:	1752	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-06-G-01-04-00	ARDL Lab No.:	300567-12 (cont'd)
Desc/Location:	6-G TASK 6	Lab Filename:	
Sample Date:	06/18/1997	Received Date:	06/21/1997
Sample Time:	1752	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-06-G-01-04-00	ARDL Lab No.:	300567-12 (cont'd)
Desc/Location:	6-G TASK 6	Lab Filename:	
Sample Date:	06/18/1997	Received Date:	06/21/1997
Sample Time:	1752	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	75%
2-FLUOROPHENOL	21-110	23%
D5 NITROBENZENE	35-114	70%
2,4,6-TRIBROMOPHENOL	10-123	40%
D5 PHENOL	10-94	20%
D14 TERPHENYL	33-141	73%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-06-G-01-04-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300567 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300567-12

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1592

Level: (low/med) LOW Date Received: 6/21/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/24/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 7/01/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.8

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	7.83	6.	JB
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
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ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/09/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H6JAW620010300	ARDL Lab No.:	300576-09
Desc/Location:	WELL JAW 620	Lab Filename:	
Sample Date:	06/26/1997	Received Date:	06/27/1997
Sample Time:	0920	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2329
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/09/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H6JAW620010300	ARDL Lab No.:	300576-09 (cont'd)
Desc/Location:	WELL JAW 620	Lab Filename:	
Sample Date:	06/26/1997	Received Date:	06/27/1997
Sample Time:	0920	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2329
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	76.7		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/09/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H6JAW620010300	ARDL Lab No.:	300576-09 (cont'd)
Desc/Location:	WELL JAW 620	Lab Filename:	
Sample Date:	06/26/1997	Received Date:	06/27/1997
Sample Time:	0920	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2329
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	100%
2-FLUOROPHENOL	21-110	46%
D5 NITROBENZENE	35-114	84%
2,4,6-TRIBROMOPHENOL	10-123	81%
D5 PHENOL	10-94	35%
D14 TERPHENYL	33-141	106%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H6JAW620010300

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300576 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300576-09

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1653

Level: (low/med) LOW Date Received: 6/27/97

% Moisture: not dec. --- dec. --- Date Extracted: 7/02/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 7/08/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/09/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H6JAW621010300	ARDL Lab No.:	300576-10
Desc/Location:	WELL JAW 621	Lab Filename:	
Sample Date:	06/26/1997	Received Date:	06/27/1997
Sample Time:	1140	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2329
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/09/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H6JAW621010300	ARDL Lab No.:	300576-10 (cont'd)
Desc/Location:	WELL JAW 621	Lab Filename:	
Sample Date:	06/26/1997	Received Date:	06/27/1997
Sample Time:	1140	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2329
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	70.8		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/09/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H6JAW621010300	ARDL Lab No.:	300576-10 (cont'd)
Desc/Location:	WELL JAW 621	Lab Filename:	
Sample Date:	06/26/1997	Received Date:	06/27/1997
Sample Time:	1140	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2329
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	82%
2-FLUOROPHENOL	21-110	43%
D5 NITROBENZENE	35-114	68%
2,4,6-TRIBROMOPHENOL	10-123	77%
D5 PHENOL	10-94	31%
D14 TERPHENYL	33-141	89%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H6JAW621010300

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300576 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300576-10

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1654

Level: (low/med) LOW Date Received: 6/27/97

% Moisture: not dec. --- dec. --- Date Extracted: 7/02/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 7/08/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/09/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H6JAW622010300	ARDL Lab No.:	300576-11
Desc/Location:	WELL JAW 622	Lab Filename:	
Sample Date:	06/26/1997	Received Date:	06/27/1997
Sample Time:	1505	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2329
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/09/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H6JAW622010300	ARDL Lab No.:	300576-11 (cont'd)
Desc/Location:	WELL JAW 622	Lab Filename:	
Sample Date:	06/26/1997	Received Date:	06/27/1997
Sample Time:	1505	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2329
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	26.4		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/09/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H6JAW622010300	ARDL Lab No.:	300576-11 (cont'd)
Desc/Location:	WELL JAW 622	Lab Filename:	
Sample Date:	06/26/1997	Received Date:	06/27/1997
Sample Time:	1505	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2329
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	82%
2-FLUOROPHENOL	21-110	43%
D5 NITROBENZENE	35-114	69%
2,4,6-TRIBROMOPHENOL	10-123	75%
D5 PHENOL	10-94	31%
D14 TERPHENYL	33-141	88%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H6JAW622010300

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300576 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300576-11

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1655

Level: (low/med) LOW Date Received: 6/27/97

% Moisture: not dec. --- dec. --- Date Extracted: 7/02/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 7/08/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.3

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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602

EXPLOSIVES
(Method 8330)

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-06-A-01-04-00	ARDL Lab No.:	300567-09
Desc/Location:	6-A TASK 6	Lab Filename:	
Sample Date:	06/17/1997	Received Date:	06/21/1997
Sample Time:	0815	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	06/27/1997
Amount Used:	770 mL	QC Batch:	B2318
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	85%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-06-B-01-04-00	ARDL Lab No.:	300567-11
Desc/Location:	6-B TASK 6	Lab Filename:	
Sample Date:	06/18/1997	Received Date:	06/21/1997
Sample Time:	1800	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	06/27/1997
Amount Used:	770 mL	QC Batch:	B2318
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	81%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-06-C-01-04-00	ARDL Lab No.:	300567-13
Desc/Location:	6-C TASK 6	Lab Filename:	
Sample Date:	06/18/1997	Received Date:	06/21/1997
Sample Time:	1230	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	06/27/1997
Amount Used:	770 mL	QC Batch:	B2318
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	27%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-06-D-01-04-00	ARDL Lab No.:	300567-08
Desc/Location:	6-D TASK 6	Lab Filename:	
Sample Date:	06/18/1997	Received Date:	06/21/1997
Sample Time:	1830	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	06/27/1997
Amount Used:	770 mL	QC Batch:	B2318
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	79%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-06-E-01-04-00	ARDL Lab No.:	300567-10
Desc/Location:	6-E TASK 6	Lab Filename:	
Sample Date:	06/18/1997	Received Date:	06/21/1997
Sample Time:	1845	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	06/27/1997
Amount Used:	770 mL	QC Batch:	B2318
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	87%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-13-F-01-03-00	ARDL Lab No.:	300576-02
Desc/Location:	13F	Lab Filename:	
Sample Date:	06/24/1997	Received Date:	06/27/1997
Sample Time:	1245	Prep. Date:	07/01/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	770 mL	Instrument ID:	
Final Volume:	10 mL	QC Batch:	B2340
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	64%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-06-F-01-04-00	ARDL Lab No.:	300567-06
Desc/Location:	6-F TASK 6	Lab Filename:	
Sample Date:	06/18/1997	Received Date:	06/21/1997
Sample Time:	1422	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	06/27/1997
Amount Used:	770 mL	QC Batch:	B2318
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	79%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-06-G-01-04-00	ARDL Lab No.:	300567-12
Desc/Location:	6-G TASK 6	Lab Filename:	
Sample Date:	06/18/1997	Received Date:	06/21/1997
Sample Time:	1752	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	06/27/1997
Amount Used:	770 mL	QC Batch:	B2318
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	4.0		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	79%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H6JAW620010300	ARDL Lab No.:	300576-09
Desc/Location:	WELL JAW 620	Lab Filename:	
Sample Date:	06/26/1997	Received Date:	06/27/1997
Sample Time:	0920	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	770 mL	QC Batch:	B2344
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	2.8		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	67%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H6JAW621010300	ARDL Lab No.:	300576-10
Desc/Location:	WELL JAW 621	Lab Filename:	
Sample Date:	06/26/1997	Received Date:	06/27/1997
Sample Time:	1140	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	770 mL	QC Batch:	B2344
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	129%*

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H6JAW622010300	ARDL Lab No.:	300576-11
Desc/Location:	WELL JAW 622	Lab Filename:	
Sample Date:	06/26/1997	Received Date:	06/27/1997
Sample Time:	1505	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	770 mL	QC Batch:	B2344
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	60%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

APPENDIX L
FIXED LABORATORY ANALYTICAL DATA

L-2 Task 7. Surface Water & Sediment Sampling, Site Drainages

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VOLATILE ORGANIC COMPOUNDS
(Method 8260)

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-A-01-06-00	ARDL Lab No.:	300555-05
Desc/Location:	7A	Lab Filename:	
Sample Date:	06/11/1997	Received Date:	06/13/1997
Sample Time:	0900	Prep. Date:	06/18/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	5 mL	QC Batch:	0623LS4
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	1.4	10.0	ND		UG/L	1
CHLOROMETHANE	1.2	10.0	ND		UG/L	1
VINYL CHLORIDE	1.2	10.0	ND		UG/L	1
BROMOMETHANE	1.3	10.0	ND		UG/L	1
CHLOROETHANE	1.4	10.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	1.4	10.0	ND		UG/L	1
1,1-DICHLOROETHENE	1.2	5.0	ND		UG/L	1
METHYLENE CHLORIDE	1.3	5.0	7.4	B	UG/L	1
trans-1,2-DICHLOROETHENE	1.3	5.0	ND		UG/L	1
1,1-DICHLOROETHANE	1.0	5.0	ND		UG/L	1
CARBON DISULFIDE	1.1	5.0	ND		UG/L	1
2,2-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.86	5.0	ND		UG/L	1
BROMOCHLOROMETHANE	1.1	5.0	ND		UG/L	1
CHLOROFORM	0.79	5.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.89	5.0	ND		UG/L	1
1,1-DICHLOROPROPENE	1.3	5.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.87	5.0	ND		UG/L	1
BENZENE	0.90	5.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.85	5.0	ND		UG/L	1
TRICHLOROETHENE	0.85	5.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.77	5.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.82	5.0	ND		UG/L	1
DIBROMOMETHANE	0.96	5.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.83	5.0	ND		UG/L	1
TOLUENE	0.85	5.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.96	5.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	1.0	5.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.92	5.0	ND		UG/L	1
TETRACHLOROETHENE	0.81	5.0	ND		UG/L	1
1,3-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	1.3	5.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-A-01-06-00	ARDL Lab No.:	300555-05 (cont'd)
Desc/Location:	7A	Lab Filename:	
Sample Date:	06/11/1997	Received Date:	06/13/1997
Sample Time:	0900	Prep. Date:	06/18/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	5 mL	QC Batch:	0623LS4
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.96	5.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	1.4	5.0	ND		UG/L	1
ETHYLBENZENE	0.93	5.0	ND		UG/L	1
m & p-XYLENE	1.5	5.0	ND		UG/L	1
o-XYLENE	0.92	5.0	ND		UG/L	1
STYRENE	1.2	5.0	ND		UG/L	1
2-HEXANONE	4.5	20.0	ND		UG/L	1
BROMOFORM	2.0	5.0	ND		UG/L	1
ISOPROPYLBENZENE	1.1	5.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	3.0	5.0	ND		UG/L	1
BROMOBENZENE	1.2	5.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	2.2	5.0	ND		UG/L	1
n-PROPYLBENZENE	1.2	5.0	ND		UG/L	1
2-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
4-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	1.3	5.0	ND		UG/L	1
tert-BUTYLBENZENE	1.0	5.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	1.0	5.0	ND		UG/L	1
sec-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	1.3	5.0	ND		UG/L	1
1,3-DICHLOROBENZENE	1.9	5.0	ND		UG/L	1
1,4-DICHLOROBENZENE	1.6	5.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	5.0	ND		UG/L	1
n-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	3.2	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	1.2	5.0	ND		UG/L	1
HEXACHLOROBUTADIENE	1.3	5.0	ND		UG/L	1
NAPHTHALENE	2.3	5.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	1.9	5.0	ND		UG/L	1
ACETONE	11.0	50.0	ND		UG/L	1
2-BUTANONE	7.0	50.0	ND		UG/L	1
4-METHYL-2-PENTANONE	8.9	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-A-01-06-00	ARDL Lab No.:	300555-05 (cont'd)
Desc/Location:	7A	Lab Filename:	
Sample Date:	06/11/1997	Received Date:	06/13/1997
Sample Time:	0900	Prep. Date:	06/18/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	5 mL	QC Batch:	0623LS4
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	82-125	112%
DIBROMOFLUOROMETHANE	89-127	96%
1,2-DICHLOROETHANE-D4	79-130	97%
TOLUENE-D8	84-122	113%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-A-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300555 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300555-05

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: >K5081

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. --- Date Analyzed: 6/18/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: SW5030

Field ID:	H-07-A1-01-05-1	ARDL Lab No.:	300554-14
Desc/Location:	SITE A1 @ 1'	Lab Filename:	
Sample Date:	06/11/1997	Received Date:	06/13/1997
Sample Time:	0852	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/16/1997
Amount Used:	5 g	QC Batch:	0624TJP1
% Moisture:	35.5	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	3.3	15.5	ND		UG/KG	1
CHLOROMETHANE	2.3	15.5	ND		UG/KG	1
VINYL CHLORIDE	2	15.5	ND		UG/KG	1
BROMOMETHANE	1.2	15.5	ND		UG/KG	1
CHLOROETHANE	2.3	15.5	ND		UG/KG	1
TRICHLOROFLUOROMETHANE	3.7	15.5	ND		UG/KG	1
1,1-DICHLOROETHENE	2	7.8	ND		UG/KG	1
METHYLENE CHLORIDE	3.9	7.8	10.1	B	UG/KG	1
trans-1,2-DICHLOROETHENE	1	7.8	ND		UG/KG	1
1,1-DICHLOROETHANE	1	7.8	ND		UG/KG	1
CARBON DISULFIDE	2.3	7.8	ND		UG/KG	1
2,2-DICHLOROPROPANE	1.9	7.8	ND		UG/KG	1
cis-1,2-DICHLOROETHENE	1.1	7.8	ND		UG/KG	1
BROMOCHLOROMETHANE	1.3	7.8	ND		UG/KG	1
CHLOROFORM	1.2	7.8	ND		UG/KG	1
1,1,1-TRICHLOROETHANE	0.79	7.8	ND		UG/KG	1
1,1-DICHLOROPROPENE	1.6	7.8	ND		UG/KG	1
CARBON TETRACHLORIDE	1.5	7.8	ND		UG/KG	1
BENZENE	0.81	7.8	ND		UG/KG	1
1,2-DICHLOROETHANE	1.3	7.8	ND		UG/KG	1
TRICHLOROETHENE	1.7	7.8	ND		UG/KG	1
1,2-DICHLOROPROPANE	1.7	7.8	ND		UG/KG	1
BROMODICHLOROMETHANE	1	7.8	ND		UG/KG	1
DIBROMOMETHANE	1.5	7.8	ND		UG/KG	1
cis-1,3-DICHLOROPROPENE	1.5	7.8	ND		UG/KG	1
TOLUENE	1.2	7.8	ND		UG/KG	1
trans-1,3-DICHLOROPROPENE	0.91	7.8	ND		UG/KG	1
1,1,2-TRICHLOROETHANE	1.3	7.8	ND		UG/KG	1
1,2-DIBROMOETHANE	1.4	7.8	ND		UG/KG	1
TETRACHLOROETHENE	1.2	7.8	ND		UG/KG	1
1,3-DICHLOROPROPANE	1.3	7.8	ND		UG/KG	1
DIBROMOCHLOROMETHANE	0.9	7.8	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: SW5030

Field ID:	H-07-A1-01-05-1	ARDL Lab No.:	300554-14 (cont'd)
Desc/Location:	SITE A1 @ 1'	Lab Filename:	
Sample Date:	06/11/1997	Received Date:	06/13/1997
Sample Time:	0852	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/16/1997
Amount Used:	5 g	QC Batch:	0624TJP1
% Moisture:	35.5	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.88	7.8	ND		UG/KG	1
1,1,1,2-TETRACHLOROETHANE	0.76	7.8	ND		UG/KG	1
ETHYLBENZENE	1.1	7.8	ND		UG/KG	1
m & p-XYLENE	1.6	7.8	ND		UG/KG	1
o-XYLENE	0.71	7.8	ND		UG/KG	1
STYRENE	0.93	7.8	ND		UG/KG	1
2-HEXANONE	6.7	31.0	ND		UG/KG	1
BROMOFORM	1.9	7.8	ND		UG/KG	1
ISOPROPYLBENZENE	1	7.8	ND		UG/KG	1
1,1,2,2-TETRACHLOROETHANE	3.4	7.8	ND		UG/KG	1
BROMOBENZENE	1.5	7.8	ND		UG/KG	1
1,2,3-TRICHLOROPROPANE	3.1	7.8	ND		UG/KG	1
n-PROPYLBENZENE	0.9	7.8	ND		UG/KG	1
2-CHLOROTOLUENE	1.2	7.8	ND		UG/KG	1
4-CHLOROTOLUENE	1.2	7.8	ND		UG/KG	1
1,3,5-TRIMETHYLBENZENE	0.78	7.8	ND		UG/KG	1
tert-BUTYLBENZENE	0.84	7.8	ND		UG/KG	1
1,2,4-TRIMETHYLBENZENE	1.1	7.8	ND		UG/KG	1
sec-BUTYLBENZENE	0.98	7.8	ND		UG/KG	1
p-ISOPROPYLTOLUENE	0.95	7.8	ND		UG/KG	1
1,3-DICHLOROBENZENE	1.4	7.8	ND		UG/KG	1
1,4-DICHLOROBENZENE	1.6	7.8	ND		UG/KG	1
1,2-DICHLOROBENZENE	1.9	7.8	ND		UG/KG	1
n-BUTYLBENZENE	1.6	7.8	ND		UG/KG	1
1,2-DIBROMO-3-CHLOROPROPANE	3.9	15.5	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	1.7	7.8	ND		UG/KG	1
HEXACHLOROBUTADIENE	1.2	7.8	ND		UG/KG	1
NAPHTHALENE	2.6	7.8	ND		UG/KG	1
1,2,3-TRICHLOROBENZENE	2	7.8	ND		UG/KG	1
ACETONE	13.3	77.5	ND		UG/KG	1
2-BUTANONE	12.2	77.5	ND		UG/KG	1
4-METHYL-2-PENTANONE	5.6	31.0	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: SW5030

Field ID:	H-07-A1-01-05-1	ARDL Lab No.:	300554-14 (cont'd)
Desc/Location:	SITE A1 @ 1'	Lab Filename:	
Sample Date:	06/11/1997	Received Date:	06/13/1997
Sample Time:	0852	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/16/1997
Amount Used:	5 g	QC Batch:	0624TJP1
% Moisture:	35.5	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	76-141	109%
DIBROMOFLUOROMETHANE	86-125	115%
1,2-DICHLOROETHANE-D4	78-135	117%
TOLUENE-D8	86-129	107%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-A1-01-05-1

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300554 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300554-14

Sample wt/vol: 5.0 (g/mL) g Lab File ID: >G2848

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. 35.5 Date Analyzed: 6/16/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-B-01-06-00	ARDL Lab No.:	300555-04
Desc/Location:	7B	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1700	Prep. Date:	06/16/1997
Matrix:	WATER	Analysis Date:	06/16/1997
Amount Used:	5 mL	QC Batch:	0617LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	1.4	10.0	ND		UG/L	1
CHLOROMETHANE	1.2	10.0	ND		UG/L	1
VINYL CHLORIDE	1.2	10.0	ND		UG/L	1
BROMOMETHANE	1.3	10.0	ND		UG/L	1
CHLOROETHANE	1.4	10.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	1.4	10.0	ND		UG/L	1
1,1-DICHLOROETHENE	1.2	5.0	ND		UG/L	1
METHYLENE CHLORIDE	1.3	5.0	12.1	B	UG/L	1
trans-1,2-DICHLOROETHENE	1.3	5.0	ND		UG/L	1
1,1-DICHLOROETHANE	1.0	5.0	ND		UG/L	1
CARBON DISULFIDE	1.1	5.0	ND		UG/L	1
2,2-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.86	5.0	ND		UG/L	1
BROMOCHLOROMETHANE	1.1	5.0	ND		UG/L	1
CHLOROFORM	0.79	5.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.89	5.0	ND		UG/L	1
1,1-DICHLOROPROPENE	1.3	5.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.87	5.0	ND		UG/L	1
BENZENE	0.90	5.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.85	5.0	ND		UG/L	1
TRICHLOROETHENE	0.85	5.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.77	5.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.82	5.0	ND		UG/L	1
DIBROMOMETHANE	0.96	5.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.83	5.0	ND		UG/L	1
TOLUENE	0.85	5.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.96	5.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	1.0	5.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.92	5.0	ND		UG/L	1
TETRACHLOROETHENE	0.81	5.0	ND		UG/L	1
1,3-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	1.3	5.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-B-01-06-00	ARDL Lab No.:	300555-04 (cont'd)
Desc/Location:	7B	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1700	Prep. Date:	06/16/1997
Matrix:	WATER	Analysis Date:	06/16/1997
Amount Used:	5 mL	QC Batch:	0617LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.96	5.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	1.4	5.0	ND		UG/L	1
ETHYLBENZENE	0.93	5.0	ND		UG/L	1
m & p-XYLENE	1.5	5.0	ND		UG/L	1
o-XYLENE	0.92	5.0	ND		UG/L	1
STYRENE	1.2	5.0	ND		UG/L	1
2-HEXANONE	4.5	20.0	ND		UG/L	1
BROMOFORM	2.0	5.0	ND		UG/L	1
ISOPROPYLBENZENE	1.1	5.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	3.0	5.0	ND		UG/L	1
BROMOBENZENE	1.2	5.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	2.2	5.0	ND		UG/L	1
n-PROPYLBENZENE	1.2	5.0	ND		UG/L	1
2-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
4-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	1.3	5.0	ND		UG/L	1
tert-BUTYLBENZENE	1.0	5.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	1.0	5.0	ND		UG/L	1
sec-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	1.3	5.0	ND		UG/L	1
1,3-DICHLOROBENZENE	1.9	5.0	ND		UG/L	1
1,4-DICHLOROBENZENE	1.6	5.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	5.0	ND		UG/L	1
n-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	3.2	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	1.2	5.0	ND		UG/L	1
HEXACHLOROBUTADIENE	1.3	5.0	ND		UG/L	1
NAPHTHALENE	2.3	5.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	1.9	5.0	ND		UG/L	1
ACETONE	11.0	50.0	ND		UG/L	1
2-BUTANONE	7.0	50.0	ND		UG/L	1
4-METHYL-2-PENTANONE	8.9	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-B-01-06-00	ARDL Lab No.:	300555-04 (cont'd)
Desc/Location:	7B	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1700	Prep. Date:	06/16/1997
Matrix:	WATER	Analysis Date:	06/16/1997
Amount Used:	5 mL	QC Batch:	0617LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	82-125	110%
DIBROMOFLUOROMETHANE	89-127	95%
1,2-DICHLOROETHANE-D4	79-130	96%
TOLUENE-D8	84-122	110%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-B-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300555 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300555-04

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: >K5055

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. --- Date Analyzed: 6/16/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: SW5030

Field ID:	H-07-B1-01-05-1	ARDL Lab No.:	300554-04
Desc/Location:	STATION B1 @ 1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1653	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/16/1997
Amount Used:	5 g	QC Batch:	0624TJP1
% Moisture:	22.8	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	2.7	13.0	ND		UG/KG	1
CHLOROMETHANE	1.9	13.0	ND		UG/KG	1
VINYL CHLORIDE	1.7	13.0	ND		UG/KG	1
BROMOMETHANE	1	13.0	ND		UG/KG	1
CHLOROETHANE	1.9	13.0	ND		UG/KG	1
TRICHLOROFLUOROMETHANE	3.1	13.0	ND		UG/KG	1
1,1-DICHLOROETHENE	1.7	6.5	ND		UG/KG	1
METHYLENE CHLORIDE	3.2	6.5	8.7	B	UG/KG	1
trans-1,2-DICHLOROETHENE	0.84	6.5	ND		UG/KG	1
1,1-DICHLOROETHANE	0.84	6.5	ND		UG/KG	1
CARBON DISULFIDE	1.9	6.5	ND		UG/KG	1
2,2-DICHLOROPROPANE	1.6	6.5	ND		UG/KG	1
cis-1,2-DICHLOROETHENE	0.91	6.5	ND		UG/KG	1
BROMOCHLOROMETHANE	1.1	6.5	ND		UG/KG	1
CHLOROFORM	1	6.5	ND		UG/KG	1
1,1,1-TRICHLOROETHANE	0.66	6.5	ND		UG/KG	1
1,1-DICHLOROPROPENE	1.3	6.5	ND		UG/KG	1
CARBON TETRACHLORIDE	1.3	6.5	ND		UG/KG	1
BENZENE	0.67	6.5	ND		UG/KG	1
1,2-DICHLOROETHANE	1	6.5	ND		UG/KG	1
TRICHLOROETHENE	1.4	6.5	ND		UG/KG	1
1,2-DICHLOROPROPANE	1.4	6.5	ND		UG/KG	1
BROMODICHLOROMETHANE	0.85	6.5	ND		UG/KG	1
DIBROMOMETHANE	1.2	6.5	ND		UG/KG	1
cis-1,3-DICHLOROPROPENE	1.3	6.5	ND		UG/KG	1
TOLUENE	1	6.5	ND		UG/KG	1
trans-1,3-DICHLOROPROPENE	0.76	6.5	ND		UG/KG	1
1,1,2-TRICHLOROETHANE	1	6.5	ND		UG/KG	1
1,2-DIBROMOETHANE	1.1	6.5	ND		UG/KG	1
TETRACHLOROETHENE	1	6.5	ND		UG/KG	1
1,3-DICHLOROPROPANE	1.1	6.5	ND		UG/KG	1
DIBROMOCHLOROMETHANE	0.75	6.5	ND		UG/KG	1

ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: SW5030

Field ID:	H-07-B1-01-05-1	ARDL Lab No.:	300554-04 (cont'd)
Desc/Location:	STATION B1 @ 1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1653	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/16/1997
Amount Used:	5 g	QC Batch:	0624TJP1
% Moisture:	22.8	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.74	6.5	ND		UG/KG	1
1,1,1,2-TETRACHLOROETHANE	0.63	6.5	ND		UG/KG	1
ETHYLBENZENE	0.91	6.5	ND		UG/KG	1
m & p-XYLENE	1.3	6.5	ND		UG/KG	1
o-XYLENE	0.6	6.5	ND		UG/KG	1
STYRENE	0.78	6.5	ND		UG/KG	1
2-HEXANONE	5.6	25.9	ND		UG/KG	1
BROMOFORM	1.6	6.5	ND		UG/KG	1
ISOPROPYLBENZENE	0.85	6.5	ND		UG/KG	1
1,1,2,2-TETRACHLOROETHANE	2.8	6.5	ND		UG/KG	1
BROMOBENZENE	1.2	6.5	ND		UG/KG	1
1,2,3-TRICHLOROPROPANE	2.6	6.5	ND		UG/KG	1
n-PROPYLBENZENE	0.75	6.5	ND		UG/KG	1
2-CHLOROTOLUENE	1	6.5	ND		UG/KG	1
4-CHLOROTOLUENE	1	6.5	ND		UG/KG	1
1,3,5-TRIMETHYLBENZENE	0.65	6.5	ND		UG/KG	1
tert-BUTYLBENZENE	0.7	6.5	ND		UG/KG	1
1,2,4-TRIMETHYLBENZENE	0.91	6.5	ND		UG/KG	1
sec-BUTYLBENZENE	0.82	6.5	ND		UG/KG	1
p-ISOPROPYLTOLUENE	0.79	6.5	ND		UG/KG	1
1,3-DICHLOROBENZENE	1.2	6.5	ND		UG/KG	1
1,4-DICHLOROBENZENE	1.3	6.5	ND		UG/KG	1
1,2-DICHLOROBENZENE	1.6	6.5	ND		UG/KG	1
n-BUTYLBENZENE	1.3	6.5	ND		UG/KG	1
1,2-DIBROMO-3-CHLOROPROPANE	3.2	13.0	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	1.4	6.5	ND		UG/KG	1
HEXACHLOROBUTADIENE	1	6.5	ND		UG/KG	1
NAPHTHALENE	2.2	6.5	ND		UG/KG	1
1,2,3-TRICHLOROBENZENE	1.7	6.5	ND		UG/KG	1
ACETONE	11.1	64.8	ND		UG/KG	1
2-BUTANONE	10.2	64.8	ND		UG/KG	1
4-METHYL-2-PENTANONE	4.7	25.9	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: SW5030

Field ID:	H-07-B1-01-05-1	ARDL Lab No.:	300554-04 (cont'd)
Desc/Location:	STATION B1 @ 1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1653	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/16/1997
Amount Used:	5 g	QC Batch:	0624TJP1
% Moisture:	22.8	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	76-141	107%
DIBROMOFLUOROMETHANE	86-125	106%
1,2-DICHLOROETHANE-D4	78-135	104%
TOLUENE-D8	86-129	105%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-B1-01-05-1

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300554 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300554-04

Sample wt/vol: 5.0 (g/mL) g Lab File ID: >G2844

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. 22.8 Date Analyzed: 6/16/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-C-01-06-00	ARDL Lab No.:	300555-07
Desc/Location:	STATION C	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1445	Prep. Date:	06/18/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	5 mL	QC Batch:	0623LS4
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	1.4	10.0	ND		UG/L	1
CHLOROMETHANE	1.2	10.0	ND		UG/L	1
VINYL CHLORIDE	1.2	10.0	ND		UG/L	1
BROMOMETHANE	1.3	10.0	ND		UG/L	1
CHLOROETHANE	1.4	10.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	1.4	10.0	ND		UG/L	1
1,1-DICHLOROETHENE	1.2	5.0	ND		UG/L	1
METHYLENE CHLORIDE	1.3	5.0	8.3	B	UG/L	1
trans-1,2-DICHLOROETHENE	1.3	5.0	ND		UG/L	1
1,1-DICHLOROETHANE	1.0	5.0	ND		UG/L	1
CARBON DISULFIDE	1.1	5.0	ND		UG/L	1
2,2-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.86	5.0	ND		UG/L	1
BROMOCHLOROMETHANE	1.1	5.0	ND		UG/L	1
CHLOROFORM	0.79	5.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.89	5.0	ND		UG/L	1
1,1-DICHLOROPROPENE	1.3	5.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.87	5.0	ND		UG/L	1
BENZENE	0.90	5.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.85	5.0	ND		UG/L	1
TRICHLOROETHENE	0.85	5.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.77	5.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.82	5.0	ND		UG/L	1
DIBROMOMETHANE	0.96	5.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.83	5.0	ND		UG/L	1
TOLUENE	0.85	5.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.96	5.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	1.0	5.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.92	5.0	ND		UG/L	1
TETRACHLOROETHENE	0.81	5.0	ND		UG/L	1
1,3-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	1.3	5.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-C-01-06-00	ARDL Lab No.:	300555-07 (cont'd)
Desc/Location:	STATION C	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1445	Prep. Date:	06/18/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	5 mL	QC Batch:	0623LS4
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.96	5.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	1.4	5.0	ND		UG/L	1
ETHYLBENZENE	0.93	5.0	ND		UG/L	1
m & p-XYLENE	1.5	5.0	ND		UG/L	1
o-XYLENE	0.92	5.0	ND		UG/L	1
STYRENE	1.2	5.0	ND		UG/L	1
2-HEXANONE	4.5	20.0	ND		UG/L	1
BROMOFORM	2.0	5.0	ND		UG/L	1
ISOPROPYLBENZENE	1.1	5.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	3.0	5.0	ND		UG/L	1
BROMOBENZENE	1.2	5.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	2.2	5.0	ND		UG/L	1
n-PROPYLBENZENE	1.2	5.0	ND		UG/L	1
2-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
4-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	1.3	5.0	ND		UG/L	1
tert-BUTYLBENZENE	1.0	5.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	1.0	5.0	ND		UG/L	1
sec-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	1.3	5.0	ND		UG/L	1
1,3-DICHLOROBENZENE	1.9	5.0	ND		UG/L	1
1,4-DICHLOROBENZENE	1.6	5.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	5.0	ND		UG/L	1
n-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	3.2	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	1.2	5.0	ND		UG/L	1
HEXACHLOROBUTADIENE	1.3	5.0	ND		UG/L	1
NAPHTHALENE	2.3	5.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	1.9	5.0	ND		UG/L	1
ACETONE	11.0	50.0	ND		UG/L	1
2-BUTANONE	7.0	50.0	ND		UG/L	1
4-METHYL-2-PENTANONE	8.9	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name:	IOWA ARMY AMM PLANT	Analysis:	VOLATILES, GC/MS (8260)
Project No.:	5644V	Analytical Method:	8260A
		Prep Method:	5030A

Field ID:	H-07-C-01-06-00	ARDL Lab No.:	300555-07 (cont'd)
Desc/Location:	STATION C	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1445	Prep. Date:	06/18/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	5 mL	QC Batch:	0623LS4
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	82-125	113%
DIBROMOFLUOROMETHANE	89-127	95%
1,2-DICHLOROETHANE-D4	79-130	97%
TOLUENE-D8	84-122	114%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-C-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300555 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300555-07

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: >K5082

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. --- Date Analyzed: 6/18/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: SW5030

Field ID:	H-07-C1-01-05-1	ARDL Lab No.:	300554-01
Desc/Location:	STATION C1 @ 0-1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1439	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/16/1997
Amount Used:	5 g	QC Batch:	0624TJP1
% Moisture:	17.3	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	2.5	12.1	ND		UG/KG	1
CHLOROMETHANE	1.8	12.1	ND		UG/KG	1
VINYL CHLORIDE	1.6	12.1	ND		UG/KG	1
BROMOMETHANE	0.96	12.1	ND		UG/KG	1
CHLOROETHANE	1.8	12.1	ND		UG/KG	1
TRICHLOROFLUOROMETHANE	2.9	12.1	ND		UG/KG	1
1,1-DICHLOROETHENE	1.6	6	ND		UG/KG	1
METHYLENE CHLORIDE	3	6	6.5	B	UG/KG	1
trans-1,2-DICHLOROETHENE	0.79	6	ND		UG/KG	1
1,1-DICHLOROETHANE	0.79	6	ND		UG/KG	1
CARBON DISULFIDE	1.8	6	ND		UG/KG	1
2,2-DICHLOROPROPANE	1.5	6	ND		UG/KG	1
cis-1,2-DICHLOROETHENE	0.85	6	ND		UG/KG	1
BROMOCHLOROMETHANE	0.99	6	ND		UG/KG	1
CHLOROFORM	0.97	6	ND		UG/KG	1
1,1,1-TRICHLOROETHANE	0.62	6	ND		UG/KG	1
1,1-DICHLOROPROPENE	1.2	6	ND		UG/KG	1
CARBON TETRACHLORIDE	1.2	6	ND		UG/KG	1
BENZENE	0.63	6	ND		UG/KG	1
1,2-DICHLOROETHANE	0.98	6	ND		UG/KG	1
TRICHLOROETHENE	1.3	6	ND		UG/KG	1
1,2-DICHLOROPROPANE	1.3	6	ND		UG/KG	1
BROMODICHLOROMETHANE	0.8	6	ND		UG/KG	1
DIBROMOMETHANE	1.2	6	ND		UG/KG	1
cis-1,3-DICHLOROPROPENE	1.2	6	ND		UG/KG	1
TOLUENE	0.97	6	ND		UG/KG	1
trans-1,3-DICHLOROPROPENE	0.71	6	ND		UG/KG	1
1,1,2-TRICHLOROETHANE	0.98	6	ND		UG/KG	1
1,2-DIBROMOETHANE	1.1	6	ND		UG/KG	1
TETRACHLOROETHENE	0.94	6	ND		UG/KG	1
1,3-DICHLOROPROPANE	1	6	ND		UG/KG	1
DIBROMOCHLOROMETHANE	0.7	6	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: SW5030

Field ID:	H-07-C1-01-05-1	ARDL Lab No.:	300554-01 (cont'd)
Desc/Location:	STATION C1 @ 0-1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1439	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/16/1997
Amount Used:	5 g	QC Batch:	0624TJP1
% Moisture:	17.3	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.69	6	ND		UG/KG	1
1,1,1,2-TETRACHLOROETHANE	0.59	6	ND		UG/KG	1
ETHYLBENZENE	0.85	6	ND		UG/KG	1
m & p-XYLENE	1.2	6	ND		UG/KG	1
o-XYLENE	0.56	6	ND		UG/KG	1
STYRENE	0.73	6	ND		UG/KG	1
2-HEXANONE	5.2	24.2	ND		UG/KG	1
BROMOFORM	1.5	6	ND		UG/KG	1
ISOPROPYLBENZENE	0.8	6	ND		UG/KG	1
1,1,2,2-TETRACHLOROETHANE	2.7	6	ND		UG/KG	1
BROMOBENZENE	1.1	6	ND		UG/KG	1
1,2,3-TRICHLOROPROPANE	2.4	6	ND		UG/KG	1
n-PROPYLBENZENE	0.7	6	ND		UG/KG	1
2-CHLOROTOLUENE	0.94	6	ND		UG/KG	1
4-CHLOROTOLUENE	0.97	6	ND		UG/KG	1
1,3,5-TRIMETHYLBENZENE	0.6	6	ND		UG/KG	1
tert-BUTYLBENZENE	0.65	6	ND		UG/KG	1
1,2,4-TRIMETHYLBENZENE	0.85	6	ND		UG/KG	1
sec-BUTYLBENZENE	0.76	6	ND		UG/KG	1
p-ISOPROPYLTOLUENE	0.74	6	ND		UG/KG	1
1,3-DICHLOROBENZENE	1.1	6	ND		UG/KG	1
1,4-DICHLOROBENZENE	1.2	6	ND		UG/KG	1
1,2-DICHLOROBENZENE	1.5	6	ND		UG/KG	1
n-BUTYLBENZENE	1.2	6	ND		UG/KG	1
1,2-DIBROMO-3-CHLOROPROPANE	3	12.1	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	1.3	6	ND		UG/KG	1
HEXACHLOROBUTADIENE	0.94	6	ND		UG/KG	1
NAPHTHALENE	2.1	6	ND		UG/KG	1
1,2,3-TRICHLOROBENZENE	1.6	6	ND		UG/KG	1
ACETONE	10.4	60.5	ND		UG/KG	1
2-BUTANONE	9.5	60.5	ND		UG/KG	1
4-METHYL-2-PENTANONE	4.4	24.2	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: SW5030

Field ID:	H-07-C1-01-05-1	ARDL Lab No.:	300554-01 (cont'd)
Desc/Location:	STATION C1 @ 0-1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1439	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/16/1997
Amount Used:	5 g	QC Batch:	0624TJP1
% Moisture:	17.3	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	76-141	106%
DIBROMOFLUOROMETHANE	86-125	113%
1,2-DICHLOROETHANE-D4	78-135	106%
TOLUENE-D8	86-129	112%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-C1-01-05-1

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300554 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300554-01

Sample wt/vol: 5.0 (g/mL) g Lab File ID: >G2842

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. 17.3 Date Analyzed: 6/16/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-E-01-06-00	ARDL Lab No.:	300555-10
Desc/Location:	7E	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1130	Prep. Date:	06/16/1997
Matrix:	WATER	Analysis Date:	06/16/1997
Amount Used:	5 mL	QC Batch:	0617LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	1.4	10.0	ND		UG/L	1
CHLOROMETHANE	1.2	10.0	ND		UG/L	1
VINYL CHLORIDE	1.2	10.0	ND		UG/L	1
BROMOMETHANE	1.3	10.0	ND		UG/L	1
CHLOROETHANE	1.4	10.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	1.4	10.0	ND		UG/L	1
1,1-DICHLOROETHENE	1.2	5.0	ND		UG/L	1
METHYLENE CHLORIDE	1.3	5.0	4.5	JB	UG/L	1
trans-1,2-DICHLOROETHENE	1.3	5.0	ND		UG/L	1
1,1-DICHLOROETHANE	1.0	5.0	ND		UG/L	1
CARBON DISULFIDE	1.1	5.0	ND		UG/L	1
2,2-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.86	5.0	ND		UG/L	1
BROMOCHLOROMETHANE	1.1	5.0	ND		UG/L	1
CHLOROFORM	0.79	5.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.89	5.0	ND		UG/L	1
1,1-DICHLOROPROPENE	1.3	5.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.87	5.0	ND		UG/L	1
BENZENE	0.90	5.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.85	5.0	ND		UG/L	1
TRICHLOROETHENE	0.85	5.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.77	5.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.82	5.0	ND		UG/L	1
DIBROMOMETHANE	0.96	5.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.83	5.0	ND		UG/L	1
TOLUENE	0.85	5.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.96	5.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	1.0	5.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.92	5.0	ND		UG/L	1
TETRACHLOROETHENE	0.81	5.0	ND		UG/L	1
1,3-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	1.3	5.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-E-01-06-00	ARDL Lab No.:	300555-10 (cont'd)
Desc/Location:	7E	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1130	Prep. Date:	06/16/1997
Matrix:	WATER	Analysis Date:	06/16/1997
Amount Used:	5 mL	QC Batch:	0617LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.96	5.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	1.4	5.0	ND		UG/L	1
ETHYLBENZENE	0.93	5.0	ND		UG/L	1
m & p-XYLENE	1.5	5.0	ND		UG/L	1
o-XYLENE	0.92	5.0	ND		UG/L	1
STYRENE	1.2	5.0	ND		UG/L	1
2-HEXANONE	4.5	20.0	ND		UG/L	1
BROMOFORM	2.0	5.0	ND		UG/L	1
ISOPROPYLBENZENE	1.1	5.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	3.0	5.0	ND		UG/L	1
BROMOBENZENE	1.2	5.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	2.2	5.0	ND		UG/L	1
n-PROPYLBENZENE	1.2	5.0	ND		UG/L	1
2-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
4-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	1.3	5.0	ND		UG/L	1
tert-BUTYLBENZENE	1.0	5.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	1.0	5.0	ND		UG/L	1
sec-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	1.3	5.0	ND		UG/L	1
1,3-DICHLOROBENZENE	1.9	5.0	ND		UG/L	1
1,4-DICHLOROBENZENE	1.6	5.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	5.0	ND		UG/L	1
n-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	3.2	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	1.2	5.0	ND		UG/L	1
HEXACHLOROBUTADIENE	1.3	5.0	ND		UG/L	1
NAPHTHALENE	2.3	5.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	1.9	5.0	ND		UG/L	1
ACETONE	11.0	50.0	ND		UG/L	1
2-BUTANONE	7.0	50.0	ND		UG/L	1
4-METHYL-2-PENTANONE	8.9	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-E-01-06-00	ARDL Lab No.:	300555-10 (cont'd)
Desc/Location:	7E	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1130	Prep. Date:	06/16/1997
Matrix:	WATER	Analysis Date:	06/16/1997
Amount Used:	5 mL	QC Batch:	0617LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	82-125	105%
DIBROMOFLUOROMETHANE	89-127	89%
1,2-DICHLOROETHANE-D4	79-130	93%
TOLUENE-D8	84-122	106%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/05/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-D-01-06-00	ARDL Lab No.:	300542-13
Desc/Location:	7D	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1600	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/03/1997
Amount Used:	5 mL	QC Batch:	0605TJP7
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	1.4	10.0	ND		UG/L	1
CHLOROMETHANE	1.2	10.0	ND		UG/L	1
VINYL CHLORIDE	1.2	10.0	ND		UG/L	1
BROMOMETHANE	1.3	10.0	ND		UG/L	1
CHLOROETHANE	1.4	10.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	1.4	10.0	ND		UG/L	1
1,1-DICHLOROETHENE	1.2	5.0	ND		UG/L	1
METHYLENE CHLORIDE	1.3	5.0	ND		UG/L	1
trans-1,2-DICHLOROETHENE	1.3	5.0	ND		UG/L	1
1,1-DICHLOROETHANE	1.0	5.0	ND		UG/L	1
CARBON DISULFIDE	1.1	5.0	ND		UG/L	1
2,2-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.86	5.0	ND		UG/L	1
BROMOCHLOROMETHANE	1.1	5.0	ND		UG/L	1
CHLOROFORM	0.79	5.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.89	5.0	ND		UG/L	1
1,1-DICHLOROPROPENE	1.3	5.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.87	5.0	ND		UG/L	1
BENZENE	0.90	5.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.85	5.0	ND		UG/L	1
TRICHLOROETHENE	0.85	5.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.77	5.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.82	5.0	ND		UG/L	1
DIBROMOMETHANE	0.96	5.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.83	5.0	ND		UG/L	1
TOLUENE	0.85	5.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.96	5.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	1.0	5.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.92	5.0	ND		UG/L	1
TETRACHLOROETHENE	0.81	5.0	ND		UG/L	1
1,3-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	1.3	5.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/05/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-D-01-06-00	ARDL Lab No.:	300542-13 (cont'd)
Desc/Location:	7D	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1600	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/03/1997
Amount Used:	5 mL	QC Batch:	0605TJP7
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.96	5.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	1.4	5.0	ND		UG/L	1
ETHYLBENZENE	0.93	5.0	ND		UG/L	1
m & p-XYLENE	1.5	5.0	ND		UG/L	1
o-XYLENE	0.92	5.0	ND		UG/L	1
STYRENE	1.2	5.0	ND		UG/L	1
2-HEXANONE	4.5	20.0	ND		UG/L	1
BROMOFORM	2.0	5.0	ND		UG/L	1
ISOPROPYLBENZENE	1.1	5.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	3.0	5.0	ND		UG/L	1
BROMOBENZENE	1.2	5.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	2.2	5.0	ND		UG/L	1
n-PROPYLBENZENE	1.2	5.0	ND		UG/L	1
2-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
4-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	1.3	5.0	ND		UG/L	1
tert-BUTYLBENZENE	1.0	5.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	1.0	5.0	ND		UG/L	1
sec-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	1.3	5.0	ND		UG/L	1
1,3-DICHLOROBENZENE	1.9	5.0	ND		UG/L	1
1,4-DICHLOROBENZENE	1.6	5.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	5.0	ND		UG/L	1
n-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	3.2	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	1.2	5.0	ND		UG/L	1
HEXACHLOROBUTADIENE	1.3	5.0	ND		UG/L	1
NAPHTHALENE	2.3	5.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	1.9	5.0	ND		UG/L	1
ACETONE	11.0	50.0	ND		UG/L	1
2-BUTANONE	7.0	50.0	ND		UG/L	1
4-METHYL-2-PENTANONE	8.9	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/05/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-D-01-06-00	ARDL Lab No.:	300542-13 (cont'd)
Desc/Location:	7D	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1600	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/03/1997
Amount Used:	5 mL	QC Batch:	0605TJP7
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	82-125	87%
DIBROMOFLUOROMETHANE	89-127	98%
1,2-DICHLOROETHANE-D4	79-130	95%
TOLUENE-D8	84-122	97%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-D-01-06-00

Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300542 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300542-13

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: >G2409

Level: (low/med) LOW Date Received: 5/31/97

% Moisture: not dec. --- Date Analyzed: 6/03/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/05/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-D1-01-05-1	ARDL Lab No.:	300542-05
Desc/Location:	7D1	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1600	Prep. Date:	06/02/1997
Matrix:	SOIL	Analysis Date:	06/02/1997
Amount Used:	5 g	QC Batch:	0605TJP6
% Moisture:	33.7	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	3.2	15.1	ND		UG/KG	1
CHLOROMETHANE	2.3	15.1	ND		UG/KG	1
VINYL CHLORIDE	2	15.1	ND		UG/KG	1
BROMOMETHANE	1.2	15.1	ND		UG/KG	1
CHLOROETHANE	2.3	15.1	ND		UG/KG	1
TRICHLOROFLUOROMETHANE	3.6	15.1	ND		UG/KG	1
1,1-DICHLOROETHENE	2	7.5	ND		UG/KG	1
METHYLENE CHLORIDE	3.8	7.5	7.6	B	UG/KG	1
trans-1,2-DICHLOROETHENE	0.98	7.5	ND		UG/KG	1
1,1-DICHLOROETHANE	0.98	7.5	ND		UG/KG	1
CARBON DISULFIDE	2.3	7.5	ND		UG/KG	1
2,2-DICHLOROPROPANE	1.8	7.5	ND		UG/KG	1
cis-1,2-DICHLOROETHENE	1.1	7.5	ND		UG/KG	1
BROMOCHLOROMETHANE	1.2	7.5	ND		UG/KG	1
CHLOROFORM	1.2	7.5	ND		UG/KG	1
1,1,1-TRICHLOROETHANE	0.77	7.5	ND		UG/KG	1
1,1-DICHLOROPROPENE	1.5	7.5	ND		UG/KG	1
CARBON TETRACHLORIDE	1.5	7.5	ND		UG/KG	1
BENZENE	0.78	7.5	ND		UG/KG	1
1,2-DICHLOROETHANE	1.2	7.5	ND		UG/KG	1
TRICHLOROETHENE	1.7	7.5	ND		UG/KG	1
1,2-DICHLOROPROPANE	1.7	7.5	ND		UG/KG	1
BROMODICHLOROMETHANE	1	7.5	ND		UG/KG	1
DIBROMOMETHANE	1.4	7.5	ND		UG/KG	1
cis-1,3-DICHLOROPROPENE	1.5	7.5	ND		UG/KG	1
TOLUENE	1.2	7.5	ND		UG/KG	1
trans-1,3-DICHLOROPROPENE	0.89	7.5	ND		UG/KG	1
1,1,2-TRICHLOROETHANE	1.2	7.5	ND		UG/KG	1
1,2-DIBROMOETHANE	1.3	7.5	ND		UG/KG	1
TETRACHLOROETHENE	1.2	7.5	ND		UG/KG	1
1,3-DICHLOROPROPANE	1.3	7.5	ND		UG/KG	1
DIBROMOCHLOROMETHANE	0.87	7.5	ND		UG/KG	1

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Lab Report No: 300542 Report Date: 06/05/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-D1-01-05-1	ARDL Lab No.:	300542-05 (cont'd)
Desc/Location:	7D1	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1600	Prep. Date:	06/02/1997
Matrix:	SOIL	Analysis Date:	06/02/1997
Amount Used:	5 g	QC Batch:	0605TJP6
% Moisture:	33.7	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.86	7.5	ND		UG/KG	1
1,1,1,2-TETRACHLOROETHANE	0.74	7.5	ND		UG/KG	1
ETHYLBENZENE	1.1	7.5	ND		UG/KG	1
m & p-XYLENE	1.5	7.5	ND		UG/KG	1
o-XYLENE	0.69	7.5	ND		UG/KG	1
STYRENE	0.9	7.5	ND		UG/KG	1
2-HEXANONE	6.5	30.2	ND		UG/KG	1
BROMOFORM	1.8	7.5	ND		UG/KG	1
ISOPROPYLBENZENE	1	7.5	ND		UG/KG	1
1,1,2,2-TETRACHLOROETHANE	3.3	7.5	ND		UG/KG	1
BROMOBENZENE	1.4	7.5	ND		UG/KG	1
1,2,3-TRICHLOROPROPANE	3	7.5	ND		UG/KG	1
n-PROPYLBENZENE	0.87	7.5	ND		UG/KG	1
2-CHLOROTOLUENE	1.2	7.5	ND		UG/KG	1
4-CHLOROTOLUENE	1.2	7.5	ND		UG/KG	1
1,3,5-TRIMETHYLBENZENE	0.75	7.5	ND		UG/KG	1
tert-BUTYLBENZENE	0.81	7.5	ND		UG/KG	1
1,2,4-TRIMETHYLBENZENE	1.1	7.5	ND		UG/KG	1
sec-BUTYLBENZENE	0.95	7.5	ND		UG/KG	1
p-ISOPROPYLTOLUENE	0.92	7.5	ND		UG/KG	1
1,3-DICHLOROBENZENE	1.4	7.5	ND		UG/KG	1
1,4-DICHLOROBENZENE	1.5	7.5	ND		UG/KG	1
1,2-DICHLOROBENZENE	1.8	7.5	ND		UG/KG	1
n-BUTYLBENZENE	1.5	7.5	ND		UG/KG	1
1,2-DIBROMO-3-CHLOROPROPANE	3.8	15.1	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	1.7	7.5	ND		UG/KG	1
HEXACHLOROBUTADIENE	1.2	7.5	ND		UG/KG	1
NAPHTHALENE	2.6	7.5	ND		UG/KG	1
1,2,3-TRICHLOROBENZENE	2	7.5	ND		UG/KG	1
ACETONE	13.0	75.4	ND		UG/KG	1
2-BUTANONE	11.9	75.4	ND		UG/KG	1
4-METHYL-2-PENTANONE	5.4	30.2	ND		UG/KG	1

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Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/05/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-D1-01-05-1	ARDL Lab No.:	300542-05 (cont'd)
Desc/Location:	7D1	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1600	Prep. Date:	06/02/1997
Matrix:	SOIL	Analysis Date:	06/02/1997
Amount Used:	5 g	QC Batch:	0605TJP6
% Moisture:	33.7	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	76-141	100%
DIBROMOFLUOROMETHANE	86-125	106%
1,2-DICHLOROETHANE-D4	78-135	106%
TOLUENE-D8	86-129	105%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-D1-01-05-1

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300542 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300542-05

Sample wt/vol: 5.0 (g/mL) g Lab File ID: >G2392

Level: (low/med) LOW Date Received: 5/31/97

% Moisture: not dec. 33.7 Date Analyzed: 6/02/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-E-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300555 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300555-10

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: >K5061

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. --- Date Analyzed: 6/16/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: SW5030

Field ID:	H-07-E1-01-05-1	ARDL Lab No.:	300554-09 (cont'd)
Desc/Location:	E1 @ 1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1129	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/16/1997
Amount Used:	5 g	QC Batch:	0624TJP1
% Moisture:	18.7	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.7	6.2	ND		UG/KG	1
1,1,1,2-TETRACHLOROETHANE	0.6	6.2	ND		UG/KG	1
ETHYLBENZENE	0.86	6.2	ND		UG/KG	1
m & p-XYLENE	1.2	6.2	ND		UG/KG	1
o-XYLENE	0.57	6.2	ND		UG/KG	1
STYRENE	0.74	6.2	ND		UG/KG	1
2-HEXANONE	5.3	24.6	ND		UG/KG	1
BROMOFORM	1.5	6.2	ND		UG/KG	1
ISOPROPYLBENZENE	0.81	6.2	ND		UG/KG	1
1,1,2,2-TETRACHLOROETHANE	2.7	6.2	ND		UG/KG	1
BROMOBENZENE	1.2	6.2	ND		UG/KG	1
1,2,3-TRICHLOROPROPANE	2.5	6.2	ND		UG/KG	1
n-PROPYLBENZENE	0.71	6.2	ND		UG/KG	1
2-CHLOROTOLUENE	0.96	6.2	ND		UG/KG	1
4-CHLOROTOLUENE	0.98	6.2	ND		UG/KG	1
1,3,5-TRIMETHYLBENZENE	0.62	6.2	ND		UG/KG	1
tert-BUTYLBENZENE	0.66	6.2	ND		UG/KG	1
1,2,4-TRIMETHYLBENZENE	0.86	6.2	ND		UG/KG	1
sec-BUTYLBENZENE	0.77	6.2	ND		UG/KG	1
p-ISOPROPYLTOLUENE	0.75	6.2	ND		UG/KG	1
1,3-DICHLOROBENZENE	1.1	6.2	ND		UG/KG	1
1,4-DICHLOROBENZENE	1.2	6.2	ND		UG/KG	1
1,2-DICHLOROBENZENE	1.5	6.2	ND		UG/KG	1
n-BUTYLBENZENE	1.2	6.2	ND		UG/KG	1
1,2-DIBROMO-3-CHLOROPROPANE	3.1	12.3	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	1.4	6.2	ND		UG/KG	1
HEXACHLOROBUTADIENE	0.96	6.2	ND		UG/KG	1
NAPHTHALENE	2.1	6.2	ND		UG/KG	1
1,2,3-TRICHLOROBENZENE	1.6	6.2	ND		UG/KG	1
ACETONE	10.6	61.5	ND		UG/KG	1
2-BUTANONE	9.7	61.5	ND		UG/KG	1
4-METHYL-2-PENTANONE	4.4	24.6	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: SW5030

Field ID:	H-07-E1-01-05-1	ARDL Lab No.:	300554-09 (cont'd)
Desc/Location:	E1 @ 1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1129	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/16/1997
Amount Used:	5 g	QC Batch:	0624TJP1
% Moisture:	18.7	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	76-141	112%
DIBROMOFLUOROMETHANE	86-125	116%
1,2-DICHLOROETHANE-D4	78-135	120%
TOLUENE-D8	86-129	108%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-E1-01-05-1

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300554 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300554-09

Sample wt/vol: 5.0 (g/mL) g Lab File ID: >G2846

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. 18.7 Date Analyzed: 6/16/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-F-01-06-00	ARDL Lab No.:	300555-06
Desc/Location:	STATION F	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	0909	Prep. Date:	06/16/1997
Matrix:	WATER	Analysis Date:	06/16/1997
Amount Used:	5 mL	QC Batch:	0617LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	1.4	10.0	ND		UG/L	1
CHLOROMETHANE	1.2	10.0	ND		UG/L	1
VINYL CHLORIDE	1.2	10.0	ND		UG/L	1
BROMOMETHANE	1.3	10.0	ND		UG/L	1
CHLOROETHANE	1.4	10.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	1.4	10.0	ND		UG/L	1
1,1-DICHLOROETHENE	1.2	5.0	ND		UG/L	1
METHYLENE CHLORIDE	1.3	5.0	12.4	B	UG/L	1
trans-1,2-DICHLOROETHENE	1.3	5.0	ND		UG/L	1
1,1-DICHLOROETHANE	1.0	5.0	ND		UG/L	1
CARBON DISULFIDE	1.1	5.0	ND		UG/L	1
2,2-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.86	5.0	ND		UG/L	1
BROMOCHLOROMETHANE	1.1	5.0	ND		UG/L	1
CHLOROFORM	0.79	5.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.89	5.0	ND		UG/L	1
1,1-DICHLOROPROPENE	1.3	5.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.87	5.0	ND		UG/L	1
BENZENE	0.90	5.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.85	5.0	ND		UG/L	1
TRICHLOROETHENE	0.85	5.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.77	5.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.82	5.0	ND		UG/L	1
DIBROMOMETHANE	0.96	5.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.83	5.0	ND		UG/L	1
TOLUENE	0.85	5.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.96	5.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	1.0	5.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.92	5.0	ND		UG/L	1
TETRACHLOROETHENE	0.81	5.0	ND		UG/L	1
1,3-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	1.3	5.0	ND		UG/L	1

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ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-F-01-06-00	ARDL Lab No.:	300555-06 (cont'd)
Desc/Location:	STATION F	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	0909	Prep. Date:	06/16/1997
Matrix:	WATER	Analysis Date:	06/16/1997
Amount Used:	5 mL	QC Batch:	0617LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.96	5.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	1.4	5.0	ND		UG/L	1
ETHYLBENZENE	0.93	5.0	ND		UG/L	1
m & p-XYLENE	1.5	5.0	ND		UG/L	1
o-XYLENE	0.92	5.0	ND		UG/L	1
STYRENE	1.2	5.0	ND		UG/L	1
2-HEXANONE	4.5	20.0	ND		UG/L	1
BROMOFORM	2.0	5.0	ND		UG/L	1
ISOPROPYLBENZENE	1.1	5.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	3.0	5.0	ND		UG/L	1
BROMOBENZENE	1.2	5.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	2.2	5.0	ND		UG/L	1
n-PROPYLBENZENE	1.2	5.0	ND		UG/L	1
2-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
4-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	1.3	5.0	ND		UG/L	1
tert-BUTYLBENZENE	1.0	5.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	1.0	5.0	ND		UG/L	1
sec-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	1.3	5.0	ND		UG/L	1
1,3-DICHLOROBENZENE	1.9	5.0	ND		UG/L	1
1,4-DICHLOROBENZENE	1.6	5.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	5.0	ND		UG/L	1
n-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	3.2	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	1.2	5.0	ND		UG/L	1
HEXACHLOROBUTADIENE	1.3	5.0	ND		UG/L	1
NAPHTHALENE	2.3	5.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	1.9	5.0	ND		UG/L	1
ACETONE	11.0	50.0	ND		UG/L	1
2-BUTANONE	7.0	50.0	ND		UG/L	1
4-METHYL-2-PENTANONE	8.9	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-F-01-06-00	ARDL Lab No.:	300555-06 (cont'd)
Desc/Location:	STATION F	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	0909	Prep. Date:	06/16/1997
Matrix:	WATER	Analysis Date:	06/16/1997
Amount Used:	5 mL	QC Batch:	0617LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	82-125	108%
DIBROMOFLUOROMETHANE	89-127	90%
1,2-DICHLOROETHANE-D4	79-130	95%
TOLUENE-D8	84-122	109%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-F-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300555 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300555-06

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: >K5057

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. --- Date Analyzed: 6/16/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/26/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: SW5030

Field ID:	H-07-F1-01-05-01	ARDL Lab No.:	300554-02
Desc/Location:	STATION F1 @ 0-1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	0910	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/16/1997
Amount Used:	5 g	Instrument ID:	
Final Volume:	5 mL	QC Batch:	0624TJP1
% Moisture:	18.6	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	2.6	12.3	ND		UG/KG	1
CHLOROMETHANE	1.8	12.3	ND		UG/KG	1
VINYL CHLORIDE	1.6	12.3	ND		UG/KG	1
BROMOMETHANE	0.97	12.3	ND		UG/KG	1
CHLOROETHANE	1.8	12.3	ND		UG/KG	1
TRICHLOROFLUOROMETHANE	2.9	12.3	ND		UG/KG	1
1,1-DICHLOROETHENE	1.6	6.1	ND		UG/KG	1
METHYLENE CHLORIDE	3.1	6.1	8.3	B	UG/KG	1
trans-1,2-DICHLOROETHENE	0.8	6.1	ND		UG/KG	1
1,1-DICHLOROETHANE	0.8	6.1	ND		UG/KG	1
CARBON DISULFIDE	1.8	6.1	ND		UG/KG	1
2,2-DICHLOROPROPANE	1.5	6.1	ND		UG/KG	1
cis-1,2-DICHLOROETHENE	0.86	6.1	ND		UG/KG	1
BROMOCHLOROMETHANE	1	6.1	ND		UG/KG	1
CHLOROFORM	0.98	6.1	ND		UG/KG	1
1,1,1-TRICHLOROETHANE	0.63	6.1	ND		UG/KG	1
1,1-DICHLOROPROPENE	1.2	6.1	ND		UG/KG	1
CARBON TETRACHLORIDE	1.2	6.1	ND		UG/KG	1
BENZENE	0.64	6.1	ND		UG/KG	1
1,2-DICHLOROETHANE	1	6.1	ND		UG/KG	1
TRICHLOROETHENE	1.4	6.1	ND		UG/KG	1
1,2-DICHLOROPROPANE	1.4	6.1	ND		UG/KG	1
BROMODICHLOROMETHANE	0.81	6.1	ND		UG/KG	1
DIBROMOMETHANE	1.2	6.1	ND		UG/KG	1
cis-1,3-DICHLOROPROPENE	1.2	6.1	ND		UG/KG	1
TOLUENE	0.98	6.1	ND		UG/KG	1
trans-1,3-DICHLOROPROPENE	0.72	6.1	ND		UG/KG	1
1,1,2-TRICHLOROETHANE	1	6.1	ND		UG/KG	1
1,2-DIBROMOETHANE	1.1	6.1	ND		UG/KG	1
TETRACHLOROETHENE	0.96	6.1	ND		UG/KG	1
1,3-DICHLOROPROPANE	1.1	6.1	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/26/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: SW5030

Field ID:	H-07-F1-01-05-01	ARDL Lab No.:	300554-02 (cont'd)
Desc/Location:	STATION F1 @ 0-1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	0910	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/16/1997
Amount Used:	5 g	Instrument ID:	
Final Volume:	5 mL	QC Batch:	0624TJP1
% Moisture:	18.6	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DIBROMOCHLOROMETHANE	0.71	6.1	ND		UG/KG	1
CHLOROBENZENE	0.70	6.1	ND		UG/KG	1
1,1,1,2-TETRACHLOROETHANE	0.6	6.1	ND		UG/KG	1
ETHYLBENZENE	0.86	6.1	ND		UG/KG	1
m & p-XYLENE	1.2	6.1	ND		UG/KG	1
o-XYLENE	0.57	6.1	ND		UG/KG	1
STYRENE	0.74	6.1	ND		UG/KG	1
2-HEXANONE	5.3	24.6	ND		UG/KG	1
BROMOFORM	1.5	6.1	ND		UG/KG	1
ISOPROPYLBENZENE	0.81	6.1	ND		UG/KG	1
1,1,2,2-TETRACHLOROETHANE	2.7	6.1	ND		UG/KG	1
BROMOBENZENE	1.2	6.1	ND		UG/KG	1
1,2,3-TRICHLOROPROPANE	2.5	6.1	ND		UG/KG	1
n-PROPYLBENZENE	0.71	6.1	ND		UG/KG	1
2-CHLOROTOLUENE	0.96	6.1	ND		UG/KG	1
4-CHLOROTOLUENE	0.98	6.1	ND		UG/KG	1
1,3,5-TRIMETHYLBENZENE	0.61	6.1	ND		UG/KG	1
tert-BUTYLBENZENE	0.66	6.1	ND		UG/KG	1
1,2,4-TRIMETHYLBENZENE	0.86	6.1	ND		UG/KG	1
sec-BUTYLBENZENE	0.77	6.1	ND		UG/KG	1
p-ISOPROPYLTOLUENE	0.75	6.1	ND		UG/KG	1
1,3-DICHLOROBENZENE	1.1	6.1	ND		UG/KG	1
1,4-DICHLOROBENZENE	1.2	6.1	ND		UG/KG	1
1,2-DICHLOROBENZENE	1.5	6.1	ND		UG/KG	1
n-BUTYLBENZENE	1.2	6.1	ND		UG/KG	1
1,2-DIBROMO-3-CHLOROPROPANE	3.1	12.3	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	1.4	6.1	ND		UG/KG	1
HEXACHLOROBUTADIENE	0.96	6.1	ND		UG/KG	1
NAPHTHALENE	2.1	6.1	ND		UG/KG	1
1,2,3-TRICHLOROBENZENE	1.6	6.1	ND		UG/KG	1
ACETONE	10.6	61.4	ND		UG/KG	1

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Lab Report No: 300554 Report Date: 06/26/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: SW5030

Field ID:	H-07-F1-01-05-01	ARDL Lab No.:	300554-02 (cont'd)
Desc/Location:	STATION F1 @ 0-1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	0910	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/16/1997
Amount Used:	5 g	Instrument ID:	
Final Volume:	5 mL	QC Batch:	0624TJP1
% Moisture:	18.6	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2-BUTANONE	9.7	61.4	ND		UG/KG	1
4-METHYL-2-PENTANONE	4.4	24.6	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	76-141	104%
DIBROMOFLUOROMETHANE	86-125	112%
1,2-DICHLOROETHANE-D4	78-135	106%
TOLUENE-D8	86-129	109%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-F1-01-05-01

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300554 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300554-02

Sample wt/vol: 5.0 (g/mL) g Lab File ID: >G2843

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. 18.6 Date Analyzed: 6/16/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-G-01-06-00	ARDL Lab No.:	300555-09
Desc/Location:	7G	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1040	Prep. Date:	06/16/1997
Matrix:	WATER	Analysis Date:	06/16/1997
Amount Used:	5 mL	QC Batch:	0617LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	1.4	10.0	ND		UG/L	1
CHLOROMETHANE	1.2	10.0	ND		UG/L	1
VINYL CHLORIDE	1.2	10.0	ND		UG/L	1
BROMOMETHANE	1.3	10.0	ND		UG/L	1
CHLOROETHANE	1.4	10.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	1.4	10.0	ND		UG/L	1
1,1-DICHLOROETHENE	1.2	5.0	ND		UG/L	1
METHYLENE CHLORIDE	1.3	5.0	11.6	B	UG/L	1
trans-1,2-DICHLOROETHENE	1.3	5.0	ND		UG/L	1
1,1-DICHLOROETHANE	1.0	5.0	ND		UG/L	1
CARBON DISULFIDE	1.1	5.0	ND		UG/L	1
2,2-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.86	5.0	ND		UG/L	1
BROMOCHLOROMETHANE	1.1	5.0	ND		UG/L	1
CHLOROFORM	0.79	5.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.89	5.0	ND		UG/L	1
1,1-DICHLOROPROPENE	1.3	5.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.87	5.0	ND		UG/L	1
BENZENE	0.90	5.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.85	5.0	ND		UG/L	1
TRICHLOROETHENE	0.85	5.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.77	5.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.82	5.0	ND		UG/L	1
DIBROMOMETHANE	0.96	5.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.83	5.0	ND		UG/L	1
TOLUENE	0.85	5.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.96	5.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	1.0	5.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.92	5.0	ND		UG/L	1
TETRACHLOROETHENE	0.81	5.0	ND		UG/L	1
1,3-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	1.3	5.0	ND		UG/L	1

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Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-G-01-06-00	ARDL Lab No.:	300555-09 (cont'd)
Desc/Location:	7G	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1040	Prep. Date:	06/16/1997
Matrix:	WATER	Analysis Date:	06/16/1997
Amount Used:	5 mL	QC Batch:	0617LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.96	5.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	1.4	5.0	ND		UG/L	1
ETHYLBENZENE	0.93	5.0	ND		UG/L	1
m & p-XYLENE	1.5	5.0	ND		UG/L	1
o-XYLENE	0.92	5.0	ND		UG/L	1
STYRENE	1.2	5.0	ND		UG/L	1
2-HEXANONE	4.5	20.0	ND		UG/L	1
BROMOFORM	2.0	5.0	ND		UG/L	1
ISOPROPYLBENZENE	1.1	5.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	3.0	5.0	ND		UG/L	1
BROMOBENZENE	1.2	5.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	2.2	5.0	ND		UG/L	1
n-PROPYLBENZENE	1.2	5.0	ND		UG/L	1
2-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
4-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	1.3	5.0	ND		UG/L	1
tert-BUTYLBENZENE	1.0	5.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	1.0	5.0	ND		UG/L	1
sec-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	1.3	5.0	ND		UG/L	1
1,3-DICHLOROBENZENE	1.9	5.0	ND		UG/L	1
1,4-DICHLOROBENZENE	1.6	5.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	5.0	ND		UG/L	1
n-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	3.2	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	1.2	5.0	ND		UG/L	1
HEXACHLOROBUTADIENE	1.3	5.0	ND		UG/L	1
NAPHTHALENE	2.3	5.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	1.9	5.0	ND		UG/L	1
ACETONE	11.0	50.0	ND		UG/L	1
2-BUTANONE	7.0	50.0	ND		UG/L	1
4-METHYL-2-PENTANONE	8.9	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name:	IOWA ARMY AMM PLANT	Analysis:	VOLATILES, GC/MS (8260)
Project No.:	5644V	Analytical Method:	8260A
		Prep Method:	5030A

Field ID:	H-07-G-01-06-00	ARDL Lab No.:	300555-09 (cont'd)
Desc/Location:	7G	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1040	Prep. Date:	06/16/1997
Matrix:	WATER	Analysis Date:	06/16/1997
Amount Used:	5 mL	QC Batch:	0617LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	82-125	104%
DIBROMOFLUOROMETHANE	89-127	89%
1,2-DICHLOROETHANE-D4	79-130	94%
TOLUENE-D8	84-122	103%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-G-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300555 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300555-09

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: >K5060

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. --- Date Analyzed: 6/16/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: SW5030

Field ID:	H-07-G1-01-05-01	ARDL Lab No.:	300554-13
Desc/Location:	SITE G1 @ 1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1045	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/16/1997
Amount Used:	5 g	QC Batch:	0624TJP1
% Moisture:	24.4	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	2.8	13.2	ND		UG/KG	1
CHLOROMETHANE	2	13.2	ND		UG/KG	1
VINYL CHLORIDE	1.7	13.2	ND		UG/KG	1
BROMOMETHANE	1	13.2	ND		UG/KG	1
CHLOROETHANE	2	13.2	ND		UG/KG	1
TRICHLOROFLUOROMETHANE	3.2	13.2	ND		UG/KG	1
1,1-DICHLOROETHENE	1.7	6.6	ND		UG/KG	1
METHYLENE CHLORIDE	3.3	6.6	8.7	B	UG/KG	1
trans-1,2-DICHLOROETHENE	0.86	6.6	ND		UG/KG	1
1,1-DICHLOROETHANE	0.86	6.6	ND		UG/KG	1
CARBON DISULFIDE	2	6.6	ND		UG/KG	1
2,2-DICHLOROPROPANE	1.6	6.6	ND		UG/KG	1
cis-1,2-DICHLOROETHENE	0.93	6.6	ND		UG/KG	1
BROMOCHLOROMETHANE	1.1	6.6	ND		UG/KG	1
CHLOROFORM	1.1	6.6	ND		UG/KG	1
1,1,1-TRICHLOROETHANE	0.67	6.6	ND		UG/KG	1
1,1-DICHLOROPROPENE	1.3	6.6	ND		UG/KG	1
CARBON TETRACHLORIDE	1.3	6.6	ND		UG/KG	1
BENZENE	0.69	6.6	ND		UG/KG	1
1,2-DICHLOROETHANE	1.1	6.6	ND		UG/KG	1
TRICHLOROETHENE	1.5	6.6	ND		UG/KG	1
1,2-DICHLOROPROPANE	1.5	6.6	ND		UG/KG	1
BROMODICHLOROMETHANE	0.87	6.6	ND		UG/KG	1
DIBROMOMETHANE	1.3	6.6	ND		UG/KG	1
cis-1,3-DICHLOROPROPENE	1.3	6.6	ND		UG/KG	1
TOLUENE	1.1	6.6	ND		UG/KG	1
trans-1,3-DICHLOROPROPENE	0.78	6.6	ND		UG/KG	1
1,1,2-TRICHLOROETHANE	1.1	6.6	ND		UG/KG	1
1,2-DIBROMOETHANE	1.2	6.6	ND		UG/KG	1
TETRACHLOROETHENE	1	6.6	ND		UG/KG	1
1,3-DICHLOROPROPANE	1.1	6.6	ND		UG/KG	1
DIBROMOCHLOROMETHANE	0.77	6.6	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: SW5030

Field ID:	H-07-G1-01-05-01	ARDL Lab No.:	300554-13 (cont'd)
Desc/Location:	SITE G1 @ 1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1045	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/16/1997
Amount Used:	5 g	QC Batch:	0624TJP1
% Moisture:	24.4	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.75	6.6	ND		UG/KG	1
1,1,1,2-TETRACHLOROETHANE	0.65	6.6	ND		UG/KG	1
ETHYLBENZENE	0.93	6.6	ND		UG/KG	1
m & p-XYLENE	1.3	6.6	ND		UG/KG	1
o-XYLENE	0.61	6.6	ND		UG/KG	1
STYRENE	0.79	6.6	ND		UG/KG	1
2-HEXANONE	5.7	26.5	ND		UG/KG	1
BROMOFORM	1.6	6.6	ND		UG/KG	1
ISOPROPYLBENZENE	0.87	6.6	ND		UG/KG	1
1,1,2,2-TETRACHLOROETHANE	2.9	6.6	ND		UG/KG	1
BROMOBENZENE	1.2	6.6	ND		UG/KG	1
1,2,3-TRICHLOROPROPANE	2.6	6.6	ND		UG/KG	1
n-PROPYLBENZENE	0.77	6.6	ND		UG/KG	1
2-CHLOROTOLUENE	1	6.6	ND		UG/KG	1
4-CHLOROTOLUENE	1.1	6.6	ND		UG/KG	1
1,3,5-TRIMETHYLBENZENE	0.66	6.6	ND		UG/KG	1
tert-BUTYLBENZENE	0.71	6.6	ND		UG/KG	1
1,2,4-TRIMETHYLBENZENE	0.93	6.6	ND		UG/KG	1
sec-BUTYLBENZENE	0.83	6.6	ND		UG/KG	1
p-ISOPROPYLTOLUENE	0.81	6.6	ND		UG/KG	1
1,3-DICHLOROBENZENE	1.2	6.6	ND		UG/KG	1
1,4-DICHLOROBENZENE	1.3	6.6	ND		UG/KG	1
1,2-DICHLOROBENZENE	1.6	6.6	ND		UG/KG	1
n-BUTYLBENZENE	1.3	6.6	ND		UG/KG	1
1,2-DIBROMO-3-CHLOROPROPANE	3.3	13.2	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	1.5	6.6	ND		UG/KG	1
HEXACHLOROBUTADIENE	1	6.6	ND		UG/KG	1
NAPHTHALENE	2.2	6.6	ND		UG/KG	1
1,2,3-TRICHLOROBENZENE	1.7	6.6	ND		UG/KG	1
ACETONE	11.4	66.1	ND		UG/KG	1
2-BUTANONE	10.4	66.1	ND		UG/KG	1
4-METHYL-2-PENTANONE	4.8	26.5	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: SW5030

Field ID:	H-07-G1-01-05-01	ARDL Lab No.:	300554-13 (cont'd)
Desc/Location:	SITE G1 @ 1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1045	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/16/1997
Amount Used:	5 g	QC Batch:	0624TJP1
% Moisture:	24.4	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	76-141	112%
DIBROMOFLUOROMETHANE	86-125	121%
1,2-DICHLOROETHANE-D4	78-135	131%
TOLUENE-D8	86-129	112%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-G1-01-05-01

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300554 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300554-13

Sample wt/vol: 5.0 (g/mL) g Lab File ID: >G2847

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. 24.4 Date Analyzed: 6/16/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-H-01-06-00	ARDL Lab No.:	300552-11
Desc/Location:	7H	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1415	Prep. Date:	06/10/1997
Matrix:	WATER	Analysis Date:	06/10/1997
Amount Used:	5 mL	Instrument ID:	
Final Volume:	5 mL	QC Batch:	0616TJP9
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	1.4	10.0	ND		UG/L	1
CHLOROMETHANE	1.2	10.0	ND		UG/L	1
VINYL CHLORIDE	1.2	10.0	ND		UG/L	1
BROMOMETHANE	1.3	10.0	ND		UG/L	1
CHLOROETHANE	1.4	10.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	1.4	10.0	ND		UG/L	1
1,1-DICHLOROETHENE	1.2	5.0	ND		UG/L	1
METHYLENE CHLORIDE	1.3	5.0	11.7	B	UG/L	1
trans-1,2-DICHLOROETHENE	1.3	5.0	ND		UG/L	1
1,1-DICHLOROETHANE	1.0	5.0	ND		UG/L	1
CARBON DISULFIDE	1.1	5.0	ND		UG/L	1
2,2-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.86	5.0	ND		UG/L	1
BROMOCHLOROMETHANE	1.1	5.0	ND		UG/L	1
CHLOROFORM	0.79	5.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.89	5.0	ND		UG/L	1
1,1-DICHLOROPROPENE	1.3	5.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.87	5.0	ND		UG/L	1
BENZENE	0.90	5.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.85	5.0	ND		UG/L	1
TRICHLOROETHENE	0.85	5.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.77	5.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.82	5.0	ND		UG/L	1
DIBROMOMETHANE	0.96	5.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.83	5.0	ND		UG/L	1
TOLUENE	0.85	5.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.96	5.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	1.0	5.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.92	5.0	ND		UG/L	1
TETRACHLOROETHENE	0.81	5.0	ND		UG/L	1
1,3-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-H-01-06-00	ARDL Lab No.:	300552-11 (cont'd)
Desc/Location:	7H	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1415	Prep. Date:	06/10/1997
Matrix:	WATER	Analysis Date:	06/10/1997
Amount Used:	5 mL	Instrument ID:	
Final Volume:	5 mL	QC Batch:	0616TJP9
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DIBROMOCHLOROMETHANE	1.3	5.0	ND		UG/L	1
CHLOROBENZENE	0.96	5.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	1.4	5.0	ND		UG/L	1
ETHYLBENZENE	0.93	5.0	ND		UG/L	1
m & p-XYLENE	1.5	5.0	ND		UG/L	1
o-XYLENE	0.92	5.0	ND		UG/L	1
STYRENE	1.2	5.0	ND		UG/L	1
2-HEXANONE	4.5	20.0	ND		UG/L	1
BROMOFORM	2.0	5.0	ND		UG/L	1
ISOPROPYLBENZENE	1.1	5.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	3.0	5.0	ND		UG/L	1
BROMOBENZENE	1.2	5.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	2.2	5.0	ND		UG/L	1
n-PROPYLBENZENE	1.2	5.0	ND		UG/L	1
2-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
4-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	1.3	5.0	ND		UG/L	1
tert-BUTYLBENZENE	1.0	5.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	1.0	5.0	ND		UG/L	1
sec-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	1.3	5.0	ND		UG/L	1
1,3-DICHLOROBENZENE	1.9	5.0	ND		UG/L	1
1,4-DICHLOROBENZENE	1.6	5.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	5.0	ND		UG/L	1
n-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	3.2	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	1.2	5.0	ND		UG/L	1
HEXACHLOROBUTADIENE	1.3	5.0	ND		UG/L	1
NAPHTHALENE	2.3	5.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	1.9	5.0	ND		UG/L	1
ACETONE	11.0	50.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-H-01-06-00	ARDL Lab No.:	300552-11 (cont'd)
Desc/Location:	7H	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1415	Prep. Date:	06/10/1997
Matrix:	WATER	Analysis Date:	06/10/1997
Amount Used:	5 mL	Instrument ID:	
Final Volume:	5 mL	QC Batch:	0616TJP9
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2-BUTANONE	7.0	50.0	ND		UG/L	1
4-METHYL-2-PENTANONE	8.9	20.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	82-125	114%
DIBROMOFLUOROMETHANE	89-127	99%
1,2-DICHLOROETHANE-D4	79-130	101%
TOLUENE-D8	84-122	112%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-H-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300552 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300552-11

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: >K4982

Level: (low/med) LOW Date Received: 6/10/97

% Moisture: not dec. --- Date Analyzed: 6/10/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-H1-01-05-01	ARDL Lab No.:	300552-03
Desc/Location:	7H1	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1410	Prep. Date:	06/12/1997
Matrix:	SEDIMENT	Analysis Date:	06/12/1997
Amount Used:	5 g	Instrument ID:	
Final Volume:	5 mL	QC Batch:	0616TJP1
% Moisture:	17.9	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	2.6	12.2	ND		UG/KG	1
CHLOROMETHANE	1.8	12.2	ND		UG/KG	1
VINYL CHLORIDE	1.6	12.2	ND		UG/KG	1
BROMOMETHANE	0.96	12.2	ND		UG/KG	1
CHLOROETHANE	1.8	12.2	ND		UG/KG	1
TRICHLOROFLUOROMETHANE	2.9	12.2	ND		UG/KG	1
1,1-DICHLOROETHENE	1.6	6.1	ND		UG/KG	1
METHYLENE CHLORIDE	3	6.1	18.8	B	UG/KG	1
trans-1,2-DICHLOROETHENE	0.79	6.1	ND		UG/KG	1
1,1-DICHLOROETHANE	0.79	6.1	ND		UG/KG	1
CARBON DISULFIDE	1.8	6.1	ND		UG/KG	1
2,2-DICHLOROPROPANE	1.5	6.1	ND		UG/KG	1
cis-1,2-DICHLOROETHENE	0.85	6.1	ND		UG/KG	1
BROMOCHLOROMETHANE	1	6.1	ND		UG/KG	1
CHLOROFORM	0.97	6.1	ND		UG/KG	1
1,1,1-TRICHLOROETHANE	0.62	6.1	ND		UG/KG	1
1,1-DICHLOROPROPENE	1.2	6.1	ND		UG/KG	1
CARBON TETRACHLORIDE	1.2	6.1	ND		UG/KG	1
BENZENE	0.63	6.1	ND		UG/KG	1
1,2-DICHLOROETHANE	0.99	6.1	ND		UG/KG	1
TRICHLOROETHENE	1.3	6.1	ND		UG/KG	1
1,2-DICHLOROPROPANE	1.3	6.1	ND		UG/KG	1
BROMODICHLOROMETHANE	0.8	6.1	ND		UG/KG	1
DIBROMOMETHANE	1.2	6.1	ND		UG/KG	1
cis-1,3-DICHLOROPROPENE	1.2	6.1	ND		UG/KG	1
TOLUENE	0.97	6.1	ND		UG/KG	1
trans-1,3-DICHLOROPROPENE	0.72	6.1	ND		UG/KG	1
1,1,2-TRICHLOROETHANE	0.99	6.1	ND		UG/KG	1
1,2-DIBROMOETHANE	1.1	6.1	ND		UG/KG	1
TETRACHLOROETHENE	0.95	6.1	ND		UG/KG	1
1,3-DICHLOROPROPANE	1	6.1	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-H1-01-05-01	ARDL Lab No.:	300552-03 (cont'd)
Desc/Location:	7H1	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1410	Prep. Date:	06/12/1997
Matrix:	SEDIMENT	Analysis Date:	06/12/1997
Amount Used:	5 g	Instrument ID:	
Final Volume:	5 mL	QC Batch:	0616TJP1
% Moisture:	17.9	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DIBROMOCHLOROMETHANE	0.71	6.1	ND		UG/KG	1
CHLOROBENZENE	0.69	6.1	ND		UG/KG	1
1,1,1,2-TETRACHLOROETHANE	0.6	6.1	ND		UG/KG	1
ETHYLBENZENE	0.85	6.1	ND		UG/KG	1
m & p-XYLENE	1.2	6.1	ND		UG/KG	1
o-XYLENE	0.56	6.1	ND		UG/KG	1
STYRENE	0.73	6.1	ND		UG/KG	1
2-HEXANONE	5.2	24.4	ND		UG/KG	1
BROMOFORM	1.5	6.1	ND		UG/KG	1
ISOPROPYLBENZENE	0.8	6.1	ND		UG/KG	1
1,1,2,2-TETRACHLOROETHANE	2.7	6.1	ND		UG/KG	1
BROMOBENZENE	1.1	6.1	ND		UG/KG	1
1,2,3-TRICHLOROPROPANE	2.4	6.1	ND		UG/KG	1
n-PROPYLBENZENE	0.71	6.1	ND		UG/KG	1
2-CHLOROTOLUENE	0.95	6.1	ND		UG/KG	1
4-CHLOROTOLUENE	0.97	6.1	ND		UG/KG	1
1,3,5-TRIMETHYLBENZENE	0.61	6.1	ND		UG/KG	1
tert-BUTYLBENZENE	0.66	6.1	ND		UG/KG	1
1,2,4-TRIMETHYLBENZENE	0.85	6.1	ND		UG/KG	1
sec-BUTYLBENZENE	0.77	6.1	ND		UG/KG	1
p-ISOPROPYLTOLUENE	0.74	6.1	ND		UG/KG	1
1,3-DICHLOROBENZENE	1.1	6.1	ND		UG/KG	1
1,4-DICHLOROBENZENE	1.2	6.1	ND		UG/KG	1
1,2-DICHLOROBENZENE	1.5	6.1	ND		UG/KG	1
n-BUTYLBENZENE	1.2	6.1	ND		UG/KG	1
1,2-DIBROMO-3-CHLOROPROPANE	3	12.2	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	1.3	6.1	ND		UG/KG	1
HEXACHLOROBUTADIENE	0.95	6.1	ND		UG/KG	1
NAPHTHALENE	2.1	6.1	ND		UG/KG	1
1,2,3-TRICHLOROBENZENE	1.6	6.1	ND		UG/KG	1
ACETONE	10.5	60.9	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-H1-01-05-01	ARDL Lab No.:	300552-03 (cont'd)
Desc/Location:	7H1	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1410	Prep. Date:	06/12/1997
Matrix:	SEDIMENT	Analysis Date:	06/12/1997
Amount Used:	5 g	Instrument ID:	
Final Volume:	5 mL	QC Batch:	0616TJP1
% Moisture:	17.9	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2-BUTANONE	9.6	60.9	ND		UG/KG	1
4-METHYL-2-PENTANONE	4.4	24.4	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	76-141	108%
DIBROMOFLUOROMETHANE	86-125	117%
1,2-DICHLOROETHANE-D4	78-135	115%
TOLUENE-D8	86-129	105%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-H1-01-05-01

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300552 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300552-03

Sample wt/vol: 5.0 (g/mL) g Lab File ID: >G2522

Level: (low/med) LOW Date Received: 6/10/97

% Moisture: not dec. 17.9 Date Analyzed: 6/12/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	76131	Ethane, 1,1,2-trichloro-1,2,2-trifluoro-	3.79	92.	JNB
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-I-01-06-00	ARDL Lab No.:	300552-12
Desc/Location:	7I	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1245	Prep. Date:	06/10/1997
Matrix:	WATER	Analysis Date:	06/10/1997
Amount Used:	5 mL	Instrument ID:	
Final Volume:	5 mL	QC Batch:	0616TJP9
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	1.4	10.0	ND		UG/L	1
CHLOROMETHANE	1.2	10.0	ND		UG/L	1
VINYL CHLORIDE	1.2	10.0	ND		UG/L	1
BROMOMETHANE	1.3	10.0	ND		UG/L	1
CHLOROETHANE	1.4	10.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	1.4	10.0	ND		UG/L	1
1,1-DICHLOROETHENE	1.2	5.0	ND		UG/L	1
METHYLENE CHLORIDE	1.3	5.0	10.4	B	UG/L	1
trans-1,2-DICHLOROETHENE	1.3	5.0	ND		UG/L	1
1,1-DICHLOROETHANE	1.0	5.0	ND		UG/L	1
CARBON DISULFIDE	1.1	5.0	ND		UG/L	1
2,2-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.86	5.0	ND		UG/L	1
BROMOCHLOROMETHANE	1.1	5.0	ND		UG/L	1
CHLOROFORM	0.79	5.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.89	5.0	ND		UG/L	1
1,1-DICHLOROPROPENE	1.3	5.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.87	5.0	ND		UG/L	1
BENZENE	0.90	5.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.85	5.0	ND		UG/L	1
TRICHLOROETHENE	0.85	5.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.77	5.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.82	5.0	ND		UG/L	1
DIBROMOMETHANE	0.96	5.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.83	5.0	ND		UG/L	1
TOLUENE	0.85	5.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.96	5.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	1.0	5.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.92	5.0	ND		UG/L	1
TETRACHLOROETHENE	0.81	5.0	ND		UG/L	1
1,3-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-I-01-06-00	ARDL Lab No.:	300552-12 (cont'd)
Desc/Location:	7I	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1245	Prep. Date:	06/10/1997
Matrix:	WATER	Analysis Date:	06/10/1997
Amount Used:	5 mL	Instrument ID:	
Final Volume:	5 mL	QC Batch:	0616TJP9
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DIBROMOCHLOROMETHANE	1.3	5.0	ND		UG/L	1
CHLOROBENZENE	0.96	5.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	1.4	5.0	ND		UG/L	1
ETHYLBENZENE	0.93	5.0	ND		UG/L	1
m & p-XYLENE	1.5	5.0	ND		UG/L	1
o-XYLENE	0.92	5.0	ND		UG/L	1
STYRENE	1.2	5.0	ND		UG/L	1
2-HEXANONE	4.5	20.0	ND		UG/L	1
BROMOFORM	2.0	5.0	ND		UG/L	1
ISOPROPYLBENZENE	1.1	5.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	3.0	5.0	ND		UG/L	1
BROMOBENZENE	1.2	5.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	2.2	5.0	ND		UG/L	1
n-PROPYLBENZENE	1.2	5.0	ND		UG/L	1
2-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
4-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	1.3	5.0	ND		UG/L	1
tert-BUTYLBENZENE	1.0	5.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	1.0	5.0	ND		UG/L	1
sec-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	1.3	5.0	ND		UG/L	1
1,3-DICHLOROBENZENE	1.9	5.0	ND		UG/L	1
1,4-DICHLOROBENZENE	1.6	5.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	5.0	ND		UG/L	1
n-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	3.2	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	1.2	5.0	ND		UG/L	1
HEXACHLOROBUTADIENE	1.3	5.0	ND		UG/L	1
NAPHTHALENE	2.3	5.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	1.9	5.0	ND		UG/L	1
ACETONE	11.0	50.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-I-01-06-00	ARDL Lab No.:	300552-12 (cont'd)
Desc/Location:	7I	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1245	Prep. Date:	06/10/1997
Matrix:	WATER	Analysis Date:	06/10/1997
Amount Used:	5 mL	Instrument ID:	
Final Volume:	5 mL	QC Batch:	0616TJP9
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2-BUTANONE	7.0	50.0	ND		UG/L	1
4-METHYL-2-PENTANONE	8.9	20.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	82-125	115%
DIBROMOFLUOROMETHANE	89-127	102%
1,2-DICHLOROETHANE-D4	79-130	104%
TOLUENE-D8	84-122	114%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-I-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300552 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300552-12

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: >K4983

Level: (low/med) LOW Date Received: 6/10/97

% Moisture: not dec. --- Date Analyzed: 6/10/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	7.96	5.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-I1-01-05-01	ARDL Lab No.:	300552-06
Desc/Location:	7I1	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1237	Prep. Date:	06/20/1997
Matrix:	SEDIMENT	Analysis Date:	06/20/1997
Amount Used:	5 g	Instrument ID:	
Final Volume:	5 mL	QC Batch:	0623SAJ3
% Moisture:	25.7	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	2.8	13.5	ND		UG/KG	1
CHLOROMETHANE	2	13.5	ND		UG/KG	1
VINYL CHLORIDE	1.7	13.5	ND		UG/KG	1
BROMOMETHANE	1.1	13.5	ND		UG/KG	1
CHLOROETHANE	2	13.5	ND		UG/KG	1
TRICHLOROFLUOROMETHANE	3.2	13.5	ND		UG/KG	1
1,1-DICHLOROETHENE	1.7	6.7	ND		UG/KG	1
METHYLENE CHLORIDE	3.4	6.7	7.2	B	UG/KG	1
trans-1,2-DICHLOROETHENE	0.87	6.7	ND		UG/KG	1
1,1-DICHLOROETHANE	0.87	6.7	ND		UG/KG	1
CARBON DISULFIDE	2	6.7	ND		UG/KG	1
2,2-DICHLOROPROPANE	1.6	6.7	ND		UG/KG	1
cis-1,2-DICHLOROETHENE	0.94	6.7	ND		UG/KG	1
BROMOCHLOROMETHANE	1.1	6.7	ND		UG/KG	1
CHLOROFORM	1.1	6.7	ND		UG/KG	1
1,1,1-TRICHLOROETHANE	0.69	6.7	ND		UG/KG	1
1,1-DICHLOROPROPENE	1.3	6.7	ND		UG/KG	1
CARBON TETRACHLORIDE	1.3	6.7	ND		UG/KG	1
BENZENE	0.70	6.7	ND		UG/KG	1
1,2-DICHLOROETHANE	1.1	6.7	ND		UG/KG	1
TRICHLOROETHENE	1.5	6.7	ND		UG/KG	1
1,2-DICHLOROPROPANE	1.5	6.7	ND		UG/KG	1
BROMODICHLOROMETHANE	0.89	6.7	ND		UG/KG	1
DIBROMOMETHANE	1.3	6.7	ND		UG/KG	1
cis-1,3-DICHLOROPROPENE	1.3	6.7	ND		UG/KG	1
TOLUENE	1.1	6.7	ND		UG/KG	1
trans-1,3-DICHLOROPROPENE	0.79	6.7	ND		UG/KG	1
1,1,2-TRICHLOROETHANE	1.1	6.7	ND		UG/KG	1
1,2-DIBROMOETHANE	1.2	6.7	ND		UG/KG	1
TETRACHLOROETHENE	1	6.7	ND		UG/KG	1
1,3-DICHLOROPROPANE	1.2	6.7	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-I1-01-05-01	ARDL Lab No.:	300552-06 (cont'd)
Desc/Location:	7I1	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1237	Prep. Date:	06/20/1997
Matrix:	SEDIMENT	Analysis Date:	06/20/1997
Amount Used:	5 g	Instrument ID:	
Final Volume:	5 mL	QC Batch:	0623SAJ3
% Moisture:	25.7	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DIBROMOCHLOROMETHANE	0.78	6.7	ND		UG/KG	1
CHLOROBENZENE	0.77	6.7	ND		UG/KG	1
1,1,1,2-TETRACHLOROETHANE	0.66	6.7	ND		UG/KG	1
ETHYLBENZENE	0.94	6.7	ND		UG/KG	1
m & p-XYLENE	1.3	6.7	ND		UG/KG	1
o-XYLENE	0.62	6.7	ND		UG/KG	1
STYRENE	0.81	6.7	ND		UG/KG	1
2-HEXANONE	5.8	26.9	ND		UG/KG	1
BROMOFORM	1.6	6.7	ND		UG/KG	1
ISOPROPYLBENZENE	0.89	6.7	ND		UG/KG	1
1,1,2,2-TETRACHLOROETHANE	3	6.7	ND		UG/KG	1
BROMOBENZENE	1.3	6.7	ND		UG/KG	1
1,2,3-TRICHLOROPROPANE	2.7	6.7	ND		UG/KG	1
n-PROPYLBENZENE	0.78	6.7	ND		UG/KG	1
2-CHLOROTOLUENE	1	6.7	ND		UG/KG	1
4-CHLOROTOLUENE	1.1	6.7	ND		UG/KG	1
1,3,5-TRIMETHYLBENZENE	0.67	6.7	ND		UG/KG	1
tert-BUTYLBENZENE	0.73	6.7	ND		UG/KG	1
1,2,4-TRIMETHYLBENZENE	0.94	6.7	ND		UG/KG	1
sec-BUTYLBENZENE	0.85	6.7	ND		UG/KG	1
p-ISOPROPYLTOLUENE	0.82	6.7	ND		UG/KG	1
1,3-DICHLOROBENZENE	1.2	6.7	ND		UG/KG	1
1,4-DICHLOROBENZENE	1.3	6.7	ND		UG/KG	1
1,2-DICHLOROBENZENE	1.6	6.7	ND		UG/KG	1
n-BUTYLBENZENE	1.3	6.7	ND		UG/KG	1
1,2-DIBROMO-3-CHLOROPROPANE	3.4	13.5	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	1.5	6.7	ND		UG/KG	1
HEXACHLOROBUTADIENE	1	6.7	ND		UG/KG	1
NAPHTHALENE	2.3	6.7	ND		UG/KG	1
1,2,3-TRICHLOROBENZENE	1.7	6.7	ND		UG/KG	1
ACETONE	11.6	67.3	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-I1-01-05-01	ARDL Lab No.:	300552-06 (cont'd)
Desc/Location:	7I1	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1237	Prep. Date:	06/20/1997
Matrix:	SEDIMENT	Analysis Date:	06/20/1997
Amount Used:	5 g	Instrument ID:	
Final Volume:	5 mL	QC Batch:	0623SAJ3
% Moisture:	25.7	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2-BUTANONE	10.6	67.3	ND		UG/KG	1
4-METHYL-2-PENTANONE	4.8	26.9	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	76-141	101%
DIBROMOFLUOROMETHANE	86-125	101%
1,2-DICHLOROETHANE-D4	78-135	100%
TOLUENE-D8	86-129	104%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-II-01-05-01

Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300552 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300552-06

Sample wt/vol: 5.0 (g/mL) g Lab File ID: >G2876

Level: (low/med) LOW Date Received: 6/10/97

% Moisture: not dec. 25.7 Date Analyzed: 6/20/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-J-01-06-00	ARDL Lab No.:	300552-10
Desc/Location:	7J	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	0935	Prep. Date:	06/10/1997
Matrix:	WATER	Analysis Date:	06/10/1997
Amount Used:	5 mL	Instrument ID:	
Final Volume:	5 mL	QC Batch:	0616TJP9
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	1.4	10.0	ND		UG/L	1
CHLOROMETHANE	1.2	10.0	ND		UG/L	1
VINYL CHLORIDE	1.2	10.0	ND		UG/L	1
BROMOMETHANE	1.3	10.0	ND		UG/L	1
CHLOROETHANE	1.4	10.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	1.4	10.0	ND		UG/L	1
1,1-DICHLOROETHENE	1.2	5.0	ND		UG/L	1
METHYLENE CHLORIDE	1.3	5.0	11.3	B	UG/L	1
trans-1,2-DICHLOROETHENE	1.3	5.0	ND		UG/L	1
1,1-DICHLOROETHANE	1.0	5.0	ND		UG/L	1
CARBON DISULFIDE	1.1	5.0	ND		UG/L	1
2,2-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.86	5.0	ND		UG/L	1
BROMOCHLOROMETHANE	1.1	5.0	ND		UG/L	1
CHLOROFORM	0.79	5.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.89	5.0	ND		UG/L	1
1,1-DICHLOROPROPENE	1.3	5.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.87	5.0	ND		UG/L	1
BENZENE	0.90	5.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.85	5.0	ND		UG/L	1
TRICHLOROETHENE	0.85	5.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.77	5.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.82	5.0	ND		UG/L	1
DIBROMOMETHANE	0.96	5.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.83	5.0	ND		UG/L	1
TOLUENE	0.85	5.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.96	5.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	1.0	5.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.92	5.0	ND		UG/L	1
TETRACHLOROETHENE	0.81	5.0	ND		UG/L	1
1,3-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-J-01-06-00	ARDL Lab No.:	300552-10 (cont'd)
Desc/Location:	7J	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	0935	Prep. Date:	06/10/1997
Matrix:	WATER	Analysis Date:	06/10/1997
Amount Used:	5 mL	Instrument ID:	
Final Volume:	5 mL	QC Batch:	0616TJP9
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DIBROMOCHLOROMETHANE	1.3	5.0	ND		UG/L	1
CHLOROBENZENE	0.96	5.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	1.4	5.0	ND		UG/L	1
ETHYLBENZENE	0.93	5.0	ND		UG/L	1
m & p-XYLENE	1.5	5.0	ND		UG/L	1
o-XYLENE	0.92	5.0	ND		UG/L	1
STYRENE	1.2	5.0	ND		UG/L	1
2-HEXANONE	4.5	20.0	ND		UG/L	1
BROMOFORM	2.0	5.0	ND		UG/L	1
ISOPROPYLBENZENE	1.1	5.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	3.0	5.0	ND		UG/L	1
BROMOBENZENE	1.2	5.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	2.2	5.0	ND		UG/L	1
n-PROPYLBENZENE	1.2	5.0	ND		UG/L	1
2-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
4-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	1.3	5.0	ND		UG/L	1
tert-BUTYLBENZENE	1.0	5.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	1.0	5.0	ND		UG/L	1
sec-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	1.3	5.0	ND		UG/L	1
1,3-DICHLOROBENZENE	1.9	5.0	ND		UG/L	1
1,4-DICHLOROBENZENE	1.6	5.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	5.0	ND		UG/L	1
n-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	3.2	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	1.2	5.0	ND		UG/L	1
HEXACHLOROBUTADIENE	1.3	5.0	ND		UG/L	1
NAPHTHALENE	2.3	5.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	1.9	5.0	ND		UG/L	1
ACETONE	11.0	50.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-J-01-06-00	ARDL Lab No.:	300552-10 (cont'd)
Desc/Location:	7J	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	0935	Prep. Date:	06/10/1997
Matrix:	WATER	Analysis Date:	06/10/1997
Amount Used:	5 mL	Instrument ID:	
Final Volume:	5 mL	QC Batch:	0616TJP9
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2-BUTANONE	7.0	50.0	ND		UG/L	1
4-METHYL-2-PENTANONE	8.9	20.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	82-125	108%
DIBROMOFLUOROMETHANE	89-127	95%
1,2-DICHLOROETHANE-D4	79-130	98%
TOLUENE-D8	84-122	109%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-J-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300552 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300552-10

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: >K4981

Level: (low/med) LOW Date Received: 6/10/97

% Moisture: not dec. --- Date Analyzed: 6/10/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-J1-01-05-01	ARDL Lab No.:	300552-01
Desc/Location:	7J1	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	0955	Prep. Date:	06/12/1997
Matrix:	SEDIMENT	Analysis Date:	06/12/1997
Amount Used:	5 g	Instrument ID:	
Final Volume:	5 mL	QC Batch:	0616TJP1
% Moisture:	16.8	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	2.5	12.0	ND		UG/KG	1
CHLOROMETHANE	1.8	12.0	ND		UG/KG	1
VINYL CHLORIDE	1.6	12.0	ND		UG/KG	1
BROMOMETHANE	0.95	12.0	ND		UG/KG	1
CHLOROETHANE	1.8	12.0	ND		UG/KG	1
TRICHLOROFLUOROMETHANE	2.9	12.0	ND		UG/KG	1
1,1-DICHLOROETHENE	1.6	6	ND		UG/KG	1
METHYLENE CHLORIDE	3.0	6	16.7	B	UG/KG	1
trans-1,2-DICHLOROETHENE	0.78	6	ND		UG/KG	1
1,1-DICHLOROETHANE	0.78	6	ND		UG/KG	1
CARBON DISULFIDE	1.8	6	ND		UG/KG	1
2,2-DICHLOROPROPANE	1.4	6	ND		UG/KG	1
cis-1,2-DICHLOROETHENE	0.84	6	ND		UG/KG	1
BROMOCHLOROMETHANE	0.99	6	ND		UG/KG	1
CHLOROFORM	0.96	6	ND		UG/KG	1
1,1,1-TRICHLOROETHANE	0.61	6	ND		UG/KG	1
1,1-DICHLOROPROPENE	1.2	6	ND		UG/KG	1
CARBON TETRACHLORIDE	1.2	6	ND		UG/KG	1
BENZENE	0.63	6	ND		UG/KG	1
1,2-DICHLOROETHANE	0.97	6	ND		UG/KG	1
TRICHLOROETHENE	1.3	6	ND		UG/KG	1
1,2-DICHLOROPROPANE	1.3	6	ND		UG/KG	1
BROMODICHLOROMETHANE	0.79	6	ND		UG/KG	1
DIBROMOMETHANE	1.2	6	ND		UG/KG	1
cis-1,3-DICHLOROPROPENE	1.2	6	ND		UG/KG	1
TOLUENE	0.96	6	ND		UG/KG	1
trans-1,3-DICHLOROPROPENE	0.71	6	ND		UG/KG	1
1,1,2-TRICHLOROETHANE	0.97	6	ND		UG/KG	1
1,2-DIBROMOETHANE	1.1	6	ND		UG/KG	1
TETRACHLOROETHENE	0.94	6	ND		UG/KG	1
1,3-DICHLOROPROPANE	1	6	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-J1-01-05-01	ARDL Lab No.:	300552-01 (cont'd)
Desc/Location:	7J1	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	0955	Prep. Date:	06/12/1997
Matrix:	SEDIMENT	Analysis Date:	06/12/1997
Amount Used:	5 g	Instrument ID:	
Final Volume:	5 mL	QC Batch:	0616TJP1
% Moisture:	16.8	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DIBROMOCHLOROMETHANE	0.7	6	ND		UG/KG	1
CHLOROBENZENE	0.69	6	ND		UG/KG	1
1,1,1,2-TETRACHLOROETHANE	0.59	6	ND		UG/KG	1
ETHYLBENZENE	0.84	6	ND		UG/KG	1
m & p-XYLENE	1.2	6	ND		UG/KG	1
o-XYLENE	0.55	6	ND		UG/KG	1
STYRENE	0.72	6	ND		UG/KG	1
2-HEXANONE	5.2	24.0	ND		UG/KG	1
BROMOFORM	1.4	6	ND		UG/KG	1
ISOPROPYLBENZENE	0.79	6	ND		UG/KG	1
1,1,2,2-TETRACHLOROETHANE	2.6	6	ND		UG/KG	1
BROMOBENZENE	1.1	6	ND		UG/KG	1
1,2,3-TRICHLOROPROPANE	2.4	6	ND		UG/KG	1
n-PROPYLBENZENE	0.7	6	ND		UG/KG	1
2-CHLOROTOLUENE	0.94	6	ND		UG/KG	1
4-CHLOROTOLUENE	0.96	6	ND		UG/KG	1
1,3,5-TRIMETHYLBENZENE	0.6	6	ND		UG/KG	1
tert-BUTYLBENZENE	0.65	6	ND		UG/KG	1
1,2,4-TRIMETHYLBENZENE	0.84	6	ND		UG/KG	1
sec-BUTYLBENZENE	0.76	6	ND		UG/KG	1
p-ISOPROPYLTOLUENE	0.73	6	ND		UG/KG	1
1,3-DICHLOROBENZENE	1.1	6	ND		UG/KG	1
1,4-DICHLOROBENZENE	1.2	6	ND		UG/KG	1
1,2-DICHLOROBENZENE	1.4	6	ND		UG/KG	1
n-BUTYLBENZENE	1.2	6	ND		UG/KG	1
1,2-DIBROMO-3-CHLOROPROPANE	3.0	12.0	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	1.3	6	ND		UG/KG	1
HEXACHLOROBUTADIENE	0.94	6	ND		UG/KG	1
NAPHTHALENE	2	6	ND		UG/KG	1
1,2,3-TRICHLOROBENZENE	1.6	6	ND		UG/KG	1
ACETONE	10.3	60.1	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-J1-01-05-01	ARDL Lab No.:	300552-01 (cont'd)
Desc/Location:	7J1	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	0955	Prep. Date:	06/12/1997
Matrix:	SEDIMENT	Analysis Date:	06/12/1997
Amount Used:	5 g	Instrument ID:	
Final Volume:	5 mL	QC Batch:	0616TJP1
% Moisture:	16.8	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2-BUTANONE	9.4	60.1	ND		UG/KG	1
4-METHYL-2-PENTANONE	4.3	24.0	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	76-141	116%
DIBROMOFLUOROMETHANE	86-125	122%
1,2-DICHLOROETHANE-D4	78-135	117%
TOLUENE-D8	86-129	110%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-J1-01-05-01

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300552 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300552-01

Sample wt/vol: 5.0 (g/mL) g Lab File ID: >G2521

Level: (low/med) LOW Date Received: 6/10/97

% Moisture: not dec. 16.8 Date Analyzed: 6/12/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	76131	Ethane, 1,1,2-trichloro- 1,2,2-trifluoro-	3.72	71.	JNB
2.		Unknown	24.39	15.	J
3.		Unknown	26.95	16.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-K-01-06-00	ARDL Lab No.:	300549-07
Desc/Location:	7K	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1124	Prep. Date:	06/09/1997
Matrix:	WATER	Analysis Date:	06/09/1997
Amount Used:	5 mL	QC Batch:	0616LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	1.4	10.0	ND		UG/L	1
CHLOROMETHANE	1.2	10.0	ND		UG/L	1
VINYL CHLORIDE	1.2	10.0	ND		UG/L	1
BROMOMETHANE	1.3	10.0	ND		UG/L	1
CHLOROETHANE	1.4	10.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	1.4	10.0	ND		UG/L	1
1,1-DICHLOROETHENE	1.2	5.0	ND		UG/L	1
METHYLENE CHLORIDE	1.3	5.0	8.8	B	UG/L	1
trans-1,2-DICHLOROETHENE	1.3	5.0	ND		UG/L	1
1,1-DICHLOROETHANE	1.0	5.0	ND		UG/L	1
CARBON DISULFIDE	1.1	5.0	ND		UG/L	1
2,2-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.86	5.0	ND		UG/L	1
BROMOCHLOROMETHANE	1.1	5.0	ND		UG/L	1
CHLOROFORM	0.79	5.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.89	5.0	ND		UG/L	1
1,1-DICHLOROPROPENE	1.3	5.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.87	5.0	ND		UG/L	1
BENZENE	0.90	5.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.85	5.0	ND		UG/L	1
TRICHLOROETHENE	0.85	5.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.77	5.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.82	5.0	ND		UG/L	1
DIBROMOMETHANE	0.96	5.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.83	5.0	ND		UG/L	1
TOLUENE	0.85	5.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.96	5.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	1.0	5.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.92	5.0	ND		UG/L	1
TETRACHLOROETHENE	0.81	5.0	ND		UG/L	1
1,3-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	1.3	5.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-K-01-06-00	ARDL Lab No.:	300549-07 (cont'd)
Desc/Location:	7K	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1124	Prep. Date:	06/09/1997
Matrix:	WATER	Analysis Date:	06/09/1997
Amount Used:	5 mL	QC Batch:	0616LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.96	5.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	1.4	5.0	ND		UG/L	1
ETHYLBENZENE	0.93	5.0	ND		UG/L	1
m & p-XYLENE	1.5	5.0	ND		UG/L	1
o-XYLENE	0.92	5.0	ND		UG/L	1
STYRENE	1.2	5.0	ND		UG/L	1
2-HEXANONE	4.5	20.0	ND		UG/L	1
BROMOFORM	2.0	5.0	ND		UG/L	1
ISOPROPYLBENZENE	1.1	5.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	3.0	5.0	ND		UG/L	1
BROMOBENZENE	1.2	5.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	2.2	5.0	ND		UG/L	1
n-PROPYLBENZENE	1.2	5.0	ND		UG/L	1
2-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
4-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	1.3	5.0	ND		UG/L	1
tert-BUTYLBENZENE	1.0	5.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	1.0	5.0	ND		UG/L	1
sec-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	1.3	5.0	ND		UG/L	1
1,3-DICHLOROBENZENE	1.9	5.0	ND		UG/L	1
1,4-DICHLOROBENZENE	1.6	5.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	5.0	ND		UG/L	1
n-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	3.2	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	1.2	5.0	ND		UG/L	1
HEXACHLOROBUTADIENE	1.3	5.0	ND		UG/L	1
NAPHTHALENE	2.3	5.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	1.9	5.0	ND		UG/L	1
ACETONE	11.0	50.0	ND		UG/L	1
2-BUTANONE	7.0	50.0	ND		UG/L	1
4-METHYL-2-PENTANONE	8.9	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-K-01-06-00	ARDL Lab No.:	300549-07 (cont'd)
Desc/Location:	7K	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1124	Prep. Date:	06/09/1997
Matrix:	WATER	Analysis Date:	06/09/1997
Amount Used:	5 mL	QC Batch:	0616LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	82-125	115%
DIBROMOFLUOROMETHANE	89-127	105%
1,2-DICHLOROETHANE-D4	79-130	106%
TOLUENE-D8	84-122	114%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-K-01-06-00

Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300549 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300549-07

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: >K4964

Level: (low/med) LOW Date Received: 6/07/97

% Moisture: not dec. --- Date Analyzed: 6/09/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	7.96	8.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-K1-01-05-1	ARDL Lab No.:	300549-03
Desc/Location:	K1-1'	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1139	Prep. Date:	06/09/1997
Matrix:	SOIL	Analysis Date:	06/09/1997
Amount Used:	5 g	QC Batch:	0616LS2
% Moisture:	20.1	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	2.6	12.5	ND		UG/KG	1
CHLOROMETHANE	1.9	12.5	ND		UG/KG	1
VINYL CHLORIDE	1.6	12.5	ND		UG/KG	1
BROMOMETHANE	0.99	12.5	ND		UG/KG	1
CHLOROETHANE	1.9	12.5	ND		UG/KG	1
TRICHLOROFLUOROMETHANE	3.0	12.5	ND		UG/KG	1
1,1-DICHLOROETHENE	1.6	6.3	ND		UG/KG	1
METHYLENE CHLORIDE	3.1	6.3	13.3	B	UG/KG	1
trans-1,2-DICHLOROETHENE	0.81	6.3	ND		UG/KG	1
1,1-DICHLOROETHANE	0.81	6.3	ND		UG/KG	1
CARBON DISULFIDE	1.9	6.3	ND		UG/KG	1
2,2-DICHLOROPROPANE	1.5	6.3	ND		UG/KG	1
cis-1,2-DICHLOROETHENE	0.88	6.3	ND		UG/KG	1
BROMOCHLOROMETHANE	1	6.3	ND		UG/KG	1
CHLOROFORM	1.0	6.3	ND		UG/KG	1
1,1,1-TRICHLOROETHANE	0.64	6.3	ND		UG/KG	1
1,1-DICHLOROPROPENE	1.3	6.3	ND		UG/KG	1
CARBON TETRACHLORIDE	1.2	6.3	ND		UG/KG	1
BENZENE	0.65	6.3	ND		UG/KG	1
1,2-DICHLOROETHANE	1	6.3	ND		UG/KG	1
TRICHLOROETHENE	1.4	6.3	ND		UG/KG	1
1,2-DICHLOROPROPANE	1.4	6.3	ND		UG/KG	1
BROMODICHLOROMETHANE	0.83	6.3	ND		UG/KG	1
DIBROMOMETHANE	1.2	6.3	ND		UG/KG	1
cis-1,3-DICHLOROPROPENE	1.2	6.3	ND		UG/KG	1
TOLUENE	1.0	6.3	2.8	J	UG/KG	1
trans-1,3-DICHLOROPROPENE	0.74	6.3	ND		UG/KG	1
1,1,2-TRICHLOROETHANE	1	6.3	ND		UG/KG	1
1,2-DIBROMOETHANE	1.1	6.3	ND		UG/KG	1
TETRACHLOROETHENE	0.98	6.3	ND		UG/KG	1
1,3-DICHLOROPROPANE	1.1	6.3	ND		UG/KG	1
DIBROMOCHLOROMETHANE	0.73	6.3	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-K1-01-05-1	ARDL Lab No.:	300549-03 (cont'd)
Desc/Location:	K1-1'	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1139	Prep. Date:	06/09/1997
Matrix:	SOIL	Analysis Date:	06/09/1997
Amount Used:	5 g	QC Batch:	0616LS2
% Moisture:	20.1	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.71	6.3	ND		UG/KG	1
1,1,1,2-TETRACHLOROETHANE	0.61	6.3	ND		UG/KG	1
ETHYLBENZENE	0.88	6.3	ND		UG/KG	1
m & p-XYLENE	1.3	6.3	ND		UG/KG	1
o-XYLENE	0.58	6.3	ND		UG/KG	1
STYRENE	0.75	6.3	ND		UG/KG	1
2-HEXANONE	5.4	25.0	ND		UG/KG	1
BROMOFORM	1.5	6.3	ND		UG/KG	1
ISOPROPYLBENZENE	0.83	6.3	ND		UG/KG	1
1,1,2,2-TETRACHLOROETHANE	2.8	6.3	ND		UG/KG	1
BROMOBENZENE	1.2	6.3	ND		UG/KG	1
1,2,3-TRICHLOROPROPANE	2.5	6.3	ND		UG/KG	1
n-PROPYLBENZENE	0.73	6.3	ND		UG/KG	1
2-CHLOROTOLUENE	0.98	6.3	ND		UG/KG	1
4-CHLOROTOLUENE	1.0	6.3	ND		UG/KG	1
1,3,5-TRIMETHYLBENZENE	0.63	6.3	ND		UG/KG	1
tert-BUTYLBENZENE	0.68	6.3	ND		UG/KG	1
1,2,4-TRIMETHYLBENZENE	0.88	6.3	ND		UG/KG	1
sec-BUTYLBENZENE	0.79	6.3	ND		UG/KG	1
p-ISOPROPYLTOLUENE	0.76	6.3	ND		UG/KG	1
1,3-DICHLOROBENZENE	1.2	6.3	ND		UG/KG	1
1,4-DICHLOROBENZENE	1.3	6.3	ND		UG/KG	1
1,2-DICHLOROBENZENE	1.5	6.3	ND		UG/KG	1
n-BUTYLBENZENE	1.3	6.3	ND		UG/KG	1
1,2-DIBROMO-3-CHLOROPROPANE	3.1	12.5	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	1.4	6.3	ND		UG/KG	1
HEXACHLOROBUTADIENE	0.98	6.3	ND		UG/KG	1
NAPHTHALENE	2.1	6.3	ND		UG/KG	1
1,2,3-TRICHLOROBENZENE	1.6	6.3	ND		UG/KG	1
ACETONE	10.8	62.6	ND		UG/KG	1
2-BUTANONE	9.8	62.6	ND		UG/KG	1
4-METHYL-2-PENTANONE	4.5	25.0	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-K1-01-05-1	ARDL Lab No.:	300549-03 (cont'd)
Desc/Location:	K1-1'	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1139	Prep. Date:	06/09/1997
Matrix:	SOIL	Analysis Date:	06/09/1997
Amount Used:	5 g	QC Batch:	0616LS2
% Moisture:	20.1	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	76-141	112%
DIBROMOFLUOROMETHANE	86-125	123%
1,2-DICHLOROETHANE-D4	78-135	120%
TOLUENE-D8	86-129	115%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-K1-01-05-1

Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300549 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300549-03

Sample wt/vol: 5.0 (g/mL) g Lab File ID: >G2484

Level: (low/med) LOW Date Received: 6/07/97

% Moisture: not dec. 20.1 Date Analyzed: 6/09/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	1.76131	Ethane, 1,1,2-trichloro-1,2,2 -trifluoro-	3.65	9.	JNB
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/05/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-L-01-06-00	ARDL Lab No.:	300542-15
Desc/Location:	7L	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	0852	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/03/1997
Amount Used:	5 mL	QC Batch:	0605TJP7
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	1.4	10.0	ND		UG/L	1
CHLOROMETHANE	1.2	10.0	ND		UG/L	1
VINYL CHLORIDE	1.2	10.0	ND		UG/L	1
BROMOMETHANE	1.3	10.0	ND		UG/L	1
CHLOROETHANE	1.4	10.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	1.4	10.0	ND		UG/L	1
1,1-DICHLOROETHENE	1.2	5.0	ND		UG/L	1
METHYLENE CHLORIDE	1.3	5.0	2	JB	UG/L	1
trans-1,2-DICHLOROETHENE	1.3	5.0	ND		UG/L	1
1,1-DICHLOROETHANE	1.0	5.0	ND		UG/L	1
CARBON DISULFIDE	1.1	5.0	ND		UG/L	1
2,2-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.86	5.0	ND		UG/L	1
BROMOCHLOROMETHANE	1.1	5.0	ND		UG/L	1
CHLOROFORM	0.79	5.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.89	5.0	ND		UG/L	1
1,1-DICHLOROPROPENE	1.3	5.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.87	5.0	ND		UG/L	1
BENZENE	0.90	5.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.85	5.0	ND		UG/L	1
TRICHLOROETHENE	0.85	5.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.77	5.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.82	5.0	ND		UG/L	1
DIBROMOMETHANE	0.96	5.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.83	5.0	ND		UG/L	1
TOLUENE	0.85	5.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.96	5.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	1.0	5.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.92	5.0	ND		UG/L	1
TETRACHLOROETHENE	0.81	5.0	ND		UG/L	1
1,3-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	1.3	5.0	ND		UG/L	1

ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/05/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-L-01-06-00	ARDL Lab No.:	300542-15 (cont'd)
Desc/Location:	7L	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	0852	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/03/1997
Amount Used:	5 mL	QC Batch:	0605TJP7
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.96	5.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	1.4	5.0	ND		UG/L	1
ETHYLBENZENE	0.93	5.0	ND		UG/L	1
m & p-XYLENE	1.5	5.0	ND		UG/L	1
o-XYLENE	0.92	5.0	ND		UG/L	1
STYRENE	1.2	5.0	ND		UG/L	1
2-HEXANONE	4.5	20.0	ND		UG/L	1
BROMOFORM	2.0	5.0	ND		UG/L	1
ISOPROPYLBENZENE	1.1	5.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	3.0	5.0	ND		UG/L	1
BROMOBENZENE	1.2	5.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	2.2	5.0	ND		UG/L	1
n-PROPYLBENZENE	1.2	5.0	ND		UG/L	1
2-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
4-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	1.3	5.0	ND		UG/L	1
tert-BUTYLBENZENE	1.0	5.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	1.0	5.0	ND		UG/L	1
sec-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	1.3	5.0	ND		UG/L	1
1,3-DICHLOROBENZENE	1.9	5.0	ND		UG/L	1
1,4-DICHLOROBENZENE	1.6	5.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	5.0	ND		UG/L	1
n-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	3.2	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	1.2	5.0	ND		UG/L	1
HEXACHLOROBUTADIENE	1.3	5.0	ND		UG/L	1
NAPHTHALENE	2.3	5.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	1.9	5.0	ND		UG/L	1
ACETONE	11.0	50.0	ND		UG/L	1
2-BUTANONE	7.0	50.0	ND		UG/L	1
4-METHYL-2-PENTANONE	8.9	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/05/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-L-01-06-00	ARDL Lab No.:	300542-15 (cont'd)
Desc/Location:	7L	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	0852	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/03/1997
Amount Used:	5 mL	QC Batch:	0605TJP7
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	82-125	87%
DIBROMOFLUOROMETHANE	89-127	93%
1,2-DICHLOROETHANE-D4	79-130	92%
TOLUENE-D8	84-122	93%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-L-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300542 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300542-15

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: >G2411

Level: (low/med) LOW Date Received: 5/31/97

% Moisture: not dec. --- Date Analyzed: 6/03/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/05/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-L1-01-05-1	ARDL Lab No.:	300542-09
Desc/Location:	7L1	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	0903	Prep. Date:	06/02/1997
Matrix:	SOIL	Analysis Date:	06/02/1997
Amount Used:	5 g	QC Batch:	0605TJP6
% Moisture:	17.6	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	2.5	12.1	ND		UG/KG	1
CHLOROMETHANE	1.8	12.1	ND		UG/KG	1
VINYL CHLORIDE	1.6	12.1	ND		UG/KG	1
BROMOMETHANE	0.96	12.1	ND		UG/KG	1
CHLOROETHANE	1.8	12.1	ND		UG/KG	1
TRICHLOROFLUOROMETHANE	2.9	12.1	ND		UG/KG	1
1,1-DICHLOROETHENE	1.6	6.1	ND		UG/KG	1
METHYLENE CHLORIDE	3	6.1	6	JB	UG/KG	1
trans-1,2-DICHLOROETHENE	0.79	6.1	ND		UG/KG	1
1,1-DICHLOROETHANE	0.79	6.1	ND		UG/KG	1
CARBON DISULFIDE	1.8	6.1	ND		UG/KG	1
2,2-DICHLOROPROPANE	1.5	6.1	ND		UG/KG	1
cis-1,2-DICHLOROETHENE	0.85	6.1	ND		UG/KG	1
BROMOCHLOROMETHANE	1	6.1	ND		UG/KG	1
CHLOROFORM	0.97	6.1	ND		UG/KG	1
1,1,1-TRICHLOROETHANE	0.62	6.1	ND		UG/KG	1
1,1-DICHLOROPROPENE	1.2	6.1	ND		UG/KG	1
CARBON TETRACHLORIDE	1.2	6.1	ND		UG/KG	1
BENZENE	0.63	6.1	ND		UG/KG	1
1,2-DICHLOROETHANE	0.98	6.1	ND		UG/KG	1
TRICHLOROETHENE	1.3	6.1	ND		UG/KG	1
1,2-DICHLOROPROPANE	1.3	6.1	ND		UG/KG	1
BROMODICHLOROMETHANE	0.8	6.1	ND		UG/KG	1
DIBROMOMETHANE	1.2	6.1	ND		UG/KG	1
cis-1,3-DICHLOROPROPENE	1.2	6.1	ND		UG/KG	1
TOLUENE	0.97	6.1	3.1	J	UG/KG	1
trans-1,3-DICHLOROPROPENE	0.72	6.1	ND		UG/KG	1
1,1,2-TRICHLOROETHANE	0.98	6.1	ND		UG/KG	1
1,2-DIBROMOETHANE	1.1	6.1	ND		UG/KG	1
TETRACHLOROETHENE	0.95	6.1	ND		UG/KG	1
1,3-DICHLOROPROPANE	1	6.1	ND		UG/KG	1
DIBROMOCHLOROMETHANE	0.7	6.1	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/05/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-L1-01-05-1	ARDL Lab No.:	300542-09 (cont'd)
Desc/Location:	7L1	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	0903	Prep. Date:	06/02/1997
Matrix:	SOIL	Analysis Date:	06/02/1997
Amount Used:	5 g	QC Batch:	0605TJP6
% Moisture:	17.6	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.69	6.1	ND		UG/KG	1
1,1,1,2-TETRACHLOROETHANE	0.59	6.1	ND		UG/KG	1
ETHYLBENZENE	0.85	6.1	ND		UG/KG	1
m & p-XYLENE	1.2	6.1	ND		UG/KG	1
o-XYLENE	0.56	6.1	ND		UG/KG	1
STYRENE	0.73	6.1	ND		UG/KG	1
2-HEXANONE	5.2	24.3	ND		UG/KG	1
BROMOFORM	1.5	6.1	ND		UG/KG	1
ISOPROPYLBENZENE	0.8	6.1	ND		UG/KG	1
1,1,2,2-TETRACHLOROETHANE	2.7	6.1	ND		UG/KG	1
BROMOBENZENE	1.1	6.1	ND		UG/KG	1
1,2,3-TRICHLOROPROPANE	2.4	6.1	ND		UG/KG	1
n-PROPYLBENZENE	0.7	6.1	ND		UG/KG	1
2-CHLOROTOLUENE	0.95	6.1	ND		UG/KG	1
4-CHLOROTOLUENE	0.97	6.1	ND		UG/KG	1
1,3,5-TRIMETHYLBENZENE	0.61	6.1	ND		UG/KG	1
tert-BUTYLBENZENE	0.66	6.1	ND		UG/KG	1
1,2,4-TRIMETHYLBENZENE	0.85	6.1	ND		UG/KG	1
sec-BUTYLBENZENE	0.76	6.1	ND		UG/KG	1
p-ISOPROPYLTOLUENE	0.74	6.1	ND		UG/KG	1
1,3-DICHLOROBENZENE	1.1	6.1	ND		UG/KG	1
1,4-DICHLOROBENZENE	1.2	6.1	ND		UG/KG	1
1,2-DICHLOROBENZENE	1.5	6.1	ND		UG/KG	1
n-BUTYLBENZENE	1.2	6.1	ND		UG/KG	1
1,2-DIBROMO-3-CHLOROPROPANE	3	12.1	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	1.3	6.1	ND		UG/KG	1
HEXACHLOROBUTADIENE	0.95	6.1	ND		UG/KG	1
NAPHTHALENE	2.1	6.1	ND		UG/KG	1
1,2,3-TRICHLOROBENZENE	1.6	6.1	ND		UG/KG	1
ACETONE	10.4	60.7	ND		UG/KG	1
2-BUTANONE	9.5	60.7	ND		UG/KG	1
4-METHYL-2-PENTANONE	4.4	24.3	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/05/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-L1-01-05-1	ARDL Lab No.:	300542-09 (cont'd)
Desc/Location:	7L1	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	0903	Prep. Date:	06/02/1997
Matrix:	SOIL	Analysis Date:	06/02/1997
Amount Used:	5 g	QC Batch:	0605TJP6
% Moisture:	17.6	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	76-141	99%
DIBROMOFLUOROMETHANE	86-125	104%
1,2-DICHLOROETHANE-D4	78-135	103%
TOLUENE-D8	86-129	100%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-L1-01-05-1

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300542 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300542-09

Sample wt/vol: 5.0 (g/mL) g Lab File ID: >G2394

Level: (low/med) LOW Date Received: 5/31/97

% Moisture: not dec. 17.6 Date Analyzed: 6/02/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/05/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-M-01-06-00	ARDL Lab No.:	300542-12
Desc/Location:	7M	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1333	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/03/1997
Amount Used:	5 mL	QC Batch:	0605TJP7
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	1.4	10.0	ND		UG/L	1
CHLOROMETHANE	1.2	10.0	ND		UG/L	1
VINYL CHLORIDE	1.2	10.0	ND		UG/L	1
BROMOMETHANE	1.3	10.0	ND		UG/L	1
CHLOROETHANE	1.4	10.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	1.4	10.0	ND		UG/L	1
1,1-DICHLOROETHENE	1.2	5.0	ND		UG/L	1
METHYLENE CHLORIDE	1.3	5.0	ND		UG/L	1
trans-1,2-DICHLOROETHENE	1.3	5.0	ND		UG/L	1
1,1-DICHLOROETHANE	1.0	5.0	ND		UG/L	1
CARBON DISULFIDE	1.1	5.0	ND		UG/L	1
2,2-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.86	5.0	ND		UG/L	1
BROMOCHLOROMETHANE	1.1	5.0	ND		UG/L	1
CHLOROFORM	0.79	5.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.89	5.0	ND		UG/L	1
1,1-DICHLOROPROPENE	1.3	5.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.87	5.0	ND		UG/L	1
BENZENE	0.90	5.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.85	5.0	ND		UG/L	1
TRICHLOROETHENE	0.85	5.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.77	5.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.82	5.0	ND		UG/L	1
DIBROMOMETHANE	0.96	5.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.83	5.0	ND		UG/L	1
TOLUENE	0.85	5.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.96	5.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	1.0	5.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.92	5.0	ND		UG/L	1
TETRACHLOROETHENE	0.81	5.0	ND		UG/L	1
1,3-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	1.3	5.0	ND		UG/L	1

ARDL, INC.
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Lab Report No: 300542 Report Date: 06/05/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-M-01-06-00	ARDL Lab No.:	300542-12 (cont'd)
Desc/Location:	7M	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1333	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/03/1997
Amount Used:	5 mL	QC Batch:	0605TJP7
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.96	5.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	1.4	5.0	ND		UG/L	1
ETHYLBENZENE	0.93	5.0	ND		UG/L	1
m & p-XYLENE	1.5	5.0	ND		UG/L	1
o-XYLENE	0.92	5.0	ND		UG/L	1
STYRENE	1.2	5.0	ND		UG/L	1
2-HEXANONE	4.5	20.0	ND		UG/L	1
BROMOFORM	2.0	5.0	ND		UG/L	1
ISOPROPYLBENZENE	1.1	5.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	3.0	5.0	ND		UG/L	1
BROMOBENZENE	1.2	5.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	2.2	5.0	ND		UG/L	1
n-PROPYLBENZENE	1.2	5.0	ND		UG/L	1
2-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
4-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	1.3	5.0	ND		UG/L	1
tert-BUTYLBENZENE	1.0	5.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	1.0	5.0	ND		UG/L	1
sec-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	1.3	5.0	ND		UG/L	1
1,3-DICHLOROBENZENE	1.9	5.0	ND		UG/L	1
1,4-DICHLOROBENZENE	1.6	5.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	5.0	ND		UG/L	1
n-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	3.2	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	1.2	5.0	ND		UG/L	1
HEXACHLOROBUTADIENE	1.3	5.0	ND		UG/L	1
NAPHTHALENE	2.3	5.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	1.9	5.0	ND		UG/L	1
ACETONE	11.0	50.0	ND		UG/L	1
2-BUTANONE	7.0	50.0	ND		UG/L	1
4-METHYL-2-PENTANONE	8.9	20.0	ND		UG/L	1

ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/05/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-M-01-06-00	ARDL Lab No.:	300542-12 (cont'd)
Desc/Location:	7M	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1333	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/03/1997
Amount Used:	5 mL	QC Batch:	0605TJP7
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	82-125	84%
DIBROMOFLUOROMETHANE	89-127	93%
1,2-DICHLOROETHANE-D4	79-130	90%
TOLUENE-D8	84-122	93%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-M-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300542 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300542-12

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: >G2408

Level: (low/med) LOW Date Received: 5/31/97

% Moisture: not dec. --- Date Analyzed: 6/03/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/05/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-M1-01-05-1	ARDL Lab No.:	300542-01
Desc/Location:	7M1	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1400	Prep. Date:	06/02/1997
Matrix:	SOIL	Analysis Date:	06/02/1997
Amount Used:	5 g	QC Batch:	0605TJP6
% Moisture:	17.8	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	2.6	12.2	ND		UG/KG	1
CHLOROMETHANE	1.8	12.2	ND		UG/KG	1
VINYL CHLORIDE	1.6	12.2	ND		UG/KG	1
BROMOMETHANE	0.96	12.2	ND		UG/KG	1
CHLOROETHANE	1.8	12.2	ND		UG/KG	1
TRICHLOROFLUOROMETHANE	2.9	12.2	ND		UG/KG	1
1,1-DICHLOROETHENE	1.6	6.1	ND		UG/KG	1
METHYLENE CHLORIDE	3	6.1	9.5	B	UG/KG	1
trans-1,2-DICHLOROETHENE	0.79	6.1	ND		UG/KG	1
1,1-DICHLOROETHANE	0.79	6.1	ND		UG/KG	1
CARBON DISULFIDE	1.8	6.1	ND		UG/KG	1
2,2-DICHLOROPROPANE	1.5	6.1	ND		UG/KG	1
cis-1,2-DICHLOROETHENE	0.85	6.1	ND		UG/KG	1
BROMOCHLOROMETHANE	1	6.1	ND		UG/KG	1
CHLOROFORM	0.97	6.1	ND		UG/KG	1
1,1,1-TRICHLOROETHANE	0.62	6.1	ND		UG/KG	1
1,1-DICHLOROPROPENE	1.2	6.1	ND		UG/KG	1
CARBON TETRACHLORIDE	1.2	6.1	ND		UG/KG	1
BENZENE	0.63	6.1	ND		UG/KG	1
1,2-DICHLOROETHANE	0.99	6.1	ND		UG/KG	1
TRICHLOROETHENE	1.3	6.1	ND		UG/KG	1
1,2-DICHLOROPROPANE	1.3	6.1	ND		UG/KG	1
BROMODICHLOROMETHANE	0.8	6.1	ND		UG/KG	1
DIBROMOMETHANE	1.2	6.1	ND		UG/KG	1
cis-1,3-DICHLOROPROPENE	1.2	6.1	ND		UG/KG	1
TOLUENE	0.97	6.1	2.8	J	UG/KG	1
trans-1,3-DICHLOROPROPENE	0.72	6.1	ND		UG/KG	1
1,1,2-TRICHLOROETHANE	0.99	6.1	ND		UG/KG	1
1,2-DIBROMOETHANE	1.1	6.1	ND		UG/KG	1
TETRACHLOROETHENE	0.95	6.1	ND		UG/KG	1
1,3-DICHLOROPROPANE	1	6.1	ND		UG/KG	1
DIBROMOCHLOROMETHANE	0.71	6.1	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/05/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-M1-01-05-1	ARDL Lab No.:	300542-01 (cont'd)
Desc/Location:	7M1	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1400	Prep. Date:	06/02/1997
Matrix:	SOIL	Analysis Date:	06/02/1997
Amount Used:	5 g	QC Batch:	0605TJP6
% Moisture:	17.8	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.69	6.1	ND		UG/KG	1
1,1,1,2-TETRACHLOROETHANE	0.6	6.1	ND		UG/KG	1
ETHYLBENZENE	0.85	6.1	ND		UG/KG	1
m & p-XYLENE	1.2	6.1	ND		UG/KG	1
o-XYLENE	0.56	6.1	ND		UG/KG	1
STYRENE	0.73	6.1	ND		UG/KG	1
2-HEXANONE	5.2	24.3	ND		UG/KG	1
BROMOFORM	1.5	6.1	ND		UG/KG	1
ISOPROPYLBENZENE	0.8	6.1	ND		UG/KG	1
1,1,2,2-TETRACHLOROETHANE	2.7	6.1	ND		UG/KG	1
BROMOBENZENE	1.1	6.1	ND		UG/KG	1
1,2,3-TRICHLOROPROPANE	2.4	6.1	ND		UG/KG	1
n-PROPYLBENZENE	0.71	6.1	ND		UG/KG	1
2-CHLOROTOLUENE	0.95	6.1	ND		UG/KG	1
4-CHLOROTOLUENE	0.97	6.1	ND		UG/KG	1
1,3,5-TRIMETHYLBENZENE	0.61	6.1	ND		UG/KG	1
tert-BUTYLBENZENE	0.66	6.1	ND		UG/KG	1
1,2,4-TRIMETHYLBENZENE	0.85	6.1	ND		UG/KG	1
sec-BUTYLBENZENE	0.77	6.1	ND		UG/KG	1
p-ISOPROPYLTOLUENE	0.74	6.1	ND		UG/KG	1
1,3-DICHLOROBENZENE	1.1	6.1	ND		UG/KG	1
1,4-DICHLOROBENZENE	1.2	6.1	ND		UG/KG	1
1,2-DICHLOROBENZENE	1.5	6.1	ND		UG/KG	1
n-BUTYLBENZENE	1.2	6.1	ND		UG/KG	1
1,2-DIBROMO-3-CHLOROPROPANE	3	12.2	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	1.3	6.1	ND		UG/KG	1
HEXACHLOROBUTADIENE	0.95	6.1	ND		UG/KG	1
NAPHTHALENE	2.1	6.1	ND		UG/KG	1
1,2,3-TRICHLOROBENZENE	1.6	6.1	ND		UG/KG	1
ACETONE	10.5	60.8	ND		UG/KG	1
2-BUTANONE	9.6	60.8	ND		UG/KG	1
4-METHYL-2-PENTANONE	4.4	24.3	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/05/1997

Project Name:	IOWA ARMY AMM PLANT	Analysis:	VOLATILES, GC/MS (8260)
Project No.:	5644V	Analytical Method:	8260A
		Prep Method:	5030A

Field ID:	H-07-M1-01-05-1	ARDL Lab No.:	300542-01 (cont'd)
Desc/Location:	7M1	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1400	Prep. Date:	06/02/1997
Matrix:	SOIL	Analysis Date:	06/02/1997
Amount Used:	5 g	QC Batch:	0605TJP6
% Moisture:	17.8	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	76-141	94%
DIBROMOFLUOROMETHANE	86-125	100%
1,2-DICHLOROETHANE-D4	78-135	97%
TOLUENE-D8	86-129	101%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-M1-01-05-1

Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300542 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300542-01

Sample wt/vol: 5.0 (g/mL) g Lab File ID: >G2391

Level: (low/med) LOW Date Received: 5/31/97

% Moisture: not dec. 17.8 Date Analyzed: 6/02/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-N-01-06-00	ARDL Lab No.:	300549-06
Desc/Location:	7N	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1033	Prep. Date:	06/09/1997
Matrix:	WATER	Analysis Date:	06/09/1997
Amount Used:	5 mL	QC Batch:	0616LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	1.4	10.0	ND		UG/L	1
CHLOROMETHANE	1.2	10.0	ND		UG/L	1
VINYL CHLORIDE	1.2	10.0	ND		UG/L	1
BROMOMETHANE	1.3	10.0	ND		UG/L	1
CHLOROETHANE	1.4	10.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	1.4	10.0	ND		UG/L	1
1,1-DICHLOROETHENE	1.2	5.0	ND		UG/L	1
METHYLENE CHLORIDE	1.3	5.0	9.7	B	UG/L	1
trans-1,2-DICHLOROETHENE	1.3	5.0	ND		UG/L	1
1,1-DICHLOROETHANE	1.0	5.0	ND		UG/L	1
CARBON DISULFIDE	1.1	5.0	ND		UG/L	1
2,2-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.86	5.0	ND		UG/L	1
BROMOCHLOROMETHANE	1.1	5.0	ND		UG/L	1
CHLOROFORM	0.79	5.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.89	5.0	ND		UG/L	1
1,1-DICHLOROPROPENE	1.3	5.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.87	5.0	ND		UG/L	1
BENZENE	0.90	5.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.85	5.0	ND		UG/L	1
TRICHLOROETHENE	0.85	5.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.77	5.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.82	5.0	ND		UG/L	1
DIBROMOMETHANE	0.96	5.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.83	5.0	ND		UG/L	1
TOLUENE	0.85	5.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.96	5.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	1.0	5.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.92	5.0	ND		UG/L	1
TETRACHLOROETHENE	0.81	5.0	ND		UG/L	1
1,3-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	1.3	5.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-N-01-06-00	ARDL Lab No.:	300549-06 (cont'd)
Desc/Location:	7N	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1033	Prep. Date:	06/09/1997
Matrix:	WATER	Analysis Date:	06/09/1997
Amount Used:	5 mL	QC Batch:	0616LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.96	5.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	1.4	5.0	ND		UG/L	1
ETHYLBENZENE	0.93	5.0	ND		UG/L	1
m & p-XYLENE	1.5	5.0	ND		UG/L	1
o-XYLENE	0.92	5.0	ND		UG/L	1
STYRENE	1.2	5.0	ND		UG/L	1
2-HEXANONE	4.5	20.0	ND		UG/L	1
BROMOFORM	2.0	5.0	ND		UG/L	1
ISOPROPYLBENZENE	1.1	5.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	3.0	5.0	ND		UG/L	1
BROMOBENZENE	1.2	5.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	2.2	5.0	ND		UG/L	1
n-PROPYLBENZENE	1.2	5.0	ND		UG/L	1
2-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
4-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	1.3	5.0	ND		UG/L	1
tert-BUTYLBENZENE	1.0	5.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	1.0	5.0	ND		UG/L	1
sec-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	1.3	5.0	ND		UG/L	1
1,3-DICHLOROBENZENE	1.9	5.0	ND		UG/L	1
1,4-DICHLOROBENZENE	1.6	5.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	5.0	ND		UG/L	1
n-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	3.2	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	1.2	5.0	ND		UG/L	1
HEXACHLOROBUTADIENE	1.3	5.0	ND		UG/L	1
NAPHTHALENE	2.3	5.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	1.9	5.0	ND		UG/L	1
ACETONE	11.0	50.0	ND		UG/L	1
2-BUTANONE	7.0	50.0	ND		UG/L	1
4-METHYL-2-PENTANONE	8.9	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/16/1997

Project Name:	IOWA ARMY AMM PLANT	Analysis:	VOLATILES, GC/MS (8260)
Project No.:	5644V	Analytical Method:	8260A
		Prep Method:	5030A

Field ID:	H-07-N-01-06-00	ARDL Lab No.:	300549-06 (cont'd)
Desc/Location:	7N	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1033	Prep. Date:	06/09/1997
Matrix:	WATER	Analysis Date:	06/09/1997
Amount Used:	5 mL	QC Batch:	0616LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	82-125	119%
DIBROMOFLUOROMETHANE	89-127	107%
1,2-DICHLOROETHANE-D4	79-130	107%
TOLUENE-D8	84-122	117%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
H-07-N-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300549 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300549-06

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: >K4963

Level: (low/med) LOW Date Received: 6/07/97

% Moisture: not dec. --- Date Analyzed: 6/09/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	7.96	8.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-N1-01-05-1	ARDL Lab No.:	300549-04
Desc/Location:	N-1	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1042	Prep. Date:	06/09/1997
Matrix:	SOIL	Analysis Date:	06/09/1997
Amount Used:	5 g	QC Batch:	0616LS2
% Moisture:	27.7	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	2.9	13.8	ND		UG/KG	1
CHLOROMETHANE	2.1	13.8	ND		UG/KG	1
VINYL CHLORIDE	1.8	13.8	ND		UG/KG	1
BROMOMETHANE	1.1	13.8	ND		UG/KG	1
CHLOROETHANE	2.1	13.8	ND		UG/KG	1
TRICHLOROFLUOROMETHANE	3.3	13.8	ND		UG/KG	1
1,1-DICHLOROETHENE	1.8	6.9	ND		UG/KG	1
METHYLENE CHLORIDE	3.5	6.9	14.0	B	UG/KG	1
trans-1,2-DICHLOROETHENE	0.9	6.9	ND		UG/KG	1
1,1-DICHLOROETHANE	0.9	6.9	ND		UG/KG	1
CARBON DISULFIDE	2.1	6.9	ND		UG/KG	1
2,2-DICHLOROPROPANE	1.7	6.9	ND		UG/KG	1
cis-1,2-DICHLOROETHENE	0.97	6.9	ND		UG/KG	1
BROMOCHLOROMETHANE	1.1	6.9	ND		UG/KG	1
CHLOROFORM	1.1	6.9	ND		UG/KG	1
1,1,1-TRICHLOROETHANE	0.71	6.9	ND		UG/KG	1
1,1-DICHLOROPROPENE	1.4	6.9	ND		UG/KG	1
CARBON TETRACHLORIDE	1.4	6.9	ND		UG/KG	1
BENZENE	0.72	6.9	ND		UG/KG	1
1,2-DICHLOROETHANE	1.1	6.9	ND		UG/KG	1
TRICHLOROETHENE	1.5	6.9	ND		UG/KG	1
1,2-DICHLOROPROPANE	1.5	6.9	ND		UG/KG	1
BROMODICHLOROMETHANE	0.91	6.9	ND		UG/KG	1
DIBROMOMETHANE	1.3	6.9	ND		UG/KG	1
cis-1,3-DICHLOROPROPENE	1.3	6.9	ND		UG/KG	1
TOLUENE	1.1	6.9	ND		UG/KG	1
trans-1,3-DICHLOROPROPENE	0.82	6.9	ND		UG/KG	1
1,1,2-TRICHLOROETHANE	1.1	6.9	ND		UG/KG	1
1,2-DIBROMOETHANE	1.2	6.9	ND		UG/KG	1
TETRACHLOROETHENE	1.1	6.9	ND		UG/KG	1
1,3-DICHLOROPROPANE	1.2	6.9	ND		UG/KG	1
DIBROMOCHLOROMETHANE	0.8	6.9	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-N1-01-05-1	ARDL Lab No.:	300549-04 (cont'd)
Desc/Location:	N-1	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1042	Prep. Date:	06/09/1997
Matrix:	SOIL	Analysis Date:	06/09/1997
Amount Used:	5 g	QC Batch:	0616LS2
% Moisture:	27.7	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.79	6.9	ND		UG/KG	1
1,1,1,2-TETRACHLOROETHANE	0.68	6.9	ND		UG/KG	1
ETHYLBENZENE	0.97	6.9	ND		UG/KG	1
m & p-XYLENE	1.4	6.9	ND		UG/KG	1
o-XYLENE	0.64	6.9	ND		UG/KG	1
STYRENE	0.83	6.9	ND		UG/KG	1
2-HEXANONE	5.9	27.7	ND		UG/KG	1
BROMOFORM	1.7	6.9	ND		UG/KG	1
ISOPROPYLBENZENE	0.91	6.9	ND		UG/KG	1
1,1,2,2-TETRACHLOROETHANE	3	6.9	ND		UG/KG	1
BROMOBENZENE	1.3	6.9	ND		UG/KG	1
1,2,3-TRICHLOROPROPANE	2.8	6.9	ND		UG/KG	1
n-PROPYLBENZENE	0.8	6.9	ND		UG/KG	1
2-CHLOROTOLUENE	1.1	6.9	ND		UG/KG	1
4-CHLOROTOLUENE	1.1	6.9	ND		UG/KG	1
1,3,5-TRIMETHYLBENZENE	0.69	6.9	ND		UG/KG	1
tert-BUTYLBENZENE	0.75	6.9	ND		UG/KG	1
1,2,4-TRIMETHYLBENZENE	0.97	6.9	ND		UG/KG	1
sec-BUTYLBENZENE	0.87	6.9	ND		UG/KG	1
p-ISOPROPYLTOLUENE	0.84	6.9	ND		UG/KG	1
1,3-DICHLOROBENZENE	1.3	6.9	ND		UG/KG	1
1,4-DICHLOROBENZENE	1.4	6.9	ND		UG/KG	1
1,2-DICHLOROBENZENE	1.7	6.9	ND		UG/KG	1
n-BUTYLBENZENE	1.4	6.9	ND		UG/KG	1
1,2-DIBROMO-3-CHLOROPROPANE	3.5	13.8	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	1.5	6.9	ND		UG/KG	1
HEXACHLOROBUTADIENE	1.1	6.9	ND		UG/KG	1
NAPHTHALENE	2.4	6.9	ND		UG/KG	1
1,2,3-TRICHLOROBENZENE	1.8	6.9	ND		UG/KG	1
ACETONE	11.9	69.2	ND		UG/KG	1
2-BUTANONE	10.9	69.2	ND		UG/KG	1
4-METHYL-2-PENTANONE	5	27.7	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-N1-01-05-1	ARDL Lab No.:	300549-04 (cont'd)
Desc/Location:	N-1	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1042	Prep. Date:	06/09/1997
Matrix:	SOIL	Analysis Date:	06/09/1997
Amount Used:	5 g	QC Batch:	0616LS2
% Moisture:	27.7	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	76-141	108%
DIBROMOFLUOROMETHANE	86-125	115%
1,2-DICHLOROETHANE-D4	78-135	114%
TOLUENE-D8	86-129	108%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
H-07-N1-01-05-1

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300549 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300549-04

Sample wt/vol: 5.0 (g/mL) g Lab File ID: >G2485

Level: (low/med) LOW Date Received: 6/07/97

% Moisture: not dec. 27.7 Date Analyzed: 6/09/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.76131	Ethane, 1,1,2-trichloro-1,2,2 -trifluoro-	3.69	10.	JNB
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/05/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-O-01-06-00	ARDL Lab No.:	300542-14
Desc/Location:	7O	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	1045	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/03/1997
Amount Used:	5 mL	QC Batch:	0605TJP7
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	1.4	10.0	ND		UG/L	1
CHLOROMETHANE	1.2	10.0	ND		UG/L	1
VINYL CHLORIDE	1.2	10.0	ND		UG/L	1
BROMOMETHANE	1.3	10.0	ND		UG/L	1
CHLOROETHANE	1.4	10.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	1.4	10.0	ND		UG/L	1
1,1-DICHLOROETHENE	1.2	5.0	ND		UG/L	1
METHYLENE CHLORIDE	1.3	5.0	ND		UG/L	1
trans-1,2-DICHLOROETHENE	1.3	5.0	ND		UG/L	1
1,1-DICHLOROETHANE	1.0	5.0	ND		UG/L	1
CARBON DISULFIDE	1.1	5.0	ND		UG/L	1
2,2-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.86	5.0	ND		UG/L	1
BROMOCHLOROMETHANE	1.1	5.0	ND		UG/L	1
CHLOROFORM	0.79	5.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.89	5.0	ND		UG/L	1
1,1-DICHLOROPROPENE	1.3	5.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.87	5.0	ND		UG/L	1
BENZENE	0.90	5.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.85	5.0	ND		UG/L	1
TRICHLOROETHENE	0.85	5.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.77	5.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.82	5.0	ND		UG/L	1
DIBROMOMETHANE	0.96	5.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.83	5.0	ND		UG/L	1
TOLUENE	0.85	5.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.96	5.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	1.0	5.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.92	5.0	ND		UG/L	1
TETRACHLOROETHENE	0.81	5.0	ND		UG/L	1
1,3-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	1.3	5.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/05/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-O-01-06-00	ARDL Lab No.:	300542-14 (cont'd)
Desc/Location:	7O	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	1045	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/03/1997
Amount Used:	5 mL	QC Batch:	0605TJP7
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.96	5.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	1.4	5.0	ND		UG/L	1
ETHYLBENZENE	0.93	5.0	ND		UG/L	1
m & p-XYLENE	1.5	5.0	ND		UG/L	1
o-XYLENE	0.92	5.0	ND		UG/L	1
STYRENE	1.2	5.0	ND		UG/L	1
2-HEXANONE	4.5	20.0	ND		UG/L	1
BROMOFORM	2.0	5.0	ND		UG/L	1
ISOPROPYLBENZENE	1.1	5.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	3.0	5.0	ND		UG/L	1
BROMOBENZENE	1.2	5.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	2.2	5.0	ND		UG/L	1
n-PROPYLBENZENE	1.2	5.0	ND		UG/L	1
2-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
4-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	1.3	5.0	ND		UG/L	1
tert-BUTYLBENZENE	1.0	5.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	1.0	5.0	ND		UG/L	1
sec-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	1.3	5.0	ND		UG/L	1
1,3-DICHLOROBENZENE	1.9	5.0	ND		UG/L	1
1,4-DICHLOROBENZENE	1.6	5.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	5.0	ND		UG/L	1
n-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	3.2	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	1.2	5.0	ND		UG/L	1
HEXACHLOROBUTADIENE	1.3	5.0	ND		UG/L	1
NAPHTHALENE	2.3	5.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	1.9	5.0	ND		UG/L	1
ACETONE	11.0	50.0	ND		UG/L	1
2-BUTANONE	7.0	50.0	ND		UG/L	1
4-METHYL-2-PENTANONE	8.9	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/05/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-O-01-06-00	ARDL Lab No.:	300542-14 (cont'd)
Desc/Location:	7O	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	1045	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/03/1997
Amount Used:	5 mL	QC Batch:	0605TJP7
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	82-125	97%
DIBROMOFLUOROMETHANE	89-127	107%
1,2-DICHLOROETHANE-D4	79-130	107%
TOLUENE-D8	84-122	104%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-O-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300542 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300542-14

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: >G2412

Level: (low/med) LOW Date Received: 5/31/97

% Moisture: not dec. --- Date Analyzed: 6/03/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/05/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-01-01-05-1	ARDL Lab No.:	300542-06
Desc/Location:	701	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	1045	Prep. Date:	06/02/1997
Matrix:	SOIL	Analysis Date:	06/02/1997
Amount Used:	5 g	QC Batch:	0605TJP6
% Moisture:	15.6	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	2.5	11.8	ND		UG/KG	1
CHLOROMETHANE	1.8	11.8	ND		UG/KG	1
VINYL CHLORIDE	1.5	11.8	ND		UG/KG	1
BROMOMETHANE	0.94	11.8	ND		UG/KG	1
CHLOROETHANE	1.8	11.8	ND		UG/KG	1
TRICHLOROFLUOROMETHANE	2.8	11.8	ND		UG/KG	1
1,1-DICHLOROETHENE	1.5	5.9	ND		UG/KG	1
METHYLENE CHLORIDE	3	5.9	5.9	JB	UG/KG	1
trans-1,2-DICHLOROETHENE	0.77	5.9	ND		UG/KG	1
1,1-DICHLOROETHANE	0.77	5.9	ND		UG/KG	1
CARBON DISULFIDE	1.8	5.9	ND		UG/KG	1
2,2-DICHLOROPROPANE	1.4	5.9	ND		UG/KG	1
cis-1,2-DICHLOROETHENE	0.83	5.9	ND		UG/KG	1
BROMOCHLOROMETHANE	0.97	5.9	ND		UG/KG	1
CHLOROFORM	0.95	5.9	ND		UG/KG	1
1,1,1-TRICHLOROETHANE	0.6	5.9	ND		UG/KG	1
1,1-DICHLOROPROPENE	1.2	5.9	ND		UG/KG	1
CARBON TETRACHLORIDE	1.2	5.9	ND		UG/KG	1
BENZENE	0.62	5.9	ND		UG/KG	1
1,2-DICHLOROETHANE	0.96	5.9	ND		UG/KG	1
TRICHLOROETHENE	1.3	5.9	ND		UG/KG	1
1,2-DICHLOROPROPANE	1.3	5.9	ND		UG/KG	1
BROMODICHLOROMETHANE	0.78	5.9	ND		UG/KG	1
DIBROMOMETHANE	1.1	5.9	ND		UG/KG	1
cis-1,3-DICHLOROPROPENE	1.1	5.9	ND		UG/KG	1
TOLUENE	0.95	5.9	ND		UG/KG	1
trans-1,3-DICHLOROPROPENE	0.7	5.9	ND		UG/KG	1
1,1,2-TRICHLOROETHANE	0.96	5.9	ND		UG/KG	1
1,2-DIBROMOETHANE	1	5.9	ND		UG/KG	1
TETRACHLOROETHENE	0.92	5.9	ND		UG/KG	1
1,3-DICHLOROPROPANE	1	5.9	ND		UG/KG	1
DIBROMOCHLOROMETHANE	0.69	5.9	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/05/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-01-01-05-1	ARDL Lab No.:	300542-06 (cont'd)
Desc/Location:	701	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	1045	Prep. Date:	06/02/1997
Matrix:	SOIL	Analysis Date:	06/02/1997
Amount Used:	5 g	QC Batch:	0605TJP6
% Moisture:	15.6	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.68	5.9	ND		UG/KG	1
1,1,1,2-TETRACHLOROETHANE	0.58	5.9	ND		UG/KG	1
ETHYLBENZENE	0.83	5.9	ND		UG/KG	1
m & p-XYLENE	1.2	5.9	ND		UG/KG	1
o-XYLENE	0.55	5.9	ND		UG/KG	1
STYRENE	0.71	5.9	ND		UG/KG	1
2-HEXANONE	5.1	23.7	ND		UG/KG	1
BROMOFORM	1.4	5.9	ND		UG/KG	1
ISOPROPYLBENZENE	0.78	5.9	ND		UG/KG	1
1,1,2,2-TETRACHLOROETHANE	2.6	5.9	ND		UG/KG	1
BROMOBENZENE	1.1	5.9	ND		UG/KG	1
1,2,3-TRICHLOROPROPANE	2.4	5.9	ND		UG/KG	1
n-PROPYLBENZENE	0.69	5.9	ND		UG/KG	1
2-CHLOROTOLUENE	0.92	5.9	ND		UG/KG	1
4-CHLOROTOLUENE	0.95	5.9	ND		UG/KG	1
1,3,5-TRIMETHYLBENZENE	0.59	5.9	ND		UG/KG	1
tert-BUTYLBENZENE	0.64	5.9	ND		UG/KG	1
1,2,4-TRIMETHYLBENZENE	0.83	5.9	ND		UG/KG	1
sec-BUTYLBENZENE	0.75	5.9	ND		UG/KG	1
p-ISOPROPYLTOLUENE	0.72	5.9	ND		UG/KG	1
1,3-DICHLOROBENZENE	1.1	5.9	ND		UG/KG	1
1,4-DICHLOROBENZENE	1.2	5.9	ND		UG/KG	1
1,2-DICHLOROBENZENE	1.4	5.9	ND		UG/KG	1
n-BUTYLBENZENE	1.2	5.9	ND		UG/KG	1
1,2-DIBROMO-3-CHLOROPROPANE	3	11.8	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	1.3	5.9	ND		UG/KG	1
HEXACHLOROBUTADIENE	0.92	5.9	ND		UG/KG	1
NAPHTHALENE	2	5.9	ND		UG/KG	1
1,2,3-TRICHLOROBENZENE	1.5	5.9	ND		UG/KG	1
ACETONE	10.2	59.2	ND		UG/KG	1
2-BUTANONE	9.3	59.2	ND		UG/KG	1
4-METHYL-2-PENTANONE	4.3	23.7	ND		UG/KG	1

ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/05/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-01-01-05-1	ARDL Lab No.:	300542-06 (cont'd)
Desc/Location:	701	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	1045	Prep. Date:	06/02/1997
Matrix:	SOIL	Analysis Date:	06/02/1997
Amount Used:	5 g	QC Batch:	0605TJP6
% Moisture:	15.6	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	76-141	98%
DIBROMOFLUOROMETHANE	86-125	105%
1,2-DICHLOROETHANE-D4	78-135	104%
TOLUENE-D8	86-129	101%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-01-01-05-1

Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300542 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300542-06

Sample wt/vol: 5.0 (g/mL) g Lab File ID: >G2393

Level: (low/med) LOW Date Received: 5/31/97

% Moisture: not dec. 15.6 Date Analyzed: 6/02/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300544 Report Date: 06/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-P-01-06-00	ARDL Lab No.:	300544-03
Desc/Location:	7P	Lab Filename:	
Sample Date:	06/02/1997	Received Date:	06/04/1997
Sample Time:	1230	Prep. Date:	06/05/1997
Matrix:	WATER	Analysis Date:	06/05/1997
Amount Used:	5 mL	QC Batch:	0610TJP3
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	1.4	10.0	ND		UG/L	1
CHLOROMETHANE	1.2	10.0	ND		UG/L	1
VINYL CHLORIDE	1.2	10.0	ND		UG/L	1
BROMOMETHANE	1.3	10.0	ND		UG/L	1
CHLOROETHANE	1.4	10.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	1.4	10.0	ND		UG/L	1
1,1-DICHLOROETHENE	1.2	5.0	ND		UG/L	1
METHYLENE CHLORIDE	1.3	5.0	3.1	JB	UG/L	1
trans-1,2-DICHLOROETHENE	1.3	5.0	ND		UG/L	1
1,1-DICHLOROETHANE	1.0	5.0	ND		UG/L	1
CARBON DISULFIDE	1.1	5.0	ND		UG/L	1
2,2-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.86	5.0	ND		UG/L	1
BROMOCHLOROMETHANE	1.1	5.0	ND		UG/L	1
CHLOROFORM	0.79	5.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.89	5.0	ND		UG/L	1
1,1-DICHLOROPROPENE	1.3	5.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.87	5.0	ND		UG/L	1
BENZENE	0.90	5.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.85	5.0	ND		UG/L	1
TRICHLOROETHENE	0.85	5.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.77	5.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.82	5.0	ND		UG/L	1
DIBROMOMETHANE	0.96	5.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.83	5.0	ND		UG/L	1
TOLUENE	0.85	5.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.96	5.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	1.0	5.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.92	5.0	ND		UG/L	1
TETRACHLOROETHENE	0.81	5.0	ND		UG/L	1
1,3-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	1.3	5.0	ND		UG/L	1

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Lab Report No: 300544 Report Date: 06/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-P-01-06-00	ARDL Lab No.:	300544-03 (cont'd)
Desc/Location:	7P	Lab Filename:	
Sample Date:	06/02/1997	Received Date:	06/04/1997
Sample Time:	1230	Prep. Date:	06/05/1997
Matrix:	WATER	Analysis Date:	06/05/1997
Amount Used:	5 mL	QC Batch:	0610TJP3
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.96	5.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	1.4	5.0	ND		UG/L	1
ETHYLBENZENE	0.93	5.0	ND		UG/L	1
m & p-XYLENE	1.5	5.0	ND		UG/L	1
o-XYLENE	0.92	5.0	ND		UG/L	1
STYRENE	1.2	5.0	ND		UG/L	1
2-HEXANONE	4.5	20.0	ND		UG/L	1
BROMOFORM	2.0	5.0	ND		UG/L	1
ISOPROPYLBENZENE	1.1	5.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	3.0	5.0	ND		UG/L	1
BROMOBENZENE	1.2	5.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	2.2	5.0	ND		UG/L	1
n-PROPYLBENZENE	1.2	5.0	ND		UG/L	1
2-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
4-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	1.3	5.0	ND		UG/L	1
tert-BUTYLBENZENE	1.0	5.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	1.0	5.0	ND		UG/L	1
sec-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	1.3	5.0	ND		UG/L	1
1,3-DICHLOROBENZENE	1.9	5.0	ND		UG/L	1
1,4-DICHLOROBENZENE	1.6	5.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	5.0	ND		UG/L	1
n-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	3.2	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	1.2	5.0	ND		UG/L	1
HEXACHLOROBUTADIENE	1.3	5.0	ND		UG/L	1
NAPHTHALENE	2.3	5.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	1.9	5.0	ND		UG/L	1
ACETONE	11.0	50.0	ND		UG/L	1
2-BUTANONE	7.0	50.0	ND		UG/L	1
4-METHYL-2-PENTANONE	8.9	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300544 Report Date: 06/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-P-01-06-00	ARDL Lab No.:	300544-03 (cont'd)
Desc/Location:	7P	Lab Filename:	
Sample Date:	06/02/1997	Received Date:	06/04/1997
Sample Time:	1230	Prep. Date:	06/05/1997
Matrix:	WATER	Analysis Date:	06/05/1997
Amount Used:	5 mL	QC Batch:	0610TJP3
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	82-125	105%
DIBROMOFLUOROMETHANE	89-127	93%
1,2-DICHLOROETHANE-D4	79-130	94%
TOLUENE-D8	84-122	105%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-P-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300544 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300544-03

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: >K4939

Level: (low/med) LOW Date Received: 6/04/97

% Moisture: not dec. --- Date Analyzed: 6/05/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	7.97	5.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300544 Report Date: 06/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-P1-01-05-01	ARDL Lab No.:	300544-01
Desc/Location:	7P,0 TO 1 FT	Lab Filename:	
Sample Date:	06/02/1997	Received Date:	06/04/1997
Sample Time:	1400	Prep. Date:	06/05/1997
Matrix:	SOIL	Analysis Date:	06/05/1997
Amount Used:	5 g	QC Batch:	0610TJP2
% Moisture:	14.1	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	2.4	11.6	ND		UG/KG	1
CHLOROMETHANE	1.7	11.6	ND		UG/KG	1
VINYL CHLORIDE	1.5	11.6	ND		UG/KG	1
BROMOMETHANE	0.92	11.6	ND		UG/KG	1
CHLOROETHANE	1.7	11.6	ND		UG/KG	1
TRICHLOROFLUOROMETHANE	2.8	11.6	ND		UG/KG	1
1,1-DICHLOROETHENE	1.5	5.8	ND		UG/KG	1
METHYLENE CHLORIDE	2.9	5.8	6.1		UG/KG	1
trans-1,2-DICHLOROETHENE	0.76	5.8	ND		UG/KG	1
1,1-DICHLOROETHANE	0.76	5.8	ND		UG/KG	1
CARBON DISULFIDE	1.7	5.8	ND		UG/KG	1
2,2-DICHLOROPROPANE	1.4	5.8	ND		UG/KG	1
cis-1,2-DICHLOROETHENE	0.81	5.8	ND		UG/KG	1
BROMOCHLOROMETHANE	0.95	5.8	ND		UG/KG	1
CHLOROFORM	0.93	5.8	ND		UG/KG	1
1,1,1-TRICHLOROETHANE	0.59	5.8	ND		UG/KG	1
1,1-DICHLOROPROPENE	1.2	5.8	ND		UG/KG	1
CARBON TETRACHLORIDE	1.1	5.8	ND		UG/KG	1
BENZENE	0.61	5.8	ND		UG/KG	1
1,2-DICHLOROETHANE	0.94	5.8	ND		UG/KG	1
TRICHLOROETHENE	1.3	5.8	ND		UG/KG	1
1,2-DICHLOROPROPANE	1.3	5.8	ND		UG/KG	1
BROMODICHLOROMETHANE	0.77	5.8	ND		UG/KG	1
DIBROMOMETHANE	1.1	5.8	ND		UG/KG	1
cis-1,3-DICHLOROPROPENE	1.1	5.8	ND		UG/KG	1
TOLUENE	0.93	5.8	ND		UG/KG	1
trans-1,3-DICHLOROPROPENE	0.69	5.8	ND		UG/KG	1
1,1,2-TRICHLOROETHANE	0.94	5.8	ND		UG/KG	1
1,2-DIBROMOETHANE	1	5.8	ND		UG/KG	1
TETRACHLOROETHENE	0.91	5.8	ND		UG/KG	1
1,3-DICHLOROPROPANE	1.0	5.8	ND		UG/KG	1
DIBROMOCHLOROMETHANE	0.68	5.8	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300544 Report Date: 06/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-P1-01-05-01	ARDL Lab No.:	300544-01 (cont'd)
Desc/Location:	7P,0 TO 1 FT	Lab Filename:	
Sample Date:	06/02/1997	Received Date:	06/04/1997
Sample Time:	1400	Prep. Date:	06/05/1997
Matrix:	SOIL	Analysis Date:	06/05/1997
Amount Used:	5 g	QC Batch:	0610TJP2
% Moisture:	14.1	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.66	5.8	ND		UG/KG	1
1,1,1,2-TETRACHLOROETHANE	0.57	5.8	ND		UG/KG	1
ETHYLBENZENE	0.81	5.8	ND		UG/KG	1
m & p-XYLENE	1.2	5.8	ND		UG/KG	1
o-XYLENE	0.54	5.8	ND		UG/KG	1
STYRENE	0.7	5.8	ND		UG/KG	1
2-HEXANONE	5	23.3	ND		UG/KG	1
BROMOFORM	1.4	5.8	ND		UG/KG	1
ISOPROPYLBENZENE	0.77	5.8	ND		UG/KG	1
1,1,2,2-TETRACHLOROETHANE	2.6	5.8	ND		UG/KG	1
BROMOBENZENE	1.1	5.8	ND		UG/KG	1
1,2,3-TRICHLOROPROPANE	2.3	5.8	ND		UG/KG	1
n-PROPYLBENZENE	0.68	5.8	ND		UG/KG	1
2-CHLOROTOLUENE	0.91	5.8	ND		UG/KG	1
4-CHLOROTOLUENE	0.93	5.8	ND		UG/KG	1
1,3,5-TRIMETHYLBENZENE	0.58	5.8	ND		UG/KG	1
tert-BUTYLBENZENE	0.63	5.8	ND		UG/KG	1
1,2,4-TRIMETHYLBENZENE	0.81	5.8	ND		UG/KG	1
sec-BUTYLBENZENE	0.73	5.8	ND		UG/KG	1
p-ISOPROPYLTOLUENE	0.71	5.8	ND		UG/KG	1
1,3-DICHLOROBENZENE	1.1	5.8	ND		UG/KG	1
1,4-DICHLOROBENZENE	1.2	5.8	ND		UG/KG	1
1,2-DICHLOROBENZENE	1.4	5.8	ND		UG/KG	1
n-BUTYLBENZENE	1.2	5.8	ND		UG/KG	1
1,2-DIBROMO-3-CHLOROPROPANE	2.9	11.6	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	1.3	5.8	ND		UG/KG	1
HEXACHLOROBUTADIENE	0.91	5.8	ND		UG/KG	1
NAPHTHALENE	2	5.8	ND		UG/KG	1
1,2,3-TRICHLOROBENZENE	1.5	5.8	ND		UG/KG	1
ACETONE	10.0	58.2	ND		UG/KG	1
2-BUTANONE	9.2	58.2	ND		UG/KG	1
4-METHYL-2-PENTANONE	4.2	23.3	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300544 Report Date: 06/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-P1-01-05-01	ARDL Lab No.:	300544-01 (cont'd)
Desc/Location:	7P,0 TO 1 FT	Lab Filename:	
Sample Date:	06/02/1997	Received Date:	06/04/1997
Sample Time:	1400	Prep. Date:	06/05/1997
Matrix:	SOIL	Analysis Date:	06/05/1997
Amount Used:	5 g	QC Batch:	0610TJP2
% Moisture:	14.1	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	76-141	96%
DIBROMOFLUOROMETHANE	86-125	105%
1,2-DICHLOROETHANE-D4	78-135	101%
TOLUENE-D8	86-129	100%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-P1-01-05-01

Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300544 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300544-01

Sample wt/vol: 5.0 (g/mL) g Lab File ID: >G2448

Level: (low/med) LOW Date Received: 6/04/97

% Moisture: not dec. 14.1 Date Analyzed: 6/05/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-Q-01-06-00	ARDL Lab No.:	300549-08
Desc/Location:	7Q	Lab Filename:	
Sample Date:	06/05/1997	Received Date:	06/07/1997
Sample Time:	1630	Prep. Date:	06/09/1997
Matrix:	WATER	Analysis Date:	06/09/1997
Amount Used:	5 mL	QC Batch:	0616LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	1.4	10.0	ND		UG/L	1
CHLOROMETHANE	1.2	10.0	ND		UG/L	1
VINYL CHLORIDE	1.2	10.0	ND		UG/L	1
BROMOMETHANE	1.3	10.0	ND		UG/L	1
CHLOROETHANE	1.4	10.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	1.4	10.0	ND		UG/L	1
1,1-DICHLOROETHENE	1.2	5.0	ND		UG/L	1
METHYLENE CHLORIDE	1.3	5.0	7.9	B	UG/L	1
trans-1,2-DICHLOROETHENE	1.3	5.0	ND		UG/L	1
1,1-DICHLOROETHANE	1.0	5.0	ND		UG/L	1
CARBON DISULFIDE	1.1	5.0	ND		UG/L	1
2,2-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.86	5.0	ND		UG/L	1
BROMOCHLOROMETHANE	1.1	5.0	ND		UG/L	1
CHLOROFORM	0.79	5.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.89	5.0	ND		UG/L	1
1,1-DICHLOROPROPENE	1.3	5.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.87	5.0	ND		UG/L	1
BENZENE	0.90	5.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.85	5.0	ND		UG/L	1
TRICHLOROETHENE	0.85	5.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.77	5.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.82	5.0	ND		UG/L	1
DIBROMOMETHANE	0.96	5.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.83	5.0	ND		UG/L	1
TOLUENE	0.85	5.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.96	5.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	1.0	5.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.92	5.0	ND		UG/L	1
TETRACHLOROETHENE	0.81	5.0	ND		UG/L	1
1,3-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	1.3	5.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-Q-01-06-00	ARDL Lab No.:	300549-08 (cont'd)
Desc/Location:	7Q	Lab Filename:	
Sample Date:	06/05/1997	Received Date:	06/07/1997
Sample Time:	1630	Prep. Date:	06/09/1997
Matrix:	WATER	Analysis Date:	06/09/1997
Amount Used:	5 mL	QC Batch:	0616LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.96	5.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	1.4	5.0	ND		UG/L	1
ETHYLBENZENE	0.93	5.0	ND		UG/L	1
m & p-XYLENE	1.5	5.0	ND		UG/L	1
o-XYLENE	0.92	5.0	ND		UG/L	1
STYRENE	1.2	5.0	ND		UG/L	1
2-HEXANONE	4.5	20.0	ND		UG/L	1
BROMOFORM	2.0	5.0	ND		UG/L	1
ISOPROPYLBENZENE	1.1	5.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	3.0	5.0	ND		UG/L	1
BROMOBENZENE	1.2	5.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	2.2	5.0	ND		UG/L	1
n-PROPYLBENZENE	1.2	5.0	ND		UG/L	1
2-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
4-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	1.3	5.0	ND		UG/L	1
tert-BUTYLBENZENE	1.0	5.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	1.0	5.0	ND		UG/L	1
sec-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	1.3	5.0	ND		UG/L	1
1,3-DICHLOROBENZENE	1.9	5.0	ND		UG/L	1
1,4-DICHLOROBENZENE	1.6	5.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	5.0	ND		UG/L	1
n-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	3.2	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	1.2	5.0	ND		UG/L	1
HEXACHLOROBUTADIENE	1.3	5.0	ND		UG/L	1
NAPHTHALENE	2.3	5.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	1.9	5.0	ND		UG/L	1
ACETONE	11.0	50.0	ND		UG/L	1
2-BUTANONE	7.0	50.0	ND		UG/L	1
4-METHYL-2-PENTANONE	8.9	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-Q-01-06-00	ARDL Lab No.:	300549-08 (cont'd)
Desc/Location:	7Q	Lab Filename:	
Sample Date:	06/05/1997	Received Date:	06/07/1997
Sample Time:	1630	Prep. Date:	06/09/1997
Matrix:	WATER	Analysis Date:	06/09/1997
Amount Used:	5 mL	QC Batch:	0616LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	82-125	112%
DIBROMOFLUOROMETHANE	89-127	101%
1,2-DICHLOROETHANE-D4	79-130	104%
TOLUENE-D8	84-122	110%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-Q-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300549 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300549-08

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: >K4965

Level: (low/med) LOW Date Received: 6/07/97

% Moisture: not dec. --- Date Analyzed: 6/09/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	7.96	10.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-Q1-01-05-1	ARDL Lab No.:	300549-05
Desc/Location:	7Q	Lab Filename:	
Sample Date:	06/05/1997	Received Date:	06/07/1997
Sample Time:	1620	Prep. Date:	06/09/1997
Matrix:	SOIL	Analysis Date:	06/09/1997
Amount Used:	5 g	QC Batch:	0616LS2
% Moisture:	19.2	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	2.6	12.4	ND		UG/KG	1
CHLOROMETHANE	1.9	12.4	ND		UG/KG	1
VINYL CHLORIDE	1.6	12.4	ND		UG/KG	1
BROMOMETHANE	0.98	12.4	ND		UG/KG	1
CHLOROETHANE	1.9	12.4	ND		UG/KG	1
TRICHLOROFLUOROMETHANE	3	12.4	ND		UG/KG	1
1,1-DICHLOROETHENE	1.6	6.2	ND		UG/KG	1
METHYLENE CHLORIDE	3.1	6.2	12.7	B	UG/KG	1
trans-1,2-DICHLOROETHENE	0.8	6.2	ND		UG/KG	1
1,1-DICHLOROETHANE	0.8	6.2	ND		UG/KG	1
CARBON DISULFIDE	1.9	6.2	ND		UG/KG	1
2,2-DICHLOROPROPANE	1.5	6.2	ND		UG/KG	1
cis-1,2-DICHLOROETHENE	0.87	6.2	ND		UG/KG	1
BROMOCHLOROMETHANE	1	6.2	ND		UG/KG	1
CHLOROFORM	0.99	6.2	ND		UG/KG	1
1,1,1-TRICHLOROETHANE	0.63	6.2	ND		UG/KG	1
1,1-DICHLOROPROPENE	1.2	6.2	ND		UG/KG	1
CARBON TETRACHLORIDE	1.2	6.2	ND		UG/KG	1
BENZENE	0.64	6.2	ND		UG/KG	1
1,2-DICHLOROETHANE	1.0	6.2	ND		UG/KG	1
TRICHLOROETHENE	1.4	6.2	ND		UG/KG	1
1,2-DICHLOROPROPANE	1.4	6.2	ND		UG/KG	1
BROMODICHLOROMETHANE	0.82	6.2	ND		UG/KG	1
DIBROMOMETHANE	1.2	6.2	ND		UG/KG	1
cis-1,3-DICHLOROPROPENE	1.2	6.2	ND		UG/KG	1
TOLUENE	0.99	6.2	ND		UG/KG	1
trans-1,3-DICHLOROPROPENE	0.73	6.2	ND		UG/KG	1
1,1,2-TRICHLOROETHANE	1.0	6.2	ND		UG/KG	1
1,2-DIBROMOETHANE	1.1	6.2	ND		UG/KG	1
TETRACHLOROETHENE	0.97	6.2	ND		UG/KG	1
1,3-DICHLOROPROPANE	1.1	6.2	ND		UG/KG	1
DIBROMOCHLOROMETHANE	0.72	6.2	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-Q1-01-05-1	ARDL Lab No.:	300549-05 (cont'd)
Desc/Location:	7Q	Lab Filename:	
Sample Date:	06/05/1997	Received Date:	06/07/1997
Sample Time:	1620	Prep. Date:	06/09/1997
Matrix:	SOIL	Analysis Date:	06/09/1997
Amount Used:	5 g	QC Batch:	0616LS2
% Moisture:	19.2	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.71	6.2	ND		UG/KG	1
1,1,1,2-TETRACHLOROETHANE	0.61	6.2	ND		UG/KG	1
ETHYLBENZENE	0.87	6.2	ND		UG/KG	1
m & p-XYLENE	1.2	6.2	ND		UG/KG	1
o-XYLENE	0.57	6.2	ND		UG/KG	1
STYRENE	0.74	6.2	ND		UG/KG	1
2-HEXANONE	5.3	24.8	ND		UG/KG	1
BROMOFORM	1.5	6.2	ND		UG/KG	1
ISOPROPYLBENZENE	0.82	6.2	ND		UG/KG	1
1,1,2,2-TETRACHLOROETHANE	2.7	6.2	ND		UG/KG	1
BROMOBENZENE	1.2	6.2	ND		UG/KG	1
1,2,3-TRICHLOROPROPANE	2.5	6.2	ND		UG/KG	1
n-PROPYLBENZENE	0.72	6.2	ND		UG/KG	1
2-CHLOROTOLUENE	0.97	6.2	ND		UG/KG	1
4-CHLOROTOLUENE	0.99	6.2	ND		UG/KG	1
1,3,5-TRIMETHYLBENZENE	0.62	6.2	ND		UG/KG	1
tert-BUTYLBENZENE	0.67	6.2	ND		UG/KG	1
1,2,4-TRIMETHYLBENZENE	0.87	6.2	ND		UG/KG	1
sec-BUTYLBENZENE	0.78	6.2	ND		UG/KG	1
p-ISOPROPYLTOLUENE	0.75	6.2	ND		UG/KG	1
1,3-DICHLOROBENZENE	1.1	6.2	ND		UG/KG	1
1,4-DICHLOROBENZENE	1.2	6.2	ND		UG/KG	1
1,2-DICHLOROBENZENE	1.5	6.2	ND		UG/KG	1
n-BUTYLBENZENE	1.2	6.2	ND		UG/KG	1
1,2-DIBROMO-3-CHLOROPROPANE	3.1	12.4	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	1.4	6.2	ND		UG/KG	1
HEXACHLOROBUTADIENE	0.97	6.2	ND		UG/KG	1
NAPHTHALENE	2.1	6.2	ND		UG/KG	1
1,2,3-TRICHLOROBENZENE	1.6	6.2	ND		UG/KG	1
ACETONE	10.6	61.9	ND		UG/KG	1
2-BUTANONE	9.7	61.9	ND		UG/KG	1
4-METHYL-2-PENTANONE	4.5	24.8	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-07-Q1-01-05-1	ARDL Lab No.:	300549-05 (cont'd)
Desc/Location:	7Q	Lab Filename:	
Sample Date:	06/05/1997	Received Date:	06/07/1997
Sample Time:	1620	Prep. Date:	06/09/1997
Matrix:	SOIL	Analysis Date:	06/09/1997
Amount Used:	5 g	QC Batch:	0616LS2
% Moisture:	19.2	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	76-141	109%
DIBROMOFLUOROMETHANE	86-125	121%
1,2-DICHLOROETHANE-D4	78-135	121%
TOLUENE-D8	86-129	109%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

750

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-07-Q1-01-05-1

Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300549 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300549-05

Sample wt/vol: 5.0 (g/mL) g Lab File ID: >G2486

Level: (low/med) LOW Date Received: 6/07/97

% Moisture: not dec. 19.2 Date Analyzed: 6/09/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 76131	Ethane, 1,1,2-trichloro-1,2,2 -trifluoro-	3.69	7.	JNB
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SEMI-VOLATILE ORGANIC COMPOUNDS
(Method 8270)

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-A-01-06-00	ARDL Lab No.:	300555-05
Desc/Location:	7A	Lab Filename:	
Sample Date:	06/11/1997	Received Date:	06/13/1997
Sample Time:	0900	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-A-01-06-00	ARDL Lab No.:	300555-05 (cont'd)
Desc/Location:	7A	Lab Filename:	
Sample Date:	06/11/1997	Received Date:	06/13/1997
Sample Time:	0900	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-A-01-06-00	ARDL Lab No.:	300555-05 (cont'd)
Desc/Location:	7A	Lab Filename:	
Sample Date:	06/11/1997	Received Date:	06/13/1997
Sample Time:	0900	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	58%
2-FLUOROPHENOL	21-110	22%
D5 NITROBENZENE	35-114	52%
2,4,6-TRIBROMOPHENOL	10-123	43%
D5 PHENOL	10-94	18%
D14 TERPHENYL	33-141	56%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-A-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300555 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300555-05

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1558

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/13/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/18/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.8

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-A1-01-05-1	ARDL Lab No.:	300554-14
Desc/Location:	SITE A1 @ 1'	Lab Filename:	
Sample Date:	06/11/1997	Received Date:	06/13/1997
Sample Time:	0852	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/18/1997
Amount Used:	30 g	QC Batch:	B2281
% Moisture:	35.5	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	66.7	512	ND		UG/KG	1
BIS(-2-CHLOROETHYL)ETHER	63.6	512	ND		UG/KG	1
2-CHLOROPHENOL	65.1	512	ND		UG/KG	1
1,3-DICHLOROBENZENE	69.8	512	ND		UG/KG	1
1,4-DICHLOROBENZENE	65.1	512	ND		UG/KG	1
BENZYL ALCOHOL	62.0	512	ND		UG/KG	1
1,2-DICHLOROBENZENE	85.3	512	ND		UG/KG	1
2-METHYLPHENOL	69.8	512	ND		UG/KG	1
2,2'-OXYBIS(1-CHLOROPROPANE)	76.0	512	ND		UG/KG	1
4-METHYLPHENOL	66.7	512	ND		UG/KG	1
N-NITROSO-DI-N-PROPYLAMINE	71.3	512	ND		UG/KG	1
HEXACHLOROETHANE	76.0	512	ND		UG/KG	1
NITROBENZENE	54.3	512	ND		UG/KG	1
ISOPHORONE	43.4	512	ND		UG/KG	1
2-NITROPHENOL	60.5	512	ND		UG/KG	1
2,4-DIMETHYLPHENOL	51.2	512	ND		UG/KG	1
BENZOIC ACID	127	512	ND		UG/KG	1
BIS(-2-CHLOROETHOXY)METHANE	58.9	512	ND		UG/KG	1
2,4-DICHLOROPHENOL	68.2	512	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	58.9	512	ND		UG/KG	1
NAPHTHALENE	58.9	512	ND		UG/KG	1
4-CHLOROANILINE	214	512	ND		UG/KG	1
HEXACHLOROBUTADIENE	63.6	512	ND		UG/KG	1
4-CHLORO-3-METHYLPHENOL	55.8	512	ND		UG/KG	1
2-METHYLNAPHTHALENE	55.8	512	ND		UG/KG	1
HEXACHLOROCYCLOPENTADIENE	52.7	512	ND		UG/KG	1
2,4,6-TRICHLOROPHENOL	51.2	512	ND		UG/KG	1
2,4,5-TRICHLOROPHENOL	57.4	512	ND		UG/KG	1
2-CHLORONAPHTHALENE	54.3	512	ND		UG/KG	1
2-NITROANILINE	40.3	512	ND		UG/KG	1
DIMETHYL PHTHALATE	48.1	512	ND		UG/KG	1
ACENAPHTHYLENE	60.5	512	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-A1-01-05-1	ARDL Lab No.:	300554-14 (cont'd)
Desc/Location:	SITE A1 @ 1'	Lab Filename:	
Sample Date:	06/11/1997	Received Date:	06/13/1997
Sample Time:	0852	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/18/1997
Amount Used:	30 g	QC Batch:	B2281
% Moisture:	35.5	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	49.6	512	ND		UG/KG	1
3-NITROANILINE	121	512	ND		UG/KG	1
ACENAPHTHENE	49.6	512	ND		UG/KG	1
2,4-DINITROPHENOL	46.5	512	ND		UG/KG	1
4-NITROPHENOL	72.9	512	ND		UG/KG	1
DIBENZOFURAN	52.7	512	ND		UG/KG	1
2,4-DINITROTOLUENE	46.5	512	ND		UG/KG	1
DIETHYLPHTHALATE	55.8	512	ND		UG/KG	1
4-CHLOROPHENYL-PHENYLETHER	52.7	512	ND		UG/KG	1
FLUORENE	54.3	512	ND		UG/KG	1
4-NITROANILINE	91.5	512	ND		UG/KG	1
4,6-DINITRO-2-METHYLPHENOL	71.3	512	ND		UG/KG	1
N-NITROSODIPHENYLAMINE	60.5	512	ND		UG/KG	1
4-BROMOPHENYL-PHENYLETHER	54.3	512	ND		UG/KG	1
PHENANTHRENE	46.5	512	ND		UG/KG	1
HEXACHLOROBENZENE	48.1	512	ND		UG/KG	1
PENTACHLOROPHENOL	86.8	512	ND		UG/KG	1
ANTHRACENE	45.0	512	ND		UG/KG	1
DI-N-BUTYLPHTHALATE	34.1	512	ND		UG/KG	1
FLUORANTHENE	43.4	512	ND		UG/KG	1
PYRENE	43.4	512	ND		UG/KG	1
BUTYLBENZYLPHTHALATE	46.5	512	ND		UG/KG	1
3,3'-DICHLOROBENZIDINE	366	512	ND		UG/KG	1
BENZO(a)ANTHRACENE	37.2	512	ND		UG/KG	1
CHRYSENE	38.8	512	ND		UG/KG	1
BIS(2-ETHYLHEXYL)PHTHALATE	48.1	512	293	J	UG/KG	1
DI-N-OCTYL PHTHALATE	43.4	512	ND		UG/KG	1
BENZO(b)FLUORANTHENE	82.2	512	ND		UG/KG	1
BENZO(k)FLUORANTHENE	102	512	ND		UG/KG	1
BENZO(a)PYRENE	45.0	512	ND		UG/KG	1
INDENO(1,2,3-cd)PYRENE	51.2	512	ND		UG/KG	1
DIBENZO(a,h)ANTHRACENE	48.1	512	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-A1-01-05-1	ARDL Lab No.:	300554-14 (cont'd)
Desc/Location:	SITE A1 @ 1'	Lab Filename:	
Sample Date:	06/11/1997	Received Date:	06/13/1997
Sample Time:	0852	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/18/1997
Amount Used:	30 g	QC Batch:	B2281
% Moisture:	35.5	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	52.7	512	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	30-115	71%
2-FLUOROPHENOL	25-121	61%
D5 NITROBENZENE	23-120	60%
2,4,6-TRIBROMOPHENOL	19-122	66%
D5 PHENOL	24-113	66%
D14 TERPHENYL	18-137	72%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-A1-01-05-1

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300554 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300554-14

Sample wt/vol: 30.0 (g/mL) g Lab File ID: >W8111

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. 35.5 dec. --- Date Extracted: 6/16/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/18/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ---

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	19.23	2100.	J
2.	Unknown	20.00	3400.	J
3.	Unknown	20.25	1500.	J
4.	Unknown	20.45	2900.	J
5.	Unknown	21.21	6400.	J
6. 57103	Hexadecanoic acid	21.42	5200.	J
7.	Unknown	22.08	2300.	J
8.	Unknown	22.44	1200.	J
9.	Unknown	22.76	2000.	J
10.	Unknown	23.08	4100.	J
11.	Unknown alkane	27.81	1100.	J
12.	Unknown	31.04	1200.	J
13.	Unknown alkane	32.95	1100.	J
14.	Unknown	33.37	4200.	J
15.	Unknown	33.60	1100.	J
16.	Unknown	34.12	3000.	J
17.	Unknown	34.88	1200.	J
18.	Unknown	35.22	1800.	J
19.	Unknown	35.70	4000.	J
20.	Unknown	35.92	1300.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-B-01-06-00	ARDL Lab No.:	300555-04
Desc/Location:	7B	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1700	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-B-01-06-00	ARDL Lab No.:	300555-04 (cont'd)
Desc/Location:	7B	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1700	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-B-01-06-00	ARDL Lab No.:	300555-04 (cont'd)
Desc/Location:	7B	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1700	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	58%
2-FLUOROPHENOL	21-110	30%
D5 NITROBENZENE	35-114	56%
2,4,6-TRIBROMOPHENOL	10-123	58%
D5 PHENOL	10-94	22%
D14 TERPHENYL	33-141	65%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-B-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300555 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300555-04

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1557

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/13/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/18/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-B1-01-05-1	ARDL Lab No.:	300554-04
Desc/Location:	STATION B1 @ 1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1653	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/18/1997
Amount Used:	30 g	QC Batch:	B2281
% Moisture:	22.8	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	55.7	427	ND		UG/KG	1
BIS(-2-CHLOROETHYL)ETHER	53.1	427	ND		UG/KG	1
2-CHLOROPHENOL	54.4	427	ND		UG/KG	1
1,3-DICHLOROBENZENE	58.3	427	ND		UG/KG	1
1,4-DICHLOROBENZENE	54.4	427	ND		UG/KG	1
BENZYL ALCOHOL	51.8	427	ND		UG/KG	1
1,2-DICHLOROBENZENE	71.2	427	ND		UG/KG	1
2-METHYLPHENOL	58.3	427	ND		UG/KG	1
2,2'-OXYBIS(1-CHLOROPROPANE)	63.5	427	ND		UG/KG	1
4-METHYLPHENOL	55.7	427	ND		UG/KG	1
N-NITROSO-DI-N-PROPYLAMINE	59.6	427	ND		UG/KG	1
HEXACHLOROETHANE	63.5	427	ND		UG/KG	1
NITROBENZENE	45.3	427	ND		UG/KG	1
ISOPHORONE	36.3	427	ND		UG/KG	1
2-NITROPHENOL	50.5	427	ND		UG/KG	1
2,4-DIMETHYLPHENOL	42.7	427	ND		UG/KG	1
BENZOIC ACID	106	427	ND		UG/KG	1
BIS(-2-CHLOROETHOXY)METHANE	49.2	427	ND		UG/KG	1
2,4-DICHLOROPHENOL	57.0	427	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	49.2	427	ND		UG/KG	1
NAPHTHALENE	49.2	427	ND		UG/KG	1
4-CHLOROANILINE	179	427	ND		UG/KG	1
HEXACHLOROBUTADIENE	53.1	427	ND		UG/KG	1
4-CHLORO-3-METHYLPHENOL	46.6	427	ND		UG/KG	1
2-METHYLNAPHTHALENE	46.6	427	ND		UG/KG	1
HEXACHLOROCYCLOPENTADIENE	44.0	427	ND		UG/KG	1
2,4,6-TRICHLOROPHENOL	42.7	427	ND		UG/KG	1
2,4,5-TRICHLOROPHENOL	47.9	427	ND		UG/KG	1
2-CHLORONAPHTHALENE	45.3	427	ND		UG/KG	1
2-NITROANILINE	33.7	427	ND		UG/KG	1
DIMETHYL PHTHALATE	40.2	427	ND		UG/KG	1
ACENAPHTHYLENE	50.5	427	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-B1-01-05-1	ARDL Lab No.:	300554-04 (cont'd)
Desc/Location:	STATION B1 @ 1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1653	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/18/1997
Amount Used:	30 g	QC Batch:	B2281
% Moisture:	22.8	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	41.5	427	ND		UG/KG	1
3-NITROANILINE	101	427	ND		UG/KG	1
ACENAPHTHENE	41.5	427	ND		UG/KG	1
2,4-DINITROPHENOL	38.9	427	ND		UG/KG	1
4-NITROPHENOL	60.9	427	ND		UG/KG	1
DIBENZOFURAN	44.0	427	ND		UG/KG	1
2,4-DINITROTOLUENE	38.9	427	ND		UG/KG	1
DIETHYLPHTHALATE	46.6	427	ND		UG/KG	1
4-CHLOROPHENYL-PHENYLETHER	44.0	427	ND		UG/KG	1
FLUORENE	45.3	427	ND		UG/KG	1
4-NITROANILINE	76.4	427	ND		UG/KG	1
4,6-DINITRO-2-METHYLPHENOL	59.6	427	ND		UG/KG	1
N-NITROSODIPHENYLAMINE	50.5	427	ND		UG/KG	1
4-BROMOPHENYL-PHENYLETHER	45.3	427	ND		UG/KG	1
PHENANTHRENE	38.9	427	ND		UG/KG	1
HEXACHLOROBENZENE	40.2	427	ND		UG/KG	1
PENTACHLOROPHENOL	72.5	427	ND		UG/KG	1
ANTHRACENE	37.6	427	ND		UG/KG	1
DI-N-BUTYLPHTHALATE	28.5	427	ND		UG/KG	1
FLUORANTHENE	36.3	427	ND		UG/KG	1
PYRENE	36.3	427	ND		UG/KG	1
BUTYLBENZYLPHTHALATE	38.9	427	ND		UG/KG	1
3,3'-DICHLOROBENZIDINE	306	427	ND		UG/KG	1
BENZO(a)ANTHRACENE	31.1	427	ND		UG/KG	1
CHRYSENE	32.4	427	ND		UG/KG	1
BIS(2-ETHYLHEXYL)PHTHALATE	40.2	427	ND		UG/KG	1
DI-N-OCTYL PHTHALATE	36.3	427	ND		UG/KG	1
BENZO(b)FLUORANTHENE	68.7	427	ND		UG/KG	1
BENZO(k)FLUORANTHENE	85.5	427	ND		UG/KG	1
BENZO(a)PYRENE	37.6	427	ND		UG/KG	1
INDENO(1,2,3-cd)PYRENE	42.7	427	ND		UG/KG	1
DIBENZO(a,h)ANTHRACENE	40.2	427	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-B1-01-05-1	ARDL Lab No.:	300554-04 (cont'd)
Desc/Location:	STATION B1 @ 1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1653	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/18/1997
Amount Used:	30 g	QC Batch:	B2281
% Moisture:	22.8	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	44.0	427	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	30-115	68%
2-FLUOROPHENOL	25-121	61%
D5 NITROBENZENE	23-120	59%
2,4,6-TRIBROMOPHENOL	19-122	70%
D5 PHENOL	24-113	64%
D14 TERPHENYL	18-137	75%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-B1-01-05-1

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300554 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300554-04

Sample wt/vol: 30.0 (g/mL) g Lab File ID: >W8107

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. 22.8 dec. --- Date Extracted: 6/16/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/18/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ---

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-C-01-06-00	ARDL Lab No.:	300555-07
Desc/Location:	STATION C	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1445	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/19/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-C-01-06-00	ARDL Lab No.:	300555-07 (cont'd)
Desc/Location:	STATION C	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1445	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/19/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-C-01-06-00	ARDL Lab No.:	300555-07 (cont'd)
Desc/Location:	STATION C	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1445	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/19/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	64%
2-FLUOROPHENOL	21-110	26%
D5 NITROBENZENE	35-114	61%
2,4,6-TRIBROMOPHENOL	10-123	49%
D5 PHENOL	10-94	21%
D14 TERPHENYL	33-141	65%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-C-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300555 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300555-07

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1562

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/13/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/19/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.2

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-C1-01-05-1	ARDL Lab No.:	300554-01
Desc/Location:	STATION C1 @ 0-1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1439	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/18/1997
Amount Used:	30 g	QC Batch:	B2281
% Moisture:	17.3	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	52.0	399	ND		UG/KG	1
BIS(-2-CHLOROETHYL)ETHER	49.6	399	ND		UG/KG	1
2-CHLOROPHENOL	50.8	399	ND		UG/KG	1
1,3-DICHLOROBENZENE	54.4	399	ND		UG/KG	1
1,4-DICHLOROBENZENE	50.8	399	ND		UG/KG	1
BENZYL ALCOHOL	48.4	399	ND		UG/KG	1
1,2-DICHLOROBENZENE	66.5	399	ND		UG/KG	1
2-METHYLPHENOL	54.4	399	ND		UG/KG	1
2,2'-OXYBIS(1-CHLOROPROPANE)	59.3	399	ND		UG/KG	1
4-METHYLPHENOL	52.0	399	ND		UG/KG	1
N-NITROSO-DI-N-PROPYLAMINE	55.6	399	ND		UG/KG	1
HEXACHLOROETHANE	59.3	399	ND		UG/KG	1
NITROBENZENE	42.3	399	ND		UG/KG	1
ISOPHORONE	33.9	399	ND		UG/KG	1
2-NITROPHENOL	47.2	399	ND		UG/KG	1
2,4-DIMETHYLPHENOL	39.9	399	ND		UG/KG	1
BENZOIC ACID	99.2	399	ND		UG/KG	1
BIS(-2-CHLOROETHOXY)METHANE	45.9	399	ND		UG/KG	1
2,4-DICHLOROPHENOL	53.2	399	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	45.9	399	ND		UG/KG	1
NAPHTHALENE	45.9	399	ND		UG/KG	1
4-CHLOROANILINE	167	399	ND		UG/KG	1
HEXACHLOROBUTADIENE	49.6	399	ND		UG/KG	1
4-CHLORO-3-METHYLPHENOL	43.5	399	ND		UG/KG	1
2-METHYLNAPHTHALENE	43.5	399	ND		UG/KG	1
HEXACHLOROCYCLOPENTADIENE	41.1	399	ND		UG/KG	1
2,4,6-TRICHLOROPHENOL	39.9	399	ND		UG/KG	1
2,4,5-TRICHLOROPHENOL	44.7	399	ND		UG/KG	1
2-CHLORONAPHTHALENE	42.3	399	ND		UG/KG	1
2-NITROANILINE	31.4	399	ND		UG/KG	1
DIMETHYL PHTHALATE	37.5	399	ND		UG/KG	1
ACENAPHTHYLENE	47.2	399	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-C1-01-05-1	ARDL Lab No.:	300554-01 (cont'd)
Desc/Location:	STATION C1 @ 0-1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1439	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/18/1997
Amount Used:	30 g	QC Batch:	B2281
% Moisture:	17.3	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	38.7	399	ND		UG/KG	1
3-NITROANILINE	94.3	399	ND		UG/KG	1
ACENAPHTHENE	38.7	399	ND		UG/KG	1
2,4-DINITROPHENOL	36.3	399	ND		UG/KG	1
4-NITROPHENOL	56.8	399	ND		UG/KG	1
DIBENZOFURAN	41.1	399	ND		UG/KG	1
2,4-DINITROTOLUENE	36.3	399	ND		UG/KG	1
DIETHYLPHTHALATE	43.5	399	ND		UG/KG	1
4-CHLOROPHENYL-PHENYLETHER	41.1	399	ND		UG/KG	1
FLUORENE	42.3	399	ND		UG/KG	1
4-NITROANILINE	71.3	399	ND		UG/KG	1
4,6-DINITRO-2-METHYLPHENOL	55.6	399	ND		UG/KG	1
N-NITROSODIPHENYLAMINE	47.2	399	ND		UG/KG	1
4-BROMOPHENYL-PHENYLETHER	42.3	399	ND		UG/KG	1
PHENANTHRENE	36.3	399	ND		UG/KG	1
HEXACHLOROBENZENE	37.5	399	ND		UG/KG	1
PENTACHLOROPHENOL	67.7	399	ND		UG/KG	1
ANTHRACENE	35.1	399	ND		UG/KG	1
DI-N-BUTYLPHTHALATE	26.6	399	ND		UG/KG	1
FLUORANTHENE	33.9	399	ND		UG/KG	1
PYRENE	33.9	399	ND		UG/KG	1
BUTYLBENZYLPHTHALATE	36.3	399	ND		UG/KG	1
3,3'-DICHLOROBENZIDINE	285	399	ND		UG/KG	1
BENZO(a)ANTHRACENE	29.0	399	ND		UG/KG	1
CHRYSENE	30.2	399	ND		UG/KG	1
BIS(2-ETHYLHEXYL)PHTHALATE	37.5	399	ND		UG/KG	1
DI-N-OCTYL PHTHALATE	33.9	399	ND		UG/KG	1
BENZO(b)FLUORANTHENE	64.1	399	ND		UG/KG	1
BENZO(k)FLUORANTHENE	79.8	399	ND		UG/KG	1
BENZO(a)PYRENE	35.1	399	ND		UG/KG	1
INDENO(1,2,3-cd)PYRENE	39.9	399	ND		UG/KG	1
DIBENZO(a,h)ANTHRACENE	37.5	399	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-C1-01-05-1	ARDL Lab No.:	300554-01 (cont'd)
Desc/Location:	STATION C1 @ 0-1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1439	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/18/1997
Amount Used:	30 g	QC Batch:	B2281
% Moisture:	17.3	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	41.1	399	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	30-115	79%
2-FLUOROPHENOL	25-121	73%
D5 NITROBENZENE	23-120	71%
2,4,6-TRIBROMOPHENOL	19-122	76%
D5 PHENOL	24-113	77%
D14 TERPHENYL	18-137	82%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-C1-01-05-1

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300554 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300554-01

Sample wt/vol: 30.0 (g/mL) g Lab File ID: >W8105

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. 17.3 dec. --- Date Extracted: 6/16/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/18/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ---

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	10544500	Sulfur, mol.	22.06	190.	JN
2.		Unknown	35.66	310.	J
3.					
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-D-01-06-00	ARDL Lab No.:	300542-13
Desc/Location:	7D	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1600	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/09/1997
Amount Used:	1000 mL	QC Batch:	B2247
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-D-01-06-00	ARDL Lab No.:	300542-13 (cont'd)
Desc/Location:	7D	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1600	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/09/1997
Amount Used:	1000 mL	QC Batch:	B2247
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-D-01-06-00	ARDL Lab No.:	300542-13 (cont'd)
Desc/Location:	7D	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1600	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/09/1997
Amount Used:	1000 mL	QC Batch:	B2247
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	103%
2-FLUOROPHENOL	21-110	40%
D5 NITROBENZENE	35-114	91%
2,4,6-TRIBROMOPHENOL	10-123	83%
D5 PHENOL	10-94	29%
D14 TERPHENYL	33-141	104%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-D-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300542 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300542-13

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >W8033

Level: (low/med) LOW Date Received: 5/31/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/03/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/09/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.1

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	6.46	20.	J B
2.		Unknown	6.70	7.	J B
3.		Unknown	7.17	20.	J B
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-D1-01-05-1	ARDL Lab No.:	300542-05
Desc/Location:	7D1	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1600	Prep. Date:	06/06/1997
Matrix:	SOIL	Analysis Date:	06/09/1997
Amount Used:	30 g	QC Batch:	B2248
% Moisture:	33.7	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	64.9	498	ND		UG/KG	1
BIS(-2-CHLOROETHYL)ETHER	61.8	498	ND		UG/KG	1
2-CHLOROPHENOL	63.3	498	ND		UG/KG	1
1,3-DICHLOROBENZENE	67.9	498	ND		UG/KG	1
1,4-DICHLOROBENZENE	63.3	498	ND		UG/KG	1
BENZYL ALCOHOL	60.3	498	ND		UG/KG	1
1,2-DICHLOROBENZENE	83.0	498	ND		UG/KG	1
2-METHYLPHENOL	67.9	498	ND		UG/KG	1
2,2'-OXYBIS(1-CHLOROPROPANE)	73.9	498	ND		UG/KG	1
4-METHYLPHENOL	64.9	498	ND		UG/KG	1
N-NITROSO-DI-N-PROPYLAMINE	69.4	498	ND		UG/KG	1
HEXACHLOROETHANE	73.9	498	ND		UG/KG	1
NITROBENZENE	52.8	498	ND		UG/KG	1
ISOPHORONE	42.2	498	ND		UG/KG	1
2-NITROPHENOL	58.8	498	ND		UG/KG	1
2,4-DIMETHYLPHENOL	49.8	498	ND		UG/KG	1
BENZOIC ACID	124	498	ND		UG/KG	1
BIS(-2-CHLOROETHOXY)METHANE	57.3	498	ND		UG/KG	1
2,4-DICHLOROPHENOL	66.4	498	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	57.3	498	ND		UG/KG	1
NAPHTHALENE	57.3	498	ND		UG/KG	1
4-CHLOROANILINE	208	498	ND		UG/KG	1
HEXACHLOROBUTADIENE	61.8	498	ND		UG/KG	1
4-CHLORO-3-METHYLPHENOL	54.3	498	ND		UG/KG	1
2-METHYLNAPHTHALENE	54.3	498	ND		UG/KG	1
HEXACHLOROCYCLOPENTADIENE	51.3	498	ND		UG/KG	1
2,4,6-TRICHLOROPHENOL	49.8	498	ND		UG/KG	1
2,4,5-TRICHLOROPHENOL	55.8	498	ND		UG/KG	1
2-CHLORONAPHTHALENE	52.8	498	ND		UG/KG	1
2-NITROANILINE	39.2	498	ND		UG/KG	1
DIMETHYL PHTHALATE	46.8	498	ND		UG/KG	1
ACENAPHTHYLENE	58.8	498	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-D1-01-05-1	ARDL Lab No.:	300542-05 (cont'd)
Desc/Location:	7D1	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1600	Prep. Date:	06/06/1997
Matrix:	SOIL	Analysis Date:	06/09/1997
Amount Used:	30 g	QC Batch:	B2248
% Moisture:	33.7	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	48.3	498	ND		UG/KG	1
3-NITROANILINE	118	498	ND		UG/KG	1
ACENAPHTHENE	48.3	498	ND		UG/KG	1
2,4-DINITROPHENOL	45.2	498	ND		UG/KG	1
4-NITROPHENOL	70.9	498	ND		UG/KG	1
DIBENZOFURAN	51.3	498	ND		UG/KG	1
2,4-DINITROTOLUENE	45.2	498	ND		UG/KG	1
DIETHYLPHTHALATE	54.3	498	ND		UG/KG	1
4-CHLOROPHENYL-PHENYLETHER	51.3	498	ND		UG/KG	1
FLUORENE	52.8	498	ND		UG/KG	1
4-NITROANILINE	89.0	498	ND		UG/KG	1
4,6-DINITRO-2-METHYLPHENOL	69.4	498	ND		UG/KG	1
N-NITROSODIPHENYLAMINE	58.8	498	ND		UG/KG	1
4-BROMOPHENYL-PHENYLETHER	52.8	498	ND		UG/KG	1
PHENANTHRENE	45.2	498	ND		UG/KG	1
HEXACHLOROBENZENE	46.8	498	ND		UG/KG	1
PENTACHLOROPHENOL	84.5	498	ND		UG/KG	1
ANTHRACENE	43.7	498	ND		UG/KG	1
DI-N-BUTYLPHTHALATE	33.2	498	ND		UG/KG	1
FLUORANTHENE	42.2	498	ND		UG/KG	1
PYRENE	42.2	498	ND		UG/KG	1
BUTYLBENZYLPHTHALATE	45.2	498	ND		UG/KG	1
3,3'-DICHLOROBENZIDINE	356	498	ND		UG/KG	1
BENZO(a)ANTHRACENE	36.2	498	ND		UG/KG	1
CHRYSENE	37.7	498	ND		UG/KG	1
BIS(2-ETHYLHEXYL)PHTHALATE	46.8	498	ND		UG/KG	1
DI-N-OCTYL PHTHALATE	42.2	498	ND		UG/KG	1
BENZO(b)FLUORANTHENE	79.9	498	ND		UG/KG	1
BENZO(k)FLUORANTHENE	99.5	498	ND		UG/KG	1
BENZO(a)PYRENE	43.7	498	ND		UG/KG	1
INDENO(1,2,3-cd)PYRENE	49.8	498	ND		UG/KG	1
DIBENZO(a,h)ANTHRACENE	46.8	498	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-D1-01-05-1	ARDL Lab No.:	300542-05 (cont'd)
Desc/Location:	7D1	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1600	Prep. Date:	06/06/1997
Matrix:	SOIL	Analysis Date:	06/09/1997
Amount Used:	30 g	QC Batch:	B2248
% Moisture:	33.7	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	51.3	498	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	30-115	90%
2-FLUOROPHENOL	25-121	89%
D5 NITROBENZENE	23-120	80%
2,4,6-TRIBROMOPHENOL	19-122	91%
D5 PHENOL	24-113	93%
D14 TERPHENYL	18-137	93%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-D1-01-05-1

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300542 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300542-05

Sample wt/vol: 30.0 (g/mL) g Lab File ID: >W8039

Level: (low/med) LOW Date Received: 5/31/97

% Moisture: not dec. 33.7 dec. --- Date Extracted: 6/06/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/09/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ---

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	22.23	5200.	J
2.		Unknown alkane	26.17	970.	J
3.		Unknown alkane	27.93	1400.	J
4.		Unknown alkane	33.16	1700.	J
5.		Unknown	33.81	2200.	J
6.		Unknown	34.31	590.	J
7.		Unknown	35.11	620.	J
8.		Unknown	35.34	1100.	J
9.		Unknown	35.49	1000.	J
10.		Unknown alkane	35.61	720.	J
11.		Unknown	35.71	900.	J
12.		Unknown	35.84	8400.	J
13.		Unknown	35.93	2100.	J
14.		Unknown	36.00	1100.	J
15.		Unknown	36.11	3600.	J
16.		Unknown	36.25	3200.	J
17.		Unknown	36.50	1400.	J
18.		Unknown	36.98	2600.	J
19.		Unknown	37.53	1100.	J
20.		Unknown	37.77	3200.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-E-01-06-00	ARDL Lab No.:	300555-10
Desc/Location:	7E	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1130	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/19/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
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Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-E-01-06-00	ARDL Lab No.:	300555-10 (cont'd)
Desc/Location:	7E	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1130	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/19/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-E-01-06-00	ARDL Lab No.:	300555-10 (cont'd)
Desc/Location:	7E	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1130	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/19/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	63%
2-FLUOROPHENOL	21-110	33%
D5 NITROBENZENE	35-114	60%
2,4,6-TRIBROMOPHENOL	10-123	71%
D5 PHENOL	10-94	23%
D14 TERPHENYL	33-141	65%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-E-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300555 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300555-10

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1565

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/13/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/19/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.2

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-E1-01-05-1	ARDL Lab No.:	300554-09
Desc/Location:	E1 @ 1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1129	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/18/1997
Amount Used:	30 g	QC Batch:	B2281
% Moisture:	18.7	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	52.9	406	ND		UG/KG	1
BIS(-2-CHLOROETHYL)ETHER	50.4	406	ND		UG/KG	1
2-CHLOROPHENOL	51.7	406	ND		UG/KG	1
1,3-DICHLOROBENZENE	55.4	406	ND		UG/KG	1
1,4-DICHLOROBENZENE	51.7	406	ND		UG/KG	1
BENZYL ALCOHOL	49.2	406	ND		UG/KG	1
1,2-DICHLOROBENZENE	67.7	406	ND		UG/KG	1
2-METHYLPHENOL	55.4	406	ND		UG/KG	1
2,2'-OXYBIS(1-CHLOROPROPANE)	60.3	406	ND		UG/KG	1
4-METHYLPHENOL	52.9	406	ND		UG/KG	1
N-NITROSO-DI-N-PROPYLAMINE	56.6	406	ND		UG/KG	1
HEXACHLOROETHANE	60.3	406	ND		UG/KG	1
NITROBENZENE	43.1	406	ND		UG/KG	1
ISOPHORONE	34.4	406	ND		UG/KG	1
2-NITROPHENOL	48.0	406	ND		UG/KG	1
2,4-DIMETHYLPHENOL	40.6	406	ND		UG/KG	1
BENZOIC ACID	101	406	ND		UG/KG	1
BIS(-2-CHLOROETHOXY)METHANE	46.7	406	ND		UG/KG	1
2,4-DICHLOROPHENOL	54.1	406	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	46.7	406	ND		UG/KG	1
NAPHTHALENE	46.7	406	ND		UG/KG	1
4-CHLOROANILINE	170	406	ND		UG/KG	1
HEXACHLOROBUTADIENE	50.4	406	ND		UG/KG	1
4-CHLORO-3-METHYLPHENOL	44.3	406	ND		UG/KG	1
2-METHYLNAPHTHALENE	44.3	406	ND		UG/KG	1
HEXACHLOROCYCLOPENTADIENE	41.8	406	ND		UG/KG	1
2,4,6-TRICHLOROPHENOL	40.6	406	ND		UG/KG	1
2,4,5-TRICHLOROPHENOL	45.5	406	ND		UG/KG	1
2-CHLORONAPHTHALENE	43.1	406	ND		UG/KG	1
2-NITROANILINE	32.0	406	ND		UG/KG	1
DIMETHYL PHTHALATE	38.1	406	ND		UG/KG	1
ACENAPHTHYLENE	48.0	406	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-E1-01-05-1	ARDL Lab No.:	300554-09 (cont'd)
Desc/Location:	E1 @ 1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1129	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/18/1997
Amount Used:	30 g	QC Batch:	B2281
% Moisture:	18.7	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	39.4	406	ND		UG/KG	1
3-NITROANILINE	95.9	406	ND		UG/KG	1
ACENAPHTHENE	39.4	406	ND		UG/KG	1
2,4-DINITROPHENOL	36.9	406	ND		UG/KG	1
4-NITROPHENOL	57.8	406	ND		UG/KG	1
DIBENZOFURAN	41.8	406	ND		UG/KG	1
2,4-DINITROTOLUENE	36.9	406	ND		UG/KG	1
DIETHYLPHTHALATE	44.3	406	ND		UG/KG	1
4-CHLOROPHENYL-PHENYLETHER	41.8	406	ND		UG/KG	1
FLUORENE	43.1	406	ND		UG/KG	1
4-NITROANILINE	72.6	406	ND		UG/KG	1
4,6-DINITRO-2-METHYLPHENOL	56.6	406	ND		UG/KG	1
N-NITROSODIPHENYLAMINE	48.0	406	ND		UG/KG	1
4-BROMOPHENYL-PHENYLETHER	43.1	406	ND		UG/KG	1
PHENANTHRENE	36.9	406	ND		UG/KG	1
HEXACHLOROBENZENE	38.1	406	ND		UG/KG	1
PENTACHLOROPHENOL	68.9	406	ND		UG/KG	1
ANTHRACENE	35.7	406	ND		UG/KG	1
DI-N-BUTYLPHTHALATE	27.1	406	ND		UG/KG	1
FLUORANTHENE	34.4	406	ND		UG/KG	1
PYRENE	34.4	406	ND		UG/KG	1
BUTYLBENZYLPHTHALATE	36.9	406	ND		UG/KG	1
3,3'-DICHLOROBENZIDINE	290	406	ND		UG/KG	1
BENZO(a)ANTHRACENE	29.5	406	ND		UG/KG	1
CHRYSENE	30.8	406	ND		UG/KG	1
BIS(2-ETHYLHEXYL)PHTHALATE	38.1	406	ND		UG/KG	1
DI-N-OCTYL PHTHALATE	34.4	406	ND		UG/KG	1
BENZO(b)FLUORANTHENE	65.2	406	ND		UG/KG	1
BENZO(k)FLUORANTHENE	81.2	406	ND		UG/KG	1
BENZO(a)PYRENE	35.7	406	ND		UG/KG	1
INDENO(1,2,3-cd)PYRENE	40.6	406	ND		UG/KG	1
DIBENZO(a,h)ANTHRACENE	38.1	406	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-E1-01-05-1	ARDL Lab No.:	300554-09 (cont'd)
Desc/Location:	E1 @ 1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1129	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/18/1997
Amount Used:	30 g	QC Batch:	B2281
% Moisture:	18.7	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	41.8	406	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	30-115	72%
2-FLUOROPHENOL	25-121	59%
D5 NITROBENZENE	23-120	55%
2,4,6-TRIBROMOPHENOL	19-122	67%
D5 PHENOL	24-113	64%
D14 TERPHENYL	18-137	77%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-E1-01-05-1

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300554 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300554-09

Sample wt/vol: 30.0 (g/mL) g Lab File ID: >W8109

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. 18.7 dec. --- Date Extracted: 6/16/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/18/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ---

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	35.33	230.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-F-01-06-00	ARDL Lab No.:	300555-06
Desc/Location:	STATION F	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	0909	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/19/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-F-01-06-00	ARDL Lab No.:	300555-06 (cont'd)
Desc/Location:	STATION F	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	0909	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/19/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-F-01-06-00	ARDL Lab No.:	300555-06 (cont'd)
Desc/Location:	STATION F	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	0909	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/19/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	66%
2-FLUOROPHENOL	21-110	33%
D5 NITROBENZENE	35-114	64%
2,4,6-TRIBROMOPHENOL	10-123	71%
D5 PHENOL	10-94	24%
D14 TERPHENYL	33-141	70%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-F-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300555 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300555-06

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1561

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/13/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/19/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-F1-01-05-01	ARDL Lab No.:	300554-02
Desc/Location:	STATION F1 @ 0-1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	0910	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/18/1997
Amount Used:	30 g	QC Batch:	B2281
% Moisture:	18.6	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	52.8	405	ND		UG/KG	1
BIS(-2-CHLOROETHYL)ETHER	50.4	405	ND		UG/KG	1
2-CHLOROPHENOL	51.6	405	ND		UG/KG	1
1,3-DICHLOROBENZENE	55.3	405	ND		UG/KG	1
1,4-DICHLOROBENZENE	51.6	405	ND		UG/KG	1
BENZYL ALCOHOL	49.1	405	ND		UG/KG	1
1,2-DICHLOROBENZENE	67.6	405	ND		UG/KG	1
2-METHYLPHENOL	55.3	405	ND		UG/KG	1
2,2'-OXYBIS(1-CHLOROPROPANE)	60.2	405	ND		UG/KG	1
4-METHYLPHENOL	52.8	405	ND		UG/KG	1
N-NITROSO-DI-N-PROPYLAMINE	56.5	405	ND		UG/KG	1
HEXACHLOROETHANE	60.2	405	ND		UG/KG	1
NITROBENZENE	43.0	405	ND		UG/KG	1
ISOPHORONE	34.4	405	ND		UG/KG	1
2-NITROPHENOL	47.9	405	ND		UG/KG	1
2,4-DIMETHYLPHENOL	40.5	405	ND		UG/KG	1
BENZOIC ACID	101	405	ND		UG/KG	1
BIS(-2-CHLOROETHOXY)METHANE	46.7	405	ND		UG/KG	1
2,4-DICHLOROPHENOL	54.1	405	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	46.7	405	ND		UG/KG	1
NAPHTHALENE	46.7	405	ND		UG/KG	1
4-CHLOROANILINE	170	405	ND		UG/KG	1
HEXACHLOROBUTADIENE	50.4	405	ND		UG/KG	1
4-CHLORO-3-METHYLPHENOL	44.2	405	ND		UG/KG	1
2-METHYLNAPHTHALENE	44.2	405	ND		UG/KG	1
HEXACHLOROCYCLOPENTADIENE	41.8	405	ND		UG/KG	1
2,4,6-TRICHLOROPHENOL	40.5	405	ND		UG/KG	1
2,4,5-TRICHLOROPHENOL	45.5	405	ND		UG/KG	1
2-CHLORONAPHTHALENE	43.0	405	ND		UG/KG	1
2-NITROANILINE	31.9	405	ND		UG/KG	1
DIMETHYL PHTHALATE	38.1	405	ND		UG/KG	1
ACENAPHTHYLENE	47.9	405	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-F1-01-05-01	ARDL Lab No.:	300554-02 (cont'd)
Desc/Location:	STATION F1 @ 0-1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	0910	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/18/1997
Amount Used:	30 g	QC Batch:	B2281
% Moisture:	18.6	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	39.3	405	ND		UG/KG	1
3-NITROANILINE	95.8	405	ND		UG/KG	1
ACENAPHTHENE	39.3	405	ND		UG/KG	1
2,4-DINITROPHENOL	36.9	405	ND		UG/KG	1
4-NITROPHENOL	57.7	405	ND		UG/KG	1
DIBENZOFURAN	41.8	405	ND		UG/KG	1
2,4-DINITROTOLUENE	36.9	405	ND		UG/KG	1
DIETHYLPHTHALATE	44.2	405	ND		UG/KG	1
4-CHLOROPHENYL-PHENYLETHER	41.8	405	ND		UG/KG	1
FLUORENE	43.0	405	ND		UG/KG	1
4-NITROANILINE	72.5	405	ND		UG/KG	1
4,6-DINITRO-2-METHYLPHENOL	56.5	405	ND		UG/KG	1
N-NITROSODIPHENYLAMINE	47.9	405	ND		UG/KG	1
4-BROMOPHENYL-PHENYLETHER	43.0	405	ND		UG/KG	1
PHENANTHRENE	36.9	405	ND		UG/KG	1
HEXACHLOROBENZENE	38.1	405	ND		UG/KG	1
PENTACHLOROPHENOL	68.8	405	ND		UG/KG	1
ANTHRACENE	35.6	405	ND		UG/KG	1
DI-N-BUTYLPHTHALATE	27.0	405	ND		UG/KG	1
FLUORANTHENE	34.4	405	ND		UG/KG	1
PYRENE	34.4	405	ND		UG/KG	1
BUTYLBENZYLPHTHALATE	36.9	405	ND		UG/KG	1
3,3'-DICHLOROBENZIDINE	290	405	ND		UG/KG	1
BENZO(a)ANTHRACENE	29.5	405	ND		UG/KG	1
CHRYSENE	30.7	405	ND		UG/KG	1
BIS(2-ETHYLHEXYL)PHTHALATE	38.1	405	ND		UG/KG	1
DI-N-OCTYL PHTHALATE	34.4	405	ND		UG/KG	1
BENZO(b)FLUORANTHENE	65.1	405	ND		UG/KG	1
BENZO(k)FLUORANTHENE	81.1	405	ND		UG/KG	1
BENZO(a)PYRENE	35.6	405	ND		UG/KG	1
INDENO(1,2,3-cd)PYRENE	40.5	405	ND		UG/KG	1
DIBENZO(a,h)ANTHRACENE	38.1	405	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-F1-01-05-01	ARDL Lab No.:	300554-02 (cont'd)
Desc/Location:	STATION F1 @ 0-1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	0910	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/18/1997
Amount Used:	30 g	QC Batch:	B2281
% Moisture:	18.6	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	41.8	405	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	30-115	66%
2-FLUOROPHENOL	25-121	55%
D5 NITROBENZENE	23-120	54%
2,4,6-TRIBROMOPHENOL	19-122	62%
D5 PHENOL	24-113	59%
D14 TERPHENYL	18-137	70%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-F1-01-05-01

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300554 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300554-02

Sample wt/vol: 30.0 (g/mL) g Lab File ID: >W8106

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. 18.6 dec. --- Date Extracted: 6/16/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/18/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ---

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 10544500	Sulfur, mol.	22.07	270.	JN
2.	Unknown	34.97	200.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-G-01-06-00	ARDL Lab No.:	300555-09
Desc/Location:	7G	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1040	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/19/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-G-01-06-00	ARDL Lab No.:	300555-09 (cont'd)
Desc/Location:	7G	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1040	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/19/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-G-01-06-00	ARDL Lab No.:	300555-09 (cont'd)
Desc/Location:	7G	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1040	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/19/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	59%
2-FLUOROPHENOL	21-110	32%
D5 NITROBENZENE	35-114	57%
2,4,6-TRIBROMOPHENOL	10-123	67%
D5 PHENOL	10-94	24%
D14 TERPHENYL	33-141	65%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-G-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300555 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300555-09

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1564

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/13/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/19/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-G1-01-05-1	ARDL Lab No.:	300554-13
Desc/Location:	SITE G1 @ 1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1045	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/18/1997
Amount Used:	30 g	QC Batch:	B2281
% Moisture:	24.4	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	56.9	437	ND		UG/KG	1
BIS(-2-CHLOROETHYL)ETHER	54.2	437	ND		UG/KG	1
2-CHLOROPHENOL	55.6	437	ND		UG/KG	1
1,3-DICHLOROBENZENE	59.5	437	ND		UG/KG	1
1,4-DICHLOROBENZENE	55.6	437	ND		UG/KG	1
BENZYL ALCOHOL	52.9	437	ND		UG/KG	1
1,2-DICHLOROBENZENE	72.8	437	ND		UG/KG	1
2-METHYLPHENOL	59.5	437	ND		UG/KG	1
2,2'-OXYBIS(1-CHLOROPROPANE)	64.8	437	ND		UG/KG	1
4-METHYLPHENOL	56.9	437	ND		UG/KG	1
N-NITROSO-DI-N-PROPYLAMINE	60.8	437	ND		UG/KG	1
HEXACHLOROETHANE	64.8	437	ND		UG/KG	1
NITROBENZENE	46.3	437	ND		UG/KG	1
ISOPHORONE	37.0	437	ND		UG/KG	1
2-NITROPHENOL	51.6	437	ND		UG/KG	1
2,4-DIMETHYLPHENOL	43.7	437	ND		UG/KG	1
BENZOIC ACID	108	437	ND		UG/KG	1
BIS(-2-CHLOROETHOXY)METHANE	50.3	437	ND		UG/KG	1
2,4-DICHLOROPHENOL	58.2	437	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	50.3	437	ND		UG/KG	1
NAPHTHALENE	50.3	437	ND		UG/KG	1
4-CHLOROANILINE	183	437	ND		UG/KG	1
HEXACHLOROBUTADIENE	54.2	437	ND		UG/KG	1
4-CHLORO-3-METHYLPHENOL	47.6	437	ND		UG/KG	1
2-METHYLNAPHTHALENE	47.6	437	ND		UG/KG	1
HEXACHLOROCYCLOPENTADIENE	45.0	437	ND		UG/KG	1
2,4,6-TRICHLOROPHENOL	43.7	437	ND		UG/KG	1
2,4,5-TRICHLOROPHENOL	48.9	437	ND		UG/KG	1
2-CHLORONAPHTHALENE	46.3	437	ND		UG/KG	1
2-NITROANILINE	34.4	437	ND		UG/KG	1
DIMETHYL PHTHALATE	41.0	437	ND		UG/KG	1
ACENAPHTHYLENE	51.6	437	ND		UG/KG	1

ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-G1-01-05-1	ARDL Lab No.:	300554-13 (cont'd)
Desc/Location:	SITE G1 @ 1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1045	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/18/1997
Amount Used:	30 g	QC Batch:	B2281
% Moisture:	24.4	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	42.3	437	ND		UG/KG	1
3-NITROANILINE	103	437	ND		UG/KG	1
ACENAPHTHENE	42.3	437	ND		UG/KG	1
2,4-DINITROPHENOL	39.7	437	ND		UG/KG	1
4-NITROPHENOL	62.2	437	ND		UG/KG	1
DIBENZOFURAN	45.0	437	ND		UG/KG	1
2,4-DINITROTOLUENE	39.7	437	ND		UG/KG	1
DIETHYLPHTHALATE	47.6	437	ND		UG/KG	1
4-CHLOROPHENYL-PHENYLETHER	45.0	437	ND		UG/KG	1
FLUORENE	46.3	437	ND		UG/KG	1
4-NITROANILINE	78.0	437	ND		UG/KG	1
4,6-DINITRO-2-METHYLPHENOL	60.8	437	ND		UG/KG	1
N-NITROSODIPHENYLAMINE	51.6	437	ND		UG/KG	1
4-BROMOPHENYL-PHENYLETHER	46.3	437	ND		UG/KG	1
PHENANTHRENE	39.7	437	ND		UG/KG	1
HEXACHLOROBENZENE	41.0	437	ND		UG/KG	1
PENTACHLOROPHENOL	74.1	437	ND		UG/KG	1
ANTHRACENE	38.4	437	ND		UG/KG	1
DI-N-BUTYLPHTHALATE	29.1	437	ND		UG/KG	1
FLUORANTHENE	37.0	437	ND		UG/KG	1
PYRENE	37.0	437	ND		UG/KG	1
BUTYLBENZYLPHTHALATE	39.7	437	ND		UG/KG	1
3,3'-DICHLOROBENZIDINE	312	437	ND		UG/KG	1
BENZO(a)ANTHRACENE	31.7	437	ND		UG/KG	1
CHRYSENE	33.1	437	ND		UG/KG	1
BIS(2-ETHYLHEXYL)PHTHALATE	41.0	437	ND		UG/KG	1
DI-N-OCTYL PHTHALATE	37.0	437	ND		UG/KG	1
BENZO(b)FLUORANTHENE	70.1	437	ND		UG/KG	1
BENZO(k)FLUORANTHENE	87.3	437	ND		UG/KG	1
BENZO(a)PYRENE	38.4	437	ND		UG/KG	1
INDENO(1,2,3-cd)PYRENE	43.7	437	ND		UG/KG	1
DIBENZO(a,h)ANTHRACENE	41.0	437	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-G1-01-05-1	ARDL Lab No.:	300554-13 (cont'd)
Desc/Location:	SITE G1 @ 1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1045	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/18/1997
Amount Used:	30 g	QC Batch:	B2281
% Moisture:	24.4	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	45.0	437	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	30-115	67%
2-FLUOROPHENOL	25-121	61%
D5 NITROBENZENE	23-120	57%
2,4,6-TRIBROMOPHENOL	19-122	64%
D5 PHENOL	24-113	64%
D14 TERPHENYL	18-137	71%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-G1-01-05-01

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300554 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300554-13

Sample wt/vol: 30.0 (g/mL) g Lab File ID: >W8110

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. 24.4 dec. --- Date Extracted: 6/16/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/18/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ---

Number TICs found: 16

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	4.45	400.	J
2.	Unknown	20.45	350.	J
3.	Unknown	21.28	200.	J
4.	Unknown	22.11	2100.	J
5.	Unknown alkane	27.81	280.	J
6.	Unknown alkane	32.94	530.	J
7.	Unknown	33.31	700.	J
8.	Unknown	33.57	330.	J
9.	Unknown	34.09	300.	J
10.	Unknown	34.87	300.	J
11.	Unknown	34.97	590.	J
12.	Unknown	35.21	500.	J
13.	Unknown alkane	35.50	180.	J
14.	Unknown	35.57	190.	J
15.	Unknown	35.70	2900.	J
16.	Unknown	35.97	540.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/19/1997

Project Name: IOWA ARMY AMMUNITION Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-H-01-06-00	ARDL Lab No.:	300552-11
Desc/Location:	7H	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1415	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	1000 mL	QC Batch:	B2282
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/19/1997

Project Name: IOWA ARMY AMMUNITION Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-H-01-06-00	ARDL Lab No.:	300552-11 (cont'd)
Desc/Location:	7H	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1415	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	1000 mL	QC Batch:	B2282
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/19/1997

Project Name: IOWA ARMY AMMUNITION Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-H-01-06-00	ARDL Lab No.:	300552-11 (cont'd)
Desc/Location:	7H	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1415	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	1000 mL	QC Batch:	B2282
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	74%
2-FLUOROPHENOL	21-110	31%
D5 NITROBENZENE	35-114	70%
2,4,6-TRIBROMOPHENOL	10-123	63%
D5 PHENOL	10-94	22%
D14 TERPHENYL	33-141	72%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-H-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300552 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300552-11

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >W8101

Level: (low/med) LOW Date Received: 6/10/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/11/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/18/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.3

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	6.38	5.	J B
2.		Unknown	7.10	5.	J B
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/19/1997

Project Name: IOWA ARMY AMMUNITION Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-H1-01-05-01	ARDL Lab No.:	300552-03
Desc/Location:	7H1	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1410	Prep. Date:	06/10/1997
Matrix:	SEDIMENT	Analysis Date:	06/11/1997
Amount Used:	30 g	QC Batch:	B2283
% Moisture:	17.9	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	52.4	402	ND		UG/KG	1
BIS(-2-CHLOROETHYL)ETHER	49.9	402	ND		UG/KG	1
2-CHLOROPHENOL	51.2	402	ND		UG/KG	1
1,3-DICHLOROBENZENE	54.8	402	ND		UG/KG	1
1,4-DICHLOROBENZENE	51.2	402	ND		UG/KG	1
BENZYL ALCOHOL	48.7	402	ND		UG/KG	1
1,2-DICHLOROBENZENE	67.0	402	ND		UG/KG	1
2-METHYLPHENOL	54.8	402	ND		UG/KG	1
2,2'-OXYBIS(1-CHLOROPROPANE)	59.7	402	ND		UG/KG	1
4-METHYLPHENOL	52.4	402	ND		UG/KG	1
N-NITROSO-DI-N-PROPYLAMINE	56.0	402	ND		UG/KG	1
HEXACHLOROETHANE	59.7	402	ND		UG/KG	1
NITROBENZENE	42.6	402	ND		UG/KG	1
ISOPHORONE	34.1	402	ND		UG/KG	1
2-NITROPHENOL	47.5	402	ND		UG/KG	1
2,4-DIMETHYLPHENOL	40.2	402	ND		UG/KG	1
BENZOIC ACID	99.9	402	ND		UG/KG	1
BIS(-2-CHLOROETHOXY)METHANE	46.3	402	ND		UG/KG	1
2,4-DICHLOROPHENOL	53.6	402	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	46.3	402	ND		UG/KG	1
NAPHTHALENE	46.3	402	ND		UG/KG	1
4-CHLOROANILINE	168	402	ND		UG/KG	1
HEXACHLOROBUTADIENE	49.9	402	ND		UG/KG	1
4-CHLORO-3-METHYLPHENOL	43.8	402	ND		UG/KG	1
2-METHYLNAPHTHALENE	43.8	402	ND		UG/KG	1
HEXACHLOROCYCLOPENTADIENE	41.4	402	ND		UG/KG	1
2,4,6-TRICHLOROPHENOL	40.2	402	ND		UG/KG	1
2,4,5-TRICHLOROPHENOL	45.1	402	ND		UG/KG	1
2-CHLORONAPHTHALENE	42.6	402	ND		UG/KG	1
2-NITROANILINE	31.7	402	ND		UG/KG	1
DIMETHYL PHTHALATE	37.8	402	ND		UG/KG	1
ACENAPHTHYLENE	47.5	402	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/19/1997

Project Name: IOWA ARMY AMMUNITION Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-H1-01-05-01	ARDL Lab No.:	300552-03 (cont'd)
Desc/Location:	7H1	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1410	Prep. Date:	06/10/1997
Matrix:	SEDIMENT	Analysis Date:	06/11/1997
Amount Used:	30 g	QC Batch:	B2283
% Moisture:	17.9	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	39.0	402	ND		UG/KG	1
3-NITROANILINE	95.0	402	ND		UG/KG	1
ACENAPHTHENE	39.0	402	ND		UG/KG	1
2,4-DINITROPHENOL	36.5	402	ND		UG/KG	1
4-NITROPHENOL	57.2	402	ND		UG/KG	1
DIBENZOFURAN	41.4	402	ND		UG/KG	1
2,4-DINITROTOLUENE	36.5	402	ND		UG/KG	1
DIETHYLPHTHALATE	43.8	402	ND		UG/KG	1
4-CHLOROPHENYL-PHENYLETHER	41.4	402	ND		UG/KG	1
FLUORENE	42.6	402	ND		UG/KG	1
4-NITROANILINE	71.9	402	ND		UG/KG	1
4,6-DINITRO-2-METHYLPHENOL	56.0	402	ND		UG/KG	1
N-NITROSODIPHENYLAMINE	47.5	402	ND		UG/KG	1
4-BROMOPHENYL-PHENYLETHER	42.6	402	ND		UG/KG	1
PHENANTHRENE	36.5	402	ND		UG/KG	1
HEXACHLOROBENZENE	37.8	402	ND		UG/KG	1
PENTACHLOROPHENOL	68.2	402	ND		UG/KG	1
ANTHRACENE	35.3	402	ND		UG/KG	1
DI-N-BUTYLPHTHALATE	26.8	402	ND		UG/KG	1
FLUORANTHENE	34.1	402	ND		UG/KG	1
PYRENE	34.1	402	ND		UG/KG	1
BUTYLBENZYLPHTHALATE	36.5	402	ND		UG/KG	1
3,3'-DICHLOROBENZIDINE	287	402	ND		UG/KG	1
BENZO(a)ANTHRACENE	29.2	402	ND		UG/KG	1
CHRYSENE	30.5	402	ND		UG/KG	1
BIS(2-ETHYLHEXYL)PHTHALATE	37.8	402	ND		UG/KG	1
DI-N-OCTYL PHTHALATE	34.1	402	ND		UG/KG	1
BENZO(b)FLUORANTHENE	64.6	402	ND		UG/KG	1
BENZO(k)FLUORANTHENE	80.4	402	ND		UG/KG	1
BENZO(a)PYRENE	35.3	402	ND		UG/KG	1
INDENO(1,2,3-cd)PYRENE	40.2	402	ND		UG/KG	1
DIBENZO(a,h)ANTHRACENE	37.8	402	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/19/1997

Project Name: IOWA ARMY AMMUNITION Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-H1-01-05-01	ARDL Lab No.:	300552-03 (cont'd)
Desc/Location:	7H1	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1410	Prep. Date:	06/10/1997
Matrix:	SEDIMENT	Analysis Date:	06/11/1997
Amount Used:	30 g	QC Batch:	B2283
% Moisture:	17.9	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	41.4	402	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	30-115	80%
2-FLUOROPHENOL	25-121	66%
D5 NITROBENZENE	23-120	67%
2,4,6-TRIBROMOPHENOL	19-122	74%
D5 PHENOL	24-113	70%
D14 TERPHENYL	18-137	85%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-H1-01-05-01

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300552 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300552-03

Sample wt/vol: 30.0 (g/mL) g Lab File ID: >WB067

Level: (low/med) LOW Date Received: 6/10/97

% Moisture: not dec. 17.9 dec. --- Date Extracted: 6/10/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/11/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ---

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/19/1997

Project Name: IOWA ARMY AMMUNITION Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-I-01-06-00	ARDL Lab No.:	300552-12
Desc/Location:	7I	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1245	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	1000 mL	QC Batch:	B2282
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/19/1997

Project Name: IOWA ARMY AMMUNITION Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-I-01-06-00	ARDL Lab No.:	300552-12 (cont'd)
Desc/Location:	7I	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1245	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	1000 mL	QC Batch:	B2282
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/19/1997

Project Name: IOWA ARMY AMMUNITION Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-I-01-06-00	ARDL Lab No.:	300552-12 (cont'd)
Desc/Location:	7I	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1245	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	1000 mL	QC Batch:	B2282
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	67%
2-FLUOROPHENOL	21-110	29%
D5 NITROBENZENE	35-114	61%
2,4,6-TRIBROMOPHENOL	10-123	60%
D5 PHENOL	10-94	21%
D14 TERPHENYL	33-141	78%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-I-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300552 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300552-12

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >W8102

Level: (low/med) LOW Date Received: 6/10/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/11/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/18/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.0

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	6.39	8.	J B
2.	Unknown	7.10	8.	J B
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-I1-01-05-01	ARDL Lab No.:	300552-06
Desc/Location:	7I1	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1237	Prep. Date:	06/10/1997
Matrix:	SEDIMENT	Analysis Date:	06/11/1997
Amount Used:	30 g	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2283
% Moisture:	25.7	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	57.9	444	ND		UG/KG	1
BIS(-2-CHLOROETHYL)ETHER	55.2	444	ND		UG/KG	1
2-CHLOROPHENOL	56.5	444	ND		UG/KG	1
1,3-DICHLOROBENZENE	60.6	444	ND		UG/KG	1
1,4-DICHLOROBENZENE	56.5	444	ND		UG/KG	1
BENZYL ALCOHOL	53.8	444	ND		UG/KG	1
1,2-DICHLOROBENZENE	74.0	444	ND		UG/KG	1
2-METHYLPHENOL	60.6	444	ND		UG/KG	1
2,2'-OXYBIS(1-CHLOROPROPANE)	65.9	444	ND		UG/KG	1
4-METHYLPHENOL	57.9	444	ND		UG/KG	1
N-NITROSO-DI-N-PROPYLAMINE	61.9	444	ND		UG/KG	1
HEXACHLOROETHANE	65.9	444	ND		UG/KG	1
NITROBENZENE	47.1	444	ND		UG/KG	1
ISOPHORONE	37.7	444	ND		UG/KG	1
2-NITROPHENOL	52.5	444	ND		UG/KG	1
2,4-DIMETHYLPHENOL	44.4	444	ND		UG/KG	1
BENZOIC ACID	110	444	ND		UG/KG	1
BIS(-2-CHLOROETHOXY)METHANE	51.1	444	ND		UG/KG	1
2,4-DICHLOROPHENOL	59.2	444	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	51.1	444	ND		UG/KG	1
NAPHTHALENE	51.1	444	ND		UG/KG	1
4-CHLOROANILINE	186	444	ND		UG/KG	1
HEXACHLOROBUTADIENE	55.2	444	ND		UG/KG	1
4-CHLORO-3-METHYLPHENOL	48.5	444	ND		UG/KG	1
2-METHYLNAPHTHALENE	48.5	444	ND		UG/KG	1
HEXACHLOROCYCLOPENTADIENE	45.8	444	ND		UG/KG	1
2,4,6-TRICHLOROPHENOL	44.4	444	ND		UG/KG	1
2,4,5-TRICHLOROPHENOL	49.8	444	ND		UG/KG	1
2-CHLORONAPHTHALENE	47.1	444	ND		UG/KG	1
2-NITROANILINE	35.0	444	ND		UG/KG	1
DIMETHYL PHTHALATE	41.7	444	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-I1-01-05-01	ARDL Lab No.:	300552-06 (cont'd)
Desc/Location:	7I1	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1237	Prep. Date:	06/10/1997
Matrix:	SEDIMENT	Analysis Date:	06/11/1997
Amount Used:	30 g	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2283
% Moisture:	25.7	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
ACENAPHTHYLENE	52.5	444	ND		UG/KG	1
2,6-DINITROTOLUENE	43.1	444	ND		UG/KG	1
3-NITROANILINE	105	444	ND		UG/KG	1
ACENAPHTHENE	43.1	444	ND		UG/KG	1
2,4-DINITROPHENOL	40.4	444	ND		UG/KG	1
4-NITROPHENOL	63.3	444	ND		UG/KG	1
DIBENZOFURAN	45.8	444	ND		UG/KG	1
2,4-DINITROTOLUENE	40.4	444	ND		UG/KG	1
DIETHYLPHTHALATE	48.5	444	ND		UG/KG	1
4-CHLOROPHENYL-PHENYLETHER	45.8	444	ND		UG/KG	1
FLUORENE	47.1	444	ND		UG/KG	1
4-NITROANILINE	79.4	444	ND		UG/KG	1
4,6-DINITRO-2-METHYLPHENOL	61.9	444	ND		UG/KG	1
N-NITROSODIPHENYLAMINE	52.5	444	ND		UG/KG	1
4-BROMOPHENYL-PHENYLETHER	47.1	444	ND		UG/KG	1
PHENANTHRENE	40.4	444	64.3	J	UG/KG	1
HEXACHLOROBENZENE	41.7	444	ND		UG/KG	1
PENTACHLOROPHENOL	75.4	444	ND		UG/KG	1
ANTHRACENE	39.0	444	64.9	J	UG/KG	1
DI-N-BUTYLPHTHALATE	29.6	444	ND		UG/KG	1
FLUORANTHENE	37.7	444	ND		UG/KG	1
PYRENE	37.7	444	139	J	UG/KG	1
BUTYLBENZYLPHTHALATE	40.4	444	ND		UG/KG	1
3,3'-DICHLOROBENZIDINE	318	444	ND		UG/KG	1
BENZO(a)ANTHRACENE	32.3	444	47.8	J	UG/KG	1
CHRYSENE	33.6	444	57.2	J	UG/KG	1
BIS(2-ETHYLHEXYL)PHTHALATE	41.7	444	ND		UG/KG	1
DI-N-OCTYL PHTHALATE	37.7	444	ND		UG/KG	1
BENZO(b)FLUORANTHENE	71.3	444	ND		UG/KG	1
BENZO(k)FLUORANTHENE	88.8	444	ND		UG/KG	1
BENZO(a)PYRENE	39.0	444	64.6	J	UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-I1-01-05-01	ARDL Lab No.:	300552-06 (cont'd)
Desc/Location:	7I1	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1237	Prep. Date:	06/10/1997
Matrix:	SEDIMENT	Analysis Date:	06/11/1997
Amount Used:	30 g	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2283
% Moisture:	25.7	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
INDENO(1,2,3-cd)PYRENE	44.4	444	ND		UG/KG	1
DIBENZO(a,h)ANTHRACENE	41.7	444	ND		UG/KG	1
BENZO(g,h,i)PERYLENE	45.8	444	56.6	J	UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	30-115	87%
2-FLUOROPHENOL	25-121	71%
D5 NITROBENZENE	23-120	74%
2,4,6-TRIBROMOPHENOL	19-122	75%
D5 PHENOL	24-113	76%
D14 TERPHENYL	18-137	94%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-I1-01-05-01

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300552 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300552-06

Sample wt/vol: 30.0 (g/mL) g Lab File ID: >W8068

Level: (low/med) LOW Date Received: 6/10/97

% Moisture: not dec. 25.7 dec. --- Date Extracted: 6/10/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/11/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ---

Number TICs found: 7

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	13.05	210.	J
2.	Unknown alkane	18.60	230.	J
3.	Unknown	18.68	250.	J
4.	Unknown	21.13	360.	J
5.	Unknown	21.70	560.	J
6.	Unknown	22.20	2000.	J
7.	Unknown	35.82	190.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-J-01-06-00	ARDL Lab No.:	300552-10
Desc/Location:	7J	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	0935	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	1000 mL	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2282
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1

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Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-J-01-06-00	ARDL Lab No.:	300552-10 (cont'd)
Desc/Location:	7J	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	0935	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	1000 mL	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2282
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-J-01-06-00	ARDL Lab No.:	300552-10 (cont'd)
Desc/Location:	7J	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	0935	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	1000 mL	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2282
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	81%
2-FLUOROPHENOL	21-110	33%
D5 NITROBENZENE	35-114	75%
2,4,6-TRIBROMOPHENOL	10-123	68%
D5 PHENOL	10-94	25%
D14 TERPHENYL	33-141	82%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-J-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300552 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300552-10

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >W8100

Level: (low/med) LOW Date Received: 6/10/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/11/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/18/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.1

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	6.38	5.	J B
2.	Unknown	7.10	5.	J B
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Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/19/1997

Project Name: IOWA ARMY AMMUNITION Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-J1-01-05-01	ARDL Lab No.:	300552-01
Desc/Location:	7J1	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	0955	Prep. Date:	06/10/1997
Matrix:	SEDIMENT	Analysis Date:	06/11/1997
Amount Used:	30 g	QC Batch:	B2283
% Moisture:	16.8	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	51.7	397	ND		UG/KG	1
BIS(-2-CHLOROETHYL)ETHER	49.3	397	ND		UG/KG	1
2-CHLOROPHENOL	50.5	397	ND		UG/KG	1
1,3-DICHLOROBENZENE	54.1	397	ND		UG/KG	1
1,4-DICHLOROBENZENE	50.5	397	ND		UG/KG	1
BENZYL ALCOHOL	48.1	397	ND		UG/KG	1
1,2-DICHLOROBENZENE	66.1	397	ND		UG/KG	1
2-METHYLPHENOL	54.1	397	ND		UG/KG	1
2,2'-OXYBIS(1-CHLOROPROPANE)	58.9	397	ND		UG/KG	1
4-METHYLPHENOL	51.7	397	ND		UG/KG	1
N-NITROSO-DI-N-PROPYLAMINE	55.3	397	ND		UG/KG	1
HEXACHLOROETHANE	58.9	397	ND		UG/KG	1
NITROBENZENE	42.1	397	ND		UG/KG	1
ISOPHORONE	33.7	397	ND		UG/KG	1
2-NITROPHENOL	46.9	397	ND		UG/KG	1
2,4-DIMETHYLPHENOL	39.7	397	ND		UG/KG	1
BENZOIC ACID	98.6	397	ND		UG/KG	1
BIS(-2-CHLOROETHOXY)METHANE	45.7	397	ND		UG/KG	1
2,4-DICHLOROPHENOL	52.9	397	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	45.7	397	ND		UG/KG	1
NAPHTHALENE	45.7	397	ND		UG/KG	1
4-CHLOROANILINE	166	397	ND		UG/KG	1
HEXACHLOROBUTADIENE	49.3	397	ND		UG/KG	1
4-CHLORO-3-METHYLPHENOL	43.3	397	ND		UG/KG	1
2-METHYLNAPHTHALENE	43.3	397	ND		UG/KG	1
HEXACHLOROCYCLOPENTADIENE	40.9	397	ND		UG/KG	1
2,4,6-TRICHLOROPHENOL	39.7	397	ND		UG/KG	1
2,4,5-TRICHLOROPHENOL	44.5	397	ND		UG/KG	1
2-CHLORONAPHTHALENE	42.1	397	ND		UG/KG	1
2-NITROANILINE	31.3	397	ND		UG/KG	1
DIMETHYL PHTHALATE	37.3	397	ND		UG/KG	1
ACENAPHTHYLENE	46.9	397	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/19/1997

Project Name: IOWA ARMY AMMUNITION Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-J1-01-05-01	ARDL Lab No.:	300552-01 (cont'd)
Desc/Location:	7J1	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	0955	Prep. Date:	06/10/1997
Matrix:	SEDIMENT	Analysis Date:	06/11/1997
Amount Used:	30 g	QC Batch:	B2283
% Moisture:	16.8	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	38.5	397	ND		UG/KG	1
3-NITROANILINE	93.8	397	ND		UG/KG	1
ACENAPHTHENE	38.5	397	ND		UG/KG	1
2,4-DINITROPHENOL	36.1	397	ND		UG/KG	1
4-NITROPHENOL	56.5	397	ND		UG/KG	1
DIBENZOFURAN	40.9	397	ND		UG/KG	1
2,4-DINITROTOLUENE	36.1	397	ND		UG/KG	1
DIETHYLPHTHALATE	43.3	397	ND		UG/KG	1
4-CHLOROPHENYL-PHENYLETHER	40.9	397	ND		UG/KG	1
FLUORENE	42.1	397	ND		UG/KG	1
4-NITROANILINE	70.9	397	ND		UG/KG	1
4,6-DINITRO-2-METHYLPHENOL	55.3	397	ND		UG/KG	1
N-NITROSODIPHENYLAMINE	46.9	397	ND		UG/KG	1
4-BROMOPHENYL-PHENYLETHER	42.1	397	ND		UG/KG	1
PHENANTHRENE	36.1	397	ND		UG/KG	1
HEXACHLOROBENZENE	37.3	397	ND		UG/KG	1
PENTACHLOROPHENOL	67.3	397	ND		UG/KG	1
ANTHRACENE	34.9	397	ND		UG/KG	1
DI-N-BUTYLPHTHALATE	26.4	397	ND		UG/KG	1
FLUORANTHENE	33.7	397	ND		UG/KG	1
PYRENE	33.7	397	ND		UG/KG	1
BUTYLBENZYLPHTHALATE	36.1	397	ND		UG/KG	1
3,3'-DICHLOROBENZIDINE	284	397	ND		UG/KG	1
BENZO(a)ANTHRACENE	28.8	397	ND		UG/KG	1
CHRYSENE	30.0	397	ND		UG/KG	1
BIS(2-ETHYLHEXYL)PHTHALATE	37.3	397	ND		UG/KG	1
DI-N-OCTYL PHTHALATE	33.7	397	ND		UG/KG	1
BENZO(b)FLUORANTHENE	63.7	397	ND		UG/KG	1
BENZO(k)FLUORANTHENE	79.3	397	ND		UG/KG	1
BENZO(a)PYRENE	34.9	397	ND		UG/KG	1
INDENO(1,2,3-cd)PYRENE	39.7	397	ND		UG/KG	1
DIBENZO(a,h)ANTHRACENE	37.3	397	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/19/1997

Project Name: IOWA ARMY AMMUNITION Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-J1-01-05-01	ARDL Lab No.:	300552-01 (cont'd)
Desc/Location:	7J1	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	0955	Prep. Date:	06/10/1997
Matrix:	SEDIMENT	Analysis Date:	06/11/1997
Amount Used:	30 g	QC Batch:	B2283
% Moisture:	16.8	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	40.9	397	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	30-115	76%
2-FLUOROPHENOL	25-121	66%
D5 NITROBENZENE	23-120	67%
2,4,6-TRIBROMOPHENOL	19-122	73%
D5 PHENOL	24-113	69%
D14 TERPHENYL	18-137	85%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-J1-01-05-01

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300552 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300552-01

Sample wt/vol: 30.0 (g/mL) g Lab File ID: >W8066

Level: (low/med) LOW Date Received: 6/10/97

% Moisture: not dec. 16.8 dec. --- Date Extracted: 6/10/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/11/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ---

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-K-01-06-00	ARDL Lab No.:	300549-07
Desc/Location:	7K	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1124	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/17/1997
Amount Used:	1000 mL	QC Batch:	B2267
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-K-01-06-00	ARDL Lab No.:	300549-07 (cont'd)
Desc/Location:	7K	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1124	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/17/1997
Amount Used:	1000 mL	QC Batch:	B2267
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-K-01-06-00	ARDL Lab No.:	300549-07 (cont'd)
Desc/Location:	7K	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1124	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/17/1997
Amount Used:	1000 mL	QC Batch:	B2267
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	81%
2-FLUOROPHENOL	21-110	36%
D5 NITROBENZENE	35-114	72%
2,4,6-TRIBROMOPHENOL	10-123	70%
D5 PHENOL	10-94	25%
D14 TERPHENYL	33-141	81%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-K-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300549 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300549-07

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >W8094

Level: (low/med) LOW Date Received: 6/07/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/11/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/17/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.1

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	6.39	4.	J B
2.	Unknown	7.11	4.	J B
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-K1-01-05-1	ARDL Lab No.:	300549-03
Desc/Location:	K1-1'	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1139	Prep. Date:	06/10/1997
Matrix:	SOIL	Analysis Date:	06/11/1997
Amount Used:	30 g	QC Batch:	B2266
% Moisture:	20.1	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	53.8	413	ND		UG/KG	1
BIS(-2-CHLOROETHYL)ETHER	51.3	413	ND		UG/KG	1
2-CHLOROPHENOL	52.6	413	ND		UG/KG	1
1,3-DICHLOROBENZENE	56.3	413	ND		UG/KG	1
1,4-DICHLOROBENZENE	52.6	413	ND		UG/KG	1
BENZYL ALCOHOL	50.1	413	ND		UG/KG	1
1,2-DICHLOROBENZENE	68.8	413	ND		UG/KG	1
2-METHYLPHENOL	56.3	413	ND		UG/KG	1
2,2'-OXYBIS(1-CHLOROPROPANE)	61.3	413	ND		UG/KG	1
4-METHYLPHENOL	53.8	413	ND		UG/KG	1
N-NITROSO-DI-N-PROPYLAMINE	57.6	413	ND		UG/KG	1
HEXACHLOROETHANE	61.3	413	ND		UG/KG	1
NITROBENZENE	43.8	413	ND		UG/KG	1
ISOPHORONE	35.0	413	ND		UG/KG	1
2-NITROPHENOL	48.8	413	ND		UG/KG	1
2,4-DIMETHYLPHENOL	41.3	413	ND		UG/KG	1
BENZOIC ACID	103	413	ND		UG/KG	1
BIS(-2-CHLOROETHOXY)METHANE	47.6	413	ND		UG/KG	1
2,4-DICHLOROPHENOL	55.1	413	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	47.6	413	ND		UG/KG	1
NAPHTHALENE	47.6	413	ND		UG/KG	1
4-CHLOROANILINE	173	413	ND		UG/KG	1
HEXACHLOROBUTADIENE	51.3	413	ND		UG/KG	1
4-CHLORO-3-METHYLPHENOL	45.1	413	ND		UG/KG	1
2-METHYLNAPHTHALENE	45.1	413	ND		UG/KG	1
HEXACHLOROCYCLOPENTADIENE	42.6	413	ND		UG/KG	1
2,4,6-TRICHLOROPHENOL	41.3	413	ND		UG/KG	1
2,4,5-TRICHLOROPHENOL	46.3	413	ND		UG/KG	1
2-CHLORONAPHTHALENE	43.8	413	ND		UG/KG	1
2-NITROANILINE	32.5	413	ND		UG/KG	1
DIMETHYL PHTHALATE	38.8	413	ND		UG/KG	1
ACENAPHTHYLENE	48.8	413	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-K1-01-05-1	ARDL Lab No.:	300549-03 (cont'd)
Desc/Location:	K1-1'	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1139	Prep. Date:	06/10/1997
Matrix:	SOIL	Analysis Date:	06/11/1997
Amount Used:	30 g	QC Batch:	B2266
% Moisture:	20.1	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	40.1	413	ND		UG/KG	1
3-NITROANILINE	97.6	413	ND		UG/KG	1
ACENAPHTHENE	40.1	413	ND		UG/KG	1
2,4-DINITROPHENOL	37.5	413	ND		UG/KG	1
4-NITROPHENOL	58.8	413	ND		UG/KG	1
DIBENZOFURAN	42.6	413	ND		UG/KG	1
2,4-DINITROTOLUENE	37.5	413	ND		UG/KG	1
DIETHYLPHTHALATE	45.1	413	ND		UG/KG	1
4-CHLOROPHENYL-PHENYLETHER	42.6	413	ND		UG/KG	1
FLUORENE	43.8	413	ND		UG/KG	1
4-NITROANILINE	73.8	413	ND		UG/KG	1
4,6-DINITRO-2-METHYLPHENOL	57.6	413	ND		UG/KG	1
N-NITROSODIPHENYLAMINE	48.8	413	ND		UG/KG	1
4-BROMOPHENYL-PHENYLETHER	43.8	413	ND		UG/KG	1
PHENANTHRENE	37.5	413	ND		UG/KG	1
HEXACHLOROBENZENE	38.8	413	ND		UG/KG	1
PENTACHLOROPHENOL	70.1	413	ND		UG/KG	1
ANTHRACENE	36.3	413	ND		UG/KG	1
DI-N-BUTYLPHTHALATE	27.5	413	ND		UG/KG	1
FLUORANTHENE	35.0	413	ND		UG/KG	1
PYRENE	35.0	413	ND		UG/KG	1
BUTYLBENZYLPHTHALATE	37.5	413	ND		UG/KG	1
3,3'-DICHLOROBENZIDINE	295	413	ND		UG/KG	1
BENZO(a)ANTHRACENE	30.0	413	ND		UG/KG	1
CHRYSENE	31.3	413	ND		UG/KG	1
BIS(2-ETHYLHEXYL)PHTHALATE	38.8	413	ND		UG/KG	1
DI-N-OCTYL PHTHALATE	35.0	413	ND		UG/KG	1
BENZO(b)FLUORANTHENE	66.3	413	ND		UG/KG	1
BENZO(k)FLUORANTHENE	82.6	413	ND		UG/KG	1
BENZO(a)PYRENE	36.3	413	ND		UG/KG	1
INDENO(1,2,3-cd)PYRENE	41.3	413	ND		UG/KG	1
DIBENZO(a,h)ANTHRACENE	38.8	413	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-K1-01-05-1	ARDL Lab No.:	300549-03 (cont'd)
Desc/Location:	K1-1'	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1139	Prep. Date:	06/10/1997
Matrix:	SOIL	Analysis Date:	06/11/1997
Amount Used:	30 g	QC Batch:	B2266
% Moisture:	20.1	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	42.6	413	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	30-115	86%
2-FLUOROPHENOL	25-121	77%
D5 NITROBENZENE	23-120	77%
2,4,6-TRIBROMOPHENOL	19-122	80%
D5 PHENOL	24-113	78%
D14 TERPHENYL	18-137	89%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-K1-01-05-1

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300549 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300549-03

Sample wt/vol: 30.0 (g/mL) g Lab File ID: >W8063

Level: (low/med) LOW Date Received: 6/07/97

% Moisture: not dec. 20.1 dec. --- Date Extracted: 6/10/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/11/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ---

Number TICs found: 8

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	21.34	180.	J
2.	10544500	Sulfur, mol.	22.15	560.	JN
3.		Unknown	33.14	300.	J
4.		Unknown	35.35	190.	J
5.		Unknown	35.82	480.	J
6.		Unknown	36.12	270.	J
7.		Unknown	36.59	400.	J
8.		Unknown	37.74	180.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-L-01-06-00	ARDL Lab No.:	300542-15
Desc/Location:	7L	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	0852	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/09/1997
Amount Used:	1000 mL	QC Batch:	B2247
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
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Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-L-01-06-00	ARDL Lab No.:	300542-15 (cont'd)
Desc/Location:	7L	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	0852	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/09/1997
Amount Used:	1000 mL	QC Batch:	B2247
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-L-01-06-00	ARDL Lab No.:	300542-15 (cont'd)
Desc/Location:	7L	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	0852	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/09/1997
Amount Used:	1000 mL	QC Batch:	B2247
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	105%
2-FLUOROPHENOL	21-110	43%
D5 NITROBENZENE	35-114	93%
2,4,6-TRIBROMOPHENOL	10-123	83%
D5 PHENOL	10-94	30%
D14 TERPHENYL	33-141	103%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-L-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300542 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300542-15

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >W8035

Level: (low/med) LOW Date Received: 5/31/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/03/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/09/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.2

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	6.47	17.	J B
2.	Unknown	6.69	5.	J B
3.	Unknown	7.17	17.	J B
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-L1-01-05-1	ARDL Lab No.:	300542-09
Desc/Location:	7L1	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	0903	Prep. Date:	06/06/1997
Matrix:	SOIL	Analysis Date:	06/09/1997
Amount Used:	30 g	QC Batch:	B2248
% Moisture:	17.6	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	52.2	400	ND		UG/KG	1
BIS(-2-CHLOROETHYL)ETHER	49.8	400	ND		UG/KG	1
2-CHLOROPHENOL	51.0	400	ND		UG/KG	1
1,3-DICHLOROBENZENE	54.6	400	ND		UG/KG	1
1,4-DICHLOROBENZENE	51.0	400	ND		UG/KG	1
BENZYL ALCOHOL	48.5	400	ND		UG/KG	1
1,2-DICHLOROBENZENE	66.7	400	ND		UG/KG	1
2-METHYLPHENOL	54.6	400	ND		UG/KG	1
2,2'-OXYBIS(1-CHLOROPROPANE)	59.5	400	ND		UG/KG	1
4-METHYLPHENOL	52.2	400	62.1	J	UG/KG	1
N-NITROSO-DI-N-PROPYLAMINE	55.8	400	ND		UG/KG	1
HEXACHLOROETHANE	59.5	400	ND		UG/KG	1
NITROBENZENE	42.5	400	ND		UG/KG	1
ISOPHORONE	34.0	400	ND		UG/KG	1
2-NITROPHENOL	47.3	400	ND		UG/KG	1
2,4-DIMETHYLPHENOL	40.0	400	ND		UG/KG	1
BENZOIC ACID	99.5	400	ND		UG/KG	1
BIS(-2-CHLOROETHOXY)METHANE	46.1	400	ND		UG/KG	1
2,4-DICHLOROPHENOL	53.4	400	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	46.1	400	ND		UG/KG	1
NAPHTHALENE	46.1	400	ND		UG/KG	1
4-CHLOROANILINE	167	400	ND		UG/KG	1
HEXACHLOROBUTADIENE	49.8	400	ND		UG/KG	1
4-CHLORO-3-METHYLPHENOL	43.7	400	ND		UG/KG	1
2-METHYLNAPHTHALENE	43.7	400	ND		UG/KG	1
HEXACHLOROCYCLOPENTADIENE	41.3	400	ND		UG/KG	1
2,4,6-TRICHLOROPHENOL	40.0	400	ND		UG/KG	1
2,4,5-TRICHLOROPHENOL	44.9	400	ND		UG/KG	1
2-CHLORONAPHTHALENE	42.5	400	ND		UG/KG	1
2-NITROANILINE	31.6	400	ND		UG/KG	1
DIMETHYL PHTHALATE	37.6	400	ND		UG/KG	1
ACENAPHTHYLENE	47.3	400	ND		UG/KG	1

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Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-L1-01-05-1	ARDL Lab No.:	300542-09 (cont'd)
Desc/Location:	7L1	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	0903	Prep. Date:	06/06/1997
Matrix:	SOIL	Analysis Date:	06/09/1997
Amount Used:	30 g	QC Batch:	B2248
% Moisture:	17.6	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	38.8	400	ND		UG/KG	1
3-NITROANILINE	94.7	400	ND		UG/KG	1
ACENAPHTHENE	38.8	400	ND		UG/KG	1
2,4-DINITROPHENOL	36.4	400	ND		UG/KG	1
4-NITROPHENOL	57.0	400	ND		UG/KG	1
DIBENZOFURAN	41.3	400	ND		UG/KG	1
2,4-DINITROTOLUENE	36.4	400	ND		UG/KG	1
DIETHYLPHTHALATE	43.7	400	ND		UG/KG	1
4-CHLOROPHENYL-PHENYLETHER	41.3	400	ND		UG/KG	1
FLUORENE	42.5	400	ND		UG/KG	1
4-NITROANILINE	71.6	400	ND		UG/KG	1
4,6-DINITRO-2-METHYLPHENOL	55.8	400	ND		UG/KG	1
N-NITROSODIPHENYLAMINE	47.3	400	ND		UG/KG	1
4-BROMOPHENYL-PHENYLETHER	42.5	400	ND		UG/KG	1
PHENANTHRENE	36.4	400	ND		UG/KG	1
HEXACHLOROBENZENE	37.6	400	ND		UG/KG	1
PENTACHLOROPHENOL	68.0	400	ND		UG/KG	1
ANTHRACENE	35.2	400	ND		UG/KG	1
DI-N-BUTYLPHTHALATE	26.7	400	ND		UG/KG	1
FLUORANTHENE	34.0	400	ND		UG/KG	1
PYRENE	34.0	400	ND		UG/KG	1
BUTYLBENZYLPHTHALATE	36.4	400	ND		UG/KG	1
3,3'-DICHLOROBENZIDINE	286	400	ND		UG/KG	1
BENZO(a)ANTHRACENE	29.1	400	ND		UG/KG	1
CHRYSENE	30.3	400	ND		UG/KG	1
BIS(2-ETHYLHEXYL)PHTHALATE	37.6	400	ND		UG/KG	1
DI-N-OCTYL PHTHALATE	34.0	400	ND		UG/KG	1
BENZO(b)FLUORANTHENE	64.3	400	ND		UG/KG	1
BENZO(k)FLUORANTHENE	80.1	400	ND		UG/KG	1
BENZO(a)PYRENE	35.2	400	ND		UG/KG	1
INDENO(1,2,3-cd)PYRENE	40.0	400	ND		UG/KG	1
DIBENZO(a,h)ANTHRACENE	37.6	400	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-L1-01-05-1	ARDL Lab No.:	300542-09 (cont'd)
Desc/Location:	7L1	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	0903	Prep. Date:	06/06/1997
Matrix:	SOIL	Analysis Date:	06/09/1997
Amount Used:	30 g	QC Batch:	B2248
% Moisture:	17.6	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	41.3	400	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	30-115	89%
2-FLUOROPHENOL	25-121	88%
D5 NITROBENZENE	23-120	84%
2,4,6-TRIBROMOPHENOL	19-122	96%
D5 PHENOL	24-113	94%
D14 TERPHENYL	18-137	99%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-L1-01-05-1

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300542 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300542-09

Sample wt/vol: 30.0 (g/mL) g Lab File ID: >W8041

Level: (low/med) LOW Date Received: 5/31/97

% Moisture: not dec. 17.6 dec. --- Date Extracted: 6/06/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/09/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ---

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	20.06	970.	J
2.		Unknown	20.32	400.	J
3.		Unknown	20.52	1100.	J
4.	57103	Hexadecanoic acid	21.37	690.	JN
5.		Unknown	22.17	1500.	J
6.		Unknown	22.82	410.	J
7.		Unknown alkane	27.91	350.	J
8.		Unknown	32.92	550.	J
9.		Unknown alkane	33.14	630.	J
10.		Unknown	33.52	450.	J
11.		Unknown	34.27	610.	J
12.		Unknown	35.01	360.	J
13.		Unknown	35.32	460.	J
14.		Unknown	35.80	2200.	J
15.		Unknown	35.91	540.	J
16.		Unknown	36.01	350.	J
17.		Unknown	36.08	670.	J
18.		Unknown	36.47	620.	J
19.		Unknown	36.96	650.	J
20.		Unknown	37.73	700.	J
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ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-M-01-06-00	ARDL Lab No.:	300542-12
Desc/Location:	7M	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1333	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/09/1997
Amount Used:	1000 mL	QC Batch:	B2247
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-M-01-06-00	ARDL Lab No.:	300542-12 (cont'd)
Desc/Location:	7M	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1333	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/09/1997
Amount Used:	1000 mL	QC Batch:	B2247
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-M-01-06-00	ARDL Lab No.:	300542-12 (cont'd)
Desc/Location:	7M	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1333	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/09/1997
Amount Used:	1000 mL	QC Batch:	B2247
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	108%
2-FLUOROPHENOL	21-110	40%
D5 NITROBENZENE	35-114	93%
2,4,6-TRIBROMOPHENOL	10-123	86%
D5 PHENOL	10-94	28%
D14 TERPHENYL	33-141	111%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-M-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300542 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300542-12

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >W8032

Level: (low/med) LOW Date Received: 5/31/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/03/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/09/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.3

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	6.46	20.	J B
2.	Unknown	6.70	6.	J B
3.	Unknown	7.17	20.	J B
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-M1-01-05-1	ARDL Lab No.:	300542-01
Desc/Location:	7M1	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1400	Prep. Date:	06/06/1997
Matrix:	SOIL	Analysis Date:	06/09/1997
Amount Used:	30 g	QC Batch:	B2248
% Moisture:	17.8	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	52.3	401	ND		UG/KG	1
BIS(-2-CHLOROETHYL)ETHER	49.9	401	ND		UG/KG	1
2-CHLOROPHENOL	51.1	401	ND		UG/KG	1
1,3-DICHLOROBENZENE	54.7	401	ND		UG/KG	1
1,4-DICHLOROBENZENE	51.1	401	ND		UG/KG	1
BENZYL ALCOHOL	48.7	401	ND		UG/KG	1
1,2-DICHLOROBENZENE	66.9	401	ND		UG/KG	1
2-METHYLPHENOL	54.7	401	ND		UG/KG	1
2,2'-OXYBIS(1-CHLOROPROPANE)	59.6	401	ND		UG/KG	1
4-METHYLPHENOL	52.3	401	ND		UG/KG	1
N-NITROSO-DI-N-PROPYLAMINE	56.0	401	ND		UG/KG	1
HEXACHLOROETHANE	59.6	401	ND		UG/KG	1
NITROBENZENE	42.6	401	ND		UG/KG	1
ISOPHORONE	34.1	401	ND		UG/KG	1
2-NITROPHENOL	47.4	401	ND		UG/KG	1
2,4-DIMETHYLPHENOL	40.1	401	ND		UG/KG	1
BENZOIC ACID	99.8	401	ND		UG/KG	1
BIS(-2-CHLOROETHOXY)METHANE	46.2	401	ND		UG/KG	1
2,4-DICHLOROPHENOL	53.5	401	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	46.2	401	ND		UG/KG	1
NAPHTHALENE	46.2	401	ND		UG/KG	1
4-CHLOROANILINE	168	401	ND		UG/KG	1
HEXACHLOROBUTADIENE	49.9	401	ND		UG/KG	1
4-CHLORO-3-METHYLPHENOL	43.8	401	ND		UG/KG	1
2-METHYLNAPHTHALENE	43.8	401	ND		UG/KG	1
HEXACHLOROCYCLOPENTADIENE	41.4	401	ND		UG/KG	1
2,4,6-TRICHLOROPHENOL	40.1	401	ND		UG/KG	1
2,4,5-TRICHLOROPHENOL	45.0	401	ND		UG/KG	1
2-CHLORONAPHTHALENE	42.6	401	ND		UG/KG	1
2-NITROANILINE	31.6	401	ND		UG/KG	1
DIMETHYL PHTHALATE	37.7	401	ND		UG/KG	1
ACENAPHTHYLENE	47.4	401	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-M1-01-05-1	ARDL Lab No.:	300542-01 (cont'd)
Desc/Location:	7M1	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1400	Prep. Date:	06/06/1997
Matrix:	SOIL	Analysis Date:	06/09/1997
Amount Used:	30 g	QC Batch:	B2248
% Moisture:	17.8	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	38.9	401	ND		UG/KG	1
3-NITROANILINE	94.9	401	ND		UG/KG	1
ACENAPHTHENE	38.9	401	ND		UG/KG	1
2,4-DINITROPHENOL	36.5	401	ND		UG/KG	1
4-NITROPHENOL	57.2	401	ND		UG/KG	1
DIBENZOFURAN	41.4	401	ND		UG/KG	1
2,4-DINITROTOLUENE	36.5	401	ND		UG/KG	1
DIETHYLPHTHALATE	43.8	401	ND		UG/KG	1
4-CHLOROPHENYL-PHENYLETHER	41.4	401	ND		UG/KG	1
FLUORENE	42.6	401	ND		UG/KG	1
4-NITROANILINE	71.8	401	ND		UG/KG	1
4,6-DINITRO-2-METHYLPHENOL	56.0	401	ND		UG/KG	1
N-NITROSODIPHENYLAMINE	47.4	401	ND		UG/KG	1
4-BROMOPHENYL-PHENYLETHER	42.6	401	ND		UG/KG	1
PHENANTHRENE	36.5	401	ND		UG/KG	1
HEXACHLOROBENZENE	37.7	401	ND		UG/KG	1
PENTACHLOROPHENOL	68.1	401	ND		UG/KG	1
ANTHRACENE	35.3	401	ND		UG/KG	1
DI-N-BUTYLPHTHALATE	26.8	401	ND		UG/KG	1
FLUORANTHENE	34.1	401	ND		UG/KG	1
PYRENE	34.1	401	ND		UG/KG	1
BUTYLBENZYLPHTHALATE	36.5	401	ND		UG/KG	1
3,3'-DICHLOROBENZIDINE	287	401	ND		UG/KG	1
BENZO(a)ANTHRACENE	29.2	401	ND		UG/KG	1
CHRYSENE	30.4	401	ND		UG/KG	1
BIS(2-ETHYLHEXYL)PHTHALATE	37.7	401	ND		UG/KG	1
DI-N-OCTYL PHTHALATE	34.1	401	ND		UG/KG	1
BENZO(b)FLUORANTHENE	64.5	401	ND		UG/KG	1
BENZO(k)FLUORANTHENE	80.3	401	ND		UG/KG	1
BENZO(a)PYRENE	35.3	401	ND		UG/KG	1
INDENO(1,2,3-cd)PYRENE	40.1	401	ND		UG/KG	1
DIBENZO(a,h)ANTHRACENE	37.7	401	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-M1-01-05-1	ARDL Lab No.:	300542-01 (cont'd)
Desc/Location:	7M1	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1400	Prep. Date:	06/06/1997
Matrix:	SOIL	Analysis Date:	06/09/1997
Amount Used:	30 g	QC Batch:	B2248
% Moisture:	17.8	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	41.4	401	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	30-115	83%
2-FLUOROPHENOL	25-121	84%
D5 NITROBENZENE	23-120	73%
2,4,6-TRIBROMOPHENOL	19-122	89%
D5 PHENOL	24-113	86%
D14 TERPHENYL	18-137	84%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-M1-01-05-1

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300542 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300542-01

Sample wt/vol: 30.0 (g/mL) g Lab File ID: >W8038

Level: (low/med) LOW Date Received: 5/31/97

% Moisture: not dec. 17.8 dec. --- Date Extracted: 6/06/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/09/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ---

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	22.15	270.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-N-01-06-00	ARDL Lab No.:	300549-06
Desc/Location:	7N	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1033	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/17/1997
Amount Used:	1000 mL	QC Batch:	B2267
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-N-01-06-00	ARDL Lab No.:	300549-06 (cont'd)
Desc/Location:	7N	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1033	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/17/1997
Amount Used:	1000 mL	QC Batch:	B2267
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-N-01-06-00	ARDL Lab No.:	300549-06 (cont'd)
Desc/Location:	7N	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1033	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/17/1997
Amount Used:	1000 mL	QC Batch:	B2267
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	82%
2-FLUOROPHENOL	21-110	40%
D5 NITROBENZENE	35-114	76%
2,4,6-TRIBROMOPHENOL	10-123	72%
D5 PHENOL	10-94	27%
D14 TERPHENYL	33-141	82%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-N-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300549 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300549-06

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >W8093

Level: (low/med) LOW Date Received: 6/07/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/11/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/17/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.9

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	6.39	5.	J B
2.	Unknown	7.11	4.	J B
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-N1-01-05-1	ARDL Lab No.:	300549-04
Desc/Location:	N-1	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1042	Prep. Date:	06/10/1997
Matrix:	SOIL	Analysis Date:	06/11/1997
Amount Used:	30 g	QC Batch:	B2266
% Moisture:	27.7	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	59.5	456	ND		UG/KG	1
BIS(-2-CHLOROETHYL)ETHER	56.7	456	ND		UG/KG	1
2-CHLOROPHENOL	58.1	456	ND		UG/KG	1
1,3-DICHLOROBENZENE	62.2	456	ND		UG/KG	1
1,4-DICHLOROBENZENE	58.1	456	ND		UG/KG	1
BENZYL ALCOHOL	55.3	456	ND		UG/KG	1
1,2-DICHLOROBENZENE	76.1	456	ND		UG/KG	1
2-METHYLPHENOL	62.2	456	ND		UG/KG	1
2,2'-OXYBIS(1-CHLOROPROPANE)	67.8	456	ND		UG/KG	1
4-METHYLPHENOL	59.5	456	ND		UG/KG	1
N-NITROSO-DI-N-PROPYLAMINE	63.6	456	ND		UG/KG	1
HEXACHLOROETHANE	67.8	456	ND		UG/KG	1
NITROBENZENE	48.4	456	ND		UG/KG	1
ISOPHORONE	38.7	456	ND		UG/KG	1
2-NITROPHENOL	53.9	456	ND		UG/KG	1
2,4-DIMETHYLPHENOL	45.6	456	ND		UG/KG	1
BENZOIC ACID	113	456	ND		UG/KG	1
BIS(-2-CHLOROETHOXY)METHANE	52.6	456	ND		UG/KG	1
2,4-DICHLOROPHENOL	60.9	456	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	52.6	456	ND		UG/KG	1
NAPHTHALENE	52.6	456	ND		UG/KG	1
4-CHLOROANILINE	191	456	ND		UG/KG	1
HEXACHLOROBUTADIENE	56.7	456	ND		UG/KG	1
4-CHLORO-3-METHYLPHENOL	49.8	456	ND		UG/KG	1
2-METHYLNAPHTHALENE	49.8	456	ND		UG/KG	1
HEXACHLOROCYCLOPENTADIENE	47.0	456	ND		UG/KG	1
2,4,6-TRICHLOROPHENOL	45.6	456	ND		UG/KG	1
2,4,5-TRICHLOROPHENOL	51.2	456	ND		UG/KG	1
2-CHLORONAPHTHALENE	48.4	456	ND		UG/KG	1
2-NITROANILINE	36.0	456	ND		UG/KG	1
DIMETHYL PHTHALATE	42.9	456	ND		UG/KG	1
ACENAPHTHYLENE	53.9	456	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-N1-01-05-1	ARDL Lab No.:	300549-04 (cont'd)
Desc/Location:	N-1	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1042	Prep. Date:	06/10/1997
Matrix:	SOIL	Analysis Date:	06/11/1997
Amount Used:	30 g	QC Batch:	B2266
% Moisture:	27.7	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	44.3	456	ND		UG/KG	1
3-NITROANILINE	108	456	ND		UG/KG	1
ACENAPHTHENE	44.3	456	ND		UG/KG	1
2,4-DINITROPHENOL	41.5	456	ND		UG/KG	1
4-NITROPHENOL	65.0	456	ND		UG/KG	1
DIBENZOFURAN	47.0	456	ND		UG/KG	1
2,4-DINITROTOLUENE	41.5	456	ND		UG/KG	1
DIETHYLPHTHALATE	49.8	456	ND		UG/KG	1
4-CHLOROPHENYL-PHENYLETHER	47.0	456	ND		UG/KG	1
FLUORENE	48.4	456	ND		UG/KG	1
4-NITROANILINE	81.6	456	ND		UG/KG	1
4,6-DINITRO-2-METHYLPHENOL	63.6	456	ND		UG/KG	1
N-NITROSODIPHENYLAMINE	53.9	456	ND		UG/KG	1
4-BROMOPHENYL-PHENYLETHER	48.4	456	ND		UG/KG	1
PHENANTHRENE	41.5	456	ND		UG/KG	1
HEXACHLOROBENZENE	42.9	456	ND		UG/KG	1
PENTACHLOROPHENOL	77.5	456	ND		UG/KG	1
ANTHRACENE	40.1	456	ND		UG/KG	1
DI-N-BUTYLPHTHALATE	30.4	456	ND		UG/KG	1
FLUORANTHENE	38.7	456	ND		UG/KG	1
PYRENE	38.7	456	ND		UG/KG	1
BUTYLBENZYLPHTHALATE	41.5	456	ND		UG/KG	1
3,3'-DICHLOROBENZIDINE	326	456	ND		UG/KG	1
BENZO(a)ANTHRACENE	33.2	456	ND		UG/KG	1
CHRYSENE	34.6	456	ND		UG/KG	1
BIS(2-ETHYLHEXYL)PHTHALATE	42.9	456	ND		UG/KG	1
DI-N-OCTYL PHTHALATE	38.7	456	ND		UG/KG	1
BENZO(b)FLUORANTHENE	73.3	456	ND		UG/KG	1
BENZO(k)FLUORANTHENE	91.3	456	ND		UG/KG	1
BENZO(a)PYRENE	40.1	456	ND		UG/KG	1
INDENO(1,2,3-cd)PYRENE	45.6	456	ND		UG/KG	1
DIBENZO(a,h)ANTHRACENE	42.9	456	ND		UG/KG	1

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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-N1-01-05-1	ARDL Lab No.:	300549-04 (cont'd)
Desc/Location:	N-1	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1042	Prep. Date:	06/10/1997
Matrix:	SOIL	Analysis Date:	06/11/1997
Amount Used:	30 g	QC Batch:	B2266
% Moisture:	27.7	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	47.0	456	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	30-115	85%
2-FLUOROPHENOL	25-121	76%
D5 NITROBENZENE	23-120	77%
2,4,6-TRIBROMOPHENOL	19-122	80%
D5 PHENOL	24-113	78%
D14 TERPHENYL	18-137	86%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-N1-01-05-1

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300549 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300549-04

Sample wt/vol: 30.0 (g/mL) g Lab File ID: >W8064

Level: (low/med) LOW Date Received: 6/07/97

% Moisture: not dec. 27.7 dec. --- Date Extracted: 6/10/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/11/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ---

Number TICs found: 13

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	20.06	210.	J
2.	Unknown	20.52	230.	J
3.	Unknown	21.35	200.	J
4.	Unknown	22.51	200.	J
5.	Unknown alkane	27.93	190.	J
6.	Unknown alkane	33.15	270.	J
7.	Unknown	33.56	300.	J
8.	Unknown	34.28	240.	J
9.	Unknown	35.10	230.	J
10.	Unknown	35.34	210.	J
11.	Unknown alkane	35.60	190.	J
12.	Unknown	35.81	530.	J
13.	Unknown	37.74	210.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-O-01-06-00	ARDL Lab No.:	300542-14
Desc/Location:	7O	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	1045	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/09/1997
Amount Used:	1000 mL	QC Batch:	B2247
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

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Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-O-01-06-00	ARDL Lab No.:	300542-14 (cont'd)
Desc/Location:	70	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	1045	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/09/1997
Amount Used:	1000 mL	QC Batch:	B2247
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

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Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-O-01-06-00	ARDL Lab No.:	300542-14 (cont'd)
Desc/Location:	7O	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	1045	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/09/1997
Amount Used:	1000 mL	QC Batch:	B2247
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	103%
2-FLUOROPHENOL	21-110	33%
D5 NITROBENZENE	35-114	92%
2,4,6-TRIBROMOPHENOL	10-123	76%
D5 PHENOL	10-94	26%
D14 TERPHENYL	33-141	104%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-O-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300542 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300542-14

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >W8034

Level: (low/med) LOW Date Received: 5/31/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/03/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/09/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.9

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	6.45	17.	J B
2.	Unknown	6.69	5.	J B
3.	Unknown	7.17	17.	J B
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Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-01-01-05-1	ARDL Lab No.:	300542-06
Desc/Location:	701	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	1045	Prep. Date:	06/06/1997
Matrix:	SOIL	Analysis Date:	06/09/1997
Amount Used:	30 g	QC Batch:	B2248
% Moisture:	15.6	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	50.9	391	ND		UG/KG	1
BIS(-2-CHLOROETHYL)ETHER	48.6	391	ND		UG/KG	1
2-CHLOROPHENOL	49.8	391	ND		UG/KG	1
1,3-DICHLOROBENZENE	53.3	391	ND		UG/KG	1
1,4-DICHLOROBENZENE	49.8	391	ND		UG/KG	1
BENZYL ALCOHOL	47.4	391	ND		UG/KG	1
1,2-DICHLOROBENZENE	65.2	391	ND		UG/KG	1
2-METHYLPHENOL	53.3	391	ND		UG/KG	1
2,2'-OXYBIS(1-CHLOROPROPANE)	58.1	391	ND		UG/KG	1
4-METHYLPHENOL	50.9	391	ND		UG/KG	1
N-NITROSO-DI-N-PROPYLAMINE	54.5	391	ND		UG/KG	1
HEXACHLOROETHANE	58.1	391	ND		UG/KG	1
NITROBENZENE	41.5	391	ND		UG/KG	1
ISOPHORONE	33.2	391	ND		UG/KG	1
2-NITROPHENOL	46.2	391	ND		UG/KG	1
2,4-DIMETHYLPHENOL	39.1	391	ND		UG/KG	1
BENZOIC ACID	97.2	391	ND		UG/KG	1
BIS(-2-CHLOROETHOXY)METHANE	45.0	391	ND		UG/KG	1
2,4-DICHLOROPHENOL	52.1	391	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	45.0	391	ND		UG/KG	1
NAPHTHALENE	45.0	391	ND		UG/KG	1
4-CHLOROANILINE	164	391	ND		UG/KG	1
HEXACHLOROBUTADIENE	48.6	391	ND		UG/KG	1
4-CHLORO-3-METHYLPHENOL	42.7	391	ND		UG/KG	1
2-METHYLNAPHTHALENE	42.7	391	ND		UG/KG	1
HEXACHLOROCYCLOPENTADIENE	40.3	391	ND		UG/KG	1
2,4,6-TRICHLOROPHENOL	39.1	391	ND		UG/KG	1
2,4,5-TRICHLOROPHENOL	43.8	391	ND		UG/KG	1
2-CHLORONAPHTHALENE	41.5	391	ND		UG/KG	1
2-NITROANILINE	30.8	391	ND		UG/KG	1
DIMETHYL PHTHALATE	36.7	391	ND		UG/KG	1
ACENAPHTHYLENE	46.2	391	ND		UG/KG	1

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Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-01-01-05-1	ARDL Lab No.:	300542-06 (cont'd)
Desc/Location:	701	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	1045	Prep. Date:	06/06/1997
Matrix:	SOIL	Analysis Date:	06/09/1997
Amount Used:	30 g	QC Batch:	B2248
% Moisture:	15.6	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	37.9	391	ND		UG/KG	1
3-NITROANILINE	92.4	391	ND		UG/KG	1
ACENAPHTHENE	37.9	391	ND		UG/KG	1
2,4-DINITROPHENOL	35.5	391	ND		UG/KG	1
4-NITROPHENOL	55.7	391	ND		UG/KG	1
DIBENZOFURAN	40.3	391	ND		UG/KG	1
2,4-DINITROTOLUENE	35.5	391	ND		UG/KG	1
DIETHYLPHTHALATE	42.7	391	ND		UG/KG	1
4-CHLOROPHENYL-PHENYLETHER	40.3	391	ND		UG/KG	1
FLUORENE	41.5	391	ND		UG/KG	1
4-NITROANILINE	69.9	391	ND		UG/KG	1
4,6-DINITRO-2-METHYLPHENOL	54.5	391	ND		UG/KG	1
N-NITROSODIPHENYLAMINE	46.2	391	ND		UG/KG	1
4-BROMOPHENYL-PHENYLETHER	41.5	391	ND		UG/KG	1
PHENANTHRENE	35.5	391	ND		UG/KG	1
HEXACHLOROBENZENE	36.7	391	ND		UG/KG	1
PENTACHLOROPHENOL	66.4	391	ND		UG/KG	1
ANTHRACENE	34.4	391	ND		UG/KG	1
DI-N-BUTYLPHTHALATE	26.1	391	ND		UG/KG	1
FLUORANTHENE	33.2	391	ND		UG/KG	1
PYRENE	33.2	391	ND		UG/KG	1
BUTYLBENZYLPHTHALATE	35.5	391	ND		UG/KG	1
3,3'-DICHLOROBENZIDINE	280	391	ND		UG/KG	1
BENZO(a)ANTHRACENE	28.4	391	ND		UG/KG	1
CHRYSENE	29.6	391	ND		UG/KG	1
BIS(2-ETHYLHEXYL)PHTHALATE	36.7	391	ND		UG/KG	1
DI-N-OCTYL PHTHALATE	33.2	391	ND		UG/KG	1
BENZO(b)FLUORANTHENE	62.8	391	ND		UG/KG	1
BENZO(k)FLUORANTHENE	78.2	391	ND		UG/KG	1
BENZO(a)PYRENE	34.4	391	ND		UG/KG	1
INDENO(1,2,3-cd)PYRENE	39.1	391	ND		UG/KG	1
DIBENZO(a,h)ANTHRACENE	36.7	391	ND		UG/KG	1

ARDL, INC.
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Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-01-01-05-1	ARDL Lab No.:	300542-06 (cont'd)
Desc/Location:	701	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	1045	Prep. Date:	06/06/1997
Matrix:	SOIL	Analysis Date:	06/09/1997
Amount Used:	30 g	QC Batch:	B2248
% Moisture:	15.6	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	40.3	391	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	30-115	88%
2-FLUOROPHENOL	25-121	89%
D5 NITROBENZENE	23-120	82%
2,4,6-TRIBROMOPHENOL	19-122	95%
D5 PHENOL	24-113	94%
D14 TERPHENYL	18-137	92%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-01-01-05-1

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300542 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300542-06

Sample wt/vol: 30.0 (g/mL) g Lab File ID: >W8040

Level: (low/med) LOW Date Received: 5/31/97

% Moisture: not dec. 15.6 dec. --- Date Extracted: 6/06/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/09/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ---

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown alkane	33.13	220.	J
2.	Unknown	35.79	410.	J
3.	Unknown	36.94	260.	J
4.	Unknown	37.72	270.	J
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Lab Report No: 300544 Report Date: 06/12/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-P-01-06-00	ARDL Lab No.:	300544-03
Desc/Location:	7P	Lab Filename:	
Sample Date:	06/02/1997	Received Date:	06/04/1997
Sample Time:	1230	Prep. Date:	06/05/1997
Matrix:	WATER	Analysis Date:	06/10/1997
Amount Used:	1000 mL	QC Batch:	B2257
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300544 Report Date: 06/12/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-P-01-06-00	ARDL Lab No.:	300544-03 (cont'd)
Desc/Location:	7P	Lab Filename:	
Sample Date:	06/02/1997	Received Date:	06/04/1997
Sample Time:	1230	Prep. Date:	06/05/1997
Matrix:	WATER	Analysis Date:	06/10/1997
Amount Used:	1000 mL	QC Batch:	B2257
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300544 Report Date: 06/12/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-P-01-06-00	ARDL Lab No.:	300544-03 (cont'd)
Desc/Location:	7P	Lab Filename:	
Sample Date:	06/02/1997	Received Date:	06/04/1997
Sample Time:	1230	Prep. Date:	06/05/1997
Matrix:	WATER	Analysis Date:	06/10/1997
Amount Used:	1000 mL	QC Batch:	B2257
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	88%
2-FLUOROPHENOL	21-110	37%
D5 NITROBENZENE	35-114	75%
2,4,6-TRIBROMOPHENOL	10-123	76%
D5 PHENOL	10-94	25%
D14 TERPHENYL	33-141	85%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-P-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300544 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300544-03

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >W8050

Level: (low/med) LOW Date Received: 6/04/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/05/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/10/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.6

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	6.47	18.	J B
2.	Unknown	6.71	5.	J B
3.	Unknown	7.18	18.	J B
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300544 Report Date: 06/12/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-P1-01-05-01	ARDL Lab No.:	300544-01
Desc/Location:	7P,0 TO 1 FT	Lab Filename:	
Sample Date:	06/02/1997	Received Date:	06/04/1997
Sample Time:	1400	Prep. Date:	06/06/1997
Matrix:	SOIL	Analysis Date:	06/10/1997
Amount Used:	30 g	QC Batch:	B2256
% Moisture:	14.1	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	50.1	384	ND		UG/KG	1
BIS(-2-CHLOROETHYL)ETHER	47.7	384	ND		UG/KG	1
2-CHLOROPHENOL	48.9	384	ND		UG/KG	1
1,3-DICHLOROBENZENE	52.4	384	ND		UG/KG	1
1,4-DICHLOROBENZENE	48.9	384	ND		UG/KG	1
BENZYL ALCOHOL	46.6	384	ND		UG/KG	1
1,2-DICHLOROBENZENE	64.0	384	ND		UG/KG	1
2-METHYLPHENOL	52.4	384	ND		UG/KG	1
2,2'-OXYBIS(1-CHLOROPROPANE)	57.0	384	ND		UG/KG	1
4-METHYLPHENOL	50.1	384	ND		UG/KG	1
N-NITROSO-DI-N-PROPYLAMINE	53.6	384	ND		UG/KG	1
HEXACHLOROETHANE	57.0	384	ND		UG/KG	1
NITROBENZENE	40.7	384	ND		UG/KG	1
ISOPHORONE	32.6	384	ND		UG/KG	1
2-NITROPHENOL	45.4	384	ND		UG/KG	1
2,4-DIMETHYLPHENOL	38.4	384	ND		UG/KG	1
BENZOIC ACID	95.5	384	ND		UG/KG	1
BIS(-2-CHLOROETHOXY)METHANE	44.2	384	ND		UG/KG	1
2,4-DICHLOROPHENOL	51.2	384	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	44.2	384	ND		UG/KG	1
NAPHTHALENE	44.2	384	ND		UG/KG	1
4-CHLOROANILINE	161	384	ND		UG/KG	1
HEXACHLOROBUTADIENE	47.7	384	ND		UG/KG	1
4-CHLORO-3-METHYLPHENOL	41.9	384	ND		UG/KG	1
2-METHYLNAPHTHALENE	41.9	384	ND		UG/KG	1
HEXACHLOROCYCLOPENTADIENE	39.6	384	ND		UG/KG	1
2,4,6-TRICHLOROPHENOL	38.4	384	ND		UG/KG	1
2,4,5-TRICHLOROPHENOL	43.1	384	ND		UG/KG	1
2-CHLORONAPHTHALENE	40.7	384	ND		UG/KG	1
2-NITROANILINE	30.3	384	ND		UG/KG	1
DIMETHYL PHTHALATE	36.1	384	ND		UG/KG	1
ACENAPHTHYLENE	45.4	384	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300544 Report Date: 06/12/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-P1-01-05-01	ARDL Lab No.:	300544-01 (cont'd)
Desc/Location:	7P,0 TO 1 FT	Lab Filename:	
Sample Date:	06/02/1997	Received Date:	06/04/1997
Sample Time:	1400	Prep. Date:	06/06/1997
Matrix:	SOIL	Analysis Date:	06/10/1997
Amount Used:	30 g	QC Batch:	B2256
% Moisture:	14.1	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	37.3	384	ND		UG/KG	1
3-NITROANILINE	90.8	384	ND		UG/KG	1
ACENAPHTHENE	37.3	384	ND		UG/KG	1
2,4-DINITROPHENOL	34.9	384	ND		UG/KG	1
4-NITROPHENOL	54.7	384	ND		UG/KG	1
DIBENZOFURAN	39.6	384	ND		UG/KG	1
2,4-DINITROTOLUENE	34.9	384	ND		UG/KG	1
DIETHYLPHTHALATE	41.9	384	ND		UG/KG	1
4-CHLOROPHENYL-PHENYLETHER	39.6	384	ND		UG/KG	1
FLUORENE	40.7	384	ND		UG/KG	1
4-NITROANILINE	68.7	384	ND		UG/KG	1
4,6-DINITRO-2-METHYLPHENOL	53.6	384	ND		UG/KG	1
N-NITROSODIPHENYLAMINE	45.4	384	ND		UG/KG	1
4-BROMOPHENYL-PHENYLETHER	40.7	384	ND		UG/KG	1
PHENANTHRENE	34.9	384	ND		UG/KG	1
HEXACHLOROBENZENE	36.1	384	ND		UG/KG	1
PENTACHLOROPHENOL	65.2	384	ND		UG/KG	1
ANTHRACENE	33.8	384	ND		UG/KG	1
DI-N-BUTYLPHTHALATE	25.6	384	ND		UG/KG	1
FLUORANTHENE	32.6	384	ND		UG/KG	1
PYRENE	32.6	384	ND		UG/KG	1
BUTYLBENZYLPHTHALATE	34.9	384	ND		UG/KG	1
3,3'-DICHLOROBENZIDINE	275	384	ND		UG/KG	1
BENZO(a)ANTHRACENE	27.9	384	ND		UG/KG	1
CHRYSENE	29.1	384	ND		UG/KG	1
BIS(2-ETHYLHEXYL)PHTHALATE	36.1	384	ND		UG/KG	1
DI-N-OCTYL PHTHALATE	32.6	384	ND		UG/KG	1
BENZO(b)FLUORANTHENE	61.7	384	ND		UG/KG	1
BENZO(k)FLUORANTHENE	76.8	384	ND		UG/KG	1
BENZO(a)PYRENE	33.8	384	ND		UG/KG	1
INDENO(1,2,3-cd)PYRENE	38.4	384	ND		UG/KG	1
DIBENZO(a,h)ANTHRACENE	36.1	384	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300544 Report Date: 06/12/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-P1-01-05-01	ARDL Lab No.:	300544-01 (cont'd)
Desc/Location:	7P,0 TO 1 FT	Lab Filename:	
Sample Date:	06/02/1997	Received Date:	06/04/1997
Sample Time:	1400	Prep. Date:	06/06/1997
Matrix:	SOIL	Analysis Date:	06/10/1997
Amount Used:	30 g	QC Batch:	B2256
% Moisture:	14.1	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	39.6	384	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	30-115	82%
2-FLUOROPHENOL	25-121	83%
D5 NITROBENZENE	23-120	75%
2,4,6-TRIBROMOPHENOL	19-122	91%
D5 PHENOL	24-113	87%
D14 TERPHENYL	18-137	84%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-P1-01-05-01

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300544 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300544-01

Sample wt/vol: 30.0 (g/mL) g Lab File ID: >W8044

Level: (low/med) LOW Date Received: 6/04/97

% Moisture: not dec. 14.1 dec. --- Date Extracted: 6/06/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/10/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ---

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	35.80	170.	J
2.	Unknown	36.94	160.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-Q-01-06-00	ARDL Lab No.:	300549-08
Desc/Location:	7Q	Lab Filename:	
Sample Date:	06/05/1997	Received Date:	06/07/1997
Sample Time:	1630	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/17/1997
Amount Used:	1000 mL	QC Batch:	B2267
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-Q-01-06-00	ARDL Lab No.:	300549-08 (cont'd)
Desc/Location:	7Q	Lab Filename:	
Sample Date:	06/05/1997	Received Date:	06/07/1997
Sample Time:	1630	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/17/1997
Amount Used:	1000 mL	QC Batch:	B2267
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-07-Q-01-06-00	ARDL Lab No.:	300549-08 (cont'd)
Desc/Location:	7Q	Lab Filename:	
Sample Date:	06/05/1997	Received Date:	06/07/1997
Sample Time:	1630	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/17/1997
Amount Used:	1000 mL	QC Batch:	B2267
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	80%
2-FLUOROPHENOL	21-110	32%
D5 NITROBENZENE	35-114	75%
2,4,6-TRIBROMOPHENOL	10-123	64%
D5 PHENOL	10-94	24%
D14 TERPHENYL	33-141	81%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-Q-01-06-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300549 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300549-08

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >W8095

Level: (low/med) LOW Date Received: 6/07/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/11/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/17/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.0

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	6.39	5.	J B
2.	Unknown	7.10	5.	J B
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-Q1-01-05-1	ARDL Lab No.:	300549-05
Desc/Location:	7Q	Lab Filename:	
Sample Date:	06/05/1997	Received Date:	06/07/1997
Sample Time:	1620	Prep. Date:	06/10/1997
Matrix:	SOIL	Analysis Date:	06/11/1997
Amount Used:	30 g	QC Batch:	B2266
% Moisture:	19.2	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	53.2	408	ND		UG/KG	1
BIS(-2-CHLOROETHYL)ETHER	50.7	408	ND		UG/KG	1
2-CHLOROPHENOL	52.0	408	ND		UG/KG	1
1,3-DICHLOROBENZENE	55.7	408	ND		UG/KG	1
1,4-DICHLOROBENZENE	52.0	408	ND		UG/KG	1
BENZYL ALCOHOL	49.5	408	ND		UG/KG	1
1,2-DICHLOROBENZENE	68.1	408	ND		UG/KG	1
2-METHYLPHENOL	55.7	408	ND		UG/KG	1
2,2'-OXYBIS(1-CHLOROPROPANE)	60.6	408	ND		UG/KG	1
4-METHYLPHENOL	53.2	408	ND		UG/KG	1
N-NITROSO-DI-N-PROPYLAMINE	56.9	408	ND		UG/KG	1
HEXACHLOROETHANE	60.6	408	ND		UG/KG	1
NITROBENZENE	43.3	408	ND		UG/KG	1
ISOPHORONE	34.7	408	ND		UG/KG	1
2-NITROPHENOL	48.3	408	ND		UG/KG	1
2,4-DIMETHYLPHENOL	40.8	408	ND		UG/KG	1
BENZOIC ACID	101	408	ND		UG/KG	1
BIS(-2-CHLOROETHOXY)METHANE	47.0	408	ND		UG/KG	1
2,4-DICHLOROPHENOL	54.5	408	ND		UG/KG	1
1,2,4-TRICHLOROBENZENE	47.0	408	ND		UG/KG	1
NAPHTHALENE	47.0	408	ND		UG/KG	1
4-CHLOROANILINE	171	408	ND		UG/KG	1
HEXACHLOROBUTADIENE	50.7	408	ND		UG/KG	1
4-CHLORO-3-METHYLPHENOL	44.6	408	ND		UG/KG	1
2-METHYLNAPHTHALENE	44.6	408	ND		UG/KG	1
HEXACHLOROCYCLOPENTADIENE	42.1	408	ND		UG/KG	1
2,4,6-TRICHLOROPHENOL	40.8	408	ND		UG/KG	1
2,4,5-TRICHLOROPHENOL	45.8	408	ND		UG/KG	1
2-CHLORONAPHTHALENE	43.3	408	ND		UG/KG	1
2-NITROANILINE	32.2	408	ND		UG/KG	1
DIMETHYL PHTHALATE	38.4	408	ND		UG/KG	1
ACENAPHTHYLENE	48.3	408	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-Q1-01-05-1	ARDL Lab No.:	300549-05 (cont'd)
Desc/Location:	7Q	Lab Filename:	
Sample Date:	06/05/1997	Received Date:	06/07/1997
Sample Time:	1620	Prep. Date:	06/10/1997
Matrix:	SOIL	Analysis Date:	06/11/1997
Amount Used:	30 g	QC Batch:	B2266
% Moisture:	19.2	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	39.6	408	ND		UG/KG	1
3-NITROANILINE	96.5	408	ND		UG/KG	1
ACENAPHTHENE	39.6	408	ND		UG/KG	1
2,4-DINITROPHENOL	37.1	408	ND		UG/KG	1
4-NITROPHENOL	58.2	408	ND		UG/KG	1
DIBENZOFURAN	42.1	408	ND		UG/KG	1
2,4-DINITROTOLUENE	37.1	408	ND		UG/KG	1
DIETHYLPHTHALATE	44.6	408	ND		UG/KG	1
4-CHLOROPHENYL-PHENYLETHER	42.1	408	ND		UG/KG	1
FLUORENE	43.3	408	ND		UG/KG	1
4-NITROANILINE	73.0	408	ND		UG/KG	1
4,6-DINITRO-2-METHYLPHENOL	56.9	408	ND		UG/KG	1
N-NITROSODIPHENYLAMINE	48.3	408	ND		UG/KG	1
4-BROMOPHENYL-PHENYLETHER	43.3	408	ND		UG/KG	1
PHENANTHRENE	37.1	408	ND		UG/KG	1
HEXACHLOROBENZENE	38.4	408	ND		UG/KG	1
PENTACHLOROPHENOL	69.3	408	ND		UG/KG	1
ANTHRACENE	35.9	408	ND		UG/KG	1
DI-N-BUTYLPHTHALATE	27.2	408	ND		UG/KG	1
FLUORANTHENE	34.7	408	ND		UG/KG	1
PYRENE	34.7	408	ND		UG/KG	1
BUTYLBENZYLPHTHALATE	37.1	408	ND		UG/KG	1
3,3'-DICHLOROBENZIDINE	292	408	ND		UG/KG	1
BENZO(a)ANTHRACENE	29.7	408	ND		UG/KG	1
CHRYSENE	30.9	408	ND		UG/KG	1
BIS(2-ETHYLHEXYL)PHTHALATE	38.4	408	ND		UG/KG	1
DI-N-OCTYL PHTHALATE	34.7	408	ND		UG/KG	1
BENZO(b)FLUORANTHENE	65.6	408	ND		UG/KG	1
BENZO(k)FLUORANTHENE	81.7	408	ND		UG/KG	1
BENZO(a)PYRENE	35.9	408	ND		UG/KG	1
INDENO(1,2,3-cd)PYRENE	40.8	408	ND		UG/KG	1
DIBENZO(a,h)ANTHRACENE	38.4	408	ND		UG/KG	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3550A

Field ID:	H-07-Q1-01-05-1	ARDL Lab No.:	300549-05 (cont'd)
Desc/Location:	7Q	Lab Filename:	
Sample Date:	06/05/1997	Received Date:	06/07/1997
Sample Time:	1620	Prep. Date:	06/10/1997
Matrix:	SOIL	Analysis Date:	06/11/1997
Amount Used:	30 g	QC Batch:	B2266
% Moisture:	19.2	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	42.1	408	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	30-115	86%
2-FLUOROPHENOL	25-121	76%
D5 NITROBENZENE	23-120	76%
2,4,6-TRIBROMOPHENOL	19-122	80%
D5 PHENOL	24-113	80%
D14 TERPHENYL	18-137	86%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-07-Q1-01-05-1

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300549 SAS No.: --- SDG No.: ---

Matrix: (soil/water) SOIL Lab Sample ID: 300549-05

Sample wt/vol: 30.0 (g/mL) g Lab File ID: >W8065

Level: (low/med) LOW Date Received: 6/07/97

% Moisture: not dec. 19.2 dec. --- Date Extracted: 6/10/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/11/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ---

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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EXPLOSIVES
(Method 8330)

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-A-01-06-00	ARDL Lab No.:	300555-05
Desc/Location:	7A	Lab Filename:	
Sample Date:	06/11/1997	Received Date:	06/13/1997
Sample Time:	0900	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/13/1997
Amount Used:	770 mL	QC Batch:	B2294
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	25%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/26/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-A1-01-05-1	ARDL Lab No.:	300554-14
Desc/Location:	SITE A1 @ 1'	Lab Filename:	
Sample Date:	06/11/1997	Received Date:	06/13/1997
Sample Time:	0852	Prep. Date:	06/23/1997
Matrix:	SEDIMENT	Analysis Date:	06/25/1997
Amount Used:	2 g	Instrument ID:	
Final Volume:	20 mL	QC Batch:	B2301
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	99%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-B-01-06-00	ARDL Lab No.:	300555-04
Desc/Location:	7B	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1700	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/13/1997
Amount Used:	770 mL	QC Batch:	B2294
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	0.72	J	UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	87%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-B1-01-05-1	ARDL Lab No.:	300554-04
Desc/Location:	STATION B1 @ 1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1653	Prep. Date:	06/17/1997
Matrix:	SEDIMENT	Analysis Date:	06/19/1997
Amount Used:	2 g	QC Batch:	B2289
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	98%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-B1-02-05-3	ARDL Lab No.:	300554-07
Desc/Location:	B1 @ 3'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1703	Prep. Date:	06/17/1997
Matrix:	SEDIMENT	Analysis Date:	06/19/1997
Amount Used:	2 g	QC Batch:	B2289
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	99%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-C-01-06-00	ARDL Lab No.:	300555-07
Desc/Location:	STATION C	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1445	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/13/1997
Amount Used:	770 mL	QC Batch:	B2294
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	0.51	J	UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	85%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/26/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-C1-01-05-1	ARDL Lab No.:	300554-01
Desc/Location:	STATION C1 @ 0-1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1439	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/19/1997
Amount Used:	2 g	Instrument ID:	
Final Volume:	20 mL	QC Batch:	B2290
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	95%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/26/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-C1-02-05-3	ARDL Lab No.:	300554-03
Desc/Location:	STATION C1 @ 3'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1450	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/19/1997
Amount Used:	2 g	Instrument ID:	
Final Volume:	20 mL	QC Batch:	B2290
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	100%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/12/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-D-01-06-00	ARDL Lab No.:	300542-13
Desc/Location:	7D	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1600	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/06/1997
Amount Used:	770 mL	QC Batch:	B2252
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	81%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-D1-01-05-1	ARDL Lab No.:	300542-05
Desc/Location:	7D1	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1600	Prep. Date:	06/02/1997
Matrix:	SOIL	Analysis Date:	06/07/1997
Amount Used:	2 g	QC Batch:	B2250
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	96%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-E-01-06-00	ARDL Lab No.:	300555-10
Desc/Location:	7E	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1130	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	770 mL	QC Batch:	B2294
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	9.3		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	2.1	6.5	23.0		UG/L	5
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	85%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-E1-01-05-1	ARDL Lab No.:	300554-09
Desc/Location:	E1 @ 1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1129	Prep. Date:	06/17/1997
Matrix:	SEDIMENT	Analysis Date:	06/19/1997
Amount Used:	2 g	QC Batch:	B2289
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	97%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-E1-02-05-3	ARDL Lab No.:	300554-08
Desc/Location:	E1 @ 3'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1145	Prep. Date:	06/17/1997
Matrix:	SEDIMENT	Analysis Date:	06/19/1997
Amount Used:	2 g	QC Batch:	B2289
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	97%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-E2-01-05-1	ARDL Lab No.:	300554-11
Desc/Location:	E2 @ 1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1130	Prep. Date:	06/17/1997
Matrix:	SEDIMENT	Analysis Date:	06/19/1997
Amount Used:	2 g	QC Batch:	B2289
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	470	J	UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	97%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-F-01-06-00	ARDL Lab No.:	300555-06
Desc/Location:	STATION F	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	0909	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/13/1997
Amount Used:	770 mL	QC Batch:	B2294
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	5.2		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	5.0		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	87%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/26/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-F1-01-05-01	ARDL Lab No.:	300554-02
Desc/Location:	STATION F1 @ 0-1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	0910	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/19/1997
Amount Used:	2 g	Instrument ID:	
Final Volume:	20 mL	QC Batch:	B2290
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	400	J	UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	99%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/26/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-F2-01-05-01	ARDL Lab No.:	300554-05
Desc/Location:	F2 @ 0-1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	0910	Prep. Date:	06/17/1997
Matrix:	SEDIMENT	Analysis Date:	06/19/1997
Amount Used:	2 g	Instrument ID:	
Final Volume:	20 mL	QC Batch:	B2289
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	310	J	UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	99%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-G-01-06-00	ARDL Lab No.:	300555-09
Desc/Location:	7G	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1040	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	770 mL	QC Batch:	B2294
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	85%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-G1-01-05-01	ARDL Lab No.:	300554-13
Desc/Location:	SITE G1 @ 1'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1045	Prep. Date:	06/17/1997
Matrix:	SEDIMENT	Analysis Date:	06/19/1997
Amount Used:	2 g	QC Batch:	B2289
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	97%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-G2-01-05-01	ARDL Lab No.:	300554-10
Desc/Location:	G2 @ 01'	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1045	Prep. Date:	06/17/1997
Matrix:	SEDIMENT	Analysis Date:	06/19/1997
Amount Used:	2 g	QC Batch:	B2289
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	99%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-H-01-06-00	ARDL Lab No.:	300552-11
Desc/Location:	7H	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1415	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/12/1997
Amount Used:	770 mL	Instrument ID:	
Final Volume:	10 mL	QC Batch:	B2285
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	3.0		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	1.6		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	92%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-H1-01-05-01	ARDL Lab No.:	300552-03
Desc/Location:	7H1	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1410	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/18/1997
Amount Used:	2 g	Instrument ID:	
Final Volume:	20 mL	QC Batch:	B2286
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	104%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-H1-02-05-03	ARDL Lab No.:	300552-04
Desc/Location:	7H1	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1430	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/18/1997
Amount Used:	2 g	Instrument ID:	
Final Volume:	20 mL	QC Batch:	B2286
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	95%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-H2-01-05-01	ARDL Lab No.:	300552-05
Desc/Location:	7H2	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1410	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/18/1997
Amount Used:	2 g	Instrument ID:	
Final Volume:	20 mL	QC Batch:	B2286
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	330	J	UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	96%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-I-01-06-00	ARDL Lab No.:	300552-12
Desc/Location:	7I	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1245	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/12/1997
Amount Used:	770 mL	Instrument ID:	
Final Volume:	10 mL	QC Batch:	B2285
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	3.4		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	1.9		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	83%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-I1-01-05-01	ARDL Lab No.:	300552-06
Desc/Location:	7I1	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1237	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/19/1997
Amount Used:	2 g	Instrument ID:	
Final Volume:	20 mL	QC Batch:	B2286
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	7300		UG/KG	1
2,4-DINITROTOLUENE	316	1000	800	J	UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	7000		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	2000		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	9900		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	1900		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	98%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-I1-02-05-03	ARDL Lab No.:	300552-09
Desc/Location:	7I1	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1250	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/19/1997
Amount Used:	2 g	Instrument ID:	
Final Volume:	20 mL	QC Batch:	B2286
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	98%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-I2-01-05-01	ARDL Lab No.:	300552-07
Desc/Location:	7I2	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1237	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/19/1997
Amount Used:	2 g	Instrument ID:	
Final Volume:	20 mL	QC Batch:	B2286
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	460	J	UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	99%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-J-01-06-00	ARDL Lab No.:	300552-10
Desc/Location:	7J	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	0935	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/12/1997
Amount Used:	770 mL	Instrument ID:	
Final Volume:	10 mL	QC Batch:	B2285
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	5.3		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	1.5		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	89%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-J1-01-05-01	ARDL Lab No.:	300552-01
Desc/Location:	7J1	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	0955	Prep. Date:	06/11/1997
Matrix:	SEDIMENT	Analysis Date:	06/12/1997
Amount Used:	2 g	Instrument ID:	
Final Volume:	20 mL	QC Batch:	B2284
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	760	J	UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	660	J	UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	470	J	UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	97%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-J1-02-05-03	ARDL Lab No.:	300552-08
Desc/Location:	7J1	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	1055	Prep. Date:	06/16/1997
Matrix:	SEDIMENT	Analysis Date:	06/19/1997
Amount Used:	2 g	Instrument ID:	
Final Volume:	20 mL	QC Batch:	B2286
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	94%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300552 Report Date: 06/23/1997

Project Name: IOWA ARMY AMMUNITION Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-J2-01-05-01	ARDL Lab No.:	300552-02
Desc/Location:	7J2	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/10/1997
Sample Time:	0955	Prep. Date:	06/11/1997
Matrix:	SEDIMENT	Analysis Date:	06/12/1997
Amount Used:	2 g	Instrument ID:	
Final Volume:	20 mL	QC Batch:	B2284
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	600	J	UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	1700		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	790	J	UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	1400		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	100%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-K-01-06-00	ARDL Lab No.:	300549-07
Desc/Location:	7K	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1124	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/12/1997
Amount Used:	770 mL	QC Batch:	B2269
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	1.7		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	0.97	J	UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	39%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-K1-01-05-1	ARDL Lab No.:	300549-03
Desc/Location:	K1-1'	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1139	Prep. Date:	06/11/1997
Matrix:	SOIL	Analysis Date:	06/12/1997
Amount Used:	2 g	QC Batch:	B2271
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	99%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-K1-02-05-03	ARDL Lab No.:	300549-02
Desc/Location:	K1-3'	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1210	Prep. Date:	06/11/1997
Matrix:	SOIL	Analysis Date:	06/12/1997
Amount Used:	2 g	QC Batch:	B2271
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	99%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-K2-01-05-1	ARDL Lab No.:	300549-01
Desc/Location:	K2	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1139	Prep. Date:	06/11/1997
Matrix:	SOIL	Analysis Date:	06/12/1997
Amount Used:	2 g	QC Batch:	B2271
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	101%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/12/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-L-01-06-00	ARDL Lab No.:	300542-15
Desc/Location:	7L	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	0852	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/06/1997
Amount Used:	770 mL	QC Batch:	B2252
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	6.2		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	1.7		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	75%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-L1-01-05-1	ARDL Lab No.:	300542-09
Desc/Location:	7L1	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	0903	Prep. Date:	06/02/1997
Matrix:	SOIL	Analysis Date:	06/07/1997
Amount Used:	2 g	QC Batch:	B2250
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	107%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-L2-01-05-1	ARDL Lab No.:	300542-10
Desc/Location:	7L2	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	0925	Prep. Date:	06/02/1997
Matrix:	SOIL	Analysis Date:	06/07/1997
Amount Used:	2 g	QC Batch:	B2250
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	99%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/12/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-L2-02-05-2.7	ARDL Lab No.:	300542-11
Desc/Location:	7L2	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	1000	Prep. Date:	06/04/1997
Matrix:	SOIL	Analysis Date:	06/07/1997
Amount Used:	2 g	QC Batch:	B2251
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	403	1290	ND		UG/KG	1
1,3-DINITROBENZENE	381	1160	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	406	1290	ND		UG/KG	1
2,4-DINITROTOLUENE	408	1290	ND		UG/KG	1
2,6-DINITROTOLUENE	372	1160	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	340	1160	ND		UG/KG	1
2-NITROTOLUENE	376	1160	ND		UG/KG	1
3-NITROTOLUENE	442	1420	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	366	1160	ND		UG/KG	1
4-NITROTOLUENE	348	1160	ND		UG/KG	1
RDX	353	1160	ND		UG/KG	1
NITROBENZENE	425	1290	ND		UG/KG	1
HMX	368	1160	ND		UG/KG	1
TETRYL	370	1160	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	98%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-M-01-06-00	ARDL Lab No.:	300542-12
Desc/Location:	7M	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1333	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/06/1997
Amount Used:	770 mL	QC Batch:	B2252
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	6.2		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	1.7		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	77%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-M1-01-05-1	ARDL Lab No.:	300542-01
Desc/Location:	7M1	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1400	Prep. Date:	06/02/1997
Matrix:	SOIL	Analysis Date:	06/06/1997
Amount Used:	2 g	QC Batch:	B2250
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	103%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-M1-02-05-3	ARDL Lab No.:	300542-02
Desc/Location:	7M1	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1430	Prep. Date:	06/02/1997
Matrix:	SOIL	Analysis Date:	06/06/1997
Amount Used:	2 g	QC Batch:	B2250
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	103%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-M1-03-05-4.5	ARDL Lab No.:	300542-03
Desc/Location:	7M1	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1500	Prep. Date:	06/02/1997
Matrix:	SOIL	Analysis Date:	06/06/1997
Amount Used:	2 g	QC Batch:	B2250
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	102%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-M2-01-05-1	ARDL Lab No.:	300542-04
Desc/Location:	7M2	Lab Filename:	
Sample Date:	05/29/1997	Received Date:	05/31/1997
Sample Time:	1515	Prep. Date:	06/02/1997
Matrix:	SOIL	Analysis Date:	06/07/1997
Amount Used:	2 g	QC Batch:	B2250
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	99%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-N-01-06-00	ARDL Lab No.:	300549-06
Desc/Location:	7N	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1033	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/12/1997
Amount Used:	770 mL	QC Batch:	B2269
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	87%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-N1-01-05-1	ARDL Lab No.:	300549-04
Desc/Location:	N-1	Lab Filename:	
Sample Date:	06/06/1997	Received Date:	06/07/1997
Sample Time:	1042	Prep. Date:	06/11/1997
Matrix:	SOIL	Analysis Date:	06/12/1997
Amount Used:	2 g	QC Batch:	B2271
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	101%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-O-01-06-00	ARDL Lab No.:	300542-14
Desc/Location:	7O	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	1045	Prep. Date:	06/03/1997
Matrix:	WATER	Analysis Date:	06/06/1997
Amount Used:	770 mL	QC Batch:	B2252
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	81%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-01-01-05-1	ARDL Lab No.:	300542-06
Desc/Location:	701	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	1045	Prep. Date:	06/02/1997
Matrix:	SOIL	Analysis Date:	06/07/1997
Amount Used:	2 g	QC Batch:	B2250
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	98%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-01-02-05-3	ARDL Lab No.:	300542-07
Desc/Location:	701	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	1100	Prep. Date:	06/02/1997
Matrix:	SOIL	Analysis Date:	06/07/1997
Amount Used:	2 g	QC Batch:	B2250
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	98%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-01-03-05-4.5	ARDL Lab No.:	300542-08
Desc/Location:	701	Lab Filename:	
Sample Date:	05/30/1997	Received Date:	05/31/1997
Sample Time:	1125	Prep. Date:	06/02/1997
Matrix:	SOIL	Analysis Date:	06/07/1997
Amount Used:	2 g	QC Batch:	B2250
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	96%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300544 Report Date: 06/17/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-P-01-06-00	ARDL Lab No.:	300544-03
Desc/Location:	7P	Lab Filename:	
Sample Date:	06/02/1997	Received Date:	06/04/1997
Sample Time:	1230	Prep. Date:	06/05/1997
Matrix:	WATER	Analysis Date:	06/07/1997
Amount Used:	770 mL	QC Batch:	B2261
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	87%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300544 Report Date: 06/17/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-P1-01-05-01	ARDL Lab No.:	300544-01
Desc/Location:	7P,0 TO 1 FT	Lab Filename:	
Sample Date:	06/02/1997	Received Date:	06/04/1997
Sample Time:	1400	Prep. Date:	06/04/1997
Matrix:	SOIL	Analysis Date:	06/07/1997
Amount Used:	2 g	QC Batch:	B2262
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	95%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-Q-01-06-00	ARDL Lab No.:	300549-08
Desc/Location:	7Q	Lab Filename:	
Sample Date:	06/05/1997	Received Date:	06/07/1997
Sample Time:	1630	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/12/1997
Amount Used:	770 mL	QC Batch:	B2269
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	7.8		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	1.6		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	87%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-07-Q1-01-05-1	ARDL Lab No.:	300549-05
Desc/Location:	7Q	Lab Filename:	
Sample Date:	06/05/1997	Received Date:	06/07/1997
Sample Time:	1620	Prep. Date:	06/11/1997
Matrix:	SOIL	Analysis Date:	06/12/1997
Amount Used:	2 g	QC Batch:	B2271
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	312	1000	ND		UG/KG	1
1,3-DINITROBENZENE	295	900	ND		UG/KG	1
2,4,6-TRINITROTOLUENE	314	1000	ND		UG/KG	1
2,4-DINITROTOLUENE	316	1000	ND		UG/KG	1
2,6-DINITROTOLUENE	288	900	ND		UG/KG	1
2-AMINO-4,6-DINITROTOLUENE	263	900	ND		UG/KG	1
2-NITROTOLUENE	291	900	ND		UG/KG	1
3-NITROTOLUENE	342	1100	ND		UG/KG	1
4-AMINO-2,6-DINITROTOLUENE	283	900	ND		UG/KG	1
4-NITROTOLUENE	269	900	ND		UG/KG	1
RDX	273	900	ND		UG/KG	1
NITROBENZENE	329	1000	ND		UG/KG	1
HMX	285	900	ND		UG/KG	1
TETRYL	286	900	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	0-179	99%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

INORGANICS

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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/26/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-A-01-06-00 ARDL No: 300555-05
Sampling Loc'n: 7A Received: 06/13/1997
Sampling Date: 06/11/1997 Matrix: WATER
Sampling Time: 0900 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.078	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ARSENIC	0.00050	0.0013	MG/L	3020	7061	06/16/97	06/17/97	BH2708
BARIUM	0.010	0.16	MG/L	3010	6010A	06/16/97	06/18/97	P2126
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CALCIUM	0.10	62.2	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CHROMIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
COBALT	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
COPPER	0.010	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
IRON	0.050	0.23	MG/L	3010	6010A	06/16/97	06/18/97	P2126
LEAD	0.0010	ND	MG/L	3020	7421	06/16/97	06/17/97	F2128
MAGNESIUM	0.10	21.6	MG/L	3010	6010A	06/16/97	06/18/97	P2126
MANGANESE	0.0050	0.13	MG/L	3010	6010A	06/16/97	06/18/97	P2126
MERCURY	0.00020	ND	MG/L	7470	7470	06/16/97	06/16/97	C0894
NICKEL	0.020	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
POTASSIUM	1.5	4	MG/L	3010	6010A	06/16/97	06/18/97	P2126
SELENIUM	0.00050	ND	MG/L	3020	7741	06/16/97	06/17/97	BH2710
SILVER	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
SODIUM	0.40	34.2	MG/L	3010	6010A	06/16/97	06/18/97	P2126
THALLIUM	0.0010	ND	MG/L	3020	7841	06/16/97	06/17/97	F2130
VANADIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ZINC	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/16/97	06/16/97	06184189

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Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-A1-01-05-1 ARDL No: 300554-14
Sampling Loc'n: SITE A1 @ 1' Received: 06/13/1997
Sampling Date: 06/11/1997 Matrix: SEDIMENT
Sampling Time: 0852 Moisture: 35.5

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	7.8	3210	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ANTIMONY	3.1	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ARSENIC	0.78	5.6	MG/KG	3050	7061	06/18/97	06/19/97	BH2704
BARIUM	1.6	189	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
BERYLLIUM	0.16	0.33	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CADMIUM	0.78	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CALCIUM	15.5	7590	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CHROMIUM	0.78	6.5	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
COBALT	0.78	5.4	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
COPPER	1.6	9.4	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
IRON	7.8	7770	MG/KG	3050	6010A	06/17/97	06/18/97	P21
LEAD	0.78	14.9	MG/KG	3050	7421	06/18/97	06/19/97	F21[illegible]
MAGNESIUM	15.5	2200	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
MANGANESE	0.78	495	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
MERCURY	0.12	ND	MG/KG	7470	7470	06/16/97	06/16/97	C0893
NICKEL	3.1	11.9	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
POTASSIUM	233	271	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
SELENIUM	0.078	0.42	MG/KG	3050	7741	06/18/97	06/19/97	BH2705
SILVER	0.78	0.92	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
SODIUM	62.0	122	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
THALLIUM	0.16	ND	MG/KG	3050	7841	06/18/97	06/20/97	F2125
VANADIUM	0.78	12.2	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ZINC	0.78	28.7	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CYANIDE, TOTAL	0.76	ND	MG/KG	9010	9010	06/19/97	06/20/97	06234203
SOLIDS, TOTAL	1.0	64.5	%	NONE	160.3	NA	06/16/97	06234202

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Lab Report No: 300555 Report Date: 06/26/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-B-01-06-00 ARDL No: 300555-04
Sampling Loc'n: 7B Received: 06/13/1997
Sampling Date: 06/10/1997 Matrix: WATER
Sampling Time: 1700 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.073	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ARSENIC	0.00050	0.0017	MG/L	3020	7061	06/16/97	06/17/97	BH2708
BARIUM	0.010	0.14	MG/L	3010	6010A	06/16/97	06/18/97	P2126
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CALCIUM	0.10	59.7	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CHROMIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
COBALT	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
COPPER	0.010	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
IRON	0.050	0.21	MG/L	3010	6010A	06/16/97	06/18/97	P2126
LEAD	0.0010	ND	MG/L	3020	7421	06/16/97	06/17/97	F2128
MAGNESIUM	0.10	22.1	MG/L	3010	6010A	06/16/97	06/18/97	P2126
MANGANESE	0.0050	0.1	MG/L	3010	6010A	06/16/97	06/18/97	P2126
MERCURY	0.00020	ND	MG/L	7470	7470	06/16/97	06/16/97	C0894
NICKEL	0.020	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
POTASSIUM	1.5	3.7	MG/L	3010	6010A	06/16/97	06/18/97	P2126
SELENIUM	0.00050	ND	MG/L	3020	7741	06/16/97	06/17/97	BH2710
SILVER	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
SODIUM	0.40	28.2	MG/L	3010	6010A	06/16/97	06/18/97	P2126
THALLIUM	0.0010	ND	MG/L	3020	7841	06/16/97	06/17/97	F2130
VANADIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ZINC	0.0050	0.0051	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CYANIDE, TOTAL	0.010	0.011	MG/L	9012	9012	06/16/97	06/16/97	06184189

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Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-B1-01-05-1 ARDL No: 300554-04
Sampling Loc'n: STATION B1 @ 1' Received: 06/13/1997
Sampling Date: 06/10/1997 Matrix: SEDIMENT
Sampling Time: 1653 Moisture: 22.8

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	6.5	751	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ANTIMONY	2.6	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ARSENIC	0.065	1.4	MG/KG	3050	7061	06/18/97	06/19/97	BH2704
BARIUM	1.3	68.2	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
BERYLLIUM	0.13	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CADMIUM	0.65	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CALCIUM	13.0	2500	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CHROMIUM	0.65	2.1	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
COBALT	0.65	2.4	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
COPPER	1.3	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P212[illegible]
IRON	6.5	3070	MG/KG	3050	6010A	06/17/97	06/18/97	P21[illegible]
LEAD	0.13	4.4	MG/KG	3050	7421	06/18/97	06/19/97	F212[illegible]
MAGNESIUM	13.0	532	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
MANGANESE	0.65	138	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
MERCURY	0.1	ND	MG/KG	7470	7470	06/16/97	06/16/97	C0893
NICKEL	2.6	4.1	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
POTASSIUM	194	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
SELENIUM	0.065	ND	MG/KG	3050	7741	06/18/97	06/19/97	BH2705
SILVER	0.65	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
SODIUM	51.8	87.2	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
THALLIUM	0.13	ND	MG/KG	3050	7841	06/18/97	06/20/97	F2125
VANADIUM	0.65	4.5	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ZINC	0.65	8.1	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CYANIDE, TOTAL	0.65	ND	MG/KG	9010	9010	06/19/97	06/20/97	06234203
SOLIDS, TOTAL	1.0	77.2	%	NONE	160.3	NA	06/16/97	06234202

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Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-B1-02-05-3 ARDL No: 300554-07
Sampling Loc'n: B1 @ 3' Received: 06/13/1997
Sampling Date: 06/10/1997 Matrix: SEDIMENT
Sampling Time: 1703 Moisture: 20.9

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	6.3	1940	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ANTIMONY	2.5	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ARSENIC	0.063	1.8	MG/KG	3050	7061	06/18/97	06/19/97	BH2704
BARIUM	1.3	113	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
BERYLLIUM	0.13	0.34	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CADMIUM	0.63	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CALCIUM	12.6	7960	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CHROMIUM	0.63	4.5	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
COBALT	0.63	5.3	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
COPPER	1.3	5.4	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
IRON	6.3	7740	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
LEAD	0.63	6.4	MG/KG	3050	7421	06/18/97	06/19/97	F2124
MAGNESIUM	12.6	1640	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
MANGANESE	0.63	296	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
MERCURY	0.1	ND	MG/KG	7470	7470	06/16/97	06/16/97	C0893
NICKEL	2.5	10.5	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
POTASSIUM	190	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
SELENIUM	0.063	0.12	MG/KG	3050	7741	06/18/97	06/19/97	BH2705
SILVER	0.63	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
SODIUM	50.6	99.7	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
THALLIUM	0.13	ND	MG/KG	3050	7841	06/18/97	06/20/97	F2125
VANADIUM	0.63	13.7	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ZINC	0.63	22.6	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CYANIDE, TOTAL	0.63	ND	MG/KG	9010	9010	06/19/97	06/20/97	06234203
SOLIDS, TOTAL	1.0	79.1	%	NONE	160.3	NA	06/16/97	06234202

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Lab Report No: 300555 Report Date: 06/26/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-C-01-06-00 ARDL No: 300555-07
Sampling Loc'n: STATION C Received: 06/13/1997
Sampling Date: 06/10/1997 Matrix: WATER
Sampling Time: 1445 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ARSENIC	0.00050	0.0017	MG/L	3020	7061	06/16/97	06/17/97	BH2708
BARIUM	0.010	0.14	MG/L	3010	6010A	06/16/97	06/18/97	P2126
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CALCIUM	0.10	61.2	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CHROMIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
COBALT	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
COPPER	0.010	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
IRON	0.050	0.19	MG/L	3010	6010A	06/16/97	06/18/97	P212
LEAD	0.0010	ND	MG/L	3020	7421	06/16/97	06/17/97	F212
MAGNESIUM	0.10	22.2	MG/L	3010	6010A	06/16/97	06/18/97	P2126
MANGANESE	0.0050	0.076	MG/L	3010	6010A	06/16/97	06/18/97	P2126
MERCURY	0.00020	ND	MG/L	7470	7470	06/16/97	06/16/97	C0894
NICKEL	0.020	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
POTASSIUM	1.5	3.2	MG/L	3010	6010A	06/16/97	06/18/97	P2126
SELENIUM	0.00050	ND	MG/L	3020	7741	06/16/97	06/17/97	BH2710
SILVER	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
SODIUM	0.40	24.4	MG/L	3010	6010A	06/16/97	06/18/97	P2126
THALLIUM	0.0010	ND	MG/L	3020	7841	06/16/97	06/17/97	F2130
VANADIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ZINC	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/16/97	06/16/97	06184189

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Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-C1-01-05-1 ARDL No: 300554-01
Sampling Loc'n: STATION C1 @ 0-1' Received: 06/13/1997
Sampling Date: 06/10/1997 Matrix: SEDIMENT
Sampling Time: 1439 Moisture: 17.3

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	6	815	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ANTIMONY	2.4	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ARSENIC	0.6	4.7	MG/KG	3050	7061	06/18/97	06/19/97	BH2704
BARIUM	1.2	109	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
BERYLLIUM	0.12	0.23	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CADMIUM	0.6	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CALCIUM	12.1	9050	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CHROMIUM	0.6	2.9	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
COBALT	0.6	12.1	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
COPPER	1.2	3.2	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
IRON	6	7940	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
LEAD	0.6	6.3	MG/KG	3050	7421	06/18/97	06/19/97	F2124
MAGNESIUM	12.1	1560	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
MANGANESE	0.6	1520	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
MERCURY	0.097	ND	MG/KG	7470	7470	06/16/97	06/16/97	C0893
NICKEL	2.4	10.7	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
POTASSIUM	181	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
SELENIUM	0.06	0.093	MG/KG	3050	7741	06/18/97	06/19/97	BH2705
SILVER	0.6	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
SODIUM	48.4	92.7	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
THALLIUM	0.12	0.14	MG/KG	3050	7841	06/18/97	06/20/97	F2125
VANADIUM	0.6	11.2	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ZINC	0.6	14.6	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CYANIDE, TOTAL	0.6	ND	MG/KG	9010	9010	06/19/97	06/20/97	06234203
SOLIDS, TOTAL	1.0	82.7	%	NONE	160.3	NA	06/16/97	06234202

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Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-C1-02-05-3 ARDL No: 300554-03
Sampling Loc'n: STATION C1 @ 3' Received: 06/13/1997
Sampling Date: 06/10/1997 Matrix: SEDIMENT
Sampling Time: 1450 Moisture: 13.9

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	5.8	807	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ANTIMONY	2.3	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ARSENIC	0.58	5	MG/KG	3050	7061	06/18/97	06/19/97	BH2704
BARIUM	1.2	58.2	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
BERYLLIUM	0.12	0.17	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CADMIUM	0.58	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CALCIUM	11.6	4320	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CHROMIUM	0.58	5.7	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
COBALT	0.58	4.6	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
COPPER	1.2	2.4	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
IRON	5.8	8240	MG/KG	3050	6010A	06/17/97	06/18/97	P21[illegible]
LEAD	0.58	5.4	MG/KG	3050	7421	06/18/97	06/19/97	F212[illegible]
MAGNESIUM	11.6	895	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
MANGANESE	0.58	247	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
MERCURY	0.093	ND	MG/KG	7470	7470	06/16/97	06/16/97	C0893
NICKEL	2.3	9	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
POTASSIUM	174	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
SELENIUM	0.058	0.11	MG/KG	3050	7741	06/18/97	06/19/97	BH2705
SILVER	0.58	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
SODIUM	46.5	97.5	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
THALLIUM	0.12	ND	MG/KG	3050	7841	06/18/97	06/20/97	F2125
VANADIUM	0.58	8.7	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ZINC	0.58	12.9	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CYANIDE, TOTAL	0.57	ND	MG/KG	9010	9010	06/19/97	06/20/97	06234203
SOLIDS, TOTAL	1.0	86.1	%	NONE	160.3	NA	06/16/97	06234202

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Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-D-01-06-00 ARDL No: 300542-13
Sampling Loc'n: 7D Received: 05/31/1997
Sampling Date: 05/29/1997 Matrix: WATER
Sampling Time: 1600 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.18	MG/L	3010	6010	06/02/97	06/03/97	P2084
ANTIMONY	0.020	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
ARSENIC	0.00050	0.0016	MG/L	3020	7061	06/06/97	06/10/97	F2095
BARIUM	0.010	0.12	MG/L	3010	6010	06/02/97	06/03/97	P2084
BERYLLIUM	0.0010	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
CADMIUM	0.0050	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
CALCIUM	0.10	57.7	MG/L	3010	6010	06/02/97	06/03/97	P2084
CHROMIUM	0.0050	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
COBALT	0.0050	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
COPPER	0.010	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
IRON	0.050	0.33	MG/L	3010	6010	06/02/97	06/03/97	P2084
LEAD	0.0010	ND	MG/L	3020	7421	06/06/97	06/09/97	F2096
MAGNESIUM	0.10	20.3	MG/L	3010	6010	06/02/97	06/03/97	P2084
MANGANESE	0.0050	0.081	MG/L	3010	6010	06/02/97	06/03/97	P2084
MERCURY	0.00020	ND	MG/L	7470	7470	06/02/97	06/02/97	C0882
NICKEL	0.020	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
POTASSIUM	1.5	4	MG/L	3010	6010	06/02/97	06/03/97	P2084
SELENIUM	0.00050	0.0012	MG/L	3020	7741	06/06/97	06/09/97	BH2691
SILVER	0.0050	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
SODIUM	0.40	26.0	MG/L	3010	6010	06/02/97	06/03/97	P2084
THALLIUM	0.0010	ND	MG/L	3020	7841	06/06/97	06/06/97	F2092
VANADIUM	0.0050	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
ZINC	0.0050	0.0075	MG/L	3010	6010	06/02/97	06/03/97	P2084
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/06/97	06/06/97	06114157

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Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-D1-01-05-1 ARDL No: 300542-05
Sampling Loc'n: 7D1 Received: 05/31/1997
Sampling Date: 05/29/1997 Matrix: SOIL
Sampling Time: 1600 Moisture: 33.7

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	7.5	2780	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ANTIMONY	3	ND	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ARSENIC	0.075	1.4	MG/KG	3050	7061	06/03/97	06/04/97	BH2689
BARIUM	1.5	124	MG/KG	3050	6010	06/05/97	06/06/97	P2091
BERYLLIUM	0.15	0.3	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CADMIUM	0.75	ND	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CALCIUM	15.1	5700	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CHROMIUM	0.75	5.8	MG/KG	3050	6010	06/05/97	06/06/97	P2091
COBALT	0.75	5.3	MG/KG	3050	6010	06/05/97	06/06/97	P2091
COPPER	1.5	9.1	MG/KG	3050	6010	06/05/97	06/06/97	P2091
IRON	7.5	6170	MG/KG	3050	6010	06/05/97	06/06/97	P2091
LEAD	0.75	8.9	MG/KG	3050	7421	06/05/97	06/06/97	F2095
MAGNESIUM	15.1	1850	MG/KG	3050	6010	06/05/97	06/06/97	P2091
MANGANESE	0.75	289	MG/KG	3050	6010	06/05/97	06/06/97	P2091
MERCURY	0.12	ND	MG/KG	7470	7470	06/02/97	06/02/97	C0881
NICKEL	3	8.7	MG/KG	3050	6010	06/05/97	06/06/97	P2091
POTASSIUM	226	470	MG/KG	3050	6010	06/05/97	06/06/97	P2091
SELENIUM	0.075	ND	MG/KG	3050	7741	06/03/97	06/04/97	BH2690
SILVER	0.75	0.87	MG/KG	3050	6010	06/05/97	06/06/97	P2091
SODIUM	60.3	111	MG/KG	3050	6010	06/05/97	06/06/97	P2091
THALLIUM	0.15	ND	MG/KG	3050	7841	06/03/97	06/03/97	F2083
VANADIUM	0.75	10.8	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ZINC	0.75	27.9	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CYANIDE, TOTAL	0.73	ND	MG/KG	9010	9010	06/05/97	06/05/97	06114158
SOLIDS, TOTAL	1.0	66.3	%	NONE	160.3	NA	06/03/97	06044147

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Lab Report No: 300555 Report Date: 06/26/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-E-01-06-00 ARDL No: 300555-10
Sampling Loc'n: 7E Received: 06/13/1997
Sampling Date: 06/10/1997 Matrix: WATER
Sampling Time: 1130 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.19	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ARSENIC	0.00050	0.00088	MG/L	3020	7061	06/16/97	06/17/97	BH2708
BARIUM	0.010	0.12	MG/L	3010	6010A	06/16/97	06/18/97	P2126
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CALCIUM	0.10	52.3	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CHROMIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
COBALT	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
COPPER	0.010	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
IRON	0.050	0.36	MG/L	3010	6010A	06/16/97	06/18/97	P2126
LEAD	0.0010	0.0013	MG/L	3020	7421	06/16/97	06/17/97	F2128
MAGNESIUM	0.10	19.4	MG/L	3010	6010A	06/16/97	06/18/97	P2126
MANGANESE	0.0050	0.061	MG/L	3010	6010A	06/16/97	06/18/97	P2126
MERCURY	0.00020	ND	MG/L	7470	7470	06/16/97	06/16/97	C0894
NICKEL	0.020	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
POTASSIUM	1.5	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
SELENIUM	0.00050	ND	MG/L	3020	7741	06/16/97	06/17/97	BH2710
SILVER	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
SODIUM	0.40	25.5	MG/L	3010	6010A	06/16/97	06/18/97	P2126
THALLIUM	0.0010	ND	MG/L	3020	7841	06/16/97	06/17/97	F2130
VANADIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ZINC	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/16/97	06/16/97	06184189

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Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-E1-01-05-1 ARDL No: 300554-09
Sampling Loc'n: E1 @ 1' Received: 06/13/1997
Sampling Date: 06/10/1997 Matrix: SEDIMENT
Sampling Time: 1129 Moisture: 18.7

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	6.2	2050	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ANTIMONY	2.5	5.9	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ARSENIC	1.2	30.8	MG/KG	3050	7061	06/18/97	06/19/97	BH2704
BARIUM	1.2	128	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
BERYLLIUM	0.12	0.6	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CADMIUM	0.62	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CALCIUM	12.3	2250	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CHROMIUM	0.62	13.7	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
COBALT	0.62	16.8	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
COPPER	1.2	8	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
IRON	6.2	26100	MG/KG	3050	6010A	06/17/97	06/18/97	P21[illegible]
LEAD	0.62	18.1	MG/KG	3050	7421	06/18/97	06/19/97	F212[illegible]
MAGNESIUM	12.3	726	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
MANGANESE	0.62	906	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
MERCURY	0.098	ND	MG/KG	7470	7470	06/16/97	06/16/97	C0893
NICKEL	2.5	15.1	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
POTASSIUM	185	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
SELENIUM	0.062	0.25	MG/KG	3050	7741	06/18/97	06/19/97	BH2705
SILVER	0.62	1.2	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
SODIUM	49.2	92.2	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
THALLIUM	0.12	ND	MG/KG	3050	7841	06/18/97	06/20/97	F2125
VANADIUM	0.62	30.4	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ZINC	0.62	27.1	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CYANIDE, TOTAL	0.61	ND	MG/KG	9010	9010	06/19/97	06/20/97	06234203
SOLIDS, TOTAL	1.0	81.3	%	NONE	160.3	NA	06/16/97	06234202

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Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-E1-02-05-3 ARDL No: 300554-08
Sampling Loc'n: E1 @ 3' Received: 06/13/1997
Sampling Date: 06/10/1997 Matrix: SEDIMENT
Sampling Time: 1145 Moisture: 18.4

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	6.1	1730	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ANTIMONY	2.5	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ARSENIC	0.061	0.43	MG/KG	3050	7061	06/18/97	06/19/97	BH2704
BARIUM	1.2	24.2	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
BERYLLIUM	0.12	0.18	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CADMIUM	0.61	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CALCIUM	12.3	664	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CHROMIUM	0.61	4.9	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
COBALT	0.61	1.5	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
COPPER	1.2	4.2	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
IRON	6.1	1850	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
LEAD	0.12	4.4	MG/KG	3050	7421	06/18/97	06/19/97	F2124
MAGNESIUM	12.3	495	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
MANGANESE	0.61	12.6	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
MERCURY	0.098	ND	MG/KG	7470	7470	06/16/97	06/16/97	C0893
NICKEL	2.5	8.8	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
POTASSIUM	184	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
SELENIUM	0.061	0.4	MG/KG	3050	7741	06/18/97	06/19/97	BH2705
SILVER	0.61	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
SODIUM	49.0	75.8	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
THALLIUM	0.12	ND	MG/KG	3050	7841	06/18/97	06/20/97	F2125
VANADIUM	0.61	6.5	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ZINC	0.61	11.9	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CYANIDE, TOTAL	0.60	ND	MG/KG	9010	9010	06/19/97	06/20/97	06234203
SOLIDS, TOTAL	1.0	81.6	%	NONE	160.3	NA	06/16/97	06234202

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Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-E2-01-05-1 ARDL No: 300554-11
Sampling Loc'n: E2 @ 1' Received: 06/13/1997
Sampling Date: 06/10/1997 Matrix: SEDIMENT
Sampling Time: 1130 Moisture: 18.6

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	6.1	2130	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ANTIMONY	2.5	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ARSENIC	0.61	14.4	MG/KG	3050	7061	06/18/97	06/19/97	BH2704
BARIUM	1.2	144	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
BERYLLIUM	0.12	0.39	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CADMIUM	0.61	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CALCIUM	12.3	3130	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CHROMIUM	0.61	7.5	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
COBALT	0.61	11.1	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
COPPER	1.2	6.4	MG/KG	3050	6010A	06/17/97	06/18/97	P212[illegible]
IRON	6.1	11400	MG/KG	3050	6010A	06/17/97	06/18/97	P2[illegible]
LEAD	0.61	14.7	MG/KG	3050	7421	06/18/97	06/19/97	F21[illegible]
MAGNESIUM	12.3	1130	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
MANGANESE	0.61	882	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
MERCURY	0.098	ND	MG/KG	7470	7470	06/16/97	06/16/97	C0893
NICKEL	2.5	12.3	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
POTASSIUM	184	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
SELENIUM	0.061	0.18	MG/KG	3050	7741	06/18/97	06/19/97	BH2705
SILVER	0.61	0.84	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
SODIUM	49.1	88.2	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
THALLIUM	0.12	0.14	MG/KG	3050	7841	06/18/97	06/20/97	F2125
VANADIUM	0.61	16.7	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ZINC	0.61	24.1	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CYANIDE, TOTAL	0.61	ND	MG/KG	9010	9010	06/19/97	06/20/97	06234203
SOLIDS, TOTAL	1.0	81.4	%	NONE	160.3	NA	06/16/97	06234202

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Lab Report No: 300555 Report Date: 06/26/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-F-01-06-00 ARDL No: 300555-06
Sampling Loc'n: STATION F Received: 06/13/1997
Sampling Date: 06/10/1997 Matrix: WATER
Sampling Time: 0909 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.14	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ARSENIC	0.00050	0.00087	MG/L	3020	7061	06/16/97	06/17/97	BH2708
BARIUM	0.010	0.11	MG/L	3010	6010A	06/16/97	06/18/97	P2126
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CALCIUM	0.10	51.0	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CHROMIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
COBALT	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
COPPER	0.010	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
IRON	0.050	0.32	MG/L	3010	6010A	06/16/97	06/18/97	P2126
LEAD	0.0010	0.0014	MG/L	3020	7421	06/16/97	06/17/97	F2128
MAGNESIUM	0.10	19.3	MG/L	3010	6010A	06/16/97	06/18/97	P2126
MANGANESE	0.0050	0.071	MG/L	3010	6010A	06/16/97	06/18/97	P2126
MERCURY	0.00020	ND	MG/L	7470	7470	06/16/97	06/16/97	C0894
NICKEL	0.020	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
POTASSIUM	1.5	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
SELENIUM	0.00050	ND	MG/L	3020	7741	06/16/97	06/17/97	BH2710
SILVER	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
SODIUM	0.40	12.6	MG/L	3010	6010A	06/16/97	06/18/97	P2126
THALLIUM	0.0010	ND	MG/L	3020	7841	06/16/97	06/17/97	F2130
VANADIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ZINC	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/16/97	06/16/97	06184189

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Lab Report No: 300554 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-F1-01-05-01 ARDL No: 300554-02
Sampling Loc'n: STATION F1 @ 0-1' Received: 06/13/1997
Sampling Date: 06/10/1997 Matrix: SEDIMENT
Sampling Time: 0910 Moisture: 18.6

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	6.1	1910	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ANTIMONY	2.5	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ARSENIC	0.61	11.4	MG/KG	3050	7061	06/18/97	06/19/97	BH2704
BARIUM	1.2	99.8	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
BERYLLIUM	0.12	0.34	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CADMIUM	0.61	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CALCIUM	12.3	1500	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CHROMIUM	0.61	7.7	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
COBALT	0.61	6.0	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
COPPER	1.2	4.7	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
IRON	6.1	12100	MG/KG	3050	6010A	06/17/97	06/18/97	P21[illegible]
LEAD	0.61	17.2	MG/KG	3050	7421	06/18/97	06/19/97	F212[illegible]
MAGNESIUM	12.3	643	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
MANGANESE	0.61	423	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
MERCURY	0.098	ND	MG/KG	7470	7470	06/16/97	06/16/97	C0893
NICKEL	2.5	8.6	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
POTASSIUM	184	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
SELENIUM	0.061	0.18	MG/KG	3050	7741	06/18/97	06/19/97	BH2705
SILVER	0.61	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
SODIUM	49.1	81.3	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
THALLIUM	0.12	ND	MG/KG	3050	7841	06/18/97	06/20/97	F2125
VANADIUM	0.61	16.3	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ZINC	0.61	21.5	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CYANIDE, TOTAL	0.61	ND	MG/KG	9010	9010	06/19/97	06/20/97	06234203
SOLIDS, TOTAL	1.0	81.4	%	NONE	160.3	NA	06/16/97	06234202

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Lab Report No: 300554 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-F2-01-05-01 ARDL No: 300554-05
Sampling Loc'n: F2 @ 0-1' Received: 06/13/1997
Sampling Date: 06/10/1997 Matrix: SEDIMENT
Sampling Time: 0910 Moisture: 19.2

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	6.2	1310	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ANTIMONY	2.5	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ARSENIC	0.62	9.5	MG/KG	3050	7061	06/18/97	06/19/97	BH2704
BARIUM	1.2	96.8	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
BERYLLIUM	0.12	0.25	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CADMIUM	0.62	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CALCIUM	12.4	1890	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CHROMIUM	0.62	12.3	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
COBALT	0.62	7.3	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
COPPER	1.2	16.1	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
IRON	6.2	10900	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
LEAD	0.62	13.6	MG/KG	3050	7421	06/18/97	06/19/97	F2124
MAGNESIUM	12.4	820	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
MANGANESE	0.62	626	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
MERCURY	0.099	ND	MG/KG	7470	7470	06/16/97	06/16/97	C0893
NICKEL	2.5	8.6	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
POTASSIUM	186	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
SELENIUM	0.062	0.13	MG/KG	3050	7741	06/18/97	06/19/97	BH2705
SILVER	0.62	1.8	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
SODIUM	49.5	92.3	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
THALLIUM	0.12	ND	MG/KG	3050	7841	06/18/97	06/20/97	F2125
VANADIUM	0.62	11.3	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ZINC	0.62	19.2	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CYANIDE, TOTAL	0.6	ND	MG/KG	9010	9010	06/19/97	06/20/97	06234203
SOLIDS, TOTAL	1.0	80.8	%	NONE	160.3	NA	06/16/97	06234202

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Lab Report No: 300555 Report Date: 06/26/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-G-01-06-00 ARDL No: 300555-09
Sampling Loc'n: 7G Received: 06/13/1997
Sampling Date: 06/10/1997 Matrix: WATER
Sampling Time: 1040 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.52	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ARSENIC	0.00050	0.00092	MG/L	3020	7061	06/16/97	06/17/97	BH2708
BARIUM	0.010	0.12	MG/L	3010	6010A	06/16/97	06/18/97	P2126
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CALCIUM	0.10	53.3	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CHROMIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
COBALT	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
COPPER	0.010	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
IRON	0.050	0.77	MG/L	3010	6010A	06/16/97	06/18/97	P212
LEAD	0.0010	0.002	MG/L	3020	7421	06/16/97	06/17/97	F2126
MAGNESIUM	0.10	21.0	MG/L	3010	6010A	06/16/97	06/18/97	P2126
MANGANESE	0.0050	0.12	MG/L	3010	6010A	06/16/97	06/18/97	P2126
MERCURY	0.00020	ND	MG/L	7470	7470	06/16/97	06/16/97	C0894
NICKEL	0.020	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
POTASSIUM	1.5	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
SELENIUM	0.00050	ND	MG/L	3020	7741	06/16/97	06/17/97	BH2710
SILVER	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
SODIUM	0.40	13.7	MG/L	3010	6010A	06/16/97	06/18/97	P2126
THALLIUM	0.0010	ND	MG/L	3020	7841	06/16/97	06/17/97	F2130
VANADIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ZINC	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/16/97	06/16/97	06184189

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Lab Report No: 300554 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-G1-01-05-01 ARDL No: 300554-13
Sampling Loc'n: SITE G1 @ 1' Received: 06/13/1997
Sampling Date: 06/10/1997 Matrix: SEDIMENT
Sampling Time: 1045 Moisture: 24.4

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	6.6	3860	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ANTIMONY	2.6	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ARSENIC	0.66	3.9	MG/KG	3050	7061	06/18/97	06/19/97	BH2704
BARIUM	1.3	90.9	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
BERYLLIUM	0.13	0.37	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CADMIUM	0.66	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CALCIUM	13.2	4670	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CHROMIUM	0.66	6.7	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
COBALT	0.66	4.5	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
COPPER	1.3	7.4	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
IRON	6.6	9710	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
LEAD	0.66	9.6	MG/KG	3050	7421	06/18/97	06/19/97	F2124
MAGNESIUM	13.2	1150	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
MANGANESE	0.66	321	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
MERCURY	0.11	ND	MG/KG	7470	7470	06/16/97	06/16/97	C0893
NICKEL	2.6	10.8	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
POTASSIUM	198	330	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
SELENIUM	0.066	0.16	MG/KG	3050	7741	06/18/97	06/19/97	BH2705
SILVER	0.66	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
SODIUM	52.9	101	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
THALLIUM	0.13	ND	MG/KG	3050	7841	06/18/97	06/20/97	F2125
VANADIUM	0.66	13.0	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ZINC	0.66	29.8	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CYANIDE, TOTAL	0.65	ND	MG/KG	9010	9010	06/19/97	06/20/97	06234203
SOLIDS, TOTAL	1.0	75.6	%	NONE	160.3	NA	06/16/97	06234202

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Lab Report No: 300554 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-G2-01-05-01 ARDL No: 300554-10
Sampling Loc'n: G2 @ 01' Received: 06/13/1997
Sampling Date: 06/10/1997 Matrix: SEDIMENT
Sampling Time: 1045 Moisture: 24.3

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	6.6	4970	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ANTIMONY	2.6	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ARSENIC	0.66	8.8	MG/KG	3050	7061	06/18/97	06/19/97	BH2704
BARIUM	1.3	128	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
BERYLLIUM	0.13	0.5	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CADMIUM	0.66	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CALCIUM	13.2	3890	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CHROMIUM	0.66	7.5	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
COBALT	0.66	5.5	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
COPPER	1.3	9.4	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
IRON	6.6	11600	MG/KG	3050	6010A	06/17/97	06/18/97	P212
LEAD	0.66	12.3	MG/KG	3050	7421	06/18/97	06/19/97	F2124
MAGNESIUM	13.2	1520	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
MANGANESE	0.66	429	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
MERCURY	0.11	ND	MG/KG	7470	7470	06/16/97	06/16/97	C0893
NICKEL	2.6	24.9	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
POTASSIUM	198	344	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
SELENIUM	0.066	0.18	MG/KG	3050	7741	06/18/97	06/19/97	BH2705
SILVER	0.66	ND	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
SODIUM	52.8	115	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
THALLIUM	0.13	0.13	MG/KG	3050	7841	06/18/97	06/20/97	F2125
VANADIUM	0.66	15.0	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
ZINC	0.66	36.3	MG/KG	3050	6010A	06/17/97	06/18/97	P2123
CYANIDE, TOTAL	0.65	ND	MG/KG	9010	9010	06/19/97	06/20/97	06234203
SOLIDS, TOTAL	1.0	75.7	%	NONE	160.3	NA	06/16/97	06234202

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Lab Report No: 300552 Report Date: 06/19/1997

Project Name: IOWA ARMY AMMUNITION Analysis: Inorganics
Project No: 5644V

Field ID: H-07-H-01-06-00 ARDL No: 300552-11
Sampling Loc'n: 7H Received: 06/10/1997
Sampling Date: 06/09/1997 Matrix: WATER
Sampling Time: 1415 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.45	MG/L	3010	6010A	06/10/97	06/13/97	P2103
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
ARSENIC	0.00050	0.00093	MG/L	3020	7061	06/10/97	06/13/97	BH2697
BARIUM	0.010	0.12	MG/L	3010	6010A	06/10/97	06/13/97	P2103
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
CALCIUM	0.10	51.0	MG/L	3010	6010A	06/10/97	06/13/97	P2103
CHROMIUM	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
COBALT	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
COPPER	0.010	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
IRON	0.050	0.68	MG/L	3010	6010A	06/10/97	06/13/97	P2103
LEAD	0.0010	0.0017	MG/L	3020	7421	06/10/97	06/12/97	F2107
MAGNESIUM	0.10	19.4	MG/L	3010	6010A	06/10/97	06/13/97	P2103
MANGANESE	0.0050	0.08	MG/L	3010	6010A	06/10/97	06/13/97	P2103
MERCURY	0.00020	ND	MG/L	7470	7470	06/11/97	06/11/97	C0890
NICKEL	0.020	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
POTASSIUM	1.5	2	MG/L	3010	6010A	06/10/97	06/13/97	P2103
SELENIUM	0.00050	0.00094	MG/L	3020	7741	06/10/97	06/12/97	BH2700
SILVER	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
SODIUM	0.40	12.3	MG/L	3010	6010A	06/10/97	06/13/97	P2103
THALLIUM	0.0010	ND	MG/L	3020	7841	06/10/97	06/13/97	F2111
VANADIUM	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
ZINC	0.0050	0.0097	MG/L	3010	6010A	06/10/97	06/13/97	P2103
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/16/97	06/16/97	06184189

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Lab Report No: 300552 Report Date: 06/19/1997

Project Name: IOWA ARMY AMMUNITION Analysis: Inorganics
Project No: 5644V

Field ID: H-07-H1-01-05-01 ARDL No: 300552-03
Sampling Loc'n: 7H1 Received: 06/10/1997
Sampling Date: 06/09/1997 Matrix: SEDIMENT
Sampling Time: 1410 Moisture: 17.9

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	6.1	1920	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ANTIMONY	2.4	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ARSENIC	0.61	7.1	MG/KG	3050	7061	06/11/97	06/13/97	BH2696
BARIUM	1.2	182	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
BERYLLIUM	0.12	0.35	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CADMIUM	0.61	1.3	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CALCIUM	12.2	3460	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CHROMIUM	0.61	10.7	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COBALT	0.61	15.6	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COPPER	1.2	3.9	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
IRON	6.1	11400	MG/KG	3050	6010A	06/11/97	06/12/97	P21[illegible]
LEAD	0.61	9.6	MG/KG	3050	7421	06/11/97	06/13/97	F21[illegible]
MAGNESIUM	12.2	1260	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MANGANESE	0.61	1590	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MERCURY	0.097	ND	MG/KG	7470	7470	06/11/97	06/11/97	C0892
NICKEL	2.4	10.0	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
POTASSIUM	183	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SELENIUM	0.061	0.14	MG/KG	3050	7741	06/11/97	06/12/97	BH2699
SILVER	0.61	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SODIUM	48.7	80.1	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
THALLIUM	0.12	ND	MG/KG	3050	7841	06/11/97	06/13/97	F2113
VANADIUM	0.61	15.9	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ZINC	0.61	22.6	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CYANIDE, TOTAL	0.61	ND	MG/KG	9010	9010	06/12/97	06/13/97	06184190
SOLIDS, TOTAL	1.0	82.1	%	NONE	160.3	NA	06/12/97	06194194

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Lab Report No: 300552 Report Date: 06/19/1997

Project Name: IOWA ARMY AMMUNITION Analysis: Inorganics
Project No: 5644V

Field ID: H-07-H1-02-05-03 ARDL No: 300552-04
Sampling Loc'n: 7H1 Received: 06/10/1997
Sampling Date: 06/09/1997 Matrix: SEDIMENT
Sampling Time: 1430 Moisture: 15.2

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	5.9	2890	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ANTIMONY	2.4	4.1	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ARSENIC	0.59	6.4	MG/KG	3050	7061	06/11/97	06/13/97	BH2696
BARIUM	1.2	45.0	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
BERYLLIUM	0.12	0.34	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CADMIUM	0.59	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CALCIUM	11.8	32000	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CHROMIUM	0.59	6.4	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COBALT	0.59	7.3	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COPPER	1.2	9.7	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
IRON	5.9	15800	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
LEAD	0.59	8	MG/KG	3050	7421	06/11/97	06/13/97	F2109
MAGNESIUM	11.8	8060	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MANGANESE	0.59	324	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MERCURY	0.094	ND	MG/KG	7470	7470	06/11/97	06/11/97	C0892
NICKEL	2.4	14.3	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
POTASSIUM	177	386	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SELENIUM	0.059	0.47	MG/KG	3050	7741	06/11/97	06/12/97	BH2699
SILVER	0.59	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SODIUM	47.2	137	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
THALLIUM	0.12	ND	MG/KG	3050	7841	06/11/97	06/13/97	F2113
VANADIUM	0.59	11.3	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ZINC	0.59	31.8	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CYANIDE, TOTAL	0.59	ND	MG/KG	9010	9010	06/12/97	06/13/97	06184190
SOLIDS, TOTAL	1.0	84.8	%	NONE	160.3	NA	06/12/97	06194194

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Lab Report No: 300552 Report Date: 06/19/1997

Project Name: IOWA ARMY AMMUNITION Analysis: Inorganics
Project No: 5644V

Field ID: H-07-H2-01-05-01 ARDL No: 300552-05
Sampling Loc'n: 7H2 Received: 06/10/1997
Sampling Date: 06/09/1997 Matrix: SEDIMENT
Sampling Time: 1410 Moisture: 20

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	6.3	3740	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ANTIMONY	2.5	2.8	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ARSENIC	0.63	5.7	MG/KG	3050	7061	06/11/97	06/13/97	BH2696
BARIUM	1.3	99.9	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
BERYLLIUM	0.13	0.44	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CADMIUM	0.63	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CALCIUM	12.5	4310	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CHROMIUM	0.63	12.0	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COBALT	0.63	6.6	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COPPER	1.3	7.4	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
IRON	6.3	12000	MG/KG	3050	6010A	06/11/97	06/12/97	P21[illegible]
LEAD	0.63	9.5	MG/KG	3050	7421	06/11/97	06/13/97	F210[illegible]
MAGNESIUM	12.5	1370	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MANGANESE	0.63	401	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MERCURY	0.10	ND	MG/KG	7470	7470	06/11/97	06/11/97	C0892
NICKEL	2.5	9.6	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
POTASSIUM	188	299	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SELENIUM	0.063	0.26	MG/KG	3050	7741	06/11/97	06/12/97	BH2699
SILVER	0.63	0.90	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SODIUM	50.0	96.3	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
THALLIUM	0.13	ND	MG/KG	3050	7841	06/11/97	06/13/97	F2113
VANADIUM	0.63	16.0	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ZINC	0.63	29.3	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CYANIDE, TOTAL	0.63	ND	MG/KG	9010	9010	06/12/97	06/13/97	06184190
SOLIDS, TOTAL	1.0	80.0	%	NONE	160.3	NA	06/12/97	06194194

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Lab Report No: 300552 Report Date: 06/19/1997

Project Name: IOWA ARMY AMMUNITION Analysis: Inorganics
Project No: 5644V

Field ID: H-07-I-01-06-00 ARDL No: 300552-12
Sampling Loc'n: 7I Received: 06/10/1997
Sampling Date: 06/09/1997 Matrix: WATER
Sampling Time: 1245 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	1.2	MG/L	3010	6010A	06/10/97	06/13/97	P2103
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
ARSENIC	0.00050	0.0013	MG/L	3020	7061	06/10/97	06/13/97	BH2697
BARIUM	0.010	0.15	MG/L	3010	6010A	06/10/97	06/13/97	P2103
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
CALCIUM	0.10	51.4	MG/L	3010	6010A	06/10/97	06/13/97	P2103
CHROMIUM	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
COBALT	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
COPPER	0.010	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
IRON	0.050	1.9	MG/L	3010	6010A	06/10/97	06/13/97	P2103
LEAD	0.0010	0.0030	MG/L	3020	7421	06/10/97	06/12/97	F2107
MAGNESIUM	0.10	19.1	MG/L	3010	6010A	06/10/97	06/13/97	P2103
MANGANESE	0.0050	0.25	MG/L	3010	6010A	06/10/97	06/13/97	P2103
MERCURY	0.00020	ND	MG/L	7470	7470	06/11/97	06/11/97	C0890
NICKEL	0.020	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
POTASSIUM	1.5	2.3	MG/L	3010	6010A	06/10/97	06/13/97	P2103
SELENIUM	0.00050	0.0011	MG/L	3020	7741	06/10/97	06/12/97	BH2700
SILVER	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
SODIUM	0.40	12.1	MG/L	3010	6010A	06/10/97	06/13/97	P2103
THALLIUM	0.0010	ND	MG/L	3020	7841	06/10/97	06/13/97	F2111
VANADIUM	0.0050	0.0057	MG/L	3010	6010A	06/10/97	06/13/97	P2103
ZINC	0.0050	0.015	MG/L	3010	6010A	06/10/97	06/13/97	P2103
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/16/97	06/16/97	06184189

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Lab Report No: 300552 Report Date: 06/19/1997

Project Name: IOWA ARMY AMMUNITION Analysis: Inorganics
Project No: 5644V

Field ID: H-07-I1-01-05-01 ARDL No: 300552-06
Sampling Loc'n: 7I1 Received: 06/10/1997
Sampling Date: 06/09/1997 Matrix: SEDIMENT
Sampling Time: 1237 Moisture: 25.7

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	6.7	1290	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ANTIMONY	2.7	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ARSENIC	0.67	4.3	MG/KG	3050	7061	06/11/97	06/13/97	BH2696
BARIUM	1.3	567	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
BERYLLIUM	0.13	0.26	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CADMIUM	0.67	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CALCIUM	13.5	2020	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CHROMIUM	0.67	41.5	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COBALT	0.67	3.7	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COPPER	1.3	6.7	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
IRON	6.7	6030	MG/KG	3050	6010A	06/11/97	06/12/97	P210
LEAD	0.67	8.9	MG/KG	3050	7421	06/11/97	06/13/97	F210
MAGNESIUM	13.5	961	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MANGANESE	0.67	191	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MERCURY	0.11	ND	MG/KG	7470	7470	06/11/97	06/11/97	C0892
NICKEL	2.7	5.3	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
POTASSIUM	202	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SELENIUM	0.067	0.19	MG/KG	3050	7741	06/11/97	06/12/97	BH2699
SILVER	0.67	6.8	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SODIUM	53.8	79.8	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
THALLIUM	0.13	ND	MG/KG	3050	7841	06/11/97	06/13/97	F2113
VANADIUM	0.67	8.7	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ZINC	0.67	23.5	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CYANIDE, TOTAL	0.67	ND	MG/KG	9010	9010	06/12/97	06/13/97	06184190
SOLIDS, TOTAL	1.0	74.3	%	NONE	160.3	NA	06/12/97	06194194

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Lab Report No: 300552 Report Date: 06/19/1997

Project Name: IOWA ARMY AMMUNITION Analysis: Inorganics
Project No: 5644V

Field ID: H-07-I2-01-05-01 ARDL No: 300552-07
Sampling Loc'n: 7I2 Received: 06/10/1997
Sampling Date: 06/09/1997 Matrix: SEDIMENT
Sampling Time: 1237 Moisture: 18.9

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	6.2	858	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ANTIMONY	2.5	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ARSENIC	0.062	2.1	MG/KG	3050	7061	06/11/97	06/13/97	BH2696
BARIUM	1.2	84.4	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
BERYLLIUM	0.12	0.2	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CADMIUM	0.62	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CALCIUM	12.3	1270	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CHROMIUM	0.62	10.7	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COBALT	0.62	3.9	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COPPER	1.2	2.3	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
IRON	6.2	5270	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
LEAD	0.62	5.3	MG/KG	3050	7421	06/11/97	06/13/97	F2109
MAGNESIUM	12.3	467	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MANGANESE	0.62	368	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MERCURY	0.099	ND	MG/KG	7470	7470	06/11/97	06/11/97	C0892
NICKEL	2.5	4	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
POTASSIUM	185	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SELENIUM	0.062	ND	MG/KG	3050	7741	06/11/97	06/12/97	BH2699
SILVER	0.62	0.78	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SODIUM	49.3	70.4	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
THALLIUM	0.12	ND	MG/KG	3050	7841	06/11/97	06/13/97	F2113
VANADIUM	0.62	7.0	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ZINC	0.62	13.5	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CYANIDE, TOTAL	0.62	ND	MG/KG	9010	9010	06/12/97	06/13/97	06184190
SOLIDS, TOTAL	1.0	81.1	%	NONE	160.3	NA	06/12/97	06194194

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Lab Report No: 300552 Report Date: 06/19/1997

Project Name: IOWA ARMY AMMUNITION Analysis: Inorganics
Project No: 5644V

Field ID: H-07-I1-02-05-03 ARDL No: 300552-09
Sampling Loc'n: 7I1 Received: 06/10/1997
Sampling Date: 06/09/1997 Matrix: SEDIMENT
Sampling Time: 1250 Moisture: 22.3

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	6.4	10000	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ANTIMONY	2.6	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ARSENIC	0.64	3.9	MG/KG	3050	7061	06/11/97	06/13/97	BH2696
BARIUM	1.3	169	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
BERYLLIUM	0.13	0.77	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CADMIUM	0.64	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CALCIUM	12.9	2650	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CHROMIUM	0.64	17.7	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COBALT	0.64	12.6	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COPPER	1.3	9.5	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
IRON	6.4	14400	MG/KG	3050	6010A	06/11/97	06/12/97	P210[illegible]
LEAD	0.64	22.7	MG/KG	3050	7421	06/11/97	06/13/97	F210[illegible]
MAGNESIUM	12.9	1440	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MANGANESE	0.64	218	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MERCURY	0.1	ND	MG/KG	7470	7470	06/11/97	06/11/97	C0892
NICKEL	2.6	12.2	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
POTASSIUM	193	372	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SELENIUM	0.064	0.26	MG/KG	3050	7741	06/11/97	06/12/97	BH2699
SILVER	0.64	0.82	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SODIUM	51.5	96.8	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
THALLIUM	0.13	0.14	MG/KG	3050	7841	06/11/97	06/13/97	F2113
VANADIUM	0.64	25.3	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ZINC	0.64	21.0	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CYANIDE, TOTAL	0.64	ND	MG/KG	9010	9010	06/12/97	06/13/97	06184190
SOLIDS, TOTAL	1.0	77.7	%	NONE	160.3	NA	06/12/97	06194194

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Lab Report No: 300552 Report Date: 06/19/1997

Project Name: IOWA ARMY AMMUNITION Analysis: Inorganics
Project No: 5644V

Field ID: H-07-J-01-06-00 ARDL No: 300552-10
Sampling Loc'n: 7J Received: 06/10/1997
Sampling Date: 06/09/1997 Matrix: WATER
Sampling Time: 0935 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.38	MG/L	3010	6010A	06/10/97	06/13/97	P2103
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
ARSENIC	0.00050	0.00079	MG/L	3020	7061	06/10/97	06/13/97	BH2697
BARIUM	0.010	0.11	MG/L	3010	6010A	06/10/97	06/13/97	P2103
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
CALCIUM	0.10	50.2	MG/L	3010	6010A	06/10/97	06/13/97	P2103
CHROMIUM	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
COBALT	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
COPPER	0.010	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
IRON	0.050	0.63	MG/L	3010	6010A	06/10/97	06/13/97	P2103
LEAD	0.0010	ND	MG/L	3020	7421	06/10/97	06/12/97	F2107
MAGNESIUM	0.10	18.2	MG/L	3010	6010A	06/10/97	06/13/97	P2103
MANGANESE	0.0050	0.08	MG/L	3010	6010A	06/10/97	06/13/97	P2103
MERCURY	0.00020	ND	MG/L	7470	7470	06/11/97	06/11/97	C0890
NICKEL	0.020	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
POTASSIUM	1.5	1.9	MG/L	3010	6010A	06/10/97	06/13/97	P2103
SELENIUM	0.00050	0.0012	MG/L	3020	7741	06/10/97	06/12/97	BH2700
SILVER	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
SODIUM	0.40	13.7	MG/L	3010	6010A	06/10/97	06/13/97	P2103
THALLIUM	0.0010	ND	MG/L	3020	7841	06/10/97	06/13/97	F2111
VANADIUM	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
ZINC	0.0050	0.015	MG/L	3010	6010A	06/10/97	06/13/97	P2103
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/16/97	06/16/97	06184189

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Lab Report No: 300552 Report Date: 06/19/1997

Project Name: IOWA ARMY AMMUNITION Analysis: Inorganics
Project No: 5644V

Field ID: H-07-J1-01-05-01 ARDL No: 300552-01
Sampling Loc'n: 7J1 Received: 06/10/1997
Sampling Date: 06/09/1997 Matrix: SEDIMENT
Sampling Time: 0955 Moisture: 16.8

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	6	3650	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ANTIMONY	2.4	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ARSENIC	0.6	5.2	MG/KG	3050	7061	06/11/97	06/13/97	BH2696
BARIUM	1.2	130	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
BERYLLIUM	0.12	0.47	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CADMIUM	0.6	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CALCIUM	12.0	5040	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CHROMIUM	0.6	12.7	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COBALT	0.6	7.4	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COPPER	1.2	7	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
IRON	6	12000	MG/KG	3050	6010A	06/11/97	06/12/97	P210[illegible]
LEAD	0.6	10.9	MG/KG	3050	7421	06/11/97	06/13/97	F21[illegible]
MAGNESIUM	12.0	1120	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MANGANESE	0.6	526	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MERCURY	0.096	ND	MG/KG	7470	7470	06/11/97	06/11/97	C0892
NICKEL	2.4	9.1	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
POTASSIUM	180	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SELENIUM	0.06	0.16	MG/KG	3050	7741	06/11/97	06/12/97	BH2699
SILVER	0.6	0.64	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SODIUM	48.1	92.4	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
THALLIUM	0.12	ND	MG/KG	3050	7841	06/11/97	06/13/97	F2113
VANADIUM	0.6	16.5	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ZINC	0.6	32.1	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CYANIDE, TOTAL	0.59	ND	MG/KG	9010	9010	06/12/97	06/13/97	06184190
SOLIDS, TOTAL	1.0	83.2	%	NONE	160.3	NA	06/12/97	06194194

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Lab Report No: 300552 Report Date: 06/19/1997

Project Name: IOWA ARMY AMMUNITION Analysis: Inorganics
Project No: 5644V

Field ID: H-07-J1-02-05-03 ARDL No: 300552-08
Sampling Loc'n: 7J1 Received: 06/10/1997
Sampling Date: 06/09/1997 Matrix: SEDIMENT
Sampling Time: 1055 Moisture: 14.9

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	5.9	5790	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ANTIMONY	2.4	2.9	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ARSENIC	0.59	3.6	MG/KG	3050	7061	06/11/97	06/13/97	BH2696
BARIUM	1.2	62.4	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
BERYLLIUM	0.12	0.67	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CADMIUM	0.59	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CALCIUM	11.8	16000	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CHROMIUM	0.59	11.4	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COBALT	0.59	10.5	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COPPER	1.2	14.9	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
IRON	5.9	13500	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
LEAD	0.59	9.7	MG/KG	3050	7421	06/11/97	06/13/97	F2109
MAGNESIUM	11.8	3190	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MANGANESE	0.59	307	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MERCURY	0.094	ND	MG/KG	7470	7470	06/11/97	06/11/97	C0892
NICKEL	2.4	22.9	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
POTASSIUM	176	814	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SELENIUM	0.059	0.53	MG/KG	3050	7741	06/11/97	06/12/97	BH2699
SILVER	0.59	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SODIUM	47.0	99.7	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
THALLIUM	0.12	ND	MG/KG	3050	7841	06/11/97	06/13/97	F2113
VANADIUM	0.59	16.5	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ZINC	0.59	42.6	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CYANIDE, TOTAL	0.59	ND	MG/KG	9010	9010	06/12/97	06/13/97	06184190
SOLIDS, TOTAL	1.0	85.1	%	NONE	160.3	NA	06/12/97	06194194

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Lab Report No: 300552 Report Date: 06/19/1997

Project Name: IOWA ARMY AMMUNITION Analysis: Inorganics
Project No: 5644V

Field ID: H-07-J2-01-05-01 ARDL No: 300552-02
Sampling Loc'n: 7J2 Received: 06/10/1997
Sampling Date: 06/09/1997 Matrix: SEDIMENT
Sampling Time: 0955 Moisture: 23.3

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	6.5	3200	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ANTIMONY	2.6	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ARSENIC	0.65	13.8	MG/KG	3050	7061	06/11/97	06/13/97	BH2696
BARIUM	1.3	123	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
BERYLLIUM	0.13	0.44	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CADMIUM	0.65	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CALCIUM	13.0	5340	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CHROMIUM	0.65	20.8	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COBALT	0.65	5.8	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COPPER	1.3	7.2	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
IRON	6.5	9870	MG/KG	3050	6010A	06/11/97	06/12/97	P21[illegible]
LEAD	0.65	19.8	MG/KG	3050	7421	06/11/97	06/13/97	F21[illegible]
MAGNESIUM	13.0	1510	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MANGANESE	0.65	616	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MERCURY	0.1	ND	MG/KG	7470	7470	06/11/97	06/11/97	C0892
NICKEL	2.6	8	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
POTASSIUM	196	214	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SELENIUM	0.065	0.3	MG/KG	3050	7741	06/11/97	06/12/97	BH2699
SILVER	0.65	4.2	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SODIUM	52.2	107	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
THALLIUM	0.13	ND	MG/KG	3050	7841	06/11/97	06/13/97	F2113
VANADIUM	0.65	14.1	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ZINC	0.65	29.1	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CYANIDE, TOTAL	0.66	ND	MG/KG	9010	9010	06/12/97	06/13/97	06184190
SOLIDS, TOTAL	1.0	76.7	%	NONE	160.3	NA	06/12/97	06194194

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Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-K-01-06-00 ARDL No: 300549-07
Sampling Loc'n: 7K Received: 06/07/1997
Sampling Date: 06/06/1997 Matrix: WATER
Sampling Time: 1124 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.094	MG/L	3010	6010A	06/10/97	06/13/97	P2103
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
ARSENIC	0.00050	0.0012	MG/L	3020	7061	06/10/97	06/13/97	BH2697
BARIUM	0.010	0.11	MG/L	3010	6010A	06/10/97	06/13/97	P2103
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
CALCIUM	0.10	54.4	MG/L	3010	6010A	06/10/97	06/13/97	P2103
CHROMIUM	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
COBALT	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
COPPER	0.010	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
IRON	0.050	0.15	MG/L	3010	6010A	06/10/97	06/13/97	P2103
LEAD	0.0010	ND	MG/L	3020	7421	06/10/97	06/12/97	F2107
MAGNESIUM	0.10	19.9	MG/L	3010	6010A	06/10/97	06/13/97	P2103
MANGANESE	0.0050	0.035	MG/L	3010	6010A	06/10/97	06/13/97	P2103
MERCURY	0.00020	ND	MG/L	7470	7470	06/11/97	06/11/97	C0890
NICKEL	0.020	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
POTASSIUM	1.5	2.3	MG/L	3010	6010A	06/10/97	06/13/97	P2103
SELENIUM	0.00050	0.0014	MG/L	3020	7741	06/10/97	06/12/97	BH2700
SILVER	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
SODIUM	0.40	18.7	MG/L	3010	6010A	06/10/97	06/13/97	P2103
THALLIUM	0.0010	ND	MG/L	3020	7841	06/10/97	06/13/97	F2111
VANADIUM	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
ZINC	0.0050	0.0091	MG/L	3010	6010A	06/10/97	06/13/97	P2103
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/16/97	06/16/97	06184189

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Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-K1-01-05-1 ARDL No: 300549-03
Sampling Loc'n: K1-1' Received: 06/07/1997
Sampling Date: 06/06/1997 Matrix: SOIL
Sampling Time: 1139 Moisture: 20.1

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	6.3	1570	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ANTIMONY	2.5	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ARSENIC	0.063	1.9	MG/KG	3050	7061	06/11/97	06/13/97	BH2696
BARIUM	1.3	67.1	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
BERYLLIUM	0.13	0.21	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CADMIUM	0.63	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CALCIUM	12.5	2510	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CHROMIUM	0.63	5.8	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COBALT	0.63	3.3	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COPPER	1.3	2.9	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
IRON	6.3	5240	MG/KG	3050	6010A	06/11/97	06/12/97	P21[illegible]
LEAD	0.63	8.2	MG/KG	3050	7421	06/11/97	06/13/97	F21[illegible]
MAGNESIUM	12.5	593	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MANGANESE	0.63	204	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MERCURY	0.10	ND	MG/KG	7470	7470	06/11/97	06/11/97	C0892
NICKEL	2.5	4.1	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
POTASSIUM	188	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SELENIUM	0.063	0.084	MG/KG	3050	7741	06/11/97	06/12/97	BH2699
SILVER	0.63	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SODIUM	50.1	75.1	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
THALLIUM	0.13	ND	MG/KG	3050	7841	06/11/97	06/13/97	F2113
VANADIUM	0.63	8.1	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ZINC	0.63	15.4	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CYANIDE, TOTAL	0.61	ND	MG/KG	9010	9010	06/12/97	06/13/97	06184190
SOLIDS, TOTAL	1.0	79.9	%	NONE	160.3	NA	06/09/97	06104152

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Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-K1-02-05-03 ARDL No: 300549-02
Sampling Loc'n: K1-3' Received: 06/07/1997
Sampling Date: 06/06/1997 Matrix: SOIL
Sampling Time: 1210 Moisture: 16.4

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	6	4030	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ANTIMONY	2.4	4.2	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ARSENIC	0.6	4.2	MG/KG	3050	7061	06/11/97	06/13/97	BH2696
BARIUM	1.2	39.8	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
BERYLLIUM	0.12	0.52	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CADMIUM	0.6	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CALCIUM	12.0	23600	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CHROMIUM	0.6	7.2	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COBALT	0.6	6	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COPPER	1.2	11.9	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
IRON	6	14200	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
LEAD	0.6	7.7	MG/KG	3050	7421	06/11/97	06/13/97	F2109
MAGNESIUM	12.0	4860	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MANGANESE	0.6	276	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MERCURY	0.096	ND	MG/KG	7470	7470	06/11/97	06/11/97	C0892
NICKEL	2.4	16.6	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
POTASSIUM	179	636	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SELENIUM	0.06	0.25	MG/KG	3050	7741	06/11/97	06/12/97	BH2699
SILVER	0.6	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SODIUM	47.8	117	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
THALLIUM	0.12	0.18	MG/KG	3050	7841	06/11/97	06/13/97	F2113
VANADIUM	0.6	13.5	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ZINC	0.6	33.7	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CYANIDE, TOTAL	0.61	ND	MG/KG	9010	9010	06/12/97	06/13/97	06184190
SOLIDS, TOTAL	1.0	83.6	%	NONE	160.3	NA	06/09/97	06104152

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Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-K2-01-05-1 ARDL No: 300549-01
Sampling Loc'n: K2 Received: 06/07/1997
Sampling Date: 06/06/1997 Matrix: SOIL
Sampling Time: 1139 Moisture: 17.5

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	6.1	1800	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ANTIMONY	2.4	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ARSENIC	0.61	5.4	MG/KG	3050	7061	06/11/97	06/13/97	BH2696
BARIUM	1.2	109	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
BERYLLIUM	0.12	0.3	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CADMIUM	0.61	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CALCIUM	12.1	4080	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CHROMIUM	0.61	9.2	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COBALT	0.61	6.8	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COPPER	1.2	4.3	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
IRON	6.1	8660	MG/KG	3050	6010A	06/11/97	06/12/97	P210
LEAD	0.61	10.3	MG/KG	3050	7421	06/11/97	06/13/97	F210
MAGNESIUM	12.1	677	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MANGANESE	0.61	489	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MERCURY	0.097	ND	MG/KG	7470	7470	06/11/97	06/11/97	C0892
NICKEL	2.4	6.9	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
POTASSIUM	182	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SELENIUM	0.061	0.11	MG/KG	3050	7741	06/11/97	06/12/97	BH2699
SILVER	0.61	0.77	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SODIUM	48.5	85.3	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
THALLIUM	0.12	ND	MG/KG	3050	7841	06/11/97	06/13/97	F2113
VANADIUM	0.61	12.8	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ZINC	0.61	21.1	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CYANIDE, TOTAL	0.6	ND	MG/KG	9010	9010	06/12/97	06/13/97	06184190
SOLIDS, TOTAL	1.0	82.5	%	NONE	160.3	NA	06/09/97	06104152

ARDL, INC.
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Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-L-01-06-00 ARDL No: 300542-15
Sampling Loc'n: 7L Received: 05/31/1997
Sampling Date: 05/30/1997 Matrix: WATER
Sampling Time: 0852 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.093	MG/L	3010	6010	06/02/97	06/03/97	P2084
ANTIMONY	0.020	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
ARSENIC	0.00050	0.0012	MG/L	3020	7061	06/06/97	06/10/97	F2095
BARIUM	0.010	0.11	MG/L	3010	6010	06/02/97	06/03/97	P2084
BERYLLIUM	0.0010	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
CADMIUM	0.0050	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
CALCIUM	0.10	52.1	MG/L	3010	6010	06/02/97	06/03/97	P2084
CHROMIUM	0.0050	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
COBALT	0.0050	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
COPPER	0.010	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
IRON	0.050	0.24	MG/L	3010	6010	06/02/97	06/03/97	P2084
LEAD	0.0010	ND	MG/L	3020	7421	06/06/97	06/09/97	F2096
MAGNESIUM	0.10	18.5	MG/L	3010	6010	06/02/97	06/03/97	P2084
MANGANESE	0.0050	0.028	MG/L	3010	6010	06/02/97	06/03/97	P2084
MERCURY	0.00020	ND	MG/L	7470	7470	06/02/97	06/02/97	C0882
NICKEL	0.020	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
POTASSIUM	1.5	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
SELENIUM	0.00050	0.00093	MG/L	3020	7741	06/06/97	06/09/97	BH2691
SILVER	0.0050	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
SODIUM	0.40	10.6	MG/L	3010	6010	06/02/97	06/03/97	P2084
THALLIUM	0.0010	ND	MG/L	3020	7841	06/06/97	06/06/97	F2092
VANADIUM	0.0050	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
ZINC	0.0050	0.012	MG/L	3010	6010	06/02/97	06/03/97	P2084
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/06/97	06/06/97	06114157

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Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-L1-01-05-1 ARDL No: 300542-09
Sampling Loc'n: 7L1 Received: 05/31/1997
Sampling Date: 05/30/1997 Matrix: SOIL
Sampling Time: 0903 Moisture: 17.6

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	6.1	2250	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ANTIMONY	2.4	3.5	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ARSENIC	0.61	6.7	MG/KG	3050	7061	06/03/97	06/04/97	BH2689
BARIUM	1.2	71.2	MG/KG	3050	6010	06/05/97	06/06/97	P2091
BERYLLIUM	0.12	0.25	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CADMIUM	0.61	ND	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CALCIUM	12.1	25400	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CHROMIUM	0.61	5.7	MG/KG	3050	6010	06/05/97	06/06/97	P2091
COBALT	0.61	8.7	MG/KG	3050	6010	06/05/97	06/06/97	P2091
COPPER	1.2	3.6	MG/KG	3050	6010	06/05/97	06/06/97	P2091
IRON	6.1	9510	MG/KG	3050	6010	06/05/97	06/06/97	P209[illegible]
LEAD	0.12	3.3	MG/KG	3050	7421	06/05/97	06/06/97	F20[illegible]
MAGNESIUM	12.1	3620	MG/KG	3050	6010	06/05/97	06/06/97	P2091
MANGANESE	0.61	429	MG/KG	3050	6010	06/05/97	06/06/97	P2091
MERCURY	0.097	ND	MG/KG	7470	7470	06/02/97	06/02/97	C0881
NICKEL	2.4	13.3	MG/KG	3050	6010	06/05/97	06/06/97	P2091
POTASSIUM	182	622	MG/KG	3050	6010	06/05/97	06/06/97	P2091
SELENIUM	0.061	ND	MG/KG	3050	7741	06/03/97	06/04/97	BH2690
SILVER	0.61	0.65	MG/KG	3050	6010	06/05/97	06/06/97	P2091
SODIUM	48.5	79.8	MG/KG	3050	6010	06/05/97	06/06/97	P2091
THALLIUM	0.12	0.12	MG/KG	3050	7841	06/03/97	06/03/97	F2083
VANADIUM	0.61	9.8	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ZINC	0.61	46.0	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CYANIDE, TOTAL	0.60	ND	MG/KG	9010	9010	06/05/97	06/05/97	06114158
SOLIDS, TOTAL	1.0	82.4	%	NONE	160.3	NA	06/03/97	06044147

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Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-L2-01-05-1 ARDL No: 300542-10
Sampling Loc'n: 7L2 Received: 05/31/1997
Sampling Date: 05/30/1997 Matrix: SOIL
Sampling Time: 0925 Moisture: 13.1

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	5.8	927	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ANTIMONY	2.3	2.5	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ARSENIC	0.58	3	MG/KG	3050	7061	06/03/97	06/04/97	BH2689
BARIUM	1.2	41.0	MG/KG	3050	6010	06/05/97	06/06/97	P2091
BERYLLIUM	0.12	0.23	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CADMIUM	0.58	ND	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CALCIUM	11.5	13400	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CHROMIUM	0.58	6.2	MG/KG	3050	6010	06/05/97	06/06/97	P2091
COBALT	0.58	5	MG/KG	3050	6010	06/05/97	06/06/97	P2091
COPPER	1.2	2	MG/KG	3050	6010	06/05/97	06/06/97	P2091
IRON	5.8	5980	MG/KG	3050	6010	06/05/97	06/06/97	P2091
LEAD	0.58	4.2	MG/KG	3050	7421	06/05/97	06/06/97	F2093
MAGNESIUM	11.5	3150	MG/KG	3050	6010	06/05/97	06/06/97	P2091
MANGANESE	0.58	350	MG/KG	3050	6010	06/05/97	06/06/97	P2091
MERCURY	0.092	ND	MG/KG	7470	7470	06/02/97	06/02/97	C0881
NICKEL	2.3	6	MG/KG	3050	6010	06/05/97	06/06/97	P2091
POTASSIUM	173	ND	MG/KG	3050	6010	06/05/97	06/06/97	P2091
SELENIUM	0.058	ND	MG/KG	3050	7741	06/03/97	06/04/97	BH2690
SILVER	0.58	ND	MG/KG	3050	6010	06/05/97	06/06/97	P2091
SODIUM	46.0	73.9	MG/KG	3050	6010	06/05/97	06/06/97	P2091
THALLIUM	0.12	ND	MG/KG	3050	7841	06/03/97	06/03/97	F2083
VANADIUM	0.58	9.3	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ZINC	0.58	13.9	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CYANIDE, TOTAL	0.58	ND	MG/KG	9010	9010	06/05/97	06/05/97	06114158
SOLIDS, TOTAL	1.0	86.9	%	NONE	160.3	NA	06/03/97	06044147

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Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-L2-02-05-2.7 ARDL No: 300542-11
Sampling Loc'n: 7L2 Received: 05/31/1997
Sampling Date: 05/30/1997 Matrix: SOIL
Sampling Time: 1000 Moisture: 22.6

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	6.5	6580	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ANTIMONY	2.6	4.8	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ARSENIC	0.65	3.6	MG/KG	3050	7061	06/03/97	06/04/97	BH2689
BARIUM	1.3	93.6	MG/KG	3050	6010	06/05/97	06/06/97	P2091
BERYLLIUM	0.13	0.75	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CADMIUM	0.65	ND	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CALCIUM	12.9	6330	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CHROMIUM	0.65	10.7	MG/KG	3050	6010	06/05/97	06/06/97	P2091
COBALT	0.65	7.0	MG/KG	3050	6010	06/05/97	06/06/97	P2091
COPPER	1.3	15.2	MG/KG	3050	6010	06/05/97	06/06/97	P2091
IRON	6.5	13300	MG/KG	3050	6010	06/05/97	06/06/97	P20[illegible]
LEAD	0.65	8.4	MG/KG	3050	7421	06/05/97	06/06/97	F20[illegible]
MAGNESIUM	12.9	2540	MG/KG	3050	6010	06/05/97	06/06/97	P2091
MANGANESE	0.65	428	MG/KG	3050	6010	06/05/97	06/06/97	P2091
MERCURY	0.1	ND	MG/KG	7470	7470	06/02/97	06/02/97	C0881
NICKEL	2.6	16.8	MG/KG	3050	6010	06/05/97	06/06/97	P2091
POTASSIUM	194	571	MG/KG	3050	6010	06/05/97	06/06/97	P2091
SELENIUM	0.065	0.16	MG/KG	3050	7741	06/03/97	06/04/97	BH2690
SILVER	0.65	0.75	MG/KG	3050	6010	06/05/97	06/06/97	P2091
SODIUM	51.7	110	MG/KG	3050	6010	06/05/97	06/06/97	P2091
THALLIUM	0.13	ND	MG/KG	3050	7841	06/03/97	06/03/97	F2083
VANADIUM	0.65	21.0	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ZINC	0.65	29.5	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CYANIDE, TOTAL	0.65	ND	MG/KG	9010	9010	06/05/97	06/05/97	06114158
SOLIDS, TOTAL	1.0	77.4	%	NONE	160.3	NA	06/03/97	06044147

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ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-M-01-06-00 ARDL No: 300542-12
Sampling Loc'n: 7M Received: 05/31/1997
Sampling Date: 05/29/1997 Matrix: WATER
Sampling Time: 1333 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.16	MG/L	3010	6010	06/02/97	06/03/97	P2084
ANTIMONY	0.020	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
ARSENIC	0.00050	0.0012	MG/L	3020	7061	06/06/97	06/10/97	F2095
BARIUM	0.010	0.11	MG/L	3010	6010	06/02/97	06/03/97	P2084
BERYLLIUM	0.0010	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
CADMIUM	0.0050	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
CALCIUM	0.10	51.7	MG/L	3010	6010	06/02/97	06/03/97	P2084
CHROMIUM	0.0050	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
COBALT	0.0050	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
COPPER	0.010	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
IRON	0.050	0.3	MG/L	3010	6010	06/02/97	06/03/97	P2084
LEAD	0.0010	ND	MG/L	3020	7421	06/06/97	06/09/97	F2096
MAGNESIUM	0.10	18.0	MG/L	3010	6010	06/02/97	06/03/97	P2084
MANGANESE	0.0050	0.037	MG/L	3010	6010	06/02/97	06/03/97	P2084
MERCURY	0.00020	ND	MG/L	7470	7470	06/02/97	06/02/97	C0882
NICKEL	0.020	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
POTASSIUM	1.5	2	MG/L	3010	6010	06/02/97	06/03/97	P2084
SELENIUM	0.00050	0.00091	MG/L	3020	7741	06/06/97	06/09/97	BH2691
SILVER	0.0050	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
SODIUM	0.40	10.1	MG/L	3010	6010	06/02/97	06/03/97	P2084
THALLIUM	0.0010	ND	MG/L	3020	7841	06/06/97	06/06/97	F2092
VANADIUM	0.0050	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
ZINC	0.0050	0.0051	MG/L	3010	6010	06/02/97	06/03/97	P2084
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/06/97	06/06/97	06114157

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Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-M1-01-05-1 ARDL No: 300542-01
Sampling Loc'n: 7M1 Received: 05/31/1997
Sampling Date: 05/29/1997 Matrix: SOIL
Sampling Time: 1400 Moisture: 17.8

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	6.1	1420	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ANTIMONY	2.4	2.8	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ARSENIC	0.61	4.1	MG/KG	3050	7061	06/03/97	06/04/97	BH2689
BARIUM	1.2	79.6	MG/KG	3050	6010	06/05/97	06/06/97	P2091
BERYLLIUM	0.12	0.22	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CADMIUM	0.61	ND	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CALCIUM	12.2	33900	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CHROMIUM	0.61	7.7	MG/KG	3050	6010	06/05/97	06/06/97	P2091
COBALT	0.61	10.3	MG/KG	3050	6010	06/05/97	06/06/97	P2091
COPPER	1.2	2.5	MG/KG	3050	6010	06/05/97	06/06/97	P2091
IRON	6.1	8130	MG/KG	3050	6010	06/05/97	06/06/97	P20[illegible]
LEAD	0.12	4.2	MG/KG	3050	7421	06/05/97	06/06/97	F20[illegible]
MAGNESIUM	12.2	2000	MG/KG	3050	6010	06/05/97	06/06/97	P2091
MANGANESE	0.61	881	MG/KG	3050	6010	06/05/97	06/06/97	P2091
MERCURY	0.097	ND	MG/KG	7470	7470	06/02/97	06/02/97	C0881
NICKEL	2.4	9.6	MG/KG	3050	6010	06/05/97	06/06/97	P2091
POTASSIUM	182	ND	MG/KG	3050	6010	06/05/97	06/06/97	P2091
SELENIUM	0.061	ND	MG/KG	3050	7741	06/03/97	06/04/97	BH2690
SILVER	0.61	ND	MG/KG	3050	6010	06/05/97	06/06/97	P2091
SODIUM	48.7	71.5	MG/KG	3050	6010	06/05/97	06/06/97	P2091
THALLIUM	0.12	ND	MG/KG	3050	7841	06/03/97	06/03/97	F2083
VANADIUM	0.61	9.9	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ZINC	0.61	13.8	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CYANIDE, TOTAL	0.6	ND	MG/KG	9010	9010	06/05/97	06/05/97	06114158
SOLIDS, TOTAL	1.0	82.2	%	NONE	160.3	NA	06/03/97	06044147

ARDL, INC.
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Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-M1-02-05-3 ARDL No: 300542-02
Sampling Loc'n: 7M1 Received: 05/31/1997
Sampling Date: 05/29/1997 Matrix: SOIL
Sampling Time: 1430 Moisture: 14.6

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	5.9	911	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ANTIMONY	2.3	2.4	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ARSENIC	0.59	5.6	MG/KG	3050	7061	06/03/97	06/04/97	BH2689
BARIUM	1.2	58.1	MG/KG	3050	6010	06/05/97	06/06/97	P2091
BERYLLIUM	0.12	0.20	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CADMIUM	0.59	ND	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CALCIUM	11.7	21600	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CHROMIUM	0.59	6	MG/KG	3050	6010	06/05/97	06/06/97	P2091
COBALT	0.59	5.3	MG/KG	3050	6010	06/05/97	06/06/97	P2091
COPPER	1.2	1.7	MG/KG	3050	6010	06/05/97	06/06/97	P2091
IRON	5.9	5340	MG/KG	3050	6010	06/05/97	06/06/97	P2091
LEAD	0.59	5.8	MG/KG	3050	7421	06/05/97	06/06/97	F2093
MAGNESIUM	11.7	1750	MG/KG	3050	6010	06/05/97	06/06/97	P2091
MANGANESE	0.59	365	MG/KG	3050	6010	06/05/97	06/06/97	P2091
MERCURY	0.094	ND	MG/KG	7470	7470	06/02/97	06/02/97	C0881
NICKEL	2.3	6.0	MG/KG	3050	6010	06/05/97	06/06/97	P2091
POTASSIUM	176	ND	MG/KG	3050	6010	06/05/97	06/06/97	P2091
SELENIUM	0.059	ND	MG/KG	3050	7741	06/03/97	06/04/97	BH2690
SILVER	0.59	ND	MG/KG	3050	6010	06/05/97	06/06/97	P2091
SODIUM	46.8	91.1	MG/KG	3050	6010	06/05/97	06/06/97	P2091
THALLIUM	0.12	ND	MG/KG	3050	7841	06/03/97	06/09/97	F2083
VANADIUM	0.59	7.9	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ZINC	0.59	10.6	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CYANIDE, TOTAL	0.58	ND	MG/KG	9010	9010	06/05/97	06/05/97	06114158
SOLIDS, TOTAL	1.0	85.4	%	NONE	160.3	NA	06/03/97	06044147

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Rt. 15E, Mt. Vernon Airport Industrial Park
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Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-M1-03-05-4.5 ARDL No: 300542-03
Sampling Loc'n: 7M1 Received: 05/31/1997
Sampling Date: 05/29/1997 Matrix: SOIL
Sampling Time: 1500 Moisture: 13.7

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	5.8	1180	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ANTIMONY	2.3	3.5	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ARSENIC	0.58	7.3	MG/KG	3050	7061	06/03/97	06/04/97	BH2689
BARIUM	1.2	53.7	MG/KG	3050	6010	06/05/97	06/06/97	P2091
BERYLLIUM	0.12	0.18	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CADMIUM	0.58	ND	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CALCIUM	11.6	20800	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CHROMIUM	0.58	14.0	MG/KG	3050	6010	06/05/97	06/06/97	P2091
COBALT	0.58	4.8	MG/KG	3050	6010	06/05/97	06/06/97	P2091
COPPER	1.2	2.3	MG/KG	3050	6010	06/05/97	06/06/97	P2091
IRON	5.8	6660	MG/KG	3050	6010	06/05/97	06/06/97	P20[illegible]
LEAD	0.58	5.1	MG/KG	3050	7421	06/05/97	06/06/97	F209[illegible]
MAGNESIUM	11.6	2370	MG/KG	3050	6010	06/05/97	06/06/97	P2091
MANGANESE	0.58	302	MG/KG	3050	6010	06/05/97	06/06/97	P2091
MERCURY	0.093	ND	MG/KG	7470	7470	06/02/97	06/02/97	C0881
NICKEL	2.3	9.5	MG/KG	3050	6010	06/05/97	06/06/97	P2091
POTASSIUM	174	174	MG/KG	3050	6010	06/05/97	06/06/97	P2091
SELENIUM	0.058	ND	MG/KG	3050	7741	06/03/97	06/04/97	BH2690
SILVER	0.58	0.69	MG/KG	3050	6010	06/05/97	06/06/97	P2091
SODIUM	46.3	89.7	MG/KG	3050	6010	06/05/97	06/06/97	P2091
THALLIUM	0.12	ND	MG/KG	3050	7841	06/03/97	06/03/97	F2083
VANADIUM	0.58	8.2	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ZINC	0.58	14.3	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CYANIDE, TOTAL	0.57	ND	MG/KG	9010	9010	06/05/97	06/05/97	06114158
SOLIDS, TOTAL	1.0	86.3	%	NONE	160.3	NA	06/03/97	06044147

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Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-M2-01-05-1 ARDL No: 300542-04
Sampling Loc'n: 7M2 Received: 05/31/1997
Sampling Date: 05/29/1997 Matrix: SOIL
Sampling Time: 1515 Moisture: 14.7

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	5.9	936	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ANTIMONY	2.3	2.9	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ARSENIC	0.59	7.9	MG/KG	3050	7061	06/03/97	06/04/97	BH2689
BARIUM	1.2	61.1	MG/KG	3050	6010	06/05/97	06/06/97	P2091
BERYLLIUM	0.12	0.21	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CADMIUM	0.59	ND	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CALCIUM	11.7	24400	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CHROMIUM	0.59	4.9	MG/KG	3050	6010	06/05/97	06/06/97	P2091
COBALT	0.59	8.7	MG/KG	3050	6010	06/05/97	06/06/97	P2091
COPPER	1.2	2.5	MG/KG	3050	6010	06/05/97	06/06/97	P2091
IRON	5.9	6630	MG/KG	3050	6010	06/05/97	06/06/97	P2091
LEAD	0.59	5.5	MG/KG	3050	7421	06/05/97	06/06/97	F2093
MAGNESIUM	11.7	4150	MG/KG	3050	6010	06/05/97	06/06/97	P2091
MANGANESE	0.59	831	MG/KG	3050	6010	06/05/97	06/06/97	P2091
MERCURY	0.094	ND	MG/KG	7470	7470	06/02/97	06/02/97	C0881
NICKEL	2.3	7.4	MG/KG	3050	6010	06/05/97	06/06/97	P2091
POTASSIUM	176	229	MG/KG	3050	6010	06/05/97	06/06/97	P2091
SELENIUM	0.059	ND	MG/KG	3050	7741	06/03/97	06/04/97	BH2690
SILVER	0.59	ND	MG/KG	3050	6010	06/05/97	06/06/97	P2091
SODIUM	46.9	86.2	MG/KG	3050	6010	06/05/97	06/06/97	P2091
THALLIUM	0.12	ND	MG/KG	3050	7841	06/03/97	06/03/97	F2083
VANADIUM	0.59	9.9	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ZINC	0.59	185	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CYANIDE, TOTAL	0.59	ND	MG/KG	9010	9010	06/05/97	06/05/97	06114158
SOLIDS, TOTAL	1.0	85.3	%	NONE	160.3	NA	06/03/97	06044147

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Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-N-01-06-00 ARDL No: 300549-06
Sampling Loc'n: 7N Received: 06/07/1997
Sampling Date: 06/06/1997 Matrix: WATER
Sampling Time: 1033 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.085	MG/L	3010	6010A	06/10/97	06/13/97	P2103
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
ARSENIC	0.00050	0.00079	MG/L	3020	7061	06/10/97	06/13/97	BH2697
BARIUM	0.010	0.073	MG/L	3010	6010A	06/10/97	06/13/97	P2103
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
CALCIUM	0.10	39.5	MG/L	3010	6010A	06/10/97	06/13/97	P2103
CHROMIUM	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
COBALT	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
COPPER	0.010	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
IRON	0.050	0.14	MG/L	3010	6010A	06/10/97	06/13/97	P210
LEAD	0.0010	0.001	MG/L	3020	7421	06/10/97	06/12/97	F210
MAGNESIUM	0.10	17.7	MG/L	3010	6010A	06/10/97	06/13/97	P2103
MANGANESE	0.0050	0.034	MG/L	3010	6010A	06/10/97	06/13/97	P2103
MERCURY	0.00020	ND	MG/L	7470	7470	06/11/97	06/11/97	C0890
NICKEL	0.020	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
POTASSIUM	1.5	2.9	MG/L	3010	6010A	06/10/97	06/13/97	P2103
SELENIUM	0.00050	0.00090	MG/L	3020	7741	06/10/97	06/12/97	BH2700
SILVER	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
SODIUM	0.40	11.6	MG/L	3010	6010A	06/10/97	06/13/97	P2103
THALLIUM	0.0010	ND	MG/L	3020	7841	06/10/97	06/13/97	F2111
VANADIUM	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
ZINC	0.0050	0.0067	MG/L	3010	6010A	06/10/97	06/13/97	P2103
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/16/97	06/16/97	06184189

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Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-N1-01-05-1 ARDL No: 300549-04
Sampling Loc'n: N-1 Received: 06/07/1997
Sampling Date: 06/06/1997 Matrix: SOIL
Sampling Time: 1042 Moisture: 27.7

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	6.9	3830	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ANTIMONY	2.8	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ARSENIC	0.69	4.2	MG/KG	3050	7061	06/11/97	06/13/97	BH2696
BARIUM	1.4	78.6	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
BERYLLIUM	0.14	0.43	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CADMIUM	0.69	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CALCIUM	13.8	9910	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CHROMIUM	0.69	6.7	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COBALT	0.69	5.4	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COPPER	1.4	7.9	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
IRON	6.9	8790	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
LEAD	0.69	8.5	MG/KG	3050	7421	06/11/97	06/13/97	F2109
MAGNESIUM	13.8	2470	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MANGANESE	0.69	524	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MERCURY	0.11	ND	MG/KG	7470	7470	06/11/97	06/11/97	C0892
NICKEL	2.8	10.5	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
POTASSIUM	207	408	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SELENIUM	0.069	0.25	MG/KG	3050	7741	06/11/97	06/12/97	BH2699
SILVER	0.69	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SODIUM	55.3	124	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
THALLIUM	0.14	ND	MG/KG	3050	7841	06/11/97	06/13/97	F2113
VANADIUM	0.69	12.6	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ZINC	0.69	27.9	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CYANIDE, TOTAL	0.69	ND	MG/KG	9010	9010	06/12/97	06/13/97	06184190
SOLIDS, TOTAL	1.0	72.3	%	NONE	160.3	NA	06/09/97	06104152

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Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-O-01-06-00 ARDL No: 300542-14
Sampling Loc'n: 70 Received: 05/31/1997
Sampling Date: 05/30/1997 Matrix: WATER
Sampling Time: 1045 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.16	MG/L	3010	6010	06/02/97	06/03/97	P2084
ANTIMONY	0.020	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
ARSENIC	0.00050	0.0011	MG/L	3020	7061	06/06/97	06/10/97	F2095
BARIUM	0.010	0.094	MG/L	3010	6010	06/02/97	06/03/97	P2084
BERYLLIUM	0.0010	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
CADMIUM	0.0050	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
CALCIUM	0.10	42.5	MG/L	3010	6010	06/02/97	06/03/97	P2084
CHROMIUM	0.0050	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
COBALT	0.0050	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
COPPER	0.010	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
IRON	0.050	0.30	MG/L	3010	6010	06/02/97	06/03/97	P208
LEAD	0.0010	ND	MG/L	3020	7421	06/06/97	06/09/97	F20
MAGNESIUM	0.10	17.0	MG/L	3010	6010	06/02/97	06/03/97	P2084
MANGANESE	0.0050	0.082	MG/L	3010	6010	06/02/97	06/03/97	P2084
MERCURY	0.00020	ND	MG/L	7470	7470	06/02/97	06/02/97	C0882
NICKEL	0.020	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
POTASSIUM	1.5	2.2	MG/L	3010	6010	06/02/97	06/03/97	P2084
SELENIUM	0.00050	0.0012	MG/L	3020	7741	06/06/97	06/09/97	BH2691
SILVER	0.0050	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
SODIUM	0.40	11.6	MG/L	3010	6010	06/02/97	06/03/97	P2084
THALLIUM	0.0010	ND	MG/L	3020	7841	06/06/97	06/06/97	F2092
VANADIUM	0.0050	ND	MG/L	3010	6010	06/02/97	06/03/97	P2084
ZINC	0.0050	0.01	MG/L	3010	6010	06/02/97	06/03/97	P2084
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/06/97	06/06/97	06114157

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Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-01-01-05-1 ARDL No: 300542-06
Sampling Loc'n: 701 Received: 05/31/1997
Sampling Date: 05/30/1997 Matrix: SOIL
Sampling Time: 1045 Moisture: 15.6

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	5.9	2370	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ANTIMONY	2.4	3	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ARSENIC	0.59	5	MG/KG	3050	7061	06/03/97	06/04/97	BH2689
BARIUM	1.2	60.2	MG/KG	3050	6010	06/05/97	06/06/97	P2091
BERYLLIUM	0.12	0.27	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CADMIUM	0.59	ND	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CALCIUM	11.8	6110	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CHROMIUM	0.59	9.2	MG/KG	3050	6010	06/05/97	06/06/97	P2091
COBALT	0.59	6.1	MG/KG	3050	6010	06/05/97	06/06/97	P2091
COPPER	1.2	5.2	MG/KG	3050	6010	06/05/97	06/06/97	P2091
IRON	5.9	9880	MG/KG	3050	6010	06/05/97	06/06/97	P2091
LEAD	0.59	8.2	MG/KG	3050	7421	06/05/97	06/06/97	F2093
MAGNESIUM	11.8	1530	MG/KG	3050	6010	06/05/97	06/06/97	P2091
MANGANESE	0.59	353	MG/KG	3050	6010	06/05/97	06/06/97	P2091
MERCURY	0.095	ND	MG/KG	7470	7470	06/02/97	06/02/97	C0881
NICKEL	2.4	10.4	MG/KG	3050	6010	06/05/97	06/06/97	P2091
POTASSIUM	178	378	MG/KG	3050	6010	06/05/97	06/06/97	P2091
SELENIUM	0.059	0.088	MG/KG	3050	7741	06/03/97	06/04/97	BH2690
SILVER	0.59	ND	MG/KG	3050	6010	06/05/97	06/06/97	P2091
SODIUM	47.4	67.6	MG/KG	3050	6010	06/05/97	06/06/97	P2091
THALLIUM	0.12	0.13	MG/KG	3050	7841	06/03/97	06/03/97	F2083
VANADIUM	0.59	11.3	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ZINC	0.59	22.1	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CYANIDE, TOTAL	0.58	ND	MG/KG	9010	9010	06/05/97	06/05/97	06114158
SOLIDS, TOTAL	1.0	84.4	%	NONE	160.3	NA	06/03/97	06044147

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Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-01-02-05-3 ARDL No: 300542-07
Sampling Loc'n: 701 Received: 05/31/1997
Sampling Date: 05/30/1997 Matrix: SOIL
Sampling Time: 1100 Moisture: 12.3

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	5.7	1630	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ANTIMONY	2.3	3.2	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ARSENIC	0.57	2.9	MG/KG	3050	7061	06/03/97	06/04/97	BH2689
BARIUM	1.1	28.6	MG/KG	3050	6010	06/05/97	06/06/97	P2091
BERYLLIUM	0.11	0.23	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CADMIUM	0.57	ND	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CALCIUM	11.4	10500	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CHROMIUM	0.57	5.8	MG/KG	3050	6010	06/05/97	06/06/97	P2091
COBALT	0.57	4.3	MG/KG	3050	6010	06/05/97	06/06/97	P2091
COPPER	1.1	3.1	MG/KG	3050	6010	06/05/97	06/06/97	P2091
IRON	5.7	8730	MG/KG	3050	6010	06/05/97	06/06/97	P2091
LEAD	0.57	5.5	MG/KG	3050	7421	06/05/97	06/06/97	F209
MAGNESIUM	11.4	2130	MG/KG	3050	6010	06/05/97	06/06/97	P2091
MANGANESE	0.57	221	MG/KG	3050	6010	06/05/97	06/06/97	P2091
MERCURY	0.091	ND	MG/KG	7470	7470	06/02/97	06/02/97	C0881
NICKEL	2.3	7.6	MG/KG	3050	6010	06/05/97	06/06/97	P2091
POTASSIUM	171	179	MG/KG	3050	6010	06/05/97	06/06/97	P2091
SELENIUM	0.057	ND	MG/KG	3050	7741	06/03/97	06/04/97	BH2690
SILVER	0.57	0.61	MG/KG	3050	6010	06/05/97	06/06/97	P2091
SODIUM	45.6	83.1	MG/KG	3050	6010	06/05/97	06/06/97	P2091
THALLIUM	0.11	ND	MG/KG	3050	7841	06/03/97	06/03/97	F2083
VANADIUM	0.57	9.6	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ZINC	0.57	19.5	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CYANIDE, TOTAL	0.56	ND	MG/KG	9010	9010	06/05/97	06/05/97	06114158
SOLIDS, TOTAL	1.0	87.7	%	NONE	160.3	NA	06/03/97	06044147

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300542 Report Date: 06/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-01-03-05-4.5 ARDL No: 300542-08
Sampling Loc'n: 701 Received: 05/31/1997
Sampling Date: 05/30/1997 Matrix: SOIL
Sampling Time: 1125 Moisture: 15.1

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	5.9	1720	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ANTIMONY	2.4	2.4	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ARSENIC	0.59	3.7	MG/KG	3050	7061	06/03/97	06/04/97	BH2689
BARIUM	1.2	34.0	MG/KG	3050	6010	06/05/97	06/06/97	P2091
BERYLLIUM	0.12	0.21	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CADMIUM	0.59	ND	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CALCIUM	11.8	3700	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CHROMIUM	0.59	7	MG/KG	3050	6010	06/05/97	06/06/97	P2091
COBALT	0.59	5.8	MG/KG	3050	6010	06/05/97	06/06/97	P2091
COPPER	1.2	2.5	MG/KG	3050	6010	06/05/97	06/06/97	P2091
IRON	5.9	8240	MG/KG	3050	6010	06/05/97	06/06/97	P2091
LEAD	0.12	4.7	MG/KG	3050	7421	06/05/97	06/06/97	F2093
MAGNESIUM	11.8	1560	MG/KG	3050	6010	06/05/97	06/06/97	P2091
MANGANESE	0.59	242	MG/KG	3050	6010	06/05/97	06/06/97	P2091
MERCURY	0.094	ND	MG/KG	7470	7470	06/02/97	06/02/97	C0881
NICKEL	2.4	9.2	MG/KG	3050	6010	06/05/97	06/06/97	P2091
POTASSIUM	177	ND	MG/KG	3050	6010	06/05/97	06/06/97	P2091
SELENIUM	0.059	ND	MG/KG	3050	7741	06/03/97	06/04/97	BH2690
SILVER	0.59	ND	MG/KG	3050	6010	06/05/97	06/06/97	P2091
SODIUM	47.1	67.9	MG/KG	3050	6010	06/05/97	06/06/97	P2091
THALLIUM	0.12	ND	MG/KG	3050	7841	06/03/97	06/03/97	F2083
VANADIUM	0.59	9.6	MG/KG	3050	6010	06/05/97	06/06/97	P2091
ZINC	0.59	18.5	MG/KG	3050	6010	06/05/97	06/06/97	P2091
CYANIDE, TOTAL	0.59	ND	MG/KG	9010	9010	06/05/97	06/05/97	06114158
SOLIDS, TOTAL	1.0	84.9	%	NONE	160.3	NA	06/03/97	06044147

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Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300544 Report Date: 06/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-P-01-06-00 ARDL No: 300544-03
Sampling Loc'n: 7P Received: 06/04/1997
Sampling Date: 06/02/1997 Matrix: WATER
Sampling Time: 1230 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Numb
ALUMINUM	0.050	0.056	MG/L	3010	6010A	06/06/97	06/10/97	P209
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/06/97	06/10/97	P209
ARSENIC	0.00050	0.00067	MG/L	3020	7061	06/06/97	06/10/97	F209
BARIUM	0.010	0.059	MG/L	3010	6010A	06/06/97	06/10/97	P209
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/06/97	06/10/97	P209
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/06/97	06/10/97	P209
CALCIUM	0.10	75.4	MG/L	3010	6010A	06/06/97	06/10/97	P209
CHROMIUM	0.0050	ND	MG/L	3010	6010A	06/06/97	06/10/97	P209
COBALT	0.0050	ND	MG/L	3010	6010A	06/06/97	06/10/97	P209
COPPER	0.010	ND	MG/L	3010	6010A	06/06/97	06/10/97	P209
IRON	0.050	ND	MG/L	3010	6010A	06/06/97	06/10/97	0
LEAD	0.0010	ND	MG/L	3020	7421	06/06/97	06/09/97	.205
MAGNESIUM	0.10	27.3	MG/L	3010	6010A	06/06/97	06/10/97	P209
MANGANESE	0.0050	0.018	MG/L	3010	6010A	06/06/97	06/10/97	P209
MERCURY	0.00020	ND	MG/L	7470	7470	06/06/97	06/06/97	C088
NICKEL	0.020	ND	MG/L	3010	6010A	06/06/97	06/10/97	P209
POTASSIUM	1.5	ND	MG/L	3010	6010A	06/06/97	06/10/97	P209
SELENIUM	0.00050	ND	MG/L	3020	7741	06/06/97	06/09/97	BH26
SILVER	0.0050	ND	MG/L	3010	6010A	06/06/97	06/10/97	P209
SODIUM	0.40	4.3	MG/L	3010	6010A	06/06/97	06/10/97	P209
THALLIUM	0.0010	ND	MG/L	3020	7841	06/06/97	06/06/97	F209
VANADIUM	0.0050	ND	MG/L	3010	6010A	06/06/97	06/10/97	P209
ZINC	0.0050	ND	MG/L	3010	6010A	06/06/97	06/10/97	P209
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/06/97	06/06/97	06114

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300544 Report Date: 06/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-P1-01-05-01 ARDL No: 300544-01
Sampling Loc'n: 7P,0 TO 1 FT Received: 06/04/1997
Sampling Date: 06/02/1997 Matrix: SOIL
Sampling Time: 1400 Moisture: 14.1

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	5.8	4160	MG/KG	3050	6010A	06/05/97	06/06/97	P2091
ANTIMONY	2.3	12.0	MG/KG	3050	6010A	06/05/97	06/06/97	P2091
ARSENIC	0.58	23.1	MG/KG	3050	7061	06/05/97	06/13/97	BH2692
BARIUM	1.2	345	MG/KG	3050	6010A	06/05/97	06/06/97	P2091
BERYLLIUM	0.12	0.92	MG/KG	3050	6010A	06/05/97	06/06/97	P2091
CADMIUM	0.58	0.81	MG/KG	3050	6010A	06/05/97	06/06/97	P2091
CALCIUM	11.6	29900	MG/KG	3050	6010A	06/05/97	06/06/97	P2091
CHROMIUM	0.58	10.3	MG/KG	3050	6010A	06/05/97	06/06/97	P2091
COBALT	0.58	36.1	MG/KG	3050	6010A	06/05/97	06/06/97	P2091
COPPER	1.2	11.7	MG/KG	3050	6010A	06/05/97	06/06/97	P2091
IRON	5.8	30200	MG/KG	3050	6010A	06/05/97	06/06/97	P2091
LEAD	2.3	32.6	MG/KG	3050	7421	06/05/97	06/06/97	F2093
MAGNESIUM	11.6	5620	MG/KG	3050	6010A	06/05/97	06/06/97	P2091
MANGANESE	0.58	3870	MG/KG	3050	6010A	06/05/97	06/06/97	P2091
MERCURY	0.093	ND	MG/KG	7470	7470	06/06/97	06/06/97	C0885
NICKEL	2.3	42.0	MG/KG	3050	6010A	06/05/97	06/06/97	P2091
POTASSIUM	175	573	MG/KG	3050	6010A	06/05/97	06/06/97	P2091
SELENIUM	0.58	ND	MG/KG	3050	7741	06/05/97	06/09/97	BH2693
SILVER	0.58	1.2	MG/KG	3050	6010A	06/05/97	06/06/97	P2091
SODIUM	46.6	99.2	MG/KG	3050	6010A	06/05/97	06/06/97	P2091
THALLIUM	0.12	ND	MG/KG	3050	7841	06/05/97	06/06/97	F2098
VANADIUM	0.58	38.6	MG/KG	3050	6010A	06/05/97	06/06/97	P2091
ZINC	0.58	69.6	MG/KG	3050	6010A	06/05/97	06/06/97	P2091
CYANIDE, TOTAL	0.58	ND	MG/KG	9010	9010	06/05/97	06/05/97	06114158
SOLIDS, TOTAL	1.0	85.9	%	NONE	160.3	NA	06/05/97	06114159

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Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-Q-01-06-00 ARDL No: 300549-08
Sampling Loc'n: 7Q Received: 06/07/1997
Sampling Date: 06/05/1997 Matrix: WATER
Sampling Time: 1630 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.13	MG/L	3010	6010A	06/10/97	06/13/97	P2103
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
ARSENIC	0.00050	ND	MG/L	3020	7061	06/10/97	06/13/97	BH2697
BARIUM	0.010	0.067	MG/L	3010	6010A	06/10/97	06/13/97	P2103
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
CALCIUM	0.10	67.8	MG/L	3010	6010A	06/10/97	06/13/97	P2103
CHROMIUM	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
COBALT	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
COPPER	0.010	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
IRON	0.050	0.13	MG/L	3010	6010A	06/10/97	06/13/97	P21[illegible]
LEAD	0.0010	ND	MG/L	3020	7421	06/10/97	06/12/97	F210[illegible]
MAGNESIUM	0.10	20.2	MG/L	3010	6010A	06/10/97	06/13/97	P2103
MANGANESE	0.0050	0.03	MG/L	3010	6010A	06/10/97	06/13/97	P2103
MERCURY	0.00020	ND	MG/L	7470	7470	06/11/97	06/11/97	C0890
NICKEL	0.020	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
POTASSIUM	1.5	3.3	MG/L	3010	6010A	06/10/97	06/13/97	P2103
SELENIUM	0.00050	ND	MG/L	3020	7741	06/10/97	06/12/97	BH2700
SILVER	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
SODIUM	0.40	15.6	MG/L	3010	6010A	06/10/97	06/13/97	P2103
THALLIUM	0.0010	ND	MG/L	3020	7841	06/10/97	06/13/97	F2111
VANADIUM	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
ZINC	0.0050	ND	MG/L	3010	6010A	06/10/97	06/13/97	P2103
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/16/97	06/16/97	06184189

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-07-Q1-01-05-1 ARDL No: 300549-05
Sampling Loc'n: 7Q Received: 06/07/1997
Sampling Date: 06/05/1997 Matrix: SOIL
Sampling Time: 1620 Moisture: 19.2

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	6.2	866	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ANTIMONY	2.5	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ARSENIC	0.62	5.4	MG/KG	3050	7061	06/11/97	06/13/97	BH2696
BARIUM	1.2	39.3	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
BERYLLIUM	0.12	0.21	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CADMIUM	0.62	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CALCIUM	12.4	14900	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CHROMIUM	0.62	3.3	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COBALT	0.62	5.3	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
COPPER	1.2	1.7	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
IRON	6.2	7240	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
LEAD	0.62	10.2	MG/KG	3050	7421	06/11/97	06/13/97	F2109
MAGNESIUM	12.4	1660	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MANGANESE	0.62	512	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
MERCURY	0.099	ND	MG/KG	7470	7470	06/11/97	06/11/97	C0892
NICKEL	2.5	6.1	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
POTASSIUM	186	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SELENIUM	0.062	0.12	MG/KG	3050	7741	06/11/97	06/12/97	BH2699
SILVER	0.62	ND	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
SODIUM	49.5	89.8	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
THALLIUM	0.12	ND	MG/KG	3050	7841	06/11/97	06/13/97	F2113
VANADIUM	0.62	8.9	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
ZINC	0.62	10.5	MG/KG	3050	6010A	06/11/97	06/12/97	P2102
CYANIDE, TOTAL	0.6	ND	MG/KG	9010	9010	06/12/97	06/13/97	06184190
SOLIDS, TOTAL	1.0	80.8	%	NONE	160.3	NA	06/09/97	06104152

APPENDIX L
FIXED LABORATORY ANALYTICAL DATA

L-3 Task 10. Pumping Test, Line 2

VOLATILE ORGANIC COMPOUNDS
(Method 8260)

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300556 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-10-A-01-03-00	ARDL Lab No.:	300556-06
Desc/Location:	10A	Lab Filename:	
Sample Date:	06/12/1997	Received Date:	06/14/1997
Sample Time:	1445	Prep. Date:	06/26/1997
Matrix:	WATER	Analysis Date:	06/26/1997
Amount Used:	25 mL	QC Batch:	0626TJP3
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	0.47	1.0	ND		UG/L	1
CHLOROMETHANE	0.41	1.0	ND		UG/L	1
VINYL CHLORIDE	0.32	1.0	ND		UG/L	1
BROMOMETHANE	0.12	1.0	ND		UG/L	1
CHLOROETHANE	0.33	1.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	0.28	1.0	ND		UG/L	1
1,1-DICHLOROETHENE	0.27	1.0	ND		UG/L	1
METHYLENE CHLORIDE	0.27	2.0	ND		UG/L	1
trans-1,2-DICHLOROETHENE	0.33	1.0	ND		UG/L	1
1,1-DICHLOROETHANE	0.20	1.0	ND		UG/L	1
2,2-DICHLOROPROPANE	0.30	1.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.20	1.0	ND		UG/L	1
BROMOCHLOROMETHANE	0.32	1.0	ND		UG/L	1
CHLOROFORM	0.30	1.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.23	1.0	ND		UG/L	1
1,1-DICHLOROPROPENE	0.32	1.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.29	1.0	ND		UG/L	1
BENZENE	0.17	1.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.17	1.0	ND		UG/L	1
TRICHLOROETHENE	0.18	1.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.21	1.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.25	1.0	ND		UG/L	1
DIBROMOMETHANE	0.30	1.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.24	1.0	ND		UG/L	1
TOLUENE	0.32	1.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.25	1.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	0.35	1.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.31	1.0	ND		UG/L	1
TETRACHLOROETHENE	0.32	1.0	ND		UG/L	1
1,3-DICHLOROPROPANE	0.45	1.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	0.36	1.0	ND		UG/L	1
CHLOROBENZENE	0.24	1.0	ND		UG/L	1

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Mt. Vernon, Illinois 62864

Lab Report No: 300556 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-10-A-01-03-00	ARDL Lab No.:	300556-06 (cont'd)
Desc/Location:	10A	Lab Filename:	
Sample Date:	06/12/1997	Received Date:	06/14/1997
Sample Time:	1445	Prep. Date:	06/26/1997
Matrix:	WATER	Analysis Date:	06/26/1997
Amount Used:	25 mL	QC Batch:	0626TJP3
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,1,1,2-TETRACHLOROETHANE	0.34	1.0	ND		UG/L	1
ETHYLBENZENE	0.29	1.0	ND		UG/L	1
m & p-XYLENE	0.69	1.0	ND		UG/L	1
o-XYLENE	0.37	1.0	ND		UG/L	1
STYRENE	0.34	1.0	ND		UG/L	1
2-HEXANONE	2.1	10.0	ND		UG/L	1
BROMOFORM	0.48	1.0	ND		UG/L	1
ISOPROPYLBENZENE	0.40	1.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	0.57	1.0	ND		UG/L	1
BROMOBENZENE	0.39	1.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	0.28	1.0	ND		UG/L	1
n-PROPYLBENZENE	0.35	1.0	ND		UG/L	1
2-CHLOROTOLUENE	0.37	1.0	ND		UG/L	1
4-CHLOROTOLUENE	0.38	1.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	0.39	1.0	ND		UG/L	1
tert-BUTYLBENZENE	0.36	1.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	0.41	1.0	ND		UG/L	1
sec-BUTYLBENZENE	0.34	1.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	0.30	1.0	ND		UG/L	1
1,3-DICHLOROBENZENE	0.46	1.0	ND		UG/L	1
1,4-DICHLOROBENZENE	0.43	1.0	ND		UG/L	1
1,2-DICHLOROBENZENE	0.48	1.0	ND		UG/L	1
n-BUTYLBENZENE	0.31	1.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	0.65	2.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.51	1.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.34	1.0	ND		UG/L	1
NAPHTHALENE	0.45	1.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	0.56	1.0	ND		UG/L	1
ACETONE	8.4	20.0	ND		UG/L	1
2-BUTANONE	4.8	20.0	ND		UG/L	1
4-METHYL-2-PENTANONE	1.7	10.0	ND		UG/L	1

ARDL, INC.
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Lab Report No: 300556 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-10-A-01-03-00	ARDL Lab No.:	300556-06 (cont'd)
Desc/Location:	10A	Lab Filename:	
Sample Date:	06/12/1997	Received Date:	06/14/1997
Sample Time:	1445	Prep. Date:	06/26/1997
Matrix:	WATER	Analysis Date:	06/26/1997
Amount Used:	25 mL	QC Batch:	0626TJP3
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	72-120	105%
DIBROMOFLUOROMETHANE	79-128	103%
1,2-DICHLOROETHANE-D4	77-124	100%
TOLUENE-D8	86-116	100%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-10-A-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300556 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300556-06

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: >K5154

Level: (low/med) LOW Date Received: 6/14/97

% Moisture: not dec. --- Date Analyzed: 6/26/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-10-B-01-03-00	ARDL Lab No.:	300555-08
Desc/Location:	10B	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	2145	Prep. Date:	06/16/1997
Matrix:	WATER	Analysis Date:	06/16/1997
Amount Used:	5 mL	QC Batch:	0617LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	1.4	10.0	ND		UG/L	1
CHLOROMETHANE	1.2	10.0	ND		UG/L	1
VINYL CHLORIDE	1.2	10.0	ND		UG/L	1
BROMOMETHANE	1.3	10.0	ND		UG/L	1
CHLOROETHANE	1.4	10.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	1.4	10.0	ND		UG/L	1
1,1-DICHLOROETHENE	1.2	5.0	ND		UG/L	1
METHYLENE CHLORIDE	1.3	5.0	10.4	B	UG/L	1
trans-1,2-DICHLOROETHENE	1.3	5.0	ND		UG/L	1
1,1-DICHLOROETHANE	1.0	5.0	ND		UG/L	1
CARBON DISULFIDE	1.1	5.0	ND		UG/L	1
2,2-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.86	5.0	ND		UG/L	1
BROMOCHLOROMETHANE	1.1	5.0	ND		UG/L	1
CHLOROFORM	0.79	5.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.89	5.0	ND		UG/L	1
1,1-DICHLOROPROPENE	1.3	5.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.87	5.0	ND		UG/L	1
BENZENE	0.90	5.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.85	5.0	ND		UG/L	1
TRICHLOROETHENE	0.85	5.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.77	5.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.82	5.0	ND		UG/L	1
DIBROMOMETHANE	0.96	5.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.83	5.0	ND		UG/L	1
TOLUENE	0.85	5.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.96	5.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	1.0	5.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.92	5.0	ND		UG/L	1
TETRACHLOROETHENE	0.81	5.0	ND		UG/L	1
1,3-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	1.3	5.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-10-B-01-03-00	ARDL Lab No.:	300555-08 (cont'd)
Desc/Location:	10B	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	2145	Prep. Date:	06/16/1997
Matrix:	WATER	Analysis Date:	06/16/1997
Amount Used:	5 mL	QC Batch:	0617LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.96	5.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	1.4	5.0	ND		UG/L	1
ETHYLBENZENE	0.93	5.0	ND		UG/L	1
m & p-XYLENE	1.5	5.0	ND		UG/L	1
o-XYLENE	0.92	5.0	ND		UG/L	1
STYRENE	1.2	5.0	ND		UG/L	1
2-HEXANONE	4.5	20.0	ND		UG/L	1
BROMOFORM	2.0	5.0	ND		UG/L	1
ISOPROPYLBENZENE	1.1	5.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	3.0	5.0	ND		UG/L	1
BROMOBENZENE	1.2	5.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	2.2	5.0	ND		UG/L	1
n-PROPYLBENZENE	1.2	5.0	ND		UG/L	1
2-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
4-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	1.3	5.0	ND		UG/L	1
tert-BUTYLBENZENE	1.0	5.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	1.0	5.0	ND		UG/L	1
sec-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	1.3	5.0	ND		UG/L	1
1,3-DICHLOROBENZENE	1.9	5.0	ND		UG/L	1
1,4-DICHLOROBENZENE	1.6	5.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	5.0	ND		UG/L	1
n-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	3.2	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	1.2	5.0	ND		UG/L	1
HEXACHLOROBUTADIENE	1.3	5.0	ND		UG/L	1
NAPHTHALENE	2.3	5.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	1.9	5.0	ND		UG/L	1
ACETONE	11.0	50.0	ND		UG/L	1
2-BUTANONE	7.0	50.0	ND		UG/L	1
4-METHYL-2-PENTANONE	8.9	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-10-B-01-03-00	ARDL Lab No.:	300555-08 (cont'd)
Desc/Location:	10B	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	2145	Prep. Date:	06/16/1997
Matrix:	WATER	Analysis Date:	06/16/1997
Amount Used:	5 mL	QC Batch:	0617LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	82-125	115%
DIBROMOFLUOROMETHANE	89-127	93%
1,2-DICHLOROETHANE-D4	79-130	101%
TOLUENE-D8	84-122	115%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-10-B-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300555 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300555-08

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: >K5059

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. --- Date Analyzed: 6/16/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-10-JAW70-01-03-00	ARDL Lab No.:	300576-07
Desc/Location:	JAW 70,TASK 10	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/27/1997
Sample Time:	1600	Prep. Date:	07/03/1997
Matrix:	WATER	Analysis Date:	07/03/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0708TJP6
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	0.47	1.0	ND		UG/L	1
CHLOROMETHANE	0.41	1.0	ND		UG/L	1
VINYL CHLORIDE	0.32	1.0	ND		UG/L	1
BROMOMETHANE	0.12	1.0	ND		UG/L	1
CHLOROETHANE	0.33	1.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	0.28	1.0	ND		UG/L	1
1,1-DICHLOROETHENE	0.27	1.0	ND		UG/L	1
METHYLENE CHLORIDE	0.27	2.0	3.3		UG/L	1
trans-1,2-DICHLOROETHENE	0.33	1.0	ND		UG/L	1
1,1-DICHLOROETHANE	0.20	1.0	ND		UG/L	1
2,2-DICHLOROPROPANE	0.30	1.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.20	1.0	ND		UG/L	1
BROMOCHLOROMETHANE	0.32	1.0	ND		UG/L	1
CHLOROFORM	0.30	1.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.23	1.0	ND		UG/L	1
1,1-DICHLOROPROPENE	0.32	1.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.29	1.0	ND		UG/L	1
BENZENE	0.17	1.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.17	1.0	ND		UG/L	1
TRICHLOROETHENE	0.18	1.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.21	1.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.25	1.0	ND		UG/L	1
DIBROMOMETHANE	0.30	1.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.24	1.0	ND		UG/L	1
TOLUENE	0.32	1.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.25	1.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	0.35	1.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.31	1.0	ND		UG/L	1
TETRACHLOROETHENE	0.32	1.0	ND		UG/L	1
1,3-DICHLOROPROPANE	0.45	1.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	0.36	1.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-10-JAW70-01-03-00	ARDL Lab No.:	300576-07 (cont'd)
Desc/Location:	JAW 70,TASK 10	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/27/1997
Sample Time:	1600	Prep. Date:	07/03/1997
Matrix:	WATER	Analysis Date:	07/03/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0708TJP6
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.24	1.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	0.34	1.0	ND		UG/L	1
ETHYLBENZENE	0.29	1.0	ND		UG/L	1
m & p-XYLENE	0.69	1.0	ND		UG/L	1
o-XYLENE	0.37	1.0	ND		UG/L	1
STYRENE	0.34	1.0	ND		UG/L	1
2-HEXANONE	2.1	10.0	ND		UG/L	1
BROMOFORM	0.48	1.0	ND		UG/L	1
ISOPROPYLBENZENE	0.40	1.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	0.57	1.0	ND		UG/L	1
BROMOBENZENE	0.39	1.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	0.28	1.0	ND		UG/L	1
n-PROPYLBENZENE	0.35	1.0	ND		UG/L	1
2-CHLOROTOLUENE	0.37	1.0	ND		UG/L	1
4-CHLOROTOLUENE	0.38	1.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	0.39	1.0	ND		UG/L	1
tert-BUTYLBENZENE	0.36	1.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	0.41	1.0	ND		UG/L	1
sec-BUTYLBENZENE	0.34	1.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	0.30	1.0	ND		UG/L	1
1,3-DICHLOROBENZENE	0.46	1.0	ND		UG/L	1
1,4-DICHLOROBENZENE	0.43	1.0	ND		UG/L	1
1,2-DICHLOROBENZENE	0.48	1.0	ND		UG/L	1
n-BUTYLBENZENE	0.31	1.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	0.65	2.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.51	1.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.34	1.0	ND		UG/L	1
NAPHTHALENE	0.45	1.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	0.56	1.0	ND		UG/L	1
ACETONE	8.4	20.0	ND		UG/L	1
2-BUTANONE	4.8	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-10-JAW70-01-03-00	ARDL Lab No.:	300576-07 (cont'd)
Desc/Location:	JAW 70,TASK 10	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/27/1997
Sample Time:	1600	Prep. Date:	07/03/1997
Matrix:	WATER	Analysis Date:	07/03/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0708TJP6
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
4-METHYL-2-PENTANONE	1.7	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	72-120	106%
DIBROMOFLUOROMETHANE	79-128	118%
1,2-DICHLOROETHANE-D4	77-124	121%
TOLUENE-D8	86-116	108%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-10-JAW70-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300576 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300576-07

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: >G3030

Level: (low/med) LOW Date Received: 6/27/97

% Moisture: not dec. --- Date Analyzed: 7/03/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 76131	Ethane, 1,1,2-trichloro- 1,2,2-trifluoro-	3.67	10.	JN
2.	Unknown	24.76	1.	J
3.	Unknown	27.28	2.	J
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SEMI-VOLATILE ORGANIC COMPOUNDS
(Method 8270)

1015

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300556 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-10-A-01-03-00	ARDL Lab No.:	300556-06
Desc/Location:	10A	Lab Filename:	
Sample Date:	06/12/1997	Received Date:	06/14/1997
Sample Time:	1445	Prep. Date:	06/17/1997
Matrix:	WATER	Analysis Date:	06/19/1997
Amount Used:	1000 mL	QC Batch:	B2288
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300556 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-10-A-01-03-00	ARDL Lab No.:	300556-06 (cont'd)
Desc/Location:	10A	Lab Filename:	
Sample Date:	06/12/1997	Received Date:	06/14/1997
Sample Time:	1445	Prep. Date:	06/17/1997
Matrix:	WATER	Analysis Date:	06/19/1997
Amount Used:	1000 mL	QC Batch:	B2288
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300556 Report Date: 06/23/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-10-A-01-03-00	ARDL Lab No.:	300556-06 (cont'd)
Desc/Location:	10A	Lab Filename:	
Sample Date:	06/12/1997	Received Date:	06/14/1997
Sample Time:	1445	Prep. Date:	06/17/1997
Matrix:	WATER	Analysis Date:	06/19/1997
Amount Used:	1000 mL	QC Batch:	B2288
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	76%
2-FLUOROPHENOL	21-110	19%*
D5 NITROBENZENE	35-114	68%
2,4,6-TRIBROMOPHENOL	10-123	41%
D5 PHENOL	10-94	11%
D14 TERPHENYL	33-141	80%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-10-A-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300556 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300556-06

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >W8121

Level: (low/med) LOW Date Received: 6/14/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/17/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/19/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.1

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	19.19	8.	J
2.	Unknown	20.47	31.	J
3.	Unknown	21.75	4.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-10-B-01-03-00	ARDL Lab No.:	300555-08
Desc/Location:	10B	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	2145	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/19/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-10-B-01-03-00	ARDL Lab No.:	300555-08 (cont'd)
Desc/Location:	10B	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	2145	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/19/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-10-B-01-03-00	ARDL Lab No.:	300555-08 (cont'd)
Desc/Location:	10B	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	2145	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/19/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	59%
2-FLUOROPHENOL	21-110	14%*
D5 NITROBENZENE	35-114	60%
2,4,6-TRIBROMOPHENOL	10-123	19%
D5 PHENOL	10-94	12%
D14 TERPHENYL	33-141	65%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-10-B-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300555 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300555-08

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1563

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/13/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/19/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.5

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	12.80	7.	J
2.	Unknown	12.93	5.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/09/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-10-JAW70-01-03-00	ARDL Lab No.:	300576-07
Desc/Location:	JAW 70,TASK 10	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/27/1997
Sample Time:	1600	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2329
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/09/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-10-JAW70-01-03-00	ARDL Lab No.:	300576-07 (cont'd)
Desc/Location:	JAW 70,TASK 10	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/27/1997
Sample Time:	1600	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2329
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	5	J	UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/09/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-10-JAW70-01-03-00	ARDL Lab No.:	300576-07 (cont'd)
Desc/Location:	JAW 70,TASK 10	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/27/1997
Sample Time:	1600	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2329
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	93%
2-FLUOROPHENOL	21-110	44%
D5 NITROBENZENE	35-114	79%
2,4,6-TRIBROMOPHENOL	10-123	79%
D5 PHENOL	10-94	31%
D14 TERPHENYL	33-141	100%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-10-JAW70-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300576 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300576-07

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1652

Level: (low/med) LOW Date Received: 6/27/97

% Moisture: not dec. --- dec. --- Date Extracted: 7/02/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 7/08/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.3

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	12.74	25.	J
2.		Unknown	13.09	7.	J
3.		Unknown	18.72	8.	J
4.		Unknown	18.96	11.	J
5.		Unknown	20.91	7.	J
6.					
7.					
8.					
9.					
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30.					

EXPLOSIVES
(Method 8330)

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300556 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-10-A-01-03-00	ARDL Lab No.:	300556-06
Desc/Location:	10A	Lab Filename:	
Sample Date:	06/12/1997	Received Date:	06/14/1997
Sample Time:	1445	Prep. Date:	06/18/1997
Matrix:	WATER	Analysis Date:	06/26/1997
Amount Used:	770 mL	QC Batch:	B2302
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	4	13.0	ND		UG/L	10
1,3-DINITROBENZENE	3.3	13.0	ND		UG/L	10
2,4,6-TRINITROTOLUENE	3.8	13.0	ND		UG/L	10
2,4-DINITROTOLUENE	4.4	13.0	7.8	J	UG/L	10
2,6-DINITROTOLUENE	4.4	13.0	ND		UG/L	10
2-AMINO-4,6-DINITROTOLUENE	4.1	13.0	20.0		UG/L	10
2-NITROTOLUENE	3.7	13.0	ND		UG/L	10
3-NITROTOLUENE	2.7	13.0	ND		UG/L	10
4-AMINO-2,6-DINITROTOLUENE	4.2	13.0	14.0		UG/L	10
4-NITROTOLUENE	3.9	13.0	ND		UG/L	10
RDX	70.6	260	1200		UG/L	200
NITROBENZENE	4.4	13.0	ND		UG/L	10
HMX	10.7	32.5	220		UG/L	25
TETRYL	4	13.0	ND		UG/L	10

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	66%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-10-B-01-03-00	ARDL Lab No.:	300555-08
Desc/Location:	10B	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	2145	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	770 mL	QC Batch:	B2294
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	8.1		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	5.9		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	8.8	32.5	250		UG/L	25
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	4.3	13.0	82.0		UG/L	10
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	85%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-10-JAW70-01-03-00	ARDL Lab No.:	300576-07
Desc/Location:	JAW 70,TASK 10	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/27/1997
Sample Time:	1600	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/09/1997
Amount Used:	770 mL	QC Batch:	B2344
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	4	13.0	ND		UG/L	10
1,3-DINITROBENZENE	3.3	13.0	ND		UG/L	10
2,4,6-TRINITROTOLUENE	3.8	13.0	ND		UG/L	10
2,4-DINITROTOLUENE	4.4	13.0	ND		UG/L	10
2,6-DINITROTOLUENE	4.4	13.0	ND		UG/L	10
2-AMINO-4,6-DINITROTOLUENE	4.1	13.0	21.0		UG/L	10
2-NITROTOLUENE	3.7	13.0	ND		UG/L	10
3-NITROTOLUENE	2.7	13.0	ND		UG/L	10
4-AMINO-2,6-DINITROTOLUENE	4.2	13.0	23.0		UG/L	10
4-NITROTOLUENE	3.9	13.0	ND		UG/L	10
RDX	70.6	260	1200		UG/L	200
NITROBENZENE	4.4	13.0	ND		UG/L	10
HMX	4.3	13.0	130		UG/L	10
TETRYL	4	13.0	ND		UG/L	10

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	48%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

INORGANICS

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/26/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-10-B-01-03-00 ARDL No: 300555-08
Sampling Loc'n: 10B Received: 06/13/1997
Sampling Date: 06/10/1997 Matrix: WATER
Sampling Time: 2145 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	7.9	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
ARSENIC	0.00050	0.003	MG/L	3020	7061	06/16/97	06/17/97	BH2708
ARSENIC, DISSOLVED	0.00050	ND	MG/L	3005	7061	06/16/97	06/17/97	BH2707
BARIUM	0.010	0.21	MG/L	3010	6010A	06/16/97	06/18/97	P2126
BARIUM, DISSOLVED	0.010	0.15	MG/L	3005	6010A	06/16/97	06/16/97	P2115
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
CALCIUM	0.10	67.1	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CALCIUM, DISSOLVED	0.10	52.6	MG/L	3005	6010A	06/16/97	06/16/97	P2115
CHROMIUM	0.0050	0.063	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
COBALT	0.0050	0.009	MG/L	3010	6010A	06/16/97	06/18/97	P2126
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
COPPER	0.010	0.013	MG/L	3010	6010A	06/16/97	06/18/97	P2126
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
IRON	0.050	16.8	MG/L	3010	6010A	06/16/97	06/18/97	P2126
IRON, DISSOLVED	0.050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
LEAD	0.0010	0.0072	MG/L	3020	7421	06/16/97	06/17/97	F2128
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	06/16/97	06/17/97	F2127
MAGNESIUM	0.10	27.6	MG/L	3010	6010A	06/16/97	06/18/97	P2126
MAGNESIUM, DISSOLVED	0.10	22.9	MG/L	3005	6010A	06/16/97	06/16/97	P2115
MANGANESE	0.0050	0.39	MG/L	3010	6010A	06/16/97	06/18/97	P2126
MANGANESE, DISSOLVED	0.0050	0.1	MG/L	3005	6010A	06/16/97	06/16/97	P2115
MERCURY	0.00020	ND	MG/L	7470	7470	06/16/97	06/16/97	C0894
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	06/16/97	06/16/97	C0895
NICKEL	0.020	0.051	MG/L	3010	6010A	06/16/97	06/18/97	P2126
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
POTASSIUM	1.5	2.9	MG/L	3010	6010A	06/16/97	06/18/97	P2126
POTASSIUM, DISSOLVED	1.5	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
SELENIUM	0.00050	ND	MG/L	3020	7741	06/16/97	06/17/97	BH2710
SELENIUM, DISSOLVED	0.00050	ND	MG/L	3005	7741	06/16/97	06/17/97	BH2709
SILVER	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/26/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-10-B-01-03-00 ARDL No: 300555-08 (cont'd)
Sampling Loc'n: 10B Received: 06/13/1997
Sampling Date: 06/10/1997 Matrix: WATER
Sampling Time: 2145 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
SODIUM	0.40	40.7	MG/L	3010	6010A	06/16/97	06/18/97	P2126
SODIUM, DISSOLVED	0.40	43.9	MG/L	3005	6010A	06/16/97	06/16/97	P2115
THALLIUM	0.0010	ND	MG/L	3020	7841	06/16/97	06/17/97	F2130
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	06/16/97	06/17/97	F2129
VANADIUM	0.0050	0.022	MG/L	3010	6010A	06/16/97	06/18/97	P2126
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
ZINC	0.0050	0.1	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ZINC, DISSOLVED	0.0050	0.048	MG/L	3005	6010A	06/16/97	06/16/97	P2115
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	06/16/97	06/16/97	06174181
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/16/97	06/16/97	0618

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-10-JAW70-01-03-00 ARDL No: 300576-07
Sampling Loc'n: JAW 70,TASK 10 Received: 06/27/1997
Sampling Date: 06/25/1997 Matrix: WATER
Sampling Time: 1600 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ANTIMONY	0.020	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ARSENIC	0.00050	ND	MG/L	3020	7061	07/01/97	07/02/97	BH2720
ARSENIC, DISSOLVED	0.00050	ND	MG/L	3005	7061	07/01/97	07/02/97	BH2719
BARIUM	0.010	0.078	MG/L	3010	6010A	07/01/97	07/02/97	P2160
BARIUM, DISSOLVED	0.010	0.082	MG/L	3005	6010A	07/02/97	07/02/97	P2159
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CADMIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CALCIUM	0.10	63.2	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CALCIUM, DISSOLVED	0.10	68.3	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CHROMIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
COBALT	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
COPPER	0.010	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
IRON	0.050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
IRON, DISSOLVED	0.050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
LEAD	0.0010	ND	MG/L	3020	7421	07/01/97	07/02/97	F2162
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	07/01/97	07/02/97	F2161
MAGNESIUM	0.10	28.8	MG/L	3010	6010A	07/01/97	07/02/97	P2160
MAGNESIUM, DISSOLVED	0.10	31.3	MG/L	3005	6010A	07/02/97	07/02/97	P2159
MANGANESE	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
MANGANESE, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
MERCURY	0.00020	ND	MG/L	7470	7470	06/30/97	06/30/97	C0905
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	06/30/97	06/30/97	C0906
NICKEL	0.020	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
POTASSIUM	1.5	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
POTASSIUM, DISSOLVED	1.5	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
SELENIUM	0.00050	ND	MG/L	3020	7741	07/01/97	07/02/97	BH2722
SELENIUM, DISSOLVED	0.00050	ND	MG/L	3005	7741	07/01/97	07/02/97	BH2721
SILVER	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-10-JAW70-01-03-00 ARDL No: 300576-07 (cont'd)
Sampling Loc'n: JAW 70,TASK 10 Received: 06/27/1997
Sampling Date: 06/25/1997 Matrix: WATER
Sampling Time: 1600 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
SODIUM	0.40	11.9	MG/L	3010	6010A	07/01/97	07/02/97	P2160
SODIUM, DISSOLVED	0.40	13.2	MG/L	3005	6010A	07/02/97	07/02/97	P2159
THALLIUM	0.0010	ND	MG/L	3020	7841	07/01/97	07/03/97	F2165
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	07/01/97	07/03/97	F2164
VANADIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ZINC	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ZINC, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	06/30/97	06/30/97	07034246
CYANIDE, TOTAL	0.010	0.015	MG/L	9012	9012	06/30/97	06/30/97	0703[illegible]

APPENDIX L
FIXED LABORATORY ANALYTICAL DATA

L-4 Task 12. Additional Groundwater Data, Line 2

VOLATILE ORGANIC COMPOUNDS
(Method 8260)

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-12-A-01-03-00	ARDL Lab No.:	300549-09
Desc/Location:	12A	Lab Filename:	
Sample Date:	06/05/1997	Received Date:	06/07/1997
Sample Time:	1400	Prep. Date:	06/09/1997
Matrix:	WATER	Analysis Date:	06/09/1997
Amount Used:	5 mL	QC Batch:	0616LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	1.4	10.0	ND		UG/L	1
CHLOROMETHANE	1.2	10.0	ND		UG/L	1
VINYL CHLORIDE	1.2	10.0	ND		UG/L	1
BROMOMETHANE	1.3	10.0	ND		UG/L	1
CHLOROETHANE	1.4	10.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	1.4	10.0	ND		UG/L	1
1,1-DICHLOROETHENE	1.2	5.0	ND		UG/L	1
METHYLENE CHLORIDE	1.3	5.0	7.2	B	UG/L	1
trans-1,2-DICHLOROETHENE	1.3	5.0	ND		UG/L	1
1,1-DICHLOROETHANE	1.0	5.0	ND		UG/L	1
CARBON DISULFIDE	1.1	5.0	ND		UG/L	1
2,2-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.86	5.0	ND		UG/L	1
BROMOCHLOROMETHANE	1.1	5.0	ND		UG/L	1
CHLOROFORM	0.79	5.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.89	5.0	ND		UG/L	1
1,1-DICHLOROPROPENE	1.3	5.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.87	5.0	ND		UG/L	1
BENZENE	0.90	5.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.85	5.0	ND		UG/L	1
TRICHLOROETHENE	0.85	5.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.77	5.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.82	5.0	ND		UG/L	1
DIBROMOMETHANE	0.96	5.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.83	5.0	ND		UG/L	1
TOLUENE	0.85	5.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.96	5.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	1.0	5.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.92	5.0	ND		UG/L	1
TETRACHLOROETHENE	0.81	5.0	ND		UG/L	1
1,3-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	1.3	5.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-12-A-01-03-00	ARDL Lab No.:	300549-09 (cont'd)
Desc/Location:	12A	Lab Filename:	
Sample Date:	06/05/1997	Received Date:	06/07/1997
Sample Time:	1400	Prep. Date:	06/09/1997
Matrix:	WATER	Analysis Date:	06/09/1997
Amount Used:	5 mL	QC Batch:	0616LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.96	5.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	1.4	5.0	ND		UG/L	1
ETHYLBENZENE	0.93	5.0	ND		UG/L	1
m & p-XYLENE	1.5	5.0	ND		UG/L	1
o-XYLENE	0.92	5.0	ND		UG/L	1
STYRENE	1.2	5.0	ND		UG/L	1
2-HEXANONE	4.5	20.0	ND		UG/L	1
BROMOFORM	2.0	5.0	ND		UG/L	1
ISOPROPYLBENZENE	1.1	5.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	3.0	5.0	ND		UG/L	1
BROMOBENZENE	1.2	5.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	2.2	5.0	ND		UG/L	1
n-PROPYLBENZENE	1.2	5.0	ND		UG/L	1
2-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
4-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	1.3	5.0	ND		UG/L	1
tert-BUTYLBENZENE	1.0	5.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	1.0	5.0	ND		UG/L	1
sec-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	1.3	5.0	ND		UG/L	1
1,3-DICHLOROBENZENE	1.9	5.0	ND		UG/L	1
1,4-DICHLOROBENZENE	1.6	5.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	5.0	ND		UG/L	1
n-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	3.2	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	1.2	5.0	ND		UG/L	1
HEXACHLOROBUTADIENE	1.3	5.0	ND		UG/L	1
NAPHTHALENE	2.3	5.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	1.9	5.0	ND		UG/L	1
ACETONE	11.0	50.0	ND		UG/L	1
2-BUTANONE	7.0	50.0	ND		UG/L	1
4-METHYL-2-PENTANONE	8.9	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/16/1997

Project Name:	IOWA ARMY AMM PLANT	Analysis:	VOLATILES, GC/MS (8260)
Project No.:	5644V	Analytical Method:	8260A
		Prep Method:	5030A

Field ID:	H-12-A-01-03-00	ARDL Lab No.:	300549-09 (cont'd)
Desc/Location:	12A	Lab Filename:	
Sample Date:	06/05/1997	Received Date:	06/07/1997
Sample Time:	1400	Prep. Date:	06/09/1997
Matrix:	WATER	Analysis Date:	06/09/1997
Amount Used:	5 mL	QC Batch:	0616LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	82-125	119%
DIBROMOFLUOROMETHANE	89-127	106%
1,2-DICHLOROETHANE-D4	79-130	108%
TOLUENE-D8	84-122	116%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-12-A-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300549 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300549-09

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: >K4966

Level: (low/med) LOW Date Received: 6/07/97

% Moisture: not dec. --- Date Analyzed: 6/09/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	7.96	12.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300547 Report Date: 06/06/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H12B010300	ARDL Lab No.:	300547-01
Desc/Location:	MW 12-B	Lab Filename:	
Sample Date:	06/03/1997	Received Date:	06/05/1997
Sample Time:	1205	Prep. Date:	06/05/1997
Matrix:	WATER	Analysis Date:	06/05/1997
Amount Used:	5 mL	QC Batch:	0606LS9
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	1.4	10.0	ND		UG/L	1
CHLOROMETHANE	1.2	10.0	ND		UG/L	1
VINYL CHLORIDE	1.2	10.0	ND		UG/L	1
BROMOMETHANE	1.3	10.0	ND		UG/L	1
CHLOROETHANE	1.4	10.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	1.4	10.0	ND		UG/L	1
1,1-DICHLOROETHENE	1.2	5.0	ND		UG/L	1
METHYLENE CHLORIDE	1.3	5.0	ND		UG/L	1
trans-1,2-DICHLOROETHENE	1.3	5.0	ND		UG/L	1
1,1-DICHLOROETHANE	1.0	5.0	ND		UG/L	1
CARBON DISULFIDE	1.1	5.0	ND		UG/L	1
2,2-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.86	5.0	ND		UG/L	1
BROMOCHLOROMETHANE	1.1	5.0	ND		UG/L	1
CHLOROFORM	0.79	5.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.89	5.0	ND		UG/L	1
1,1-DICHLOROPROPENE	1.3	5.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.87	5.0	ND		UG/L	1
BENZENE	0.90	5.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.85	5.0	ND		UG/L	1
TRICHLOROETHENE	0.85	5.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.77	5.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.82	5.0	ND		UG/L	1
DIBROMOMETHANE	0.96	5.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.83	5.0	ND		UG/L	1
TOLUENE	0.85	5.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.96	5.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	1.0	5.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.92	5.0	ND		UG/L	1
TETRACHLOROETHENE	0.81	5.0	ND		UG/L	1
1,3-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	1.3	5.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300547 Report Date: 06/06/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H12B010300	ARDL Lab No.:	300547-01 (cont'd)
Desc/Location:	MW 12-B	Lab Filename:	
Sample Date:	06/03/1997	Received Date:	06/05/1997
Sample Time:	1205	Prep. Date:	06/05/1997
Matrix:	WATER	Analysis Date:	06/05/1997
Amount Used:	5 mL	QC Batch:	0606LS9
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.96	5.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	1.4	5.0	ND		UG/L	1
ETHYLBENZENE	0.93	5.0	ND		UG/L	1
m & p-XYLENE	1.5	5.0	ND		UG/L	1
o-XYLENE	0.92	5.0	ND		UG/L	1
STYRENE	1.2	5.0	ND		UG/L	1
2-HEXANONE	4.5	20.0	ND		UG/L	1
BROMOFORM	2.0	5.0	ND		UG/L	1
ISOPROPYLBENZENE	1.1	5.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	3.0	5.0	ND		UG/L	1
BROMOBENZENE	1.2	5.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	2.2	5.0	ND		UG/L	1
n-PROPYLBENZENE	1.2	5.0	ND		UG/L	1
2-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
4-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	1.3	5.0	ND		UG/L	1
tert-BUTYLBENZENE	1.0	5.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	1.0	5.0	ND		UG/L	1
sec-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	1.3	5.0	ND		UG/L	1
1,3-DICHLOROBENZENE	1.9	5.0	ND		UG/L	1
1,4-DICHLOROBENZENE	1.6	5.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	5.0	ND		UG/L	1
n-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	3.2	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	1.2	5.0	ND		UG/L	1
HEXACHLOROBUTADIENE	1.3	5.0	ND		UG/L	1
NAPHTHALENE	2.3	5.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	1.9	5.0	ND		UG/L	1
ACETONE	11.0	50.0	ND		UG/L	1
2-BUTANONE	7.0	50.0	ND		UG/L	1
4-METHYL-2-PENTANONE	8.9	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300547 Report Date: 06/06/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H12B010300	ARDL Lab No.:	300547-01 (cont'd)
Desc/Location:	MW 12-B	Lab Filename:	
Sample Date:	06/03/1997	Received Date:	06/05/1997
Sample Time:	1205	Prep. Date:	06/05/1997
Matrix:	WATER	Analysis Date:	06/05/1997
Amount Used:	5 mL	QC Batch:	0606LS9
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	82-125	113%
DIBROMOFLUOROMETHANE	89-127	104%
1,2-DICHLOROETHANE-D4	79-130	107%
TOLUENE-D8	84-122	113%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H12B010300

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300547 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300547-01

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: >K4944

Level: (low/med) LOW Date Received: 6/05/97

% Moisture: not dec. --- Date Analyzed: 6/05/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	7.98	9.	J
2.				
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ARDL, INC.
Rt. 15E. Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-12-C-01-03-00	ARDL Lab No.:	300555-01
Desc/Location:	MW12C	Lab Filename:	
Sample Date:	06/11/1997	Received Date:	06/13/1997
Sample Time:	1450	Prep. Date:	06/16/1997
Matrix:	WATER	Analysis Date:	06/16/1997
Amount Used:	5 mL	QC Batch:	0617LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	1.4	10.0	ND		UG/L	1
CHLOROMETHANE	1.2	10.0	ND		UG/L	1
VINYL CHLORIDE	1.2	10.0	ND		UG/L	1
BROMOMETHANE	1.3	10.0	ND		UG/L	1
CHLOROETHANE	1.4	10.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	1.4	10.0	ND		UG/L	1
1,1-DICHLOROETHENE	1.2	5.0	ND		UG/L	1
METHYLENE CHLORIDE	1.3	5.0	4.6	JB	UG/L	1
trans-1,2-DICHLOROETHENE	1.3	5.0	ND		UG/L	1
1,1-DICHLOROETHANE	1.0	5.0	ND		UG/L	1
CARBON DISULFIDE	1.1	5.0	ND		UG/L	1
2,2-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.86	5.0	ND		UG/L	1
BROMOCHLOROMETHANE	1.1	5.0	ND		UG/L	1
CHLOROFORM	0.79	5.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.89	5.0	ND		UG/L	1
1,1-DICHLOROPROPENE	1.3	5.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.87	5.0	ND		UG/L	1
BENZENE	0.90	5.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.85	5.0	ND		UG/L	1
TRICHLOROETHENE	0.85	5.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.77	5.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.82	5.0	ND		UG/L	1
DIBROMOMETHANE	0.96	5.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.83	5.0	ND		UG/L	1
TOLUENE	0.85	5.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.96	5.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	1.0	5.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.92	5.0	ND		UG/L	1
TETRACHLOROETHENE	0.81	5.0	ND		UG/L	1
1,3-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	1.3	5.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-12-C-01-03-00	ARDL Lab No.:	300555-01 (cont'd)
Desc/Location:	MW12C	Lab Filename:	
Sample Date:	06/11/1997	Received Date:	06/13/1997
Sample Time:	1450	Prep. Date:	06/16/1997
Matrix:	WATER	Analysis Date:	06/16/1997
Amount Used:	5 mL	QC Batch:	0617LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.96	5.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	1.4	5.0	ND		UG/L	1
ETHYLBENZENE	0.93	5.0	ND		UG/L	1
m & p-XYLENE	1.5	5.0	ND		UG/L	1
o-XYLENE	0.92	5.0	ND		UG/L	1
STYRENE	1.2	5.0	ND		UG/L	1
2-HEXANONE	4.5	20.0	ND		UG/L	1
BROMOFORM	2.0	5.0	ND		UG/L	1
ISOPROPYLBENZENE	1.1	5.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	3.0	5.0	ND		UG/L	1
BROMOBENZENE	1.2	5.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	2.2	5.0	ND		UG/L	1
n-PROPYLBENZENE	1.2	5.0	ND		UG/L	1
2-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
4-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	1.3	5.0	ND		UG/L	1
tert-BUTYLBENZENE	1.0	5.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	1.0	5.0	ND		UG/L	1
sec-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	1.3	5.0	ND		UG/L	1
1,3-DICHLOROBENZENE	1.9	5.0	ND		UG/L	1
1,4-DICHLOROBENZENE	1.6	5.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	5.0	ND		UG/L	1
n-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	3.2	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	1.2	5.0	ND		UG/L	1
HEXACHLOROBUTADIENE	1.3	5.0	ND		UG/L	1
NAPHTHALENE	2.3	5.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	1.9	5.0	ND		UG/L	1
ACETONE	11.0	50.0	ND		UG/L	1
2-BUTANONE	7.0	50.0	ND		UG/L	1
4-METHYL-2-PENTANONE	8.9	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-12-C-01-03-00	ARDL Lab No.:	300555-01 (cont'd)
Desc/Location:	MW12C	Lab Filename:	
Sample Date:	06/11/1997	Received Date:	06/13/1997
Sample Time:	1450	Prep. Date:	06/16/1997
Matrix:	WATER	Analysis Date:	06/16/1997
Amount Used:	5 mL	QC Batch:	0617LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	82-125	112%
DIBROMOFLUOROMETHANE	89-127	101%
1,2-DICHLOROETHANE-D4	79-130	102%
TOLUENE-D8	84-122	113%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-12-C-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300555 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300555-01

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: >K5051

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. --- Date Analyzed: 6/16/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300547 Report Date: 06/06/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H12D010300	ARDL Lab No.:	300547-02
Desc/Location:	MW 12-D	Lab Filename:	
Sample Date:	06/03/1997	Received Date:	06/05/1997
Sample Time:	1930	Prep. Date:	06/05/1997
Matrix:	WATER	Analysis Date:	06/05/1997
Amount Used:	5 mL	QC Batch:	0606LS9
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	1.4	10.0	ND		UG/L	1
CHLOROMETHANE	1.2	10.0	ND		UG/L	1
VINYL CHLORIDE	1.2	10.0	ND		UG/L	1
BROMOMETHANE	1.3	10.0	ND		UG/L	1
CHLOROETHANE	1.4	10.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	1.4	10.0	ND		UG/L	1
1,1-DICHLOROETHENE	1.2	5.0	ND		UG/L	1
METHYLENE CHLORIDE	1.3	5.0	ND		UG/L	1
trans-1,2-DICHLOROETHENE	1.3	5.0	ND		UG/L	1
1,1-DICHLOROETHANE	1.0	5.0	ND		UG/L	1
CARBON DISULFIDE	1.1	5.0	ND		UG/L	1
2,2-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.86	5.0	ND		UG/L	1
BROMOCHLOROMETHANE	1.1	5.0	ND		UG/L	1
CHLOROFORM	0.79	5.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.89	5.0	ND		UG/L	1
1,1-DICHLOROPROPENE	1.3	5.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.87	5.0	ND		UG/L	1
BENZENE	0.90	5.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.85	5.0	ND		UG/L	1
TRICHLOROETHENE	0.85	5.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.77	5.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.82	5.0	ND		UG/L	1
DIBROMOMETHANE	0.96	5.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.83	5.0	ND		UG/L	1
TOLUENE	0.85	5.0	5.2		UG/L	1
trans-1,3-DICHLOROPROPENE	0.96	5.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	1.0	5.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.92	5.0	ND		UG/L	1
TETRACHLOROETHENE	0.81	5.0	ND		UG/L	1
1,3-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	1.3	5.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300547 Report Date: 06/06/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H12D010300	ARDL Lab No.:	300547-02 (cont'd)
Desc/Location:	MW 12-D	Lab Filename:	
Sample Date:	06/03/1997	Received Date:	06/05/1997
Sample Time:	1930	Prep. Date:	06/05/1997
Matrix:	WATER	Analysis Date:	06/05/1997
Amount Used:	5 mL	QC Batch:	0606LS9
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.96	5.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	1.4	5.0	ND		UG/L	1
ETHYLBENZENE	0.93	5.0	ND		UG/L	1
m & p-XYLENE	1.5	5.0	ND		UG/L	1
o-XYLENE	0.92	5.0	ND		UG/L	1
STYRENE	1.2	5.0	ND		UG/L	1
2-HEXANONE	4.5	20.0	ND		UG/L	1
BROMOFORM	2.0	5.0	ND		UG/L	1
ISOPROPYLBENZENE	1.1	5.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	3.0	5.0	ND		UG/L	1
BROMOBENZENE	1.2	5.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	2.2	5.0	ND		UG/L	1
n-PROPYLBENZENE	1.2	5.0	ND		UG/L	1
2-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
4-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	1.3	5.0	ND		UG/L	1
tert-BUTYLBENZENE	1.0	5.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	1.0	5.0	ND		UG/L	1
sec-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	1.3	5.0	ND		UG/L	1
1,3-DICHLOROBENZENE	1.9	5.0	ND		UG/L	1
1,4-DICHLOROBENZENE	1.6	5.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	5.0	ND		UG/L	1
n-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	3.2	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	1.2	5.0	ND		UG/L	1
HEXACHLOROBUTADIENE	1.3	5.0	ND		UG/L	1
NAPHTHALENE	2.3	5.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	1.9	5.0	ND		UG/L	1
ACETONE	11.0	50.0	ND		UG/L	1
2-BUTANONE	7.0	50.0	ND		UG/L	1
4-METHYL-2-PENTANONE	8.9	20.0	ND		UG/L	1

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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300547 Report Date: 06/06/1997

Project Name:	IOWA ARMY AMM PLANT	Analysis:	VOLATILES, GC/MS (8260)
Project No.:	5644V	Analytical Method:	8260A
		Prep Method:	5030A

Field ID:	H12D010300	ARDL Lab No.:	300547-02 (cont'd)
Desc/Location:	MW 12-D	Lab Filename:	
Sample Date:	06/03/1997	Received Date:	06/05/1997
Sample Time:	1930	Prep. Date:	06/05/1997
Matrix:	WATER	Analysis Date:	06/05/1997
Amount Used:	5 mL	QC Batch:	0606LS9
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	82-125	114%
DIBROMOFLUOROMETHANE	89-127	102%
1,2-DICHLOROETHANE-D4	79-130	105%
TOLUENE-D8	84-122	115%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H12D010300

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300547 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300547-02

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: >K4945

Level: (low/med) LOW Date Received: 6/05/97

% Moisture: not dec. --- Date Analyzed: 6/05/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	7.98	6.	J
2.					
3.					
4.					
5.					
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300553 Report Date: 06/20/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H12E010300	ARDL Lab No.:	300553-01
Desc/Location:	12E	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/11/1997
Sample Time:	1610	Prep. Date:	06/12/1997
Matrix:	WATER	Analysis Date:	06/12/1997
Amount Used:	5 mL	Instrument ID:	
Final Volume:	5 mL	QC Batch:	0617TJP7
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	1.4	10.0	ND		UG/L	1
CHLOROMETHANE	1.2	10.0	ND		UG/L	1
VINYL CHLORIDE	1.2	10.0	ND		UG/L	1
BROMOMETHANE	1.3	10.0	ND		UG/L	1
CHLOROETHANE	1.4	10.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	1.4	10.0	ND		UG/L	1
1,1-DICHLOROETHENE	1.2	5.0	ND		UG/L	1
METHYLENE CHLORIDE	1.3	5.0	21.7	B	UG/L	1
trans-1,2-DICHLOROETHENE	1.3	5.0	ND		UG/L	1
1,1-DICHLOROETHANE	1.0	5.0	ND		UG/L	1
CARBON DISULFIDE	1.1	5.0	ND		UG/L	1
2,2-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.86	5.0	ND		UG/L	1
BROMOCHLOROMETHANE	1.1	5.0	ND		UG/L	1
CHLOROFORM	0.79	5.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.89	5.0	ND		UG/L	1
1,1-DICHLOROPROPENE	1.3	5.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.87	5.0	ND		UG/L	1
BENZENE	0.90	5.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.85	5.0	ND		UG/L	1
TRICHLOROETHENE	0.85	5.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.77	5.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.82	5.0	ND		UG/L	1
DIBROMOMETHANE	0.96	5.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.83	5.0	ND		UG/L	1
TOLUENE	0.85	5.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.96	5.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	1.0	5.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.92	5.0	ND		UG/L	1
TETRACHLOROETHENE	0.81	5.0	ND		UG/L	1
1,3-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300553 Report Date: 06/20/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H12E010300	ARDL Lab No.:	300553-01 (cont'd)
Desc/Location:	12E	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/11/1997
Sample Time:	1610	Prep. Date:	06/12/1997
Matrix:	WATER	Analysis Date:	06/12/1997
Amount Used:	5 mL	Instrument ID:	
Final Volume:	5 mL	QC Batch:	0617TJP7
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DIBROMOCHLOROMETHANE	1.3	5.0	ND		UG/L	1
CHLOROBENZENE	0.96	5.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	1.4	5.0	ND		UG/L	1
ETHYLBENZENE	0.93	5.0	ND		UG/L	1
m & p-XYLENE	1.5	5.0	ND		UG/L	1
o-XYLENE	0.92	5.0	ND		UG/L	1
STYRENE	1.2	5.0	ND		UG/L	1
2-HEXANONE	4.5	20.0	ND		UG/L	1
BROMOFORM	2.0	5.0	ND		UG/L	1
ISOPROPYLBENZENE	1.1	5.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	3.0	5.0	ND		UG/L	1
BROMOBENZENE	1.2	5.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	2.2	5.0	ND		UG/L	1
n-PROPYLBENZENE	1.2	5.0	ND		UG/L	1
2-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
4-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	1.3	5.0	ND		UG/L	1
tert-BUTYLBENZENE	1.0	5.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	1.0	5.0	ND		UG/L	1
sec-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	1.3	5.0	ND		UG/L	1
1,3-DICHLOROBENZENE	1.9	5.0	ND		UG/L	1
1,4-DICHLOROBENZENE	1.6	5.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	5.0	ND		UG/L	1
n-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	3.2	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	1.2	5.0	ND		UG/L	1
HEXACHLOROBUTADIENE	1.3	5.0	ND		UG/L	1
NAPHTHALENE	2.3	5.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	1.9	5.0	ND		UG/L	1
ACETONE	11.0	50.0	ND		UG/L	1

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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300553 Report Date: 06/20/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H12E010300	ARDL Lab No.:	300553-01 (cont'd)
Desc/Location:	12E	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/11/1997
Sample Time:	1610	Prep. Date:	06/12/1997
Matrix:	WATER	Analysis Date:	06/12/1997
Amount Used:	5 mL	Instrument ID:	
Final Volume:	5 mL	QC Batch:	0617TJP7
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2-BUTANONE	7.0	50.0	ND		UG/L	1
4-METHYL-2-PENTANONE	8.9	20.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	82-125	115%
DIBROMOFLUOROMETHANE	89-127	101%
1,2-DICHLOROETHANE-D4	79-130	102%
TOLUENE-D8	84-122	116%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H12E010300

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300553 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300553-01

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: >K5018

Level: (low/med) LOW Date Received: 6/11/97

% Moisture: not dec. --- Date Analyzed: 6/12/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 76131	Ethane, 1,1,2-trichloro- 1,2,2-trifluoro-	3.64	53.	JNB
2.				
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-12-G-01-03-00	ARDL Lab No.:	300555-02
Desc/Location:	MW12G	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1448	Prep. Date:	06/16/1997
Matrix:	WATER	Analysis Date:	06/16/1997
Amount Used:	5 mL	QC Batch:	0617LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	1.4	10.0	ND		UG/L	1
CHLOROMETHANE	1.2	10.0	ND		UG/L	1
VINYL CHLORIDE	1.2	10.0	ND		UG/L	1
BROMOMETHANE	1.3	10.0	ND		UG/L	1
CHLOROETHANE	1.4	10.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	1.4	10.0	ND		UG/L	1
1,1-DICHLOROETHENE	1.2	5.0	ND		UG/L	1
METHYLENE CHLORIDE	1.3	5.0	5.5	B	UG/L	1
trans-1,2-DICHLOROETHENE	1.3	5.0	ND		UG/L	1
1,1-DICHLOROETHANE	1.0	5.0	ND		UG/L	1
CARBON DISULFIDE	1.1	5.0	ND		UG/L	1
2,2-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.86	5.0	ND		UG/L	1
BROMOCHLOROMETHANE	1.1	5.0	ND		UG/L	1
CHLOROFORM	0.79	5.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.89	5.0	ND		UG/L	1
1,1-DICHLOROPROPENE	1.3	5.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.87	5.0	ND		UG/L	1
BENZENE	0.90	5.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.85	5.0	ND		UG/L	1
TRICHLOROETHENE	0.85	5.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.77	5.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.82	5.0	ND		UG/L	1
DIBROMOMETHANE	0.96	5.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.83	5.0	ND		UG/L	1
TOLUENE	0.85	5.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.96	5.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	1.0	5.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.92	5.0	ND		UG/L	1
TETRACHLOROETHENE	0.81	5.0	ND		UG/L	1
1,3-DICHLOROPROPANE	1.2	5.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	1.3	5.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-12-G-01-03-00	ARDL Lab No.:	300555-02 (cont'd)
Desc/Location:	MW12G	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1448	Prep. Date:	06/16/1997
Matrix:	WATER	Analysis Date:	06/16/1997
Amount Used:	5 mL	QC Batch:	0617LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.96	5.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	1.4	5.0	ND		UG/L	1
ETHYLBENZENE	0.93	5.0	ND		UG/L	1
m & p-XYLENE	1.5	5.0	ND		UG/L	1
o-XYLENE	0.92	5.0	ND		UG/L	1
STYRENE	1.2	5.0	ND		UG/L	1
2-HEXANONE	4.5	20.0	ND		UG/L	1
BROMOFORM	2.0	5.0	ND		UG/L	1
ISOPROPYLBENZENE	1.1	5.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	3.0	5.0	ND		UG/L	1
BROMOBENZENE	1.2	5.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	2.2	5.0	ND		UG/L	1
n-PROPYLBENZENE	1.2	5.0	ND		UG/L	1
2-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
4-CHLOROTOLUENE	1.2	5.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	1.3	5.0	ND		UG/L	1
tert-BUTYLBENZENE	1.0	5.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	1.0	5.0	ND		UG/L	1
sec-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	1.3	5.0	ND		UG/L	1
1,3-DICHLOROBENZENE	1.9	5.0	ND		UG/L	1
1,4-DICHLOROBENZENE	1.6	5.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	5.0	ND		UG/L	1
n-BUTYLBENZENE	1.3	5.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	3.2	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	1.2	5.0	ND		UG/L	1
HEXACHLOROBUTADIENE	1.3	5.0	ND		UG/L	1
NAPHTHALENE	2.3	5.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	1.9	5.0	ND		UG/L	1
ACETONE	11.0	50.0	ND		UG/L	1
2-BUTANONE	7.0	50.0	ND		UG/L	1
4-METHYL-2-PENTANONE	8.9	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-12-G-01-03-00	ARDL Lab No.:	300555-02 (cont'd)
Desc/Location:	MW12G	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1448	Prep. Date:	06/16/1997
Matrix:	WATER	Analysis Date:	06/16/1997
Amount Used:	5 mL	QC Batch:	0617LS8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	82-125	119%
DIBROMOFLUOROMETHANE	89-127	105%
1,2-DICHLOROETHANE-D4	79-130	108%
TOLUENE-D8	84-122	119%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-12-G-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300555 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300555-02

Sample wt/vol: 5.0 (g/mL) mL Lab File ID: >K5052

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. --- Date Analyzed: 6/16/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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1061

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H12I010300	ARDL Lab No.:	300579-05
Desc/Location:	12I	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/28/1997
Sample Time:	1230	Prep. Date:	07/03/1997
Matrix:	WATER	Analysis Date:	07/03/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0710LS4
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	0.47	1.0	ND		UG/L	1
CHLOROMETHANE	0.41	1.0	ND		UG/L	1
VINYL CHLORIDE	0.32	1.0	ND		UG/L	1
BROMOMETHANE	0.12	1.0	ND		UG/L	1
CHLOROETHANE	0.33	1.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	0.28	1.0	ND		UG/L	1
1,1-DICHLOROETHENE	0.27	1.0	ND		UG/L	1
METHYLENE CHLORIDE	0.27	2.0	3.1		UG/L	1
trans-1,2-DICHLOROETHENE	0.33	1.0	ND		UG/L	1
1,1-DICHLOROETHANE	0.20	1.0	ND		UG/L	1
2,2-DICHLOROPROPANE	0.30	1.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.20	1.0	ND		UG/L	1
BROMOCHLOROMETHANE	0.32	1.0	ND		UG/L	1
CHLOROFORM	0.30	1.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.23	1.0	ND		UG/L	1
1,1-DICHLOROPROPENE	0.32	1.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.29	1.0	ND		UG/L	1
BENZENE	0.17	1.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.17	1.0	ND		UG/L	1
TRICHLOROETHENE	0.18	1.0	8.6		UG/L	1
1,2-DICHLOROPROPANE	0.21	1.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.25	1.0	ND		UG/L	1
DIBROMOMETHANE	0.30	1.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.24	1.0	ND		UG/L	1
TOLUENE	0.32	1.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.25	1.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	0.35	1.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.31	1.0	ND		UG/L	1
TETRACHLOROETHENE	0.32	1.0	ND		UG/L	1
1,3-DICHLOROPROPANE	0.45	1.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	0.36	1.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H12I010300	ARDL Lab No.:	300579-05 (cont'd)
Desc/Location:	12I	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/28/1997
Sample Time:	1230	Prep. Date:	07/03/1997
Matrix:	WATER	Analysis Date:	07/03/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0710LS4
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.24	1.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	0.34	1.0	ND		UG/L	1
ETHYLBENZENE	0.29	1.0	ND		UG/L	1
m & p-XYLENE	0.69	1.0	ND		UG/L	1
o-XYLENE	0.37	1.0	ND		UG/L	1
STYRENE	0.34	1.0	ND		UG/L	1
2-HEXANONE	2.1	10.0	ND		UG/L	1
BROMOFORM	0.48	1.0	ND		UG/L	1
ISOPROPYLBENZENE	0.40	1.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	0.57	1.0	ND		UG/L	1
BROMOBENZENE	0.39	1.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	0.28	1.0	ND		UG/L	1
n-PROPYLBENZENE	0.35	1.0	ND		UG/L	1
2-CHLOROTOLUENE	0.37	1.0	ND		UG/L	1
4-CHLOROTOLUENE	0.38	1.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	0.39	1.0	ND		UG/L	1
tert-BUTYLBENZENE	0.36	1.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	0.41	1.0	ND		UG/L	1
sec-BUTYLBENZENE	0.34	1.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	0.30	1.0	ND		UG/L	1
1,3-DICHLOROBENZENE	0.46	1.0	ND		UG/L	1
1,4-DICHLOROBENZENE	0.43	1.0	ND		UG/L	1
1,2-DICHLOROBENZENE	0.48	1.0	ND		UG/L	1
n-BUTYLBENZENE	0.31	1.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	0.65	2.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.51	1.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.34	1.0	ND		UG/L	1
NAPHTHALENE	0.45	1.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	0.56	1.0	ND		UG/L	1
ACETONE	8.4	20.0	ND		UG/L	1
2-BUTANONE	4.8	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H12I010300	ARDL Lab No.:	300579-05 (cont'd)
Desc/Location:	12I	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/28/1997
Sample Time:	1230	Prep. Date:	07/03/1997
Matrix:	WATER	Analysis Date:	07/03/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0710LS4
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
4-METHYL-2-PENTANONE	1.7	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	72-120	96%
DIBROMOFLUOROMETHANE	79-128	108%
1,2-DICHLOROETHANE-D4	77-124	102%
TOLUENE-D8	86-116	99%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H12I010300

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300579 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300579-05

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: >G3033

Level: (low/med) LOW Date Received: 6/28/97

% Moisture: not dec. --- Date Analyzed: 7/03/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.76131	Ethane, 1,1,2-trichloro-1,2,2 -trifluoro-	3.67	9.	JN
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H12JAW71010300	ARDL Lab No.:	300579-03
Desc/Location:	JAW 71	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/28/1997
Sample Time:	0815	Prep. Date:	07/03/1997
Matrix:	WATER	Analysis Date:	07/03/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0710LS4
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	0.47	1.0	ND		UG/L	1
CHLOROMETHANE	0.41	1.0	ND		UG/L	1
VINYL CHLORIDE	0.32	1.0	ND		UG/L	1
BROMOMETHANE	0.12	1.0	ND		UG/L	1
CHLOROETHANE	0.33	1.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	0.28	1.0	ND		UG/L	1
1,1-DICHLOROETHENE	0.27	1.0	ND		UG/L	1
METHYLENE CHLORIDE	0.27	2.0	4.3		UG/L	1
trans-1,2-DICHLOROETHENE	0.33	1.0	ND		UG/L	1
1,1-DICHLOROETHANE	0.20	1.0	ND		UG/L	1
2,2-DICHLOROPROPANE	0.30	1.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.20	1.0	ND		UG/L	1
BROMOCHLOROMETHANE	0.32	1.0	ND		UG/L	1
CHLOROFORM	0.30	1.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.23	1.0	ND		UG/L	1
1,1-DICHLOROPROPENE	0.32	1.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.29	1.0	ND		UG/L	1
BENZENE	0.17	1.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.17	1.0	ND		UG/L	1
TRICHLOROETHENE	0.18	1.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.21	1.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.25	1.0	ND		UG/L	1
DIBROMOMETHANE	0.30	1.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.24	1.0	ND		UG/L	1
TOLUENE	0.32	1.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.25	1.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	0.35	1.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.31	1.0	ND		UG/L	1
TETRACHLOROETHENE	0.32	1.0	ND		UG/L	1
1,3-DICHLOROPROPANE	0.45	1.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	0.36	1.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H12JAW71010300	ARDL Lab No.:	300579-03 (cont'd)
Desc/Location:	JAW 71	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/28/1997
Sample Time:	0815	Prep. Date:	07/03/1997
Matrix:	WATER	Analysis Date:	07/03/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0710LS4
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.24	1.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	0.34	1.0	ND		UG/L	1
ETHYLBENZENE	0.29	1.0	ND		UG/L	1
m & p-XYLENE	0.69	1.0	ND		UG/L	1
o-XYLENE	0.37	1.0	ND		UG/L	1
STYRENE	0.34	1.0	ND		UG/L	1
2-HEXANONE	2.1	10.0	ND		UG/L	1
BROMOFORM	0.48	1.0	ND		UG/L	1
ISOPROPYLBENZENE	0.40	1.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	0.57	1.0	ND		UG/L	1
BROMOBENZENE	0.39	1.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	0.28	1.0	ND		UG/L	1
n-PROPYLBENZENE	0.35	1.0	ND		UG/L	1
2-CHLOROTOLUENE	0.37	1.0	ND		UG/L	1
4-CHLOROTOLUENE	0.38	1.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	0.39	1.0	ND		UG/L	1
tert-BUTYLBENZENE	0.36	1.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	0.41	1.0	ND		UG/L	1
sec-BUTYLBENZENE	0.34	1.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	0.30	1.0	ND		UG/L	1
1,3-DICHLOROBENZENE	0.46	1.0	ND		UG/L	1
1,4-DICHLOROBENZENE	0.43	1.0	ND		UG/L	1
1,2-DICHLOROBENZENE	0.48	1.0	ND		UG/L	1
n-BUTYLBENZENE	0.31	1.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	0.65	2.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.51	1.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.34	1.0	ND		UG/L	1
NAPHTHALENE	0.45	1.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	0.56	1.0	ND		UG/L	1
ACETONE	8.4	20.0	ND		UG/L	1
2-BUTANONE	4.8	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H12JAW71010300	ARDL Lab No.:	300579-03 (cont'd)
Desc/Location:	JAW 71	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/28/1997
Sample Time:	0815	Prep. Date:	07/03/1997
Matrix:	WATER	Analysis Date:	07/03/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0710LS4
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
4-METHYL-2-PENTANONE	1.7	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	72-120	106%
DIBROMOFLUOROMETHANE	79-128	114%
1,2-DICHLOROETHANE-D4	77-124	108%
TOLUENE-D8	86-116	109%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H12JAW71010300

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300579 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300579-03

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: >G3032

Level: (low/med) LOW Date Received: 6/28/97

% Moisture: not dec. --- Date Analyzed: 7/03/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.76131	Ethane, 1,1,2-trichloro-1,2,2 -trifluoro-	3.67	28.	JN
2.	Unknown	24.76	1.	J
3.	Unknown	27.28	1.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-12-JAW72-01-03-00	ARDL Lab No.:	300576-01
Desc/Location:	JAW 72	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/27/1997
Sample Time:	1355	Prep. Date:	07/03/1997
Matrix:	WATER	Analysis Date:	07/03/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0708TJP6
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	0.47	1.0	ND		UG/L	1
CHLOROMETHANE	0.41	1.0	ND		UG/L	1
VINYL CHLORIDE	0.32	1.0	ND		UG/L	1
BROMOMETHANE	0.12	1.0	ND		UG/L	1
CHLOROETHANE	0.33	1.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	0.28	1.0	ND		UG/L	1
1,1-DICHLOROETHENE	0.27	1.0	ND		UG/L	1
METHYLENE CHLORIDE	0.27	2.0	5.2		UG/L	1
trans-1,2-DICHLOROETHENE	0.33	1.0	ND		UG/L	1
1,1-DICHLOROETHANE	0.20	1.0	ND		UG/L	1
2,2-DICHLOROPROPANE	0.30	1.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.20	1.0	ND		UG/L	1
BROMOCHLOROMETHANE	0.32	1.0	ND		UG/L	1
CHLOROFORM	0.30	1.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.23	1.0	ND		UG/L	1
1,1-DICHLOROPROPENE	0.32	1.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.29	1.0	ND		UG/L	1
BENZENE	0.17	1.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.17	1.0	ND		UG/L	1
TRICHLOROETHENE	0.18	1.0	7.7		UG/L	1
1,2-DICHLOROPROPANE	0.21	1.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.25	1.0	ND		UG/L	1
DIBROMOMETHANE	0.30	1.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.24	1.0	ND		UG/L	1
TOLUENE	0.32	1.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.25	1.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	0.35	1.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.31	1.0	ND		UG/L	1
TETRACHLOROETHENE	0.32	1.0	ND		UG/L	1
1,3-DICHLOROPROPANE	0.45	1.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	0.36	1.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-12-JAW72-01-03-00	ARDL Lab No.:	300576-01 (cont'd)
Desc/Location:	JAW 72	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/27/1997
Sample Time:	1355	Prep. Date:	07/03/1997
Matrix:	WATER	Analysis Date:	07/03/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0708TJP6
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.24	1.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	0.34	1.0	ND		UG/L	1
ETHYLBENZENE	0.29	1.0	ND		UG/L	1
m & p-XYLENE	0.69	1.0	ND		UG/L	1
o-XYLENE	0.37	1.0	ND		UG/L	1
STYRENE	0.34	1.0	ND		UG/L	1
2-HEXANONE	2.1	10.0	ND		UG/L	1
BROMOFORM	0.48	1.0	ND		UG/L	1
ISOPROPYLBENZENE	0.40	1.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	0.57	1.0	ND		UG/L	1
BROMOBENZENE	0.39	1.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	0.28	1.0	ND		UG/L	1
n-PROPYLBENZENE	0.35	1.0	ND		UG/L	1
2-CHLOROTOLUENE	0.37	1.0	ND		UG/L	1
4-CHLOROTOLUENE	0.38	1.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	0.39	1.0	ND		UG/L	1
tert-BUTYLBENZENE	0.36	1.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	0.41	1.0	ND		UG/L	1
sec-BUTYLBENZENE	0.34	1.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	0.30	1.0	ND		UG/L	1
1,3-DICHLOROBENZENE	0.46	1.0	ND		UG/L	1
1,4-DICHLOROBENZENE	0.43	1.0	ND		UG/L	1
1,2-DICHLOROBENZENE	0.48	1.0	ND		UG/L	1
n-BUTYLBENZENE	0.31	1.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	0.65	2.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.51	1.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.34	1.0	ND		UG/L	1
NAPHTHALENE	0.45	1.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	0.56	1.0	ND		UG/L	1
ACETONE	8.4	20.0	ND		UG/L	1
2-BUTANONE	4.8	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-12-JAW72-01-03-00	ARDL Lab No.:	300576-01 (cont'd)
Desc/Location:	JAW 72	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/27/1997
Sample Time:	1355	Prep. Date:	07/03/1997
Matrix:	WATER	Analysis Date:	07/03/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0708TJP6
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
4-METHYL-2-PENTANONE	1.7	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	72-120	108%
DIBROMOFLUOROMETHANE	79-128	120%
1,2-DICHLOROETHANE-D4	77-124	114%
TOLUENE-D8	86-116	111%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-12-JAW72-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300576 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300576-01

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: >G3027

Level: (low/med) LOW Date Received: 6/27/97

% Moisture: not dec. --- Date Analyzed: 7/03/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	76131	Ethane, 1,1,2-trichloro- 1,2,2-trifluoro-	3.69	19.	JN
2.					
3.					
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H12JAW73010300	ARDL Lab No.:	300579-01
Desc/Location:	JAW 73	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/28/1997
Sample Time:	1230	Prep. Date:	07/03/1997
Matrix:	WATER	Analysis Date:	07/03/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0710LS4
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	0.47	1.0	ND		UG/L	1
CHLOROMETHANE	0.41	1.0	ND		UG/L	1
VINYL CHLORIDE	0.32	1.0	ND		UG/L	1
BROMOMETHANE	0.12	1.0	ND		UG/L	1
CHLOROETHANE	0.33	1.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	0.28	1.0	ND		UG/L	1
1,1-DICHLOROETHENE	0.27	1.0	ND		UG/L	1
METHYLENE CHLORIDE	0.27	2.0	4.4		UG/L	1
trans-1,2-DICHLOROETHENE	0.33	1.0	ND		UG/L	1
1,1-DICHLOROETHANE	0.20	1.0	ND		UG/L	1
2,2-DICHLOROPROPANE	0.30	1.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.20	1.0	ND		UG/L	1
BROMOCHLOROMETHANE	0.32	1.0	ND		UG/L	1
CHLOROFORM	0.30	1.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.23	1.0	ND		UG/L	1
1,1-DICHLOROPROPENE	0.32	1.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.29	1.0	ND		UG/L	1
BENZENE	0.17	1.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.17	1.0	ND		UG/L	1
TRICHLOROETHENE	0.18	1.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.21	1.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.25	1.0	ND		UG/L	1
DIBROMOMETHANE	0.30	1.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.24	1.0	ND		UG/L	1
TOLUENE	0.32	1.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.25	1.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	0.35	1.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.31	1.0	ND		UG/L	1
TETRACHLOROETHENE	0.32	1.0	ND		UG/L	1
1,3-DICHLOROPROPANE	0.45	1.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	0.36	1.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H12JAW73010300	ARDL Lab No.:	300579-01 (cont'd)
Desc/Location:	JAW 73	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/28/1997
Sample Time:	1230	Prep. Date:	07/03/1997
Matrix:	WATER	Analysis Date:	07/03/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0710LS4
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.24	1.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	0.34	1.0	ND		UG/L	1
ETHYLBENZENE	0.29	1.0	ND		UG/L	1
m & p-XYLENE	0.69	1.0	ND		UG/L	1
o-XYLENE	0.37	1.0	ND		UG/L	1
STYRENE	0.34	1.0	ND		UG/L	1
2-HEXANONE	2.1	10.0	ND		UG/L	1
BROMOFORM	0.48	1.0	ND		UG/L	1
ISOPROPYLBENZENE	0.40	1.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	0.57	1.0	ND		UG/L	1
BROMOBENZENE	0.39	1.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	0.28	1.0	ND		UG/L	1
n-PROPYLBENZENE	0.35	1.0	ND		UG/L	1
2-CHLOROTOLUENE	0.37	1.0	ND		UG/L	1
4-CHLOROTOLUENE	0.38	1.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	0.39	1.0	ND		UG/L	1
tert-BUTYLBENZENE	0.36	1.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	0.41	1.0	ND		UG/L	1
sec-BUTYLBENZENE	0.34	1.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	0.30	1.0	ND		UG/L	1
1,3-DICHLOROBENZENE	0.46	1.0	ND		UG/L	1
1,4-DICHLOROBENZENE	0.43	1.0	ND		UG/L	1
1,2-DICHLOROBENZENE	0.48	1.0	ND		UG/L	1
n-BUTYLBENZENE	0.31	1.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	0.65	2.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.51	1.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.34	1.0	ND		UG/L	1
NAPHTHALENE	0.45	1.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	0.56	1.0	ND		UG/L	1
ACETONE	8.4	20.0	ND		UG/L	1
2-BUTANONE	4.8	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H12JAW73010300	ARDL Lab No.:	300579-01 (cont'd)
Desc/Location:	JAW 73	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/28/1997
Sample Time:	1230	Prep. Date:	07/03/1997
Matrix:	WATER	Analysis Date:	07/03/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0710LS4
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
4-METHYL-2-PENTANONE	1.7	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	72-120	109%
DIBROMOFLUOROMETHANE	79-128	119%
1,2-DICHLOROETHANE-D4	77-124	115%
TOLUENE-D8	86-116	110%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H12JAW73010300

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300579 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300579-01

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: >G3031

Level: (low/med) LOW Date Received: 6/28/97

% Moisture: not dec. --- Date Analyzed: 7/03/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.76131	Ethane, 1,1,2-trichloro-1,2,2 -trifluoro-	3.67	26.	JN
2.				
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1077

SEMI-VOLATILE ORGANIC COMPOUNDS
(Method 8270)

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/19/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-12-A-01-03-00	ARDL Lab No.:	300549-09
Desc/Location:	12A	Lab Filename:	
Sample Date:	06/05/1997	Received Date:	06/07/1997
Sample Time:	1400	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/17/1997
Amount Used:	1000 mL	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2267
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/19/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-12-A-01-03-00	ARDL Lab No.:	300549-09 (cont'd)
Desc/Location:	12A	Lab Filename:	
Sample Date:	06/05/1997	Received Date:	06/07/1997
Sample Time:	1400	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/17/1997
Amount Used:	1000 mL	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2267
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	2.7	J	UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1

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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/19/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-12-A-01-03-00	ARDL Lab No.:	300549-09 (cont'd)
Desc/Location:	12A	Lab Filename:	
Sample Date:	06/05/1997	Received Date:	06/07/1997
Sample Time:	1400	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/17/1997
Amount Used:	1000 mL	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2267
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	80%
2-FLUOROPHENOL	21-110	33%
D5 NITROBENZENE	35-114	73%
2,4,6-TRIBROMOPHENOL	10-123	65%
D5 PHENOL	10-94	24%
D14 TERPHENYL	33-141	77%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-12-A-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300549 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300549-09

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >W8096

Level: (low/med) LOW Date Received: 6/07/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/11/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/17/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.1

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	6.40	4.	J B
2.	Unknown	7.10	4.	J B
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300547 Report Date: 06/12/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H12B010300	ARDL Lab No.:	300547-01
Desc/Location:	MW 12-B	Lab Filename:	
Sample Date:	06/03/1997	Received Date:	06/05/1997
Sample Time:	1205	Prep. Date:	06/05/1997
Matrix:	WATER	Analysis Date:	06/10/1997
Amount Used:	1000 mL	QC Batch:	B2258
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300547 Report Date: 06/12/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H12B010300	ARDL Lab No.:	300547-01 (cont'd)
Desc/Location:	MW 12-B	Lab Filename:	
Sample Date:	06/03/1997	Received Date:	06/05/1997
Sample Time:	1205	Prep. Date:	06/05/1997
Matrix:	WATER	Analysis Date:	06/10/1997
Amount Used:	1000 mL	QC Batch:	B2258
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	0.78	J	UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	3.4	J	UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300547 Report Date: 06/12/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H12B010300	ARDL Lab No.:	300547-01 (cont'd)
Desc/Location:	MW 12-B	Lab Filename:	
Sample Date:	06/03/1997	Received Date:	06/05/1997
Sample Time:	1205	Prep. Date:	06/05/1997
Matrix:	WATER	Analysis Date:	06/10/1997
Amount Used:	1000 mL	QC Batch:	B2258
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	71%
2-FLUOROPHENOL	21-110	30%
D5 NITROBENZENE	35-114	58%
2,4,6-TRIBROMOPHENOL	10-123	73%
D5 PHENOL	10-94	21%
D14 TERPHENYL	33-141	73%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H12B010300

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300547 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300547-01

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >W8054

Level: (low/med) LOW Date Received: 6/05/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/05/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/10/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.1

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	6.46	10.	J B
2.		Unknown	7.17	10.	J B
3.	134623	Benzamide, N,N-diethyl-3 methyl-	17.14	53.	JN
4.		Unknown	18.18	16.	J
5.		Unknown	35.61	4.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-12-C-01-03-00	ARDL Lab No.:	300555-01
Desc/Location:	MW12C	Lab Filename:	
Sample Date:	06/11/1997	Received Date:	06/13/1997
Sample Time:	1450	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-12-C-01-03-00	ARDL Lab No.:	300555-01 (cont'd)
Desc/Location:	MW12C	Lab Filename:	
Sample Date:	06/11/1997	Received Date:	06/13/1997
Sample Time:	1450	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-12-C-01-03-00	ARDL Lab No.:	300555-01 (cont'd)
Desc/Location:	MW12C	Lab Filename:	
Sample Date:	06/11/1997	Received Date:	06/13/1997
Sample Time:	1450	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	50%
2-FLUOROPHENOL	21-110	33%
D5 NITROBENZENE	35-114	49%
2,4,6-TRIBROMOPHENOL	10-123	58%
D5 PHENOL	10-94	25%
D14 TERPHENYL	33-141	49%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-12-C-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300555 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300555-01

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1554

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/13/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/18/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.3

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	16.97	11.	J
2.	Unknown	17.82	5.	J
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1090

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300547 Report Date: 06/12/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H12D010300	ARDL Lab No.:	300547-02
Desc/Location:	MW 12-D	Lab Filename:	
Sample Date:	06/03/1997	Received Date:	06/05/1997
Sample Time:	1930	Prep. Date:	06/05/1997
Matrix:	WATER	Analysis Date:	06/10/1997
Amount Used:	1000 mL	QC Batch:	B2258
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

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Mt. Vernon, Illinois 62864

Lab Report No: 300547 Report Date: 06/12/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H12D010300	ARDL Lab No.:	300547-02 (cont'd)
Desc/Location:	MW 12-D	Lab Filename:	
Sample Date:	06/03/1997	Received Date:	06/05/1997
Sample Time:	1930	Prep. Date:	06/05/1997
Matrix:	WATER	Analysis Date:	06/10/1997
Amount Used:	1000 mL	QC Batch:	B2258
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	2.2	J	UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	4.2	J	UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300547 Report Date: 06/12/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H12D010300	ARDL Lab No.:	300547-02 (cont'd)
Desc/Location:	MW 12-D	Lab Filename:	
Sample Date:	06/03/1997	Received Date:	06/05/1997
Sample Time:	1930	Prep. Date:	06/05/1997
Matrix:	WATER	Analysis Date:	06/10/1997
Amount Used:	1000 mL	QC Batch:	B2258
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	71%
2-FLUOROPHENOL	21-110	26%
D5 NITROBENZENE	35-114	55%
2,4,6-TRIBROMOPHENOL	10-123	78%
D5 PHENOL	10-94	20%
D14 TERPHENYL	33-141	87%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H12D010300

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300547 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300547-02

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >W8055

Level: (low/med) LOW Date Received: 6/05/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/05/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/10/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.2

Number TICs found: 6

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	6.46	8.	J B
2.	Unknown	7.17	8.	J B
3. 134623	Benzamide, N,N-diethyl-3-methyl-	17.12	33.	JN
4.	Unknown	18.16	9.	J
5.	Unknown	24.82	5.	J
6.	Unknown	27.11	7.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300553 Report Date: 06/20/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H12E010300	ARDL Lab No.:	300553-01
Desc/Location:	12E	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/11/1997
Sample Time:	1610	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	1000 mL	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2278
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300553 Report Date: 06/20/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H12E010300	ARDL Lab No.:	300553-01 (cont'd)
Desc/Location:	12E	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/11/1997
Sample Time:	1610	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	1000 mL	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2278
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	6.8	J	UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1

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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300553 Report Date: 06/20/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H12E010300	ARDL Lab No.:	300553-01 (cont'd)
Desc/Location:	12E	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/11/1997
Sample Time:	1610	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	1000 mL	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2278
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	74%
2-FLUOROPHENOL	21-110	37%
D5 NITROBENZENE	35-114	66%
2,4,6-TRIBROMOPHENOL	10-123	84%
D5 PHENOL	10-94	28%
D14 TERPHENYL	33-141	76%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H12E010300

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300553 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300553-01

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1553

Level: (low/med) LOW Date Received: 6/11/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/13/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/18/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-12-G-01-03-00	ARDL Lab No.:	300555-02
Desc/Location:	MW12G	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1448	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-12-G-01-03-00	ARDL Lab No.:	300555-02 (cont'd)
Desc/Location:	MW12G	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1448	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-12-G-01-03-00	ARDL Lab No.:	300555-02 (cont'd)
Desc/Location:	MW12G	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1448	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/18/1997
Amount Used:	1000 mL	QC Batch:	B2287
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	62%
2-FLUOROPHENOL	21-110	30%
D5 NITROBENZENE	35-114	57%
2,4,6-TRIBROMOPHENOL	10-123	70%
D5 PHENOL	10-94	24%
D14 TERPHENYL	33-141	65%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-12-G-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300555 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300555-02

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1555

Level: (low/med) LOW Date Received: 6/13/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/13/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/18/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.5

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H12I010300	ARDL Lab No.:	300579-05
Desc/Location:	12I	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/28/1997
Sample Time:	1230	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2331
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H12I010300	ARDL Lab No.:	300579-05 (cont'd)
Desc/Location:	12I	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/28/1997
Sample Time:	1230	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2331
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	16.1		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H12I010300	ARDL Lab No.:	300579-05 (cont'd)
Desc/Location:	12I	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/28/1997
Sample Time:	1230	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2331
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	79%
2-FLUOROPHENOL	21-110	37%
D5 NITROBENZENE	35-114	67%
2,4,6-TRIBROMOPHENOL	10-123	63%
D5 PHENOL	10-94	25%
D14 TERPHENYL	33-141	87%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H12I010300

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300579 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300579-05

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1658

Level: (low/med) LOW Date Received: 6/28/97

% Moisture: not dec. --- dec. --- Date Extracted: 7/02/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 7/08/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.1

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	11.75	4.	J
2.		Unknown	12.74	48.	J
3.		Unknown	18.71	5.	J
4.		Unknown	18.96	6.	J
5.		Unknown	20.91	7.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H12JAW71010300	ARDL Lab No.:	300579-03
Desc/Location:	JAW 71	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/28/1997
Sample Time:	0815	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2331
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H12JAW71010300	ARDL Lab No.:	300579-03 (cont'd)
Desc/Location:	JAW 71	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/28/1997
Sample Time:	0815	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2331
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	4.3	J	UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H12JAW71010300	ARDL Lab No.:	300579-03 (cont'd)
Desc/Location:	JAW 71	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/28/1997
Sample Time:	0815	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2331
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	81%
2-FLUOROPHENOL	21-110	46%
D5 NITROBENZENE	35-114	75%
2,4,6-TRIBROMOPHENOL	10-123	80%
D5 PHENOL	10-94	31%
D14 TERPHENYL	33-141	85%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H12JAW71010300

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300579 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300579-03

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1657

Level: (low/med) LOW Date Received: 6/28/97

% Moisture: not dec. --- dec. --- Date Extracted: 7/02/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 7/08/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/09/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-12-JAW72-01-03-00	ARDL Lab No.:	300576-01
Desc/Location:	JAW 72	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/27/1997
Sample Time:	1355	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2329
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

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Lab Report No: 300576 Report Date: 07/09/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-12-JAW72-01-03-00	ARDL Lab No.:	300576-01 (cont'd)
Desc/Location:	JAW 72	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/27/1997
Sample Time:	1355	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2329
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	6.7	J	UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/09/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-12-JAW72-01-03-00	ARDL Lab No.:	300576-01 (cont'd)
Desc/Location:	JAW 72	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/27/1997
Sample Time:	1355	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2329
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	73%
2-FLUOROPHENOL	21-110	34%
D5 NITROBENZENE	35-114	65%
2,4,6-TRIBROMOPHENOL	10-123	53%
D5 PHENOL	10-94	25%
D14 TERPHENYL	33-141	99%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-12-JAW72-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300576 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300576-01

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1651

Level: (low/med) LOW Date Received: 6/27/97

% Moisture: not dec. --- dec. --- Date Extracted: 7/02/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 7/08/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.2

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	12.74	46.	J
2.	Unknown	12.95	6.	J
3.	Unknown	18.71	4.	J
4.	Unknown	18.96	5.	J
5.	Unknown	20.90	7.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H12JAW73010300	ARDL Lab No.:	300579-01
Desc/Location:	JAW 73	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/28/1997
Sample Time:	1230	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2331
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H12JAW73010300	ARDL Lab No.:	300579-01 (cont'd)
Desc/Location:	JAW 73	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/28/1997
Sample Time:	1230	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2331
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	7.7	J	UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H12JAW73010300	ARDL Lab No.:	300579-01 (cont'd)
Desc/Location:	JAW 73	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/28/1997
Sample Time:	1230	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2331
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	82%
2-FLUOROPHENOL	21-110	41%
D5 NITROBENZENE	35-114	70%
2,4,6-TRIBROMOPHENOL	10-123	72%
D5 PHENOL	10-94	28%
D14 TERPHENYL	33-141	87%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H12JAW73010300

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300579 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300579-01

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1656

Level: (low/med) LOW Date Received: 6/28/97

% Moisture: not dec. --- dec. --- Date Extracted: 7/02/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 7/08/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.2

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	11.75	6.	J
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EXPLOSIVES
(Method 8330)

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-12-A-01-03-00	ARDL Lab No.:	300549-09
Desc/Location:	12A	Lab Filename:	
Sample Date:	06/05/1997	Received Date:	06/07/1997
Sample Time:	1400	Prep. Date:	06/11/1997
Matrix:	WATER	Analysis Date:	06/12/1997
Amount Used:	770 mL	QC Batch:	B2269
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	1.3		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	0.46	J	UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	85%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300547 Report Date: 06/17/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H12B010300	ARDL Lab No.:	300547-01
Desc/Location:	MW 12-B	Lab Filename:	
Sample Date:	06/03/1997	Received Date:	06/05/1997
Sample Time:	1205	Prep. Date:	06/05/1997
Matrix:	WATER	Analysis Date:	06/07/1997
Amount Used:	770 mL	QC Batch:	B2263
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	4.9		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	1.2	J	UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	83%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1121

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-12-C-01-03-00	ARDL Lab No.:	300555-01
Desc/Location:	MW12C	Lab Filename:	
Sample Date:	06/11/1997	Received Date:	06/13/1997
Sample Time:	1450	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/13/1997
Amount Used:	770 mL	QC Batch:	B2294
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	0.46	J	UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	1.6		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	112%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300547 Report Date: 06/17/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H12D010300	ARDL Lab No.:	300547-02
Desc/Location:	MW 12-D	Lab Filename:	
Sample Date:	06/03/1997	Received Date:	06/05/1997
Sample Time:	1930	Prep. Date:	06/05/1997
Matrix:	WATER	Analysis Date:	06/07/1997
Amount Used:	770 mL	QC Batch:	B2263
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	92%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300553 Report Date: 06/20/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H12E010300	ARDL Lab No.:	300553-01
Desc/Location:	12E	Lab Filename:	
Sample Date:	06/09/1997	Received Date:	06/11/1997
Sample Time:	1610	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/13/1997
Amount Used:	770 mL	Instrument ID:	
Final Volume:	10 mL	QC Batch:	B2277
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	0.95	J	UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	87%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-12-G-01-03-00	ARDL Lab No.:	300555-02
Desc/Location:	MW12G	Lab Filename:	
Sample Date:	06/10/1997	Received Date:	06/13/1997
Sample Time:	1448	Prep. Date:	06/13/1997
Matrix:	WATER	Analysis Date:	06/13/1997
Amount Used:	770 mL	QC Batch:	B2294
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	83%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1125

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H12I010300	ARDL Lab No.:	300579-05
Desc/Location:	12I	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/28/1997
Sample Time:	1230	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/09/1997
Amount Used:	770 mL	QC Batch:	B2346
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	4	13.0	ND		UG/L	10
1,3-DINITROBENZENE	3.3	13.0	ND		UG/L	10
2,4,6-TRINITROTOLUENE	3.8	13.0	ND		UG/L	10
2,4-DINITROTOLUENE	4.4	13.0	ND		UG/L	10
2,6-DINITROTOLUENE	4.4	13.0	ND		UG/L	10
2-AMINO-4,6-DINITROTOLUENE	4.1	13.0	130		UG/L	10
2-NITROTOLUENE	3.7	13.0	ND		UG/L	10
3-NITROTOLUENE	2.7	13.0	ND		UG/L	10
4-AMINO-2,6-DINITROTOLUENE	4.2	13.0	74.0		UG/L	10
4-NITROTOLUENE	3.9	13.0	ND		UG/L	10
RDX	177	650	5200		UG/L	500
NITROBENZENE	4.4	13.0	ND		UG/L	10
HMX	42.9	130	470		UG/L	100
TETRYL	4	13.0	ND		UG/L	10

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	173%*

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/17/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H12JAW71010300	ARDL Lab No.:	300579-03
Desc/Location:	JAW 71	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/28/1997
Sample Time:	0815	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/10/1997
Amount Used:	770 mL	Instrument ID:	
Final Volume:	10 mL	QC Batch:	B2346
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	2.4		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	9.3		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	2.6		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	81%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-12-JAW72-01-03-00	ARDL Lab No.:	300576-01
Desc/Location:	JAW 72	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/27/1997
Sample Time:	1355	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/09/1997
Amount Used:	770 mL	QC Batch:	B2344
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	4	13.0	ND		UG/L	10
1,3-DINITROBENZENE	3.3	13.0	ND		UG/L	10
2,4,6-TRINITROTOLUENE	3.8	13.0	ND		UG/L	10
2,4-DINITROTOLUENE	4.4	13.0	ND		UG/L	10
2,6-DINITROTOLUENE	4.4	13.0	ND		UG/L	10
2-AMINO-4,6-DINITROTOLUENE	4.1	13.0	30.0		UG/L	10
2-NITROTOLUENE	3.7	13.0	ND		UG/L	10
3-NITROTOLUENE	2.7	13.0	ND		UG/L	10
4-AMINO-2,6-DINITROTOLUENE	4.2	13.0	19.0		UG/L	10
4-NITROTOLUENE	3.9	13.0	ND		UG/L	10
RDX	70.6	260	1600		UG/L	200
NITROBENZENE	4.4	13.0	ND		UG/L	10
HMX	4.3	13.0	140		UG/L	10
TETRYL	4	13.0	ND		UG/L	10

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	44%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/16/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H12JAW73010300	ARDL Lab No.:	300579-01
Desc/Location:	JAW 73	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/28/1997
Sample Time:	1230	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/09/1997
Amount Used:	770 mL	QC Batch:	B2346
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	7.1	26.0	190		UG/L	20
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	4.7		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	100%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

INORGANICS

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-12-A-01-03-00 ARDL No: 300549-09
Sampling Loc'n: 12A Received: 06/07/1997
Sampling Date: 06/05/1997 Matrix: WATER
Sampling Time: 1400 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.49	MG/L	3010	6010A	06/12/97	06/13/97	P2104
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/12/97	06/13/97	P2104
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
ARSENIC	0.00050	ND	MG/L	3020	7061	06/12/97	06/17/97	BH2702
ARSENIC, DISSOLVED	0.00050	ND	MG/L	3005	7061	06/11/97	06/13/97	BH2698
BARIUM	0.010	0.085	MG/L	3010	6010A	06/12/97	06/13/97	P2104
BARIUM, DISSOLVED	0.010	0.14	MG/L	3005	6010A	06/16/97	06/16/97	P2115
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/12/97	06/13/97	P2104
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/12/97	06/13/97	P2104
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
CALCIUM	0.10	55.2	MG/L	3010	6010A	06/12/97	06/13/97	P2104
CALCIUM, DISSOLVED	0.10	63.4	MG/L	3005	6010A	06/16/97	06/16/97	P2115
CHROMIUM	0.0050	0.0081	MG/L	3010	6010A	06/12/97	06/13/97	P2104
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
COBALT	0.0050	ND	MG/L	3010	6010A	06/12/97	06/13/97	P2104
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
COPPER	0.010	ND	MG/L	3010	6010A	06/12/97	06/13/97	P2104
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
IRON	0.050	1	MG/L	3010	6010A	06/12/97	06/13/97	P2104
IRON, DISSOLVED	0.050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
LEAD	0.0010	0.001	MG/L	3020	7421	06/12/97	06/13/97	F2110
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	06/11/97	06/12/97	F2108
MAGNESIUM	0.10	22.1	MG/L	3010	6010A	06/12/97	06/13/97	P2104
MAGNESIUM, DISSOLVED	0.10	25.0	MG/L	3005	6010A	06/16/97	06/16/97	P2115
MANGANESE	0.0050	0.047	MG/L	3010	6010A	06/12/97	06/13/97	P2104
MANGANESE, DISSOLVED	0.0050	0.044	MG/L	3005	6010A	06/16/97	06/16/97	P2115
MERCURY	0.00020	ND	MG/L	7470	7470	06/11/97	06/11/97	C0890
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	06/11/97	06/11/97	C0891
NICKEL	0.020	ND	MG/L	3010	6010A	06/12/97	06/13/97	P2104
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
POTASSIUM	1.5	ND	MG/L	3010	6010A	06/12/97	06/13/97	P2104
POTASSIUM, DISSOLVED	1.5	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
SELENIUM	0.00050	0.0010	MG/L	3020	7741	06/12/97	06/17/97	BH2703
SELENIUM, DISSOLVED	0.00050	0.0015	MG/L	3005	7741	06/11/97	06/12/97	BH2701
SILVER	0.0050	ND	MG/L	3010	6010A	06/12/97	06/13/97	P2104

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300549 Report Date: 06/18/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-12-A-01-03-00 ARDL No: 300549-09 (cont'd)
Sampling Loc'n: 12A Received: 06/07/1997
Sampling Date: 06/05/1997 Matrix: WATER
Sampling Time: 1400 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
SODIUM	0.40	11.1	MG/L	3010	6010A	06/12/97	06/13/97	P2104
SODIUM, DISSOLVED	0.40	14.5	MG/L	3005	6010A	06/16/97	06/16/97	P2115
THALLIUM	0.0010	ND	MG/L	3020	7841	06/12/97	06/13/97	F2114
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	06/11/97	06/13/97	F2112
VANADIUM	0.0050	ND	MG/L	3010	6010A	06/12/97	06/13/97	P2104
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
ZINC	0.0050	0.069	MG/L	3010	6010A	06/12/97	06/13/97	P2104
ZINC, DISSOLVED	0.0050	0.19	MG/L	3005	6010A	06/16/97	06/16/97	P2115
ALKALINITY	5.0	237	MG/L	NONE	310.1	NA	06/16/97	06184188
CHLORIDE	1.0	ND	MG/L	NONE	300.0	NA	06/10/97	061841[illegible]
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	06/16/97	06/16/97	061741[illegible]
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/16/97	06/16/97	06184189
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	06/10/97	06184191
pH	0.10	7.4	PH UNITS	NONE	9040A	NA	06/12/97	06184184
SOLIDS, TOTAL DISSOLVED	40.0	295	MG/L	NONE	160.1	NA	06/10/97	06184186
SOLIDS, TOTAL SUSPENDED	2.0	28.4	MG/L	NONE	160.2	NA	06/10/97	06184187
SULFATE	2.5	27.6	MG/L	NONE	300.0	NA	06/10/97	06184191
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	06/11/97	06184185
TOTAL ORGANIC CARBON	1.0	ND	MG/L	NONE	415.1	NA	06/11/97	06164179

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300547 Report Date: 06/17/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H12B010300 ARDL No: 300547-01
Sampling Loc'n: MW 12-B Received: 06/05/1997
Sampling Date: 06/03/1997 Matrix: WATER
Sampling Time: 1205 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.12	MG/L	3010	6010A	06/06/97	06/10/97	P2097
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	06/10/97	06/10/97	P2099
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/06/97	06/10/97	P2097
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/10/97	06/10/97	P2099
ARSENIC	0.00050	0.00056	MG/L	3020	7061	06/06/97	06/10/97	F2095
ARSENIC, DISSOLVED	0.00050	ND	MG/L	3005	7061	06/06/97	06/10/97	BH2694
BARIUM	0.010	0.12	MG/L	3010	6010A	06/06/97	06/10/97	P2097
BARIUM, DISSOLVED	0.010	0.13	MG/L	3005	6010A	06/10/97	06/10/97	P2099
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/06/97	06/10/97	P2097
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	06/10/97	06/10/97	P2099
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/06/97	06/10/97	P2097
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/10/97	06/10/97	P2099
CALCIUM	0.10	48.3	MG/L	3010	6010A	06/06/97	06/10/97	P2097
CALCIUM, DISSOLVED	0.10	53.1	MG/L	3005	6010A	06/10/97	06/10/97	P2099
CHROMIUM	0.0050	ND	MG/L	3010	6010A	06/06/97	06/10/97	P2097
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/10/97	06/10/97	P2099
COBALT	0.0050	ND	MG/L	3010	6010A	06/06/97	06/10/97	P2097
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/10/97	06/10/97	P2099
COPPER	0.010	ND	MG/L	3010	6010A	06/06/97	06/10/97	P2097
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	06/10/97	06/10/97	P2099
IRON	0.050	0.18	MG/L	3010	6010A	06/06/97	06/10/97	P2097
IRON, DISSOLVED	0.050	ND	MG/L	3005	6010A	06/10/97	06/10/97	P2099
LEAD	0.0010	ND	MG/L	3020	7421	06/06/97	06/09/97	F2096
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	06/06/97	06/09/97	F2100
MAGNESIUM	0.10	20.5	MG/L	3010	6010A	06/06/97	06/10/97	P2097
MAGNESIUM, DISSOLVED	0.10	22.5	MG/L	3005	6010A	06/10/97	06/10/97	P2099
MANGANESE	0.0050	0.073	MG/L	3010	6010A	06/06/97	06/10/97	P2097
MANGANESE, DISSOLVED	0.0050	0.078	MG/L	3005	6010A	06/10/97	06/10/97	P2099
MERCURY	0.00020	ND	MG/L	7470	7470	06/06/97	06/06/97	C0886
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	06/06/97	06/06/97	C0889
NICKEL	0.020	ND	MG/L	3010	6010A	06/06/97	06/10/97	P2097
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/10/97	06/10/97	P2099
POTASSIUM	1.5	ND	MG/L	3010	6010A	06/06/97	06/10/97	P2097
POTASSIUM, DISSOLVED	1.5	ND	MG/L	3005	6010A	06/10/97	06/10/97	P2099
SELENIUM	0.00050	0.0013	MG/L	3020	7741	06/06/97	06/09/97	BH2691
SELENIUM, DISSOLVED	0.00050	0.0018	MG/L	3005	7741	06/06/97	06/09/97	BH2695
SILVER	0.0050	ND	MG/L	3010	6010A	06/06/97	06/10/97	P2097

ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 300547 Report Date: 06/17/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H12B010300 ARDL No: 300547-01 (cont'd)
Sampling Loc'n: MW 12-B Received: 06/05/1997
Sampling Date: 06/03/1997 Matrix: WATER
Sampling Time: 1205 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/10/97	06/10/97	P2099
SODIUM	0.40	11.2	MG/L	3010	6010A	06/06/97	06/10/97	P2097
SODIUM, DISSOLVED	0.40	12.2	MG/L	3005	6010A	06/10/97	06/10/97	P2099
THALLIUM	0.0010	ND	MG/L	3020	7841	06/06/97	06/09/97	F2092
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	06/06/97	06/06/97	F2101
VANADIUM	0.0050	ND	MG/L	3010	6010A	06/06/97	06/10/97	P2097
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/10/97	06/10/97	P2099
ZINC	0.0050	0.090	MG/L	3010	6010A	06/06/97	06/10/97	P2097
ZINC, DISSOLVED	0.0050	0.083	MG/L	3005	6010A	06/10/97	06/10/97	P2099
ALKALINITY	5.0	195	MG/L	NONE	310.1	NA	06/06/97	06164173
CHLORIDE	1.0	1.0	MG/L	NONE	300.0	NA	06/05/97	0616417[illegible]
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	06/16/97	06/16/97	0617418[illegible]
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/06/97	06/06/97	06164174
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	06/05/97	06164175
pH	0.10	7.2	PH UNITS	NONE	9040A	NA	06/06/97	06164176
SOLIDS, TOTAL DISSOLVED	40.0	266	MG/L	NONE	160.1	NA	06/06/97	06164178
SOLIDS, TOTAL SUSPENDED	3.3	ND	MG/L	NONE	160.2	NA	06/06/97	06164180
SULFATE	12.5	44.6	MG/L	NONE	300.0	NA	06/05/97	06164175
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	06/06/97	06164177
TOTAL ORGANIC CARBON	1.0	ND	MG/L	NONE	415.1	NA	06/11/97	06164179

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/26/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-12-C-01-03-00 ARDL No: 300555-01
Sampling Loc'n: MW12C Received: 06/13/1997
Sampling Date: 06/11/1997 Matrix: WATER
Sampling Time: 1450 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.12	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
ARSENIC	0.00050	0.014	MG/L	3020	7061	06/16/97	06/17/97	BH2708
ARSENIC, DISSOLVED	0.00050	0.016	MG/L	3005	7061	06/16/97	06/17/97	BH2707
BARIUM	0.010	0.42	MG/L	3010	6010A	06/16/97	06/18/97	P2126
BARIUM, DISSOLVED	0.010	0.44	MG/L	3005	6010A	06/16/97	06/16/97	P2115
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
CALCIUM	0.10	92.2	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CALCIUM, DISSOLVED	0.10	97.7	MG/L	3005	6010A	06/16/97	06/16/97	P2115
CHROMIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
COBALT	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
COPPER	0.010	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
IRON	0.050	0.3	MG/L	3010	6010A	06/16/97	06/18/97	P2126
IRON, DISSOLVED	0.050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
LEAD	0.0010	ND	MG/L	3020	7421	06/16/97	06/17/97	F2128
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	06/16/97	06/17/97	F2127
MAGNESIUM	0.10	32.9	MG/L	3010	6010A	06/16/97	06/18/97	P2126
MAGNESIUM, DISSOLVED	0.10	35.1	MG/L	3005	6010A	06/16/97	06/16/97	P2115
MANGANESE	0.0050	0.067	MG/L	3010	6010A	06/16/97	06/18/97	P2126
MANGANESE, DISSOLVED	0.0050	0.059	MG/L	3005	6010A	06/16/97	06/16/97	P2115
MERCURY	0.00020	ND	MG/L	7470	7470	06/16/97	06/16/97	C0894
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	06/16/97	06/16/97	C0895
NICKEL	0.020	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
POTASSIUM	1.5	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
POTASSIUM, DISSOLVED	1.5	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
SELENIUM	0.00050	ND	MG/L	3020	7741	06/16/97	06/17/97	BH2710
SELENIUM, DISSOLVED	0.00050	ND	MG/L	3005	7741	06/16/97	06/17/97	BH2709
SILVER	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/26/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-12-C-01-03-00 ARDL No: 300555-01 (cont'd)
Sampling Loc'n: MW12C Received: 06/13/1997
Sampling Date: 06/11/1997 Matrix: WATER
Sampling Time: 1450 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
SODIUM	0.40	38.2	MG/L	3010	6010A	06/16/97	06/18/97	P2126
SODIUM, DISSOLVED	0.40	37.8	MG/L	3005	6010A	06/16/97	06/16/97	P2115
THALLIUM	0.0010	ND	MG/L	3020	7841	06/16/97	06/17/97	F2130
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	06/16/97	06/17/97	F2129
VANADIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
ZINC	0.0050	0.83	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ZINC, DISSOLVED	0.0050	0.68	MG/L	3005	6010A	06/16/97	06/16/97	P2115
ALKALINITY	5.0	473	MG/L	NONE	310.1	NA	06/16/97	06184188
CHLORIDE	1.0	1.5	MG/L	NONE	300.0	NA	06/16/97	061941[illegible]
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	06/16/97	06/16/97	0617418[illegible]
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/16/97	06/16/97	06184189
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	06/16/97	06194197
pH	0.10	7.7	PH UNITS	NONE	9040A	NA	06/16/97	06234208
SOLIDS, TOTAL DISSOLVED	40.0	484	MG/L	NONE	160.1	NA	06/16/97	06234209
SOLIDS, TOTAL SUSPENDED	4.4	84.3	MG/L	NONE	160.2	NA	06/16/97	06174183
SULFATE	2.5	8.2	MG/L	NONE	300.0	NA	06/16/97	06194197
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	06/16/97	06234210
TOTAL ORGANIC CARBON	1.0	6.7	MG/L	NONE	415.1	NA	06/19/97	06234207

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300547 Report Date: 06/17/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H12D010300 ARDL No: 300547-02
Sampling Loc'n: MW 12-D Received: 06/05/1997
Sampling Date: 06/03/1997 Matrix: WATER
Sampling Time: 1930 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	1.7	MG/L	3010	6010A	06/06/97	06/10/97	P2097
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	06/10/97	06/10/97	P2099
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/06/97	06/10/97	P2097
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/10/97	06/10/97	P2099
ARSENIC	0.00050	0.0028	MG/L	3020	7061	06/06/97	06/10/97	F2095
ARSENIC, DISSOLVED	0.00050	0.001	MG/L	3005	7061	06/06/97	06/10/97	BH2694
BARIUM	0.010	0.21	MG/L	3010	6010A	06/06/97	06/10/97	P2097
BARIUM, DISSOLVED	0.010	0.2	MG/L	3005	6010A	06/10/97	06/10/97	P2099
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/06/97	06/10/97	P2097
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	06/10/97	06/10/97	P2099
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/06/97	06/10/97	P2097
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/10/97	06/10/97	P2099
CALCIUM	0.10	108	MG/L	3010	6010A	06/06/97	06/10/97	P2097
CALCIUM, DISSOLVED	0.10	90.3	MG/L	3005	6010A	06/10/97	06/10/97	P2099
CHROMIUM	0.0050	0.087	MG/L	3010	6010A	06/06/97	06/10/97	P2097
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/10/97	06/10/97	P2099
COBALT	0.0050	ND	MG/L	3010	6010A	06/06/97	06/10/97	P2097
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/10/97	06/10/97	P2099
COPPER	0.010	ND	MG/L	3010	6010A	06/06/97	06/10/97	P2097
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	06/10/97	06/10/97	P2099
IRON	0.050	5	MG/L	3010	6010A	06/06/97	06/10/97	P2097
IRON, DISSOLVED	0.050	0.066	MG/L	3005	6010A	06/10/97	06/10/97	P2099
LEAD	0.0010	0.0036	MG/L	3020	7421	06/06/97	06/09/97	F2096
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	06/06/97	06/09/97	F2100
MAGNESIUM	0.10	38.2	MG/L	3010	6010A	06/06/97	06/10/97	P2097
MAGNESIUM, DISSOLVED	0.10	37.7	MG/L	3005	6010A	06/10/97	06/10/97	P2099
MANGANESE	0.0050	0.22	MG/L	3010	6010A	06/06/97	06/10/97	P2097
MANGANESE, DISSOLVED	0.0050	0.11	MG/L	3005	6010A	06/10/97	06/10/97	P2099
MERCURY	0.00020	ND	MG/L	7470	7470	06/06/97	06/06/97	C0886
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	06/06/97	06/06/97	C0889
NICKEL	0.020	0.08	MG/L	3010	6010A	06/06/97	06/10/97	P2097
NICKEL, DISSOLVED	0.020	0.022	MG/L	3005	6010A	06/10/97	06/10/97	P2099
POTASSIUM	1.5	1.6	MG/L	3010	6010A	06/06/97	06/10/97	P2097
POTASSIUM, DISSOLVED	1.5	1.6	MG/L	3005	6010A	06/10/97	06/10/97	P2099
SELENIUM	0.00050	ND	MG/L	3020	7741	06/06/97	06/09/97	BH2691
SELENIUM, DISSOLVED	0.00050	ND	MG/L	3005	7741	06/06/97	06/09/97	BH2695
SILVER	0.0050	ND	MG/L	3010	6010A	06/06/97	06/10/97	P2097

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300547 Report Date: 06/17/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H12D010300 ARDL No: 300547-02 (cont'd)
Sampling Loc'n: MW 12-D Received: 06/05/1997
Sampling Date: 06/03/1997 Matrix: WATER
Sampling Time: 1930 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/10/97	06/10/97	P2099
SODIUM	0.40	24.9	MG/L	3010	6010A	06/06/97	06/10/97	P2097
SODIUM, DISSOLVED	0.40	30.3	MG/L	3005	6010A	06/10/97	06/10/97	P2099
THALLIUM	0.0010	ND	MG/L	3020	7841	06/06/97	06/09/97	F2092
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	06/06/97	06/06/97	F2101
VANADIUM	0.0050	0.0057	MG/L	3010	6010A	06/06/97	06/10/97	P2097
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/10/97	06/10/97	P2099
ZINC	0.0050	0.13	MG/L	3010	6010A	06/06/97	06/10/97	P2097
ZINC, DISSOLVED	0.0050	0.15	MG/L	3005	6010A	06/10/97	06/10/97	P2099
ALKALINITY	5.0	745	MG/L	NONE	310.1	NA	06/06/97	06164173
CHLORIDE	1.0	3.0	MG/L	NONE	300.0	NA	06/05/97	06164175
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	06/16/97	06/16/97	061741
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/06/97	06/06/97	06164174
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	06/05/97	06164175
pH	0.10	7.3	PH UNITS	NONE	9040A	NA	06/06/97	06164176
SOLIDS, TOTAL DISSOLVED	40.0	462	MG/L	NONE	160.1	NA	06/06/97	06164178
SOLIDS, TOTAL SUSPENDED	12.5	1320	MG/L	NONE	160.2	NA	06/06/97	06164180
SULFATE	2.5	9.5	MG/L	NONE	300.0	NA	06/05/97	06164175
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	06/06/97	06164177
TOTAL ORGANIC CARBON	1.0	3.7	MG/L	NONE	415.1	NA	06/11/97	06164179

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300553 Report Date: 06/19/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H12E010300 ARDL No: 300553-01
Sampling Loc'n: 12E Received: 06/11/1997
Sampling Date: 06/09/1997 Matrix: WATER
Sampling Time: 1610 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.17	MG/L	3010	6010A	06/12/97	06/13/97	P2104
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/12/97	06/13/97	P2104
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
ARSENIC	0.00050	ND	MG/L	3020	7061	06/12/97	06/17/97	BH2702
ARSENIC, DISSOLVED	0.00050	ND	MG/L	3005	7061	06/11/97	06/13/97	BH2698
BARIUM	0.010	0.064	MG/L	3010	6010A	06/12/97	06/13/97	P2104
BARIUM, DISSOLVED	0.010	0.065	MG/L	3005	6010A	06/16/97	06/16/97	P2115
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/12/97	06/13/97	P2104
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/12/97	06/13/97	P2104
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
CALCIUM	0.10	56.4	MG/L	3010	6010A	06/12/97	06/13/97	P2104
CALCIUM, DISSOLVED	0.10	60.7	MG/L	3005	6010A	06/16/97	06/16/97	P2115
CHROMIUM	0.0050	ND	MG/L	3010	6010A	06/12/97	06/13/97	P2104
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
COBALT	0.0050	ND	MG/L	3010	6010A	06/12/97	06/13/97	P2104
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
COPPER	0.010	ND	MG/L	3010	6010A	06/12/97	06/13/97	P2104
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
IRON	0.050	0.17	MG/L	3010	6010A	06/12/97	06/13/97	P2104
IRON, DISSOLVED	0.050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
LEAD	0.0010	ND	MG/L	3020	7421	06/12/97	06/13/97	F2110
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	06/11/97	06/12/97	F2108
MAGNESIUM	0.10	25.2	MG/L	3010	6010A	06/12/97	06/13/97	P2104
MAGNESIUM, DISSOLVED	0.10	27.1	MG/L	3005	6010A	06/16/97	06/16/97	P2115
MANGANESE	0.0050	0.0067	MG/L	3010	6010A	06/12/97	06/13/97	P2104
MANGANESE, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
MERCURY	0.00020	ND	MG/L	7470	7470	06/11/97	06/11/97	C0890
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	06/11/97	06/11/97	C0891
NICKEL	0.020	ND	MG/L	3010	6010A	06/12/97	06/13/97	P2104
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
POTASSIUM	1.5	1.8	MG/L	3010	6010A	06/12/97	06/13/97	P2104
POTASSIUM, DISSOLVED	1.5	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
SELENIUM	0.00050	0.0013	MG/L	3020	7741	06/12/97	06/17/97	BH2703
SELENIUM, DISSOLVED	0.00050	0.0016	MG/L	3005	7741	06/11/97	06/12/97	BH2701
SILVER	0.0050	ND	MG/L	3010	6010A	06/12/97	06/13/97	P2104

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Lab Report No: 300553 Report Date: 06/19/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H12E010300 ARDL No: 300553-01 (cont'd)
Sampling Loc'n: 12E Received: 06/11/1997
Sampling Date: 06/09/1997 Matrix: WATER
Sampling Time: 1610 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
SODIUM	0.40	7.2	MG/L	3010	6010A	06/12/97	06/13/97	P2104
SODIUM, DISSOLVED	0.40	8.2	MG/L	3005	6010A	06/16/97	06/16/97	P2115
THALLIUM	0.0010	ND	MG/L	3020	7841	06/12/97	06/13/97	F2114
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	06/11/97	06/13/97	F2112
VANADIUM	0.0050	ND	MG/L	3010	6010A	06/12/97	06/13/97	P2104
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
ZINC	0.0050	0.11	MG/L	3010	6010A	06/12/97	06/13/97	P2104
ZINC, DISSOLVED	0.0050	0.065	MG/L	3005	6010A	06/16/97	06/16/97	P2115
ALKALINITY	5.0	252	MG/L	NONE	310.1	NA	06/16/97	06184188
CHLORIDE	1.0	2.2	MG/L	NONE	300.0	NA	06/16/97	061941
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	06/16/97	06/16/97	061741
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/16/97	06/16/97	06184189
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	06/16/97	06194197
pH	0.10	7.1	PH UNITS	NONE	9040A	NA	06/12/97	06184184
SOLIDS, TOTAL DISSOLVED	40.0	292	MG/L	NONE	160.1	NA	06/12/97	06194195
SOLIDS, TOTAL SUSPENDED	2.0	8.5	MG/L	NONE	160.2	NA	06/12/97	06194196
SULFATE	2.5	21.3	MG/L	NONE	300.0	NA	06/16/97	06194197
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	06/11/97	06184185
TOTAL ORGANIC CARBON	1.0	ND	MG/L	NONE	415.1	NA	06/11/97	06164179

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Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/26/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-12-G-01-03-00 ARDL No: 300555-02
Sampling Loc'n: MW12G Received: 06/13/1997
Sampling Date: 06/10/1997 Matrix: WATER
Sampling Time: 1448 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.58	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
ARSENIC	0.00050	0.00063	MG/L	3020	7061	06/16/97	06/17/97	BH2708
ARSENIC, DISSOLVED	0.00050	ND	MG/L	3005	7061	06/16/97	06/17/97	BH2707
BARIUM	0.010	0.11	MG/L	3010	6010A	06/16/97	06/18/97	P2126
BARIUM, DISSOLVED	0.010	0.11	MG/L	3005	6010A	06/16/97	06/16/97	P2115
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
CALCIUM	0.10	83.3	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CALCIUM, DISSOLVED	0.10	87.8	MG/L	3005	6010A	06/16/97	06/16/97	P2115
CHROMIUM	0.0050	0.0052	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
COBALT	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
COPPER	0.010	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
IRON	0.050	1.4	MG/L	3010	6010A	06/16/97	06/18/97	P2126
IRON, DISSOLVED	0.050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
LEAD	0.0010	ND	MG/L	3020	7421	06/16/97	06/17/97	F2128
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	06/16/97	06/17/97	F2127
MAGNESIUM	0.10	35.1	MG/L	3010	6010A	06/16/97	06/18/97	P2126
MAGNESIUM, DISSOLVED	0.10	37.4	MG/L	3005	6010A	06/16/97	06/16/97	P2115
MANGANESE	0.0050	0.16	MG/L	3010	6010A	06/16/97	06/18/97	P2126
MANGANESE, DISSOLVED	0.0050	0.12	MG/L	3005	6010A	06/16/97	06/16/97	P2115
MERCURY	0.00020	ND	MG/L	7470	7470	06/16/97	06/16/97	C0894
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	06/16/97	06/16/97	C0895
NICKEL	0.020	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
POTASSIUM	1.5	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
POTASSIUM, DISSOLVED	1.5	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
SELENIUM	0.00050	0.00057	MG/L	3020	7741	06/16/97	06/17/97	BH2710
SELENIUM, DISSOLVED	0.00050	0.00088	MG/L	3005	7741	06/16/97	06/17/97	BH2709
SILVER	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300555 Report Date: 06/26/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-12-G-01-03-00 ARDL No: 300555-02 (cont'd)
Sampling Loc'n: MW12G Received: 06/13/1997
Sampling Date: 06/10/1997 Matrix: WATER
Sampling Time: 1448 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
SODIUM	0.40	14.7	MG/L	3010	6010A	06/16/97	06/18/97	P2126
SODIUM, DISSOLVED	0.40	16.1	MG/L	3005	6010A	06/16/97	06/16/97	P2115
THALLIUM	0.0010	ND	MG/L	3020	7841	06/16/97	06/17/97	F2130
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	06/16/97	06/17/97	F2129
VANADIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
ZINC	0.0050	0.029	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ZINC, DISSOLVED	0.0050	0.0072	MG/L	3005	6010A	06/16/97	06/16/97	P2115
ALKALINITY	5.0	317	MG/L	NONE	310.1	NA	06/16/97	06184188
CHLORIDE	1.0	5.3	MG/L	NONE	300.0	NA	06/16/97	061941
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	06/16/97	06/16/97	0617416_
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/16/97	06/16/97	06184189
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	06/16/97	06194197
pH	0.10	7.8	PH UNITS	NONE	9040A	NA	06/16/97	06234208
SOLIDS, TOTAL DISSOLVED	40.0	444	MG/L	NONE	160.1	NA	06/16/97	06234209
SOLIDS, TOTAL SUSPENDED	4.4	131	MG/L	NONE	160.2	NA	06/16/97	06174183
SULFATE	12.5	73.5	MG/L	NONE	300.0	NA	06/16/97	06194197
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	06/16/97	06234210
TOTAL ORGANIC CARBON	1.0	ND	MG/L	NONE	415.1	NA	06/19/97	06234207

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H12I010300 ARDL No: 300579-05
Sampling Loc'n: 12I Received: 06/28/1997
Sampling Date: 06/25/1997 Matrix: WATER
Sampling Time: 1230 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ANTIMONY	0.020	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ARSENIC	0.00050	ND	MG/L	3020	7061	07/01/97	07/02/97	BH2720
ARSENIC, DISSOLVED	0.00050	ND	MG/L	3005	7061	07/01/97	07/02/97	BH2719
BARIUM	0.010	0.069	MG/L	3010	6010A	07/01/97	07/02/97	P2160
BARIUM, DISSOLVED	0.010	0.07	MG/L	3005	6010A	07/02/97	07/02/97	P2159
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CADMIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CALCIUM	0.10	50.6	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CALCIUM, DISSOLVED	0.10	54.1	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CHROMIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
COBALT	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
COPPER	0.010	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
IRON	0.050	0.14	MG/L	3010	6010A	07/01/97	07/02/97	P2160
IRON, DISSOLVED	0.050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
LEAD	0.0010	ND	MG/L	3020	7421	07/01/97	07/02/97	F2162
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	07/01/97	07/02/97	F2161
MAGNESIUM	0.10	22.5	MG/L	3010	6010A	07/01/97	07/02/97	P2160
MAGNESIUM, DISSOLVED	0.10	24.3	MG/L	3005	6010A	07/02/97	07/02/97	P2159
MANGANESE	0.0050	0.041	MG/L	3010	6010A	07/01/97	07/02/97	P2160
MANGANESE, DISSOLVED	0.0050	0.029	MG/L	3005	6010A	07/02/97	07/02/97	P2159
MERCURY	0.00020	ND	MG/L	7470	7470	07/03/97	07/03/97	C0908
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	07/03/97	07/03/97	C0909
NICKEL	0.020	0.026	MG/L	3010	6010A	07/01/97	07/02/97	P2160
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
POTASSIUM	1.5	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
POTASSIUM, DISSOLVED	1.5	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
SELENIUM	0.00050	ND	MG/L	3020	7741	07/01/97	07/02/97	BH2722
SELENIUM, DISSOLVED	0.00050	ND	MG/L	3005	7741	07/01/97	07/02/97	BH2721
SILVER	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160

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Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H12I010300 ARDL No: 300579-05 (cont'd)
Sampling Loc'n: 12I Received: 06/28/1997
Sampling Date: 06/25/1997 Matrix: WATER
Sampling Time: 1230 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
SODIUM	0.40	11.9	MG/L	3010	6010A	07/01/97	07/02/97	P2160
SODIUM, DISSOLVED	0.40	11.9	MG/L	3005	6010A	07/02/97	07/02/97	P2159
THALLIUM	0.0010	ND	MG/L	3020	7841	07/01/97	07/03/97	F2165
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	07/01/97	07/03/97	F2164
VANADIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ZINC	0.0050	0.016	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ZINC, DISSOLVED	0.0050	0.017	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ALKALINITY	5.0	206	MG/L	NONE	310.1	NA	07/08/97	07094265
CHLORIDE	1.0	1.9	MG/L	NONE	300.0	NA	07/02/97	070742[illegible]
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	07/05/97	07/05/97	07074256
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	07/05/97	07/05/97	07074255
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	07/02/97	07074254
pH	0.10	7.5	PH UNITS	NONE	9040A	NA	07/07/97	07074264
SOLIDS, TOTAL DISSOLVED	40.0	261	MG/L	NONE	160.1	NA	07/01/97	07074257
SOLIDS, TOTAL SUSPENDED	2.0	ND	MG/L	NONE	160.2	NA	07/01/97	07074258
SULFATE	2.5	31.1	MG/L	NONE	300.0	NA	07/02/97	07074254
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	07/02/97	07074259
TOTAL ORGANIC CARBON	1.0	ND	MG/L	NONE	415.1	NA	07/09/97	07104275

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H12JAW71010300 ARDL No: 300579-03
Sampling Loc'n: JAW 71 Received: 06/28/1997
Sampling Date: 06/25/1997 Matrix: WATER
Sampling Time: 0815 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.63	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ANTIMONY	0.020	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ARSENIC	0.00050	0.00096	MG/L	3020	7061	07/01/97	07/02/97	BH2720
ARSENIC, DISSOLVED	0.00050	ND	MG/L	3005	7061	07/01/97	07/02/97	BH2719
BARIUM	0.010	0.078	MG/L	3010	6010A	07/01/97	07/02/97	P2160
BARIUM, DISSOLVED	0.010	0.067	MG/L	3005	6010A	07/02/97	07/02/97	P2159
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CADMIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CALCIUM	0.10	59.1	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CALCIUM, DISSOLVED	0.10	63.4	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CHROMIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
COBALT	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
COPPER	0.010	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
IRON	0.050	1.4	MG/L	3010	6010A	07/01/97	07/02/97	P2160
IRON, DISSOLVED	0.050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
LEAD	0.0010	0.002	MG/L	3020	7421	07/01/97	07/02/97	F2162
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	07/01/97	07/02/97	F2161
MAGNESIUM	0.10	22.2	MG/L	3010	6010A	07/01/97	07/02/97	P2160
MAGNESIUM, DISSOLVED	0.10	24.0	MG/L	3005	6010A	07/02/97	07/02/97	P2159
MANGANESE	0.0050	0.13	MG/L	3010	6010A	07/01/97	07/02/97	P2160
MANGANESE, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
MERCURY	0.00020	ND	MG/L	7470	7470	07/03/97	07/03/97	C0908
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	07/03/97	07/03/97	C0909
NICKEL	0.020	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
POTASSIUM	1.5	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
POTASSIUM, DISSOLVED	1.5	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
SELENIUM	0.00050	0.00052	MG/L	3020	7741	07/01/97	07/02/97	BH2722
SELENIUM, DISSOLVED	0.00050	ND	MG/L	3005	7741	07/01/97	07/02/97	BH2721
SILVER	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H12JAW71010300 ARDL No: 300579-03 (cont'd)
Sampling Loc'n: JAW 71 Received: 06/28/1997
Sampling Date: 06/25/1997 Matrix: WATER
Sampling Time: 0815 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
SODIUM	0.40	23.9	MG/L	3010	6010A	07/01/97	07/02/97	P2160
SODIUM, DISSOLVED	0.40	24.6	MG/L	3005	6010A	07/02/97	07/02/97	P2159
THALLIUM	0.0010	ND	MG/L	3020	7841	07/01/97	07/03/97	F2165
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	07/01/97	07/03/97	F2164
VANADIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ZINC	0.0050	0.08	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ZINC, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ALKALINITY	5.0	242	MG/L	NONE	310.1	NA	07/08/97	07094265
CHLORIDE	1.0	2.8	MG/L	NONE	300.0	NA	07/02/97	0707425
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	07/05/97	07/05/97	07074256
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	07/05/97	07/05/97	07074255
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	07/02/97	07074254
pH	0.10	7.7	PH UNITS	NONE	9040A	NA	07/07/97	07074264
SOLIDS, TOTAL DISSOLVED	40.0	290	MG/L	NONE	160.1	NA	07/01/97	07074257
SOLIDS, TOTAL SUSPENDED	2.0	33.5	MG/L	NONE	160.2	NA	07/01/97	07074258
SULFATE	2.5	34.8	MG/L	NONE	300.0	NA	07/02/97	07074254
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	07/02/97	07074259
TOTAL ORGANIC CARBON	1.0	ND	MG/L	NONE	415.1	NA	07/09/97	07104275

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-12-JAW72-01-03-00 ARDL No: 300576-01
Sampling Loc'n: JAW 72 Received: 06/27/1997
Sampling Date: 06/25/1997 Matrix: WATER
Sampling Time: 1355 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ANTIMONY	0.020	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ARSENIC	0.00050	ND	MG/L	3020	7061	07/01/97	07/02/97	BH2720
ARSENIC, DISSOLVED	0.00050	ND	MG/L	3005	7061	07/01/97	07/02/97	BH2719
BARIUM	0.010	0.069	MG/L	3010	6010A	07/01/97	07/02/97	P2160
BARIUM, DISSOLVED	0.010	0.071	MG/L	3005	6010A	07/02/97	07/02/97	P2159
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CADMIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CALCIUM	0.10	50.6	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CALCIUM, DISSOLVED	0.10	54.6	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CHROMIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
COBALT	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
COPPER	0.010	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
IRON	0.050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
IRON, DISSOLVED	0.050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
LEAD	0.0010	0.0010	MG/L	3020	7421	07/01/97	07/02/97	F2162
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	07/01/97	07/02/97	F2161
MAGNESIUM	0.10	22.5	MG/L	3010	6010A	07/01/97	07/02/97	P2160
MAGNESIUM, DISSOLVED	0.10	24.6	MG/L	3005	6010A	07/02/97	07/02/97	P2159
MANGANESE	0.0050	0.088	MG/L	3010	6010A	07/01/97	07/02/97	P2160
MANGANESE, DISSOLVED	0.0050	0.028	MG/L	3005	6010A	07/02/97	07/02/97	P2159
MERCURY	0.00020	ND	MG/L	7470	7470	06/30/97	06/30/97	C0905
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	06/30/97	06/30/97	C0906
NICKEL	0.020	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
POTASSIUM	1.5	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
POTASSIUM, DISSOLVED	1.5	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
SELENIUM	0.00050	ND	MG/L	3020	7741	07/01/97	07/02/97	BH2722
SELENIUM, DISSOLVED	0.00050	ND	MG/L	3005	7741	07/01/97	07/02/97	BH2721
SILVER	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-12-JAW72-01-03-00 ARDL No: 300576-01 (cont'd)
Sampling Loc'n: JAW 72 Received: 06/27/1997
Sampling Date: 06/25/1997 Matrix: WATER
Sampling Time: 1355 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
SODIUM	0.40	10.6	MG/L	3010	6010A	07/01/97	07/02/97	P2160
SODIUM, DISSOLVED	0.40	12.3	MG/L	3005	6010A	07/02/97	07/02/97	P2159
THALLIUM	0.0010	ND	MG/L	3020	7841	07/01/97	07/03/97	F2165
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	07/01/97	07/03/97	F2164
VANADIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ZINC	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ZINC, DISSOLVED	0.0050	0.011	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ALKALINITY	5.0	211	MG/L	NONE	310.1	NA	07/08/97	07094265
CHLORIDE	1.0	1.9	MG/L	NONE	300.0	NA	07/02/97	0707425
CYANIDE, DISSOLVED	0.010	0.012	MG/L	9012	9012	06/30/97	06/30/97	0703424
CYANIDE, TOTAL	0.010	0.014	MG/L	9012	9012	06/30/97	06/30/97	07034245
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	07/02/97	07074254
pH	0.10	7.2	PH UNITS	NONE	9040A	NA	06/30/97	07034247
SOLIDS, TOTAL DISSOLVED	40.0	245	MG/L	NONE	160.1	NA	06/30/97	07034248
SOLIDS, TOTAL SUSPENDED	2.0	ND	MG/L	NONE	160.2	NA	06/30/97	07034249
SULFATE	2.5	30.2	MG/L	NONE	300.0	NA	07/02/97	07074254
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	06/30/97	07034250
TOTAL ORGANIC CARBON	1.0	1.5	MG/L	NONE	415.1	NA	07/09/97	07104275

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H12JAW73010300 ARDL No: 300579-01
Sampling Loc'n: JAW 73 Received: 06/28/1997
Sampling Date: 06/25/1997 Matrix: WATER
Sampling Time: 1230 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.39	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ANTIMONY	0.020	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ARSENIC	0.00050	ND	MG/L	3020	7061	07/01/97	07/02/97	BH2720
ARSENIC, DISSOLVED	0.00050	ND	MG/L	3005	7061	07/01/97	07/02/97	BH2719
BARIUM	0.010	0.07	MG/L	3010	6010A	07/01/97	07/02/97	P2160
BARIUM, DISSOLVED	0.010	0.063	MG/L	3005	6010A	07/02/97	07/02/97	P2159
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CADMIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CALCIUM	0.10	58.0	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CALCIUM, DISSOLVED	0.10	60.4	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CHROMIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
COBALT	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
COPPER	0.010	0.013	MG/L	3010	6010A	07/01/97	07/02/97	P2160
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
IRON	0.050	0.93	MG/L	3010	6010A	07/01/97	07/02/97	P2160
IRON, DISSOLVED	0.050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
LEAD	0.0010	0.0012	MG/L	3020	7421	07/01/97	07/02/97	F2162
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	07/01/97	07/02/97	F2161
MAGNESIUM	0.10	25.9	MG/L	3010	6010A	07/01/97	07/02/97	P2160
MAGNESIUM, DISSOLVED	0.10	27.0	MG/L	3005	6010A	07/02/97	07/02/97	P2159
MANGANESE	0.0050	0.09	MG/L	3010	6010A	07/01/97	07/02/97	P2160
MANGANESE, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
MERCURY	0.00020	ND	MG/L	7470	7470	07/03/97	07/03/97	C0908
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	07/03/97	07/03/97	C0909
NICKEL	0.020	0.024	MG/L	3010	6010A	07/01/97	07/02/97	P2160
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
POTASSIUM	1.5	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
POTASSIUM, DISSOLVED	1.5	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
SELENIUM	0.00050	ND	MG/L	3020	7741	07/01/97	07/02/97	BH2722
SELENIUM, DISSOLVED	0.00050	ND	MG/L	3005	7741	07/01/97	07/02/97	BH2721
SILVER	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300579 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H12JAW73010300 ARDL No: 300579-01 (cont'd)
Sampling Loc'n: JAW 73 Received: 06/28/1997
Sampling Date: 06/25/1997 Matrix: WATER
Sampling Time: 1230 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
SODIUM	0.40	12.3	MG/L	3010	6010A	07/01/97	07/02/97	P2160
SODIUM, DISSOLVED	0.40	13.1	MG/L	3005	6010A	07/02/97	07/02/97	P2159
THALLIUM	0.0010	ND	MG/L	3020	7841	07/01/97	07/03/97	F2165
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	07/01/97	07/03/97	F2164
VANADIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ZINC	0.0050	0.04	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ZINC, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ALKALINITY	5.0	201	MG/L	NONE	310.1	NA	07/08/97	07094265
CHLORIDE	1.0	20.1	MG/L	NONE	300.0	NA	07/02/97	0707425
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	07/05/97	07/05/97	0707425
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	07/05/97	07/05/97	07074255
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	07/02/97	07074254
pH	0.10	7.5	PH UNITS	NONE	9040A	NA	07/07/97	07074264
SOLIDS, TOTAL DISSOLVED	40.0	284	MG/L	NONE	160.1	NA	07/01/97	07074257
SOLIDS, TOTAL SUSPENDED	2.0	10.1	MG/L	NONE	160.2	NA	07/01/97	07074258
SULFATE	2.5	40.7	MG/L	NONE	300.0	NA	07/02/97	07074254
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	07/02/97	07074259
TOTAL ORGANIC CARBON	1.0	ND	MG/L	NONE	415.1	NA	07/09/97	07104275

APPENDIX L
FIXED LABORATORY ANALYTICAL DATA

L-5 Task 13. Groundwater Data, Downstream Reach, Brush Creek

EXPLOSIVES
(Method 8330)

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300556 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-13-B-01-03-00	ARDL Lab No.:	300556-01
Desc/Location:	MW13B	Lab Filename:	
Sample Date:	06/13/1997	Received Date:	06/14/1997
Sample Time:	1305	Prep. Date:	06/18/1997
Matrix:	WATER	Analysis Date:	06/25/1997
Amount Used:	770 mL	QC Batch:	B2302
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	0.56	J	UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	73%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-13-D-01-03-00	ARDL Lab No.:	300567-05
Desc/Location:	H13-D	Lab Filename:	
Sample Date:	06/20/1997	Received Date:	06/21/1997
Sample Time:	0830	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	06/27/1997
Amount Used:	770 mL	Instrument ID:	
Final Volume:	10 mL	QC Batch:	B2319
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	1.6		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	91%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-13-E-01-03-00	ARDL Lab No.:	300567-04
Desc/Location:	H13-E	Lab Filename:	
Sample Date:	06/20/1997	Received Date:	06/21/1997
Sample Time:	0800	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	06/27/1997
Amount Used:	770 mL	QC Batch:	B2319
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	75%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-13-I-01-03-00	ARDL Lab No.:	300576-08
Desc/Location:	13I	Lab Filename:	
Sample Date:	06/25/1997	Received Date:	06/27/1997
Sample Time:	0824	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	770 mL	QC Batch:	B2344
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	35%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-13-G54-01-03-00	ARDL Lab No.:	300576-17
Desc/Location:	G 54	Lab Filename:	
Sample Date:	06/26/1997	Received Date:	06/27/1997
Sample Time:	0942	Prep. Date:	07/02/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	770 mL	QC Batch:	B2344
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	2.8		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	81%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H13G55010300	ARDL Lab No.:	300576-05
Desc/Location:	WELL G55	Lab Filename:	
Sample Date:	06/24/1997	Received Date:	06/27/1997
Sample Time:	1600	Prep. Date:	07/01/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	770 mL	QC Batch:	B2340
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	0.430	J	UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	2.2		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	85%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

EXPLOSIVES
(Method 8330)

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300556 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-13-B-01-03-00 ARDL No: 300556-01
Sampling Loc'n: MW13B Received: 06/14/1997
Sampling Date: 06/13/1997 Matrix: WATER
Sampling Time: 1305 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
ARSENIC	0.00050	ND	MG/L	3020	7061	06/16/97	06/17/97	BH2708
ARSENIC, DISSOLVED	0.00050	ND	MG/L	3005	7061	06/16/97	06/17/97	BH2707
BARIUM	0.010	0.077	MG/L	3010	6010A	06/16/97	06/18/97	P2126
BARIUM, DISSOLVED	0.010	0.08	MG/L	3005	6010A	06/16/97	06/16/97	P2115
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
CALCIUM	0.10	43.4	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CALCIUM, DISSOLVED	0.10	47.2	MG/L	3005	6010A	06/16/97	06/16/97	P2115
CHROMIUM	0.0050	0.005	MG/L	3010	6010A	06/16/97	06/18/97	P2126
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
COBALT	0.0050	0.0054	MG/L	3010	6010A	06/16/97	06/18/97	P2126
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
COPPER	0.010	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
IRON	0.050	1.7	MG/L	3010	6010A	06/16/97	06/18/97	P2126
IRON, DISSOLVED	0.050	1.5	MG/L	3005	6010A	06/16/97	06/16/97	P2115
LEAD	0.0010	ND	MG/L	3020	7421	06/16/97	06/17/97	F2128
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	06/16/97	06/17/97	F2127
MAGNESIUM	0.10	40.3	MG/L	3010	6010A	06/16/97	06/18/97	P2126
MAGNESIUM, DISSOLVED	0.10	43.9	MG/L	3005	6010A	06/16/97	06/16/97	P2115
MANGANESE	0.0050	0.3	MG/L	3010	6010A	06/16/97	06/18/97	P2126
MANGANESE, DISSOLVED	0.0050	0.31	MG/L	3005	6010A	06/16/97	06/16/97	P2115
MERCURY	0.00020	ND	MG/L	7470	7470	06/16/97	06/16/97	C0894
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	06/16/97	06/16/97	C0895
NICKEL	0.020	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
POTASSIUM	1.5	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
POTASSIUM, DISSOLVED	1.5	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
SELENIUM	0.00050	ND	MG/L	3020	7741	06/16/97	06/17/97	BH2710
SELENIUM, DISSOLVED	0.00050	ND	MG/L	3005	7741	06/16/97	06/17/97	BH2709
SILVER	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300556 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-13-B-01-03-00 ARDL No: 300556-01 (cont'd)
Sampling Loc'n: MW13B Received: 06/14/1997
Sampling Date: 06/13/1997 Matrix: WATER
Sampling Time: 1305 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
SODIUM	0.40	6.1	MG/L	3010	6010A	06/16/97	06/18/97	P2126
SODIUM, DISSOLVED	0.40	6.3	MG/L	3005	6010A	06/16/97	06/16/97	P2115
THALLIUM	0.0010	ND	MG/L	3020	7841	06/16/97	06/17/97	F2130
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	06/16/97	06/17/97	F2129
VANADIUM	0.0050	ND	MG/L	3010	6010A	06/16/97	06/18/97	P2126
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/16/97	06/16/97	P2115
ZINC	0.0050	0.028	MG/L	3010	6010A	06/16/97	06/18/97	P2126
ZINC, DISSOLVED	0.0050	0.058	MG/L	3005	6010A	06/16/97	06/16/97	P2115
ALKALINITY	5.0	297	MG/L	NONE	310.1	NA	06/16/97	06184188
CHLORIDE	1.0	1.1	MG/L	NONE	300.0	NA	06/16/97	06194[illegible]
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	06/16/97	06/16/97	06244213
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/16/97	06/16/97	06244212
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	06/16/97	06194197
pH	0.10	7.8	PH UNITS	NONE	9040A	NA	06/16/97	06234208
SOLIDS, TOTAL DISSOLVED	40.0	284	MG/L	NONE	160.1	NA	06/16/97	06234209
SOLIDS, TOTAL SUSPENDED	2.0	5.4	MG/L	NONE	160.2	NA	06/16/97	06174183
SULFATE	2.5	6.1	MG/L	NONE	300.0	NA	06/16/97	06194197
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	06/16/97	06234210
TOTAL ORGANIC CARBON	1.0	1.0	MG/L	NONE	415.1	NA	06/19/97	06234207

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/02/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-13-D-01-03-00 ARDL No: 300567-05
Sampling Loc'n: H13-D Received: 06/21/1997
Sampling Date: 06/20/1997 Matrix: WATER
Sampling Time: 0830 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.083	MG/L	3010	6010A	06/23/97	06/25/97	P2144
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ARSENIC	0.00050	0.0044	MG/L	3020	7061	06/23/97	06/24/97	BH2716
ARSENIC, DISSOLVED	0.00050	0.0036	MG/L	3005	7061	06/23/97	06/24/97	BH2715
BARIUM	0.010	0.64	MG/L	3010	6010A	06/23/97	06/25/97	P2144
BARIUM, DISSOLVED	0.010	0.67	MG/L	3005	6010A	06/23/97	06/23/97	P2142
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
CALCIUM	0.10	117	MG/L	3010	6010A	06/23/97	06/25/97	P2144
CALCIUM, DISSOLVED	0.10	125	MG/L	3005	6010A	06/23/97	06/23/97	P2142
CHROMIUM	0.0050	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
COBALT	0.0050	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
COPPER	0.010	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
IRON	0.050	0.91	MG/L	3010	6010A	06/23/97	06/25/97	P2144
IRON, DISSOLVED	0.050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
LEAD	0.0010	ND	MG/L	3020	7421	06/23/97	06/24/97	F2146
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	06/23/97	06/24/97	F2145
MAGNESIUM	0.10	47.8	MG/L	3010	6010A	06/23/97	06/25/97	P2144
MAGNESIUM, DISSOLVED	0.10	52.1	MG/L	3005	6010A	06/23/97	06/23/97	P2142
MANGANESE	0.0050	0.1	MG/L	3010	6010A	06/23/97	06/25/97	P2144
MANGANESE, DISSOLVED	0.0050	0.098	MG/L	3005	6010A	06/23/97	06/23/97	P2142
MERCURY	0.00020	ND	MG/L	7470	7470	06/23/97	06/23/97	C0900
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	06/23/97	06/23/97	C0901
NICKEL	0.020	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
POTASSIUM	1.5	3.8	MG/L	3010	6010A	06/23/97	06/25/97	P2144
POTASSIUM, DISSOLVED	1.5	4.5	MG/L	3005	6010A	06/23/97	06/23/97	P2142
SELENIUM	0.00050	ND	MG/L	3020	7741	06/23/97	06/24/97	BH2718
SELENIUM, DISSOLVED	0.00050	ND	MG/L	3005	7741	06/23/97	06/24/97	BH2717
SILVER	0.0050	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144

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Rt. 15E, Mt. Vernon Airport Industrial Park
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Lab Report No: 300567 Report Date: 07/02/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-13-D-01-03-00 ARDL No: 300567-05 (cont'd)
Sampling Loc'n: H13-D Received: 06/21/1997
Sampling Date: 06/20/1997 Matrix: WATER
Sampling Time: 0830 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
SODIUM	0.40	45.8	MG/L	3010	6010A	06/23/97	06/25/97	P2144
SODIUM, DISSOLVED	0.40	50.7	MG/L	3005	6010A	06/23/97	06/23/97	P2142
THALLIUM	0.0010	ND	MG/L	3020	7841	06/23/97	06/24/97	F2148
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	06/23/97	06/23/97	F2147
VANADIUM	0.0050	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ZINC	0.0050	0.0073	MG/L	3010	6010A	06/23/97	06/25/97	P2144
ZINC, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ALKALINITY	5.0	521	MG/L	NONE	310.1	NA	06/26/97	06274233
CHLORIDE	1.0	4.4	MG/L	NONE	300.0	NA	06/25/97	0630424
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	06/26/97	06/26/97	0630424
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/26/97	06/26/97	06304239
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	06/25/97	06304241
pH	0.10	7.9	PH UNITS	NONE	9040A	NA	06/23/97	06274234
SOLIDS, TOTAL DISSOLVED	40.0	611	MG/L	NONE	160.1	NA	06/23/97	06274236
SOLIDS, TOTAL SUSPENDED	2.0	11.0	MG/L	NONE	160.2	NA	06/23/97	06274235
SULFATE	12.5	87.3	MG/L	NONE	300.0	NA	06/25/97	06304241
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	06/23/97	06274237
TOTAL ORGANIC CARBON	1.0	3.1	MG/L	NONE	415.1	NA	06/26/97	06274232

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Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/02/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-13-E-01-03-00 ARDL No: 300567-04
Sampling Loc'n: H13-E Received: 06/21/1997
Sampling Date: 06/20/1997 Matrix: WATER
Sampling Time: 0800 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.051	MG/L	3010	6010A	06/23/97	06/25/97	P2144
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ARSENIC	0.00050	ND	MG/L	3020	7061	06/23/97	06/24/97	BH2716
ARSENIC, DISSOLVED	0.00050	0.00053	MG/L	3005	7061	06/23/97	06/24/97	BH2715
BARIUM	0.010	0.059	MG/L	3010	6010A	06/23/97	06/25/97	P2144
BARIUM, DISSOLVED	0.010	0.06	MG/L	3005	6010A	06/23/97	06/23/97	P2142
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
CALCIUM	0.10	250	MG/L	3010	6010A	06/23/97	06/25/97	P2144
CALCIUM, DISSOLVED	0.10	259	MG/L	3005	6010A	06/23/97	06/23/97	P2142
CHROMIUM	0.0050	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
COBALT	0.0050	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
COPPER	0.010	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
IRON	0.050	1.2	MG/L	3010	6010A	06/23/97	06/25/97	P2144
IRON, DISSOLVED	0.050	0.89	MG/L	3005	6010A	06/23/97	06/23/97	P2142
LEAD	0.0010	ND	MG/L	3020	7421	06/23/97	06/24/97	F2146
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	06/23/97	06/24/97	F2145
MAGNESIUM	0.10	93.5	MG/L	3010	6010A	06/23/97	06/25/97	P2144
MAGNESIUM, DISSOLVED	0.10	98.6	MG/L	3005	6010A	06/23/97	06/23/97	P2142
MANGANESE	0.0050	0.25	MG/L	3010	6010A	06/23/97	06/25/97	P2144
MANGANESE, DISSOLVED	0.0050	0.27	MG/L	3005	6010A	06/23/97	06/23/97	P2142
MERCURY	0.00020	ND	MG/L	7470	7470	06/23/97	06/23/97	C0900
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	06/23/97	06/23/97	C0901
NICKEL	0.020	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
POTASSIUM	1.5	2	MG/L	3010	6010A	06/23/97	06/25/97	P2144
POTASSIUM, DISSOLVED	1.5	2.4	MG/L	3005	6010A	06/23/97	06/23/97	P2142
SELENIUM	0.00050	ND	MG/L	3020	7741	06/23/97	06/24/97	BH2718
SELENIUM, DISSOLVED	0.00050	ND	MG/L	3005	7741	06/23/97	06/24/97	BH2717
SILVER	0.0050	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144

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Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/02/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-13-E-01-03-00 ARDL No: 300567-04 (cont'd)
Sampling Loc'n: H13-E Received: 06/21/1997
Sampling Date: 06/20/1997 Matrix: WATER
Sampling Time: 0800 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
SODIUM	0.40	22.0	MG/L	3010	6010A	06/23/97	06/25/97	P2144
SODIUM, DISSOLVED	0.40	23.5	MG/L	3005	6010A	06/23/97	06/23/97	P2142
THALLIUM	0.0010	ND	MG/L	3020	7841	06/23/97	06/24/97	F2148
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	06/23/97	06/23/97	F2147
VANADIUM	0.0050	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ZINC	0.0050	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
ZINC, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ALKALINITY	5.0	581	MG/L	NONE	310.1	NA	06/26/97	06274233
CHLORIDE	1.0	4.5	MG/L	NONE	300.0	NA	06/25/97	06304241
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	06/26/97	06/26/97	06304240
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/26/97	06/26/97	06304239
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	06/25/97	06304241
pH	0.10	7.4	PH UNITS	NONE	9040A	NA	06/23/97	06274234
SOLIDS, TOTAL DISSOLVED	40.0	1300	MG/L	NONE	160.1	NA	06/23/97	06274236
SOLIDS, TOTAL SUSPENDED	2.0	7.1	MG/L	NONE	160.2	NA	06/23/97	06274235
SULFATE	62.5	486	MG/L	NONE	300.0	NA	06/25/97	06304241
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	06/23/97	06274237
TOTAL ORGANIC CARBON	1.0	1.3	MG/L	NONE	415.1	NA	06/26/97	06274232

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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-13-F-01-03-00 ARDL No: 300576-02
Sampling Loc'n: 13F Received: 06/27/1997
Sampling Date: 06/24/1997 Matrix: WATER
Sampling Time: 1245 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	7	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ANTIMONY	0.020	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ARSENIC	0.00050	0.0056	MG/L	3020	7061	07/01/97	07/02/97	BH2720
ARSENIC, DISSOLVED	0.00050	0.0012	MG/L	3005	7061	07/01/97	07/02/97	BH2719
BARIUM	0.010	0.39	MG/L	3010	6010A	07/01/97	07/02/97	P2160
BARIUM, DISSOLVED	0.010	0.35	MG/L	3005	6010A	07/02/97	07/02/97	P2159
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CADMIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CALCIUM	0.10	111	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CALCIUM, DISSOLVED	0.10	112	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CHROMIUM	0.0050	0.024	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
COBALT	0.0050	0.0091	MG/L	3010	6010A	07/01/97	07/02/97	P2160
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
COPPER	0.010	0.02	MG/L	3010	6010A	07/01/97	07/02/97	P2160
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
IRON	0.050	20.7	MG/L	3010	6010A	07/01/97	07/02/97	P2160
IRON, DISSOLVED	0.050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
LEAD	0.0010	0.0074	MG/L	3020	7421	07/01/97	07/02/97	F2162
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	07/01/97	07/02/97	F2161
MAGNESIUM	0.10	42.0	MG/L	3010	6010A	07/01/97	07/02/97	P2160
MAGNESIUM, DISSOLVED	0.10	42.1	MG/L	3005	6010A	07/02/97	07/02/97	P2159
MANGANESE	0.0050	0.35	MG/L	3010	6010A	07/01/97	07/02/97	P2160
MANGANESE, DISSOLVED	0.0050	0.14	MG/L	3005	6010A	07/02/97	07/02/97	P2159
MERCURY	0.00020	ND	MG/L	7470	7470	06/30/97	06/30/97	C0905
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	06/30/97	06/30/97	C0906
NICKEL	0.020	0.026	MG/L	3010	6010A	07/01/97	07/02/97	P2160
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
POTASSIUM	1.5	3.1	MG/L	3010	6010A	07/01/97	07/02/97	P2160
POTASSIUM, DISSOLVED	1.5	2.4	MG/L	3005	6010A	07/02/97	07/02/97	P2159
SELENIUM	0.00050	0.00053	MG/L	3020	7741	07/01/97	07/02/97	BH2722
SELENIUM, DISSOLVED	0.00050	ND	MG/L	3005	7741	07/01/97	07/02/97	BH2721
SILVER	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160

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Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-13-F-01-03-00 ARDL No: 300576-02 (cont'd)
Sampling Loc'n: 13F Received: 06/27/1997
Sampling Date: 06/24/1997 Matrix: WATER
Sampling Time: 1245 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
SODIUM	0.40	24.6	MG/L	3010	6010A	07/01/97	07/02/97	P2160
SODIUM, DISSOLVED	0.40	26.7	MG/L	3005	6010A	07/02/97	07/02/97	P2159
THALLIUM	0.0010	ND	MG/L	3020	7841	07/01/97	07/03/97	F2165
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	07/01/97	07/03/97	F2164
VANADIUM	0.0050	0.032	MG/L	3010	6010A	07/01/97	07/02/97	P2160
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ZINC	0.0050	0.06	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ZINC, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ALKALINITY	5.0	453	MG/L	NONE	310.1	NA	07/08/97	07094265
CHLORIDE	1.0	3.4	MG/L	NONE	300.0	NA	07/02/97	0707425
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	06/30/97	06/30/97	07034246
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/30/97	06/30/97	07034245
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	07/02/97	07074254
pH	0.10	7.1	PH UNITS	NONE	9040A	NA	06/30/97	07034247
SOLIDS, TOTAL DISSOLVED	40.0	520	MG/L	NONE	160.1	NA	06/30/97	07034248
SOLIDS, TOTAL SUSPENDED	5.0	180	MG/L	NONE	160.2	NA	06/30/97	07034249
SULFATE	2.5	45.8	MG/L	NONE	300.0	NA	07/02/97	07074254
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	06/30/97	07034250
TOTAL ORGANIC CARBON	1.0	4.6	MG/L	NONE	415.1	NA	07/09/97	07104275

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Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-13-I-01-03-00 ARDL No: 300576-08
Sampling Loc'n: 13I Received: 06/27/1997
Sampling Date: 06/25/1997 Matrix: WATER
Sampling Time: 0824 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ANTIMONY	0.020	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ARSENIC	0.00050	0.00096	MG/L	3020	7061	07/01/97	07/02/97	BH2720
ARSENIC, DISSOLVED	0.00050	0.00065	MG/L	3005	7061	07/01/97	07/02/97	BH2719
BARIUM	0.010	0.13	MG/L	3010	6010A	07/01/97	07/02/97	P2160
BARIUM, DISSOLVED	0.010	0.12	MG/L	3005	6010A	07/02/97	07/02/97	P2159
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CADMIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CALCIUM	0.10	74.1	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CALCIUM, DISSOLVED	0.10	79.5	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CHROMIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
COBALT	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
COPPER	0.010	0.013	MG/L	3010	6010A	07/01/97	07/02/97	P2160
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
IRON	0.050	0.24	MG/L	3010	6010A	07/01/97	07/02/97	P2160
IRON, DISSOLVED	0.050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
LEAD	0.0010	0.0012	MG/L	3020	7421	07/01/97	07/02/97	F2162
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	07/01/97	07/02/97	F2161
MAGNESIUM	0.10	41.7	MG/L	3010	6010A	07/01/97	07/02/97	P2160
MAGNESIUM, DISSOLVED	0.10	45.6	MG/L	3005	6010A	07/02/97	07/02/97	P2159
MANGANESE	0.0050	0.12	MG/L	3010	6010A	07/01/97	07/02/97	P2160
MANGANESE, DISSOLVED	0.0050	0.008	MG/L	3005	6010A	07/02/97	07/02/97	P2159
MERCURY	0.00020	ND	MG/L	7470	7470	06/30/97	06/30/97	C0905
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	06/30/97	06/30/97	C0906
NICKEL	0.020	0.021	MG/L	3010	6010A	07/01/97	07/02/97	P2160
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
POTASSIUM	1.5	1.7	MG/L	3010	6010A	07/01/97	07/02/97	P2160
POTASSIUM, DISSOLVED	1.5	1.5	MG/L	3005	6010A	07/02/97	07/02/97	P2159
SELENIUM	0.00050	ND	MG/L	3020	7741	07/01/97	07/02/97	BH2722
SELENIUM, DISSOLVED	0.00050	0.00079	MG/L	3005	7741	07/01/97	07/02/97	BH2721
SILVER	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-13-I-01-03-00 ARDL No: 300576-08 (cont'd)
Sampling Loc'n: 13I Received: 06/27/1997
Sampling Date: 06/25/1997 Matrix: WATER
Sampling Time: 0824 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
SODIUM	0.40	14.7	MG/L	3010	6010A	07/01/97	07/02/97	P2160
SODIUM, DISSOLVED	0.40	15.6	MG/L	3005	6010A	07/02/97	07/02/97	P2159
THALLIUM	0.0010	ND	MG/L	3020	7841	07/01/97	07/03/97	F2165
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	07/01/97	07/03/97	F2164
VANADIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ZINC	0.0050	0.087	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ZINC, DISSOLVED	0.0050	0.0088	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ALKALINITY	5.0	373	MG/L	NONE	310.1	NA	07/08/97	07094265
CHLORIDE	1.0	5.6	MG/L	NONE	300.0	NA	07/02/97	070[illegible]
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	06/30/97	06/30/97	070[illegible]46
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/30/97	06/30/97	07034245
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	07/02/97	07074254
pH	0.10	7.4	PH UNITS	NONE	9040A	NA	06/30/97	07034247
SOLIDS, TOTAL DISSOLVED	40.0	368	MG/L	NONE	160.1	NA	06/30/97	07034248
SOLIDS, TOTAL SUSPENDED	2.0	ND	MG/L	NONE	160.2	NA	06/30/97	07034249
SULFATE	2.5	22.3	MG/L	NONE	300.0	NA	07/02/97	07074254
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	06/30/97	07034250
TOTAL ORGANIC CARBON	1.0	1.0	MG/L	NONE	415.1	NA	07/09/97	07104275

ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-13-G54-01-03-00 ARDL No: 300576-17
Sampling Loc'n: G 54 Received: 06/27/1997
Sampling Date: 06/26/1997 Matrix: WATER
Sampling Time: 0942 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ANTIMONY	0.020	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ARSENIC	0.00050	0.001	MG/L	3020	7061	07/01/97	07/02/97	BH2720
ARSENIC, DISSOLVED	0.00050	0.00062	MG/L	3005	7061	07/01/97	07/02/97	BH2719
BARIUM	0.010	0.13	MG/L	3010	6010A	07/01/97	07/02/97	P2160
BARIUM, DISSOLVED	0.010	0.12	MG/L	3005	6010A	07/02/97	07/02/97	P2159
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CADMIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CALCIUM	0.10	74.5	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CALCIUM, DISSOLVED	0.10	80.1	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CHROMIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
COBALT	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
COPPER	0.010	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
IRON	0.050	0.19	MG/L	3010	6010A	07/01/97	07/02/97	P2160
IRON, DISSOLVED	0.050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
LEAD	0.0010	0.0022	MG/L	3020	7421	07/01/97	07/02/97	F2162
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	07/01/97	07/02/97	F2161
MAGNESIUM	0.10	41.6	MG/L	3010	6010A	07/01/97	07/02/97	P2160
MAGNESIUM, DISSOLVED	0.10	45.9	MG/L	3005	6010A	07/02/97	07/02/97	P2159
MANGANESE	0.0050	0.13	MG/L	3010	6010A	07/01/97	07/02/97	P2160
MANGANESE, DISSOLVED	0.0050	0.0092	MG/L	3005	6010A	07/02/97	07/02/97	P2159
MERCURY	0.00020	ND	MG/L	7470	7470	06/30/97	06/30/97	C0905
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	06/30/97	06/30/97	C0906
NICKEL	0.020	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
POTASSIUM	1.5	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
POTASSIUM, DISSOLVED	1.5	1.5	MG/L	3005	6010A	07/02/97	07/02/97	P2159
SELENIUM	0.00050	ND	MG/L	3020	7741	07/01/97	07/02/97	BH2722
SELENIUM, DISSOLVED	0.00050	ND	MG/L	3005	7741	07/01/97	07/02/97	BH2721
SILVER	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-13-G54-01-03-00 ARDL No: 300576-17 (cont'd)
Sampling Loc'n: G 54 Received: 06/27/1997
Sampling Date: 06/26/1997 Matrix: WATER
Sampling Time: 0942 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
SODIUM	0.40	14.2	MG/L	3010	6010A	07/01/97	07/02/97	P2160
SODIUM, DISSOLVED	0.40	15.7	MG/L	3005	6010A	07/02/97	07/02/97	P2159
THALLIUM	0.0010	ND	MG/L	3020	7841	07/01/97	07/03/97	F2165
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	07/01/97	07/03/97	F2164
VANADIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ZINC	0.0050	0.035	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ZINC, DISSOLVED	0.0050	0.01	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ALKALINITY	5.0	373	MG/L	NONE	310.1	NA	07/08/97	07094265
CHLORIDE	1.0	5.6	MG/L	NONE	300.0	NA	07/02/97	070742
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	06/30/97	06/30/97	07034246
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/30/97	06/30/97	07034245
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	07/02/97	07074254
pH	0.10	7.4	PH UNITS	NONE	9040A	NA	06/30/97	07034247
SOLIDS, TOTAL DISSOLVED	40.0	385	MG/L	NONE	160.1	NA	06/30/97	07034248
SOLIDS, TOTAL SUSPENDED	1.0	1.9	MG/L	NONE	160.2	NA	06/30/97	07034249
SULFATE	2.5	22.3	MG/L	NONE	300.0	NA	07/02/97	07074254
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	06/30/97	07034250
TOTAL ORGANIC CARBON	1.0	ND	MG/L	NONE	415.1	NA	07/09/97	07104275

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H13G55010300 ARDL No: 300576-05
Sampling Loc'n: WELL G55 Received: 06/27/1997
Sampling Date: 06/24/1997 Matrix: WATER
Sampling Time: 1600 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.052	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ANTIMONY	0.020	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ARSENIC	0.00050	0.0015	MG/L	3020	7061	07/01/97	07/02/97	BH2720
ARSENIC, DISSOLVED	0.00050	0.00068	MG/L	3005	7061	07/01/97	07/02/97	BH2719
BARIUM	0.010	0.047	MG/L	3010	6010A	07/01/97	07/02/97	P2160
BARIUM, DISSOLVED	0.010	0.04	MG/L	3005	6010A	07/02/97	07/02/97	P2159
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CADMIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CALCIUM	0.10	270	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CALCIUM, DISSOLVED	0.10	225	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CHROMIUM	0.0050	0.0084	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
COBALT	0.0050	0.011	MG/L	3010	6010A	07/01/97	07/02/97	P2160
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
COPPER	0.010	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
IRON	0.050	1.4	MG/L	3010	6010A	07/01/97	07/02/97	P2160
IRON, DISSOLVED	0.050	0.28	MG/L	3005	6010A	07/02/97	07/02/97	P2159
LEAD	0.0010	ND	MG/L	3020	7421	07/01/97	07/02/97	F2162
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	07/01/97	07/02/97	F2161
MAGNESIUM	0.10	94.2	MG/L	3010	6010A	07/01/97	07/02/97	P2160
MAGNESIUM, DISSOLVED	0.10	76.7	MG/L	3005	6010A	07/02/97	07/02/97	P2159
MANGANESE	0.0050	3.7	MG/L	3010	6010A	07/01/97	07/02/97	P2160
MANGANESE, DISSOLVED	0.0050	1.3	MG/L	3005	6010A	07/02/97	07/02/97	P2159
MERCURY	0.00020	ND	MG/L	7470	7470	06/30/97	06/30/97	C0905
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	06/30/97	06/30/97	C0906
NICKEL	0.020	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
POTASSIUM	1.5	3.3	MG/L	3010	6010A	07/01/97	07/02/97	P2160
POTASSIUM, DISSOLVED	1.5	1.8	MG/L	3005	6010A	07/02/97	07/02/97	P2159
SELENIUM	0.00050	ND	MG/L	3020	7741	07/01/97	07/02/97	BH2722
SELENIUM, DISSOLVED	0.00050	ND	MG/L	3005	7741	07/01/97	07/02/97	BH2721
SILVER	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H13G55010300 ARDL No: 300576-05 (cont'd)
Sampling Loc'n: WELL G55 Received: 06/27/1997
Sampling Date: 06/24/1997 Matrix: WATER
Sampling Time: 1600 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
SODIUM	0.40	34.4	MG/L	3010	6010A	07/01/97	07/02/97	P2160
SODIUM, DISSOLVED	0.40	28.5	MG/L	3005	6010A	07/02/97	07/02/97	P2159
THALLIUM	0.0010	ND	MG/L	3020	7841	07/01/97	07/03/97	F2165
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	07/01/97	07/03/97	F2164
VANADIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ZINC	0.0050	0.013	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ZINC, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ALKALINITY	5.0	508	MG/L	NONE	310.1	NA	07/08/97	07094265
CHLORIDE	1.0	8.4	MG/L	NONE	300.0	NA	07/02/97	0707425
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	06/30/97	06/30/97	07034246
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/30/97	06/30/97	07034245
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	07/02/97	07074254
pH	0.10	6.7	PH UNITS	NONE	9040A	NA	06/30/97	07034247
SOLIDS, TOTAL DISSOLVED	40.0	1710	MG/L	NONE	160.1	NA	06/30/97	07034248
SOLIDS, TOTAL SUSPENDED	2.0	12.8	MG/L	NONE	160.2	NA	06/30/97	07034249
SULFATE	125	401	MG/L	NONE	300.0	NA	07/02/97	07074254
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	06/30/97	07034250
TOTAL ORGANIC CARBON	1.0	ND	MG/L	NONE	415.1	NA	07/09/97	07104275

APPENDIX L
FIXED LABORATORY ANALYTICAL DATA

L-6 Task 16. Additional Groundwater Data, Line 3

VOLATILE ORGANIC COMPOUNDS
(Method 8260)

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/02/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-16-A-01-03-00	ARDL Lab No.:	300567-03
Desc/Location:	H16-A	Lab Filename:	
Sample Date:	06/19/1997	Received Date:	06/21/1997
Sample Time:	1650	Prep. Date:	06/27/1997
Matrix:	WATER	Analysis Date:	06/27/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0630TJP1
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	0.47	1.0	ND		UG/L	1
CHLOROMETHANE	0.41	1.0	ND		UG/L	1
VINYL CHLORIDE	0.32	1.0	ND		UG/L	1
BROMOMETHANE	0.12	1.0	ND		UG/L	1
CHLOROETHANE	0.33	1.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	0.28	1.0	ND		UG/L	1
1,1-DICHLOROETHENE	0.27	1.0	ND		UG/L	1
METHYLENE CHLORIDE	0.27	2.0	6.7	B	UG/L	1
trans-1,2-DICHLOROETHENE	0.33	1.0	ND		UG/L	1
1,1-DICHLOROETHANE	0.20	1.0	ND		UG/L	1
2,2-DICHLOROPROPANE	0.30	1.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.20	1.0	ND		UG/L	1
BROMOCHLOROMETHANE	0.32	1.0	ND		UG/L	1
CHLOROFORM	0.30	1.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.23	1.0	ND		UG/L	1
1,1-DICHLOROPROPENE	0.32	1.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.29	1.0	ND		UG/L	1
BENZENE	0.17	1.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.17	1.0	ND		UG/L	1
TRICHLOROETHENE	0.18	1.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.21	1.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.25	1.0	ND		UG/L	1
DIBROMOMETHANE	0.30	1.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.24	1.0	ND		UG/L	1
TOLUENE	0.32	1.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.25	1.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	0.35	1.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.31	1.0	ND		UG/L	1
TETRACHLOROETHENE	0.32	1.0	ND		UG/L	1
1,3-DICHLOROPROPANE	0.45	1.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	0.36	1.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/02/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-16-A-01-03-00	ARDL Lab No.:	300567-03 (cont'd)
Desc/Location:	H16-A	Lab Filename:	
Sample Date:	06/19/1997	Received Date:	06/21/1997
Sample Time:	1650	Prep. Date:	06/27/1997
Matrix:	WATER	Analysis Date:	06/27/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0630TJP1
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.24	1.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	0.34	1.0	ND		UG/L	1
ETHYLBENZENE	0.29	1.0	ND		UG/L	1
m & p-XYLENE	0.69	1.0	ND		UG/L	1
o-XYLENE	0.37	1.0	ND		UG/L	1
STYRENE	0.34	1.0	ND		UG/L	1
2-HEXANONE	2.1	10.0	ND		UG/L	1
BROMOFORM	0.48	1.0	ND		UG/L	1
ISOPROPYLBENZENE	0.40	1.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	0.57	1.0	ND		UG/L	1
BROMOBENZENE	0.39	1.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	0.28	1.0	ND		UG/L	1
n-PROPYLBENZENE	0.35	1.0	ND		UG/L	1
2-CHLOROTOLUENE	0.37	1.0	ND		UG/L	1
4-CHLOROTOLUENE	0.38	1.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	0.39	1.0	ND		UG/L	1
tert-BUTYLBENZENE	0.36	1.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	0.41	1.0	ND		UG/L	1
sec-BUTYLBENZENE	0.34	1.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	0.30	1.0	ND		UG/L	1
1,3-DICHLOROBENZENE	0.46	1.0	ND		UG/L	1
1,4-DICHLOROBENZENE	0.43	1.0	ND		UG/L	1
1,2-DICHLOROBENZENE	0.48	1.0	ND		UG/L	1
n-BUTYLBENZENE	0.31	1.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	0.65	2.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.51	1.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.34	1.0	ND		UG/L	1
NAPHTHALENE	0.45	1.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	0.56	1.0	ND		UG/L	1
ACETONE	8.4	20.0	ND		UG/L	1
2-BUTANONE	4.8	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/02/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-16-A-01-03-00	ARDL Lab No.:	300567-03 (cont'd)
Desc/Location:	H16-A	Lab Filename:	
Sample Date:	06/19/1997	Received Date:	06/21/1997
Sample Time:	1650	Prep. Date:	06/27/1997
Matrix:	WATER	Analysis Date:	06/27/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0630TJP1
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
4-METHYL-2-PENTANONE	1.7	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	72-120	109%
DIBROMOFLUOROMETHANE	79-128	101%
1,2-DICHLOROETHANE-D4	77-124	97%
TOLUENE-D8	86-116	106%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-16-A-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300567 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300567-03

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: >K5190

Level: (low/med) LOW Date Received: 6/21/97

% Moisture: not dec. --- Date Analyzed: 6/27/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300560 Report Date: 06/27/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-16-B-01-03-00	ARDL Lab No.:	300560-01
Desc/Location:	H16B	Lab Filename:	
Sample Date:	06/16/1997	Received Date:	06/18/1997
Sample Time:	1730	Prep. Date:	06/26/1997
Matrix:	WATER	Analysis Date:	06/26/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0627TJP8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	0.47	1.0	ND		UG/L	1
CHLOROMETHANE	0.41	1.0	ND		UG/L	1
VINYL CHLORIDE	0.32	1.0	ND		UG/L	1
BROMOMETHANE	0.12	1.0	ND		UG/L	1
CHLOROETHANE	0.33	1.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	0.28	1.0	ND		UG/L	1
1,1-DICHLOROETHENE	0.27	1.0	ND		UG/L	1
METHYLENE CHLORIDE	0.27	2.0	ND		UG/L	1
trans-1,2-DICHLOROETHENE	0.33	1.0	ND		UG/L	1
1,1-DICHLOROETHANE	0.20	1.0	ND		UG/L	1
2,2-DICHLOROPROPANE	0.30	1.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.20	1.0	ND		UG/L	1
BROMOCHLOROMETHANE	0.32	1.0	ND		UG/L	1
CHLOROFORM	0.30	1.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.23	1.0	ND		UG/L	1
1,1-DICHLOROPROPENE	0.32	1.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.29	1.0	ND		UG/L	1
BENZENE	0.17	1.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.17	1.0	ND		UG/L	1
TRICHLOROETHENE	0.18	1.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.21	1.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.25	1.0	ND		UG/L	1
DIBROMOMETHANE	0.30	1.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.24	1.0	ND		UG/L	1
TOLUENE	0.32	1.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.25	1.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	0.35	1.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.31	1.0	ND		UG/L	1
TETRACHLOROETHENE	0.32	1.0	ND		UG/L	1
1,3-DICHLOROPROPANE	0.45	1.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	0.36	1.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300560 Report Date: 06/27/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-16-B-01-03-00	ARDL Lab No.:	300560-01 (cont'd)
Desc/Location:	H16B	Lab Filename:	
Sample Date:	06/16/1997	Received Date:	06/18/1997
Sample Time:	1730	Prep. Date:	06/26/1997
Matrix:	WATER	Analysis Date:	06/26/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0627TJP8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.24	1.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	0.34	1.0	ND		UG/L	1
ETHYLBENZENE	0.29	1.0	ND		UG/L	1
m & p-XYLENE	0.69	1.0	ND		UG/L	1
o-XYLENE	0.37	1.0	ND		UG/L	1
STYRENE	0.34	1.0	ND		UG/L	1
2-HEXANONE	2.1	10.0	ND		UG/L	1
BROMOFORM	0.48	1.0	ND		UG/L	1
ISOPROPYLBENZENE	0.40	1.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	0.57	1.0	ND		UG/L	1
BROMOBENZENE	0.39	1.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	0.28	1.0	ND		UG/L	1
n-PROPYLBENZENE	0.35	1.0	ND		UG/L	1
2-CHLOROTOLUENE	0.37	1.0	ND		UG/L	1
4-CHLOROTOLUENE	0.38	1.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	0.39	1.0	ND		UG/L	1
tert-BUTYLBENZENE	0.36	1.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	0.41	1.0	ND		UG/L	1
sec-BUTYLBENZENE	0.34	1.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	0.30	1.0	ND		UG/L	1
1,3-DICHLOROBENZENE	0.46	1.0	ND		UG/L	1
1,4-DICHLOROBENZENE	0.43	1.0	ND		UG/L	1
1,2-DICHLOROBENZENE	0.48	1.0	ND		UG/L	1
n-BUTYLBENZENE	0.31	1.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	0.65	2.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.51	1.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.34	1.0	ND		UG/L	1
NAPHTHALENE	0.45	1.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	0.56	1.0	ND		UG/L	1
ACETONE	8.4	20.0	ND		UG/L	1
2-BUTANONE	4.8	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300560 Report Date: 06/27/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-16-B-01-03-00	ARDL Lab No.:	300560-01 (cont'd)
Desc/Location:	H16B	Lab Filename:	
Sample Date:	06/16/1997	Received Date:	06/18/1997
Sample Time:	1730	Prep. Date:	06/26/1997
Matrix:	WATER	Analysis Date:	06/26/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0627TJP8
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
4-METHYL-2-PENTANONE	1.7	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	72-120	107%
DIBROMOFLUOROMETHANE	79-128	94%
1,2-DICHLOROETHANE-D4	77-124	84%
TOLUENE-D8	86-116	103%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-16-B-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300560 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300560-01

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: >K5160

Level: (low/med) LOW Date Received: 6/18/97

% Moisture: not dec. --- Date Analyzed: 6/26/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300563 Report Date: 06/27/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-16-C-01-03-00	ARDL Lab No.:	300563-03
Desc/Location:	H16C	Lab Filename:	
Sample Date:	06/17/1997	Received Date:	06/19/1997
Sample Time:	1225	Prep. Date:	06/26/1997
Matrix:	WATER	Analysis Date:	06/26/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0627LS5
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	0.47	1.0	ND		UG/L	1
CHLOROMETHANE	0.41	1.0	ND		UG/L	1
VINYL CHLORIDE	0.32	1.0	ND		UG/L	1
BROMOMETHANE	0.12	1.0	ND		UG/L	1
CHLOROETHANE	0.33	1.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	0.28	1.0	ND		UG/L	1
1,1-DICHLOROETHENE	0.27	1.0	ND		UG/L	1
METHYLENE CHLORIDE	0.27	2.0	ND		UG/L	1
trans-1,2-DICHLOROETHENE	0.33	1.0	ND		UG/L	1
1,1-DICHLOROETHANE	0.20	1.0	ND		UG/L	1
2,2-DICHLOROPROPANE	0.30	1.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.20	1.0	ND		UG/L	1
BROMOCHLOROMETHANE	0.32	1.0	ND		UG/L	1
CHLOROFORM	0.30	1.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.23	1.0	ND		UG/L	1
1,1-DICHLOROPROPENE	0.32	1.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.29	1.0	ND		UG/L	1
BENZENE	0.17	1.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.17	1.0	ND		UG/L	1
TRICHLOROETHENE	0.18	1.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.21	1.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.25	1.0	ND		UG/L	1
DIBROMOMETHANE	0.30	1.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.24	1.0	ND		UG/L	1
TOLUENE	0.32	1.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.25	1.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	0.35	1.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.31	1.0	ND		UG/L	1
TETRACHLOROETHENE	0.32	1.0	ND		UG/L	1
1,3-DICHLOROPROPANE	0.45	1.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	0.36	1.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300563 Report Date: 06/27/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-16-C-01-03-00	ARDL Lab No.:	300563-03 (cont'd)
Desc/Location:	H16C	Lab Filename:	
Sample Date:	06/17/1997	Received Date:	06/19/1997
Sample Time:	1225	Prep. Date:	06/26/1997
Matrix:	WATER	Analysis Date:	06/26/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0627LS5
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.24	1.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	0.34	1.0	ND		UG/L	1
ETHYLBENZENE	0.29	1.0	ND		UG/L	1
m & p-XYLENE	0.69	1.0	ND		UG/L	1
o-XYLENE	0.37	1.0	ND		UG/L	1
STYRENE	0.34	1.0	ND		UG/L	1
2-HEXANONE	2.1	10.0	ND		UG/L	1
BROMOFORM	0.48	1.0	ND		UG/L	1
ISOPROPYLBENZENE	0.40	1.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	0.57	1.0	ND		UG/L	1
BROMOBENZENE	0.39	1.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	0.28	1.0	ND		UG/L	1
n-PROPYLBENZENE	0.35	1.0	ND		UG/L	1
2-CHLOROTOLUENE	0.37	1.0	ND		UG/L	1
4-CHLOROTOLUENE	0.38	1.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	0.39	1.0	ND		UG/L	1
tert-BUTYLBENZENE	0.36	1.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	0.41	1.0	ND		UG/L	1
sec-BUTYLBENZENE	0.34	1.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	0.30	1.0	ND		UG/L	1
1,3-DICHLOROBENZENE	0.46	1.0	ND		UG/L	1
1,4-DICHLOROBENZENE	0.43	1.0	ND		UG/L	1
1,2-DICHLOROBENZENE	0.48	1.0	ND		UG/L	1
n-BUTYLBENZENE	0.31	1.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	0.65	2.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.51	1.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.34	1.0	ND		UG/L	1
NAPHTHALENE	0.45	1.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	0.56	1.0	ND		UG/L	1
ACETONE	8.4	20.0	ND		UG/L	1
2-BUTANONE	4.8	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300563 Report Date: 06/27/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-16-C-01-03-00	ARDL Lab No.:	300563-03 (cont'd)
Desc/Location:	H16C	Lab Filename:	
Sample Date:	06/17/1997	Received Date:	06/19/1997
Sample Time:	1225	Prep. Date:	06/26/1997
Matrix:	WATER	Analysis Date:	06/26/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0627LS5
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
4-METHYL-2-PENTANONE	1.7	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	72-120	112%
DIBROMOFLUOROMETHANE	79-128	105%
1,2-DICHLOROETHANE-D4	77-124	105%
TOLUENE-D8	86-116	105%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-16-C-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300563 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300563-03

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: >K5172

Level: (low/med) LOW Date Received: 6/19/97

% Moisture: not dec. --- Date Analyzed: 6/26/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	76131	Ethane, 1,1,2-trichloro-1,2,2-trifluoro-	3.69	22.	JNB
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300563 Report Date: 06/27/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-16-D-01-03-00	ARDL Lab No.:	300563-01
Desc/Location:	H16D	Lab Filename:	
Sample Date:	06/17/1997	Received Date:	06/19/1997
Sample Time:	1715	Prep. Date:	06/26/1997
Matrix:	WATER	Analysis Date:	06/26/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0627LS5
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	0.47	1.0	ND		UG/L	1
CHLOROMETHANE	0.41	1.0	ND		UG/L	1
VINYL CHLORIDE	0.32	1.0	ND		UG/L	1
BROMOMETHANE	0.12	1.0	ND		UG/L	1
CHLOROETHANE	0.33	1.0	ND		UG/L	I
TRICHLOROFLUOROMETHANE	0.28	1.0	ND		UG/L	1
1,1-DICHLOROETHENE	0.27	1.0	ND		UG/L	1
METHYLENE CHLORIDE	0.27	2.0	ND		UG/L	1
trans-1,2-DICHLOROETHENE	0.33	1.0	ND		UG/L	1
1,1-DICHLOROETHANE	0.20	1.0	ND		UG/L	1
2,2-DICHLOROPROPANE	0.30	1.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.20	1.0	ND		UG/L	1
BROMOCHLOROMETHANE	0.32	1.0	ND		UG/L	1
CHLOROFORM	0.30	1.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.23	1.0	ND		UG/L	1
1,1-DICHLOROPROPENE	0.32	1.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.29	1.0	ND		UG/L	1
BENZENE	0.17	1.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.17	1.0	ND		UG/L	1
TRICHLOROETHENE	0.18	1.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.21	1.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.25	1.0	ND		UG/L	1
DIBROMOMETHANE	0.30	1.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.24	1.0	ND		UG/L	1
TOLUENE	0.32	1.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.25	1.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	0.35	1.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.31	1.0	ND		UG/L	1
TETRACHLOROETHENE	0.32	1.0	ND		UG/L	1
1,3-DICHLOROPROPANE	0.45	1.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	0.36	1.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300563 Report Date: 06/27/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-16-D-01-03-00	ARDL Lab No.:	300563-01 (cont'd)
Desc/Location:	H16D	Lab Filename:	
Sample Date:	06/17/1997	Received Date:	06/19/1997
Sample Time:	1715	Prep. Date:	06/26/1997
Matrix:	WATER	Analysis Date:	06/26/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0627LS5
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.24	1.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	0.34	1.0	ND		UG/L	1
ETHYLBENZENE	0.29	1.0	ND		UG/L	1
m & p-XYLENE	0.69	1.0	ND		UG/L	1
o-XYLENE	0.37	1.0	ND		UG/L	1
STYRENE	0.34	1.0	ND		UG/L	1
2-HEXANONE	2.1	10.0	ND		UG/L	1
BROMOFORM	0.48	1.0	ND		UG/L	1
ISOPROPYLBENZENE	0.40	1.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	0.57	1.0	ND		UG/L	1
BROMOBENZENE	0.39	1.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	0.28	1.0	ND		UG/L	1
n-PROPYLBENZENE	0.35	1.0	ND		UG/L	1
2-CHLOROTOLUENE	0.37	1.0	ND		UG/L	1
4-CHLOROTOLUENE	0.38	1.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	0.39	1.0	ND		UG/L	1
tert-BUTYLBENZENE	0.36	1.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	0.41	1.0	ND		UG/L	1
sec-BUTYLBENZENE	0.34	1.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	0.30	1.0	ND		UG/L	1
1,3-DICHLOROBENZENE	0.46	1.0	ND		UG/L	1
1,4-DICHLOROBENZENE	0.43	1.0	ND		UG/L	1
1,2-DICHLOROBENZENE	0.48	1.0	ND		UG/L	1
n-BUTYLBENZENE	0.31	1.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	0.65	2.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.51	1.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.34	1.0	ND		UG/L	1
NAPHTHALENE	0.45	1.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	0.56	1.0	ND		UG/L	1
ACETONE	8.4	20.0	ND		UG/L	1
2-BUTANONE	4.8	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300563 Report Date: 06/27/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-16-D-01-03-00	ARDL Lab No.:	300563-01 (cont'd)
Desc/Location:	H16D	Lab Filename:	
Sample Date:	06/17/1997	Received Date:	06/19/1997
Sample Time:	1715	Prep. Date:	06/26/1997
Matrix:	WATER	Analysis Date:	06/26/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0627LS5
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
4-METHYL-2-PENTANONE	1.7	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	72-120	93%
DIBROMOFLUOROMETHANE	79-128	93%
1,2-DICHLOROETHANE-D4	77-124	95%
TOLUENE-D8	86-116	91%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-16-D-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300563 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300563-01

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: >K5170

Level: (low/med) LOW Date Received: 6/19/97

% Moisture: not dec. --- Date Analyzed: 6/26/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 76131	Ethane, 1,1,2-trichloro-1,2,2-trifluoro-	3.68	15.	JNB
2.				
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/02/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-16-E-01-03-00	ARDL Lab No.:	300567-01
Desc/Location:	16-E TASK 16	Lab Filename:	
Sample Date:	06/19/1997	Received Date:	06/21/1997
Sample Time:	1445	Prep. Date:	06/26/1997
Matrix:	WATER	Analysis Date:	06/26/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0630TJP9
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	0.47	1.0	ND		UG/L	1
CHLOROMETHANE	0.41	1.0	ND		UG/L	1
VINYL CHLORIDE	0.32	1.0	ND		UG/L	1
BROMOMETHANE	0.12	1.0	ND		UG/L	1
CHLOROETHANE	0.33	1.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	0.28	1.0	ND		UG/L	1
1,1-DICHLOROETHENE	0.27	1.0	ND		UG/L	1
METHYLENE CHLORIDE	0.27	2.0	0.58	JB	UG/L	1
trans-1,2-DICHLOROETHENE	0.33	1.0	ND		UG/L	1
1,1-DICHLOROETHANE	0.20	1.0	ND		UG/L	1
2,2-DICHLOROPROPANE	0.30	1.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.20	1.0	ND		UG/L	1
BROMOCHLOROMETHANE	0.32	1.0	ND		UG/L	1
CHLOROFORM	0.30	1.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.23	1.0	ND		UG/L	1
1,1-DICHLOROPROPENE	0.32	1.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.29	1.0	ND		UG/L	1
BENZENE	0.17	1.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.17	1.0	ND		UG/L	1
TRICHLOROETHENE	0.18	1.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.21	1.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.25	1.0	ND		UG/L	1
DIBROMOMETHANE	0.30	1.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.24	1.0	ND		UG/L	1
TOLUENE	0.32	1.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.25	1.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	0.35	1.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.31	1.0	ND		UG/L	1
TETRACHLOROETHENE	0.32	1.0	ND		UG/L	1
1,3-DICHLOROPROPANE	0.45	1.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	0.36	1.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/02/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-16-E-01-03-00	ARDL Lab No.:	300567-01 (cont'd)
Desc/Location:	16-E TASK 16	Lab Filename:	
Sample Date:	06/19/1997	Received Date:	06/21/1997
Sample Time:	1445	Prep. Date:	06/26/1997
Matrix:	WATER	Analysis Date:	06/26/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0630TJP9
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.24	1.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	0.34	1.0	ND		UG/L	1
ETHYLBENZENE	0.29	1.0	ND		UG/L	1
m & p-XYLENE	0.69	1.0	ND		UG/L	1
o-XYLENE	0.37	1.0	ND		UG/L	1
STYRENE	0.34	1.0	ND		UG/L	1
2-HEXANONE	2.1	10.0	ND		UG/L	1
BROMOFORM	0.48	1.0	ND		UG/L	1
ISOPROPYLBENZENE	0.40	1.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	0.57	1.0	ND		UG/L	1
BROMOBENZENE	0.39	1.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	0.28	1.0	ND		UG/L	1
n-PROPYLBENZENE	0.35	1.0	ND		UG/L	1
2-CHLOROTOLUENE	0.37	1.0	ND		UG/L	1
4-CHLOROTOLUENE	0.38	1.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	0.39	1.0	ND		UG/L	1
tert-BUTYLBENZENE	0.36	1.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	0.41	1.0	ND		UG/L	1
sec-BUTYLBENZENE	0.34	1.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	0.30	1.0	ND		UG/L	1
1,3-DICHLOROBENZENE	0.46	1.0	ND		UG/L	1
1,4-DICHLOROBENZENE	0.43	1.0	ND		UG/L	1
1,2-DICHLOROBENZENE	0.48	1.0	ND		UG/L	1
n-BUTYLBENZENE	0.31	1.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	0.65	2.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.51	1.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.34	1.0	ND		UG/L	1
NAPHTHALENE	0.45	1.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	0.56	1.0	ND		UG/L	1
ACETONE	8.4	20.0	ND		UG/L	1
2-BUTANONE	4.8	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/02/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-16-E-01-03-00	ARDL Lab No.:	300567-01 (cont'd)
Desc/Location:	16-E TASK 16	Lab Filename:	
Sample Date:	06/19/1997	Received Date:	06/21/1997
Sample Time:	1445	Prep. Date:	06/26/1997
Matrix:	WATER	Analysis Date:	06/26/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0630TJP9
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
4-METHYL-2-PENTANONE	1.7	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	72-120	108%
DIBROMOFLUOROMETHANE	79-128	102%
1,2-DICHLOROETHANE-D4	77-124	105%
TOLUENE-D8	86-116	105%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-16-E-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300567 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300567-01

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: >K5174

Level: (low/med) LOW Date Received: 6/21/97

% Moisture: not dec. --- Date Analyzed: 6/26/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 76131	Ethane, 1,1,2-trichloro- 1,2,2-trifluoro-	3.69	22.	JNB
2.				
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/02/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-16-I-01-03-00	ARDL Lab No.:	300567-02
Desc/Location:	H16-I	Lab Filename:	
Sample Date:	06/19/1997	Received Date:	06/21/1997
Sample Time:	2005	Prep. Date:	06/26/1997
Matrix:	WATER	Analysis Date:	06/26/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0630TJP9
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	0.47	1.0	ND		UG/L	1
CHLOROMETHANE	0.41	1.0	ND		UG/L	1
VINYL CHLORIDE	0.32	1.0	ND		UG/L	1
BROMOMETHANE	0.12	1.0	ND		UG/L	1
CHLOROETHANE	0.33	1.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	0.28	1.0	ND		UG/L	1
1,1-DICHLOROETHENE	0.27	1.0	ND		UG/L	1
METHYLENE CHLORIDE	0.27	2.0	1.4	JB	UG/L	1
trans-1,2-DICHLOROETHENE	0.33	1.0	ND		UG/L	1
1,1-DICHLOROETHANE	0.20	1.0	ND		UG/L	1
2,2-DICHLOROPROPANE	0.30	1.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.20	1.0	ND		UG/L	1
BROMOCHLOROMETHANE	0.32	1.0	ND		UG/L	1
CHLOROFORM	0.30	1.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.23	1.0	ND		UG/L	1
1,1-DICHLOROPROPENE	0.32	1.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.29	1.0	ND		UG/L	1
BENZENE	0.17	1.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.17	1.0	ND		UG/L	1
TRICHLOROETHENE	0.18	1.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.21	1.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.25	1.0	ND		UG/L	1
DIBROMOMETHANE	0.30	1.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.24	1.0	ND		UG/L	1
TOLUENE	0.32	1.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.25	1.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	0.35	1.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.31	1.0	ND		UG/L	1
TETRACHLOROETHENE	0.32	1.0	ND		UG/L	1
1,3-DICHLOROPROPANE	0.45	1.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	0.36	1.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/02/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-16-I-01-03-00	ARDL Lab No.:	300567-02 (cont'd)
Desc/Location:	H16-I	Lab Filename:	
Sample Date:	06/19/1997	Received Date:	06/21/1997
Sample Time:	2005	Prep. Date:	06/26/1997
Matrix:	WATER	Analysis Date:	06/26/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0630TJP9
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.24	1.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	0.34	1.0	ND		UG/L	1
ETHYLBENZENE	0.29	1.0	ND		UG/L	1
m & p-XYLENE	0.69	1.0	ND		UG/L	1
o-XYLENE	0.37	1.0	ND		UG/L	1
STYRENE	0.34	1.0	ND		UG/L	1
2-HEXANONE	2.1	10.0	ND		UG/L	1
BROMOFORM	0.48	1.0	ND		UG/L	1
ISOPROPYLBENZENE	0.40	1.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	0.57	1.0	ND		UG/L	1
BROMOBENZENE	0.39	1.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	0.28	1.0	ND		UG/L	1
n-PROPYLBENZENE	0.35	1.0	ND		UG/L	1
2-CHLOROTOLUENE	0.37	1.0	ND		UG/L	1
4-CHLOROTOLUENE	0.38	1.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	0.39	1.0	ND		UG/L	1
tert-BUTYLBENZENE	0.36	1.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	0.41	1.0	ND		UG/L	1
sec-BUTYLBENZENE	0.34	1.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	0.30	1.0	ND		UG/L	1
1,3-DICHLOROBENZENE	0.46	1.0	ND		UG/L	1
1,4-DICHLOROBENZENE	0.43	1.0	ND		UG/L	1
1,2-DICHLOROBENZENE	0.48	1.0	ND		UG/L	1
n-BUTYLBENZENE	0.31	1.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	0.65	2.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.51	1.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.34	1.0	ND		UG/L	1
NAPHTHALENE	0.45	1.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	0.56	1.0	ND		UG/L	1
ACETONE	8.4	20.0	ND		UG/L	1
2-BUTANONE	4.8	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/02/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H-16-I-01-03-00	ARDL Lab No.:	300567-02 (cont'd)
Desc/Location:	H16-I	Lab Filename:	
Sample Date:	06/19/1997	Received Date:	06/21/1997
Sample Time:	2005	Prep. Date:	06/26/1997
Matrix:	WATER	Analysis Date:	06/26/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0630TJP9
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
4-METHYL-2-PENTANONE	1.7	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	72-120	105%
DIBROMOFLUOROMETHANE	79-128	101%
1,2-DICHLOROETHANE-D4	77-124	103%
TOLUENE-D8	86-116	103%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-16-I-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300567 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300567-02

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: >K5175

Level: (low/med) LOW Date Received: 6/21/97

% Moisture: not dec. --- Date Analyzed: 6/26/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 76131	Ethane, 1,1,2-trichloro- 1,2,2-trifluoro-	3.67	17.	JNB
2.				
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H16JAW53010300	ARDL Lab No.:	300576-03
Desc/Location:	WELL JAW 53	Lab Filename:	
Sample Date:	06/24/1997	Received Date:	06/27/1997
Sample Time:	1010	Prep. Date:	07/03/1997
Matrix:	WATER	Analysis Date:	07/03/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0708TJP6
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	0.47	1.0	ND		UG/L	1
CHLOROMETHANE	0.41	1.0	ND		UG/L	1
VINYL CHLORIDE	0.32	1.0	ND		UG/L	1
BROMOMETHANE	0.12	1.0	ND		UG/L	1
CHLOROETHANE	0.33	1.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	0.28	1.0	ND		UG/L	1
1,1-DICHLOROETHENE	0.27	1.0	ND		UG/L	1
METHYLENE CHLORIDE	0.27	2.0	7.4		UG/L	1
trans-1,2-DICHLOROETHENE	0.33	1.0	ND		UG/L	1
1,1-DICHLOROETHANE	0.20	1.0	ND		UG/L	1
2,2-DICHLOROPROPANE	0.30	1.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.20	1.0	ND		UG/L	1
BROMOCHLOROMETHANE	0.32	1.0	ND		UG/L	1
CHLOROFORM	0.30	1.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.23	1.0	ND		UG/L	1
1,1-DICHLOROPROPENE	0.32	1.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.29	1.0	ND		UG/L	1
BENZENE	0.17	1.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.17	1.0	ND		UG/L	1
TRICHLOROETHENE	0.18	1.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.21	1.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.25	1.0	ND		UG/L	1
DIBROMOMETHANE	0.30	1.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.24	1.0	ND		UG/L	1
TOLUENE	0.32	1.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.25	1.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	0.35	1.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.31	1.0	ND		UG/L	1
TETRACHLOROETHENE	0.32	1.0	ND		UG/L	1
1,3-DICHLOROPROPANE	0.45	1.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	0.36	1.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H16JAW53010300	ARDL Lab No.:	300576-03 (cont'd)
Desc/Location:	WELL JAW 53	Lab Filename:	
Sample Date:	06/24/1997	Received Date:	06/27/1997
Sample Time:	1010	Prep. Date:	07/03/1997
Matrix:	WATER	Analysis Date:	07/03/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0708TJP6
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.24	1.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	0.34	1.0	ND		UG/L	1
ETHYLBENZENE	0.29	1.0	ND		UG/L	1
m & p-XYLENE	0.69	1.0	ND		UG/L	1
o-XYLENE	0.37	1.0	ND		UG/L	1
STYRENE	0.34	1.0	ND		UG/L	1
2-HEXANONE	2.1	10.0	ND		UG/L	1
BROMOFORM	0.48	1.0	ND		UG/L	1
ISOPROPYLBENZENE	0.40	1.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	0.57	1.0	ND		UG/L	1
BROMOBENZENE	0.39	1.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	0.28	1.0	ND		UG/L	1
n-PROPYLBENZENE	0.35	1.0	ND		UG/L	1
2-CHLOROTOLUENE	0.37	1.0	ND		UG/L	1
4-CHLOROTOLUENE	0.38	1.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	0.39	1.0	ND		UG/L	1
tert-BUTYLBENZENE	0.36	1.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	0.41	1.0	ND		UG/L	1
sec-BUTYLBENZENE	0.34	1.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	0.30	1.0	ND		UG/L	1
1,3-DICHLOROBENZENE	0.46	1.0	ND		UG/L	1
1,4-DICHLOROBENZENE	0.43	1.0	ND		UG/L	1
1,2-DICHLOROBENZENE	0.48	1.0	ND		UG/L	1
n-BUTYLBENZENE	0.31	1.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	0.65	2.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.51	1.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.34	1.0	ND		UG/L	1
NAPHTHALENE	0.45	1.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	0.56	1.0	ND		UG/L	1
ACETONE	8.4	20.0	ND		UG/L	1
2-BUTANONE	4.8	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H16JAW53010300	ARDL Lab No.:	300576-03 (cont'd)
Desc/Location:	WELL JAW 53	Lab Filename:	
Sample Date:	06/24/1997	Received Date:	06/27/1997
Sample Time:	1010	Prep. Date:	07/03/1997
Matrix:	WATER	Analysis Date:	07/03/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0708TJP6
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
4-METHYL-2-PENTANONE	1.7	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	72-120	105%
DIBROMOFLUOROMETHANE	79-128	103%
1,2-DICHLOROETHANE-D4	77-124	92%
TOLUENE-D8	86-116	109%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H16JAW53010300

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300576 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300576-03

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: >G3023

Level: (low/med) LOW Date Received: 6/27/97

% Moisture: not dec. --- Date Analyzed: 7/03/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 76131	Ethane, 1,1,2-trichloro- 1,2,2-trifluoro-	3.59	26.	JN
2.				
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H16JAW54010300	ARDL Lab No.:	300576-04
Desc/Location:	WELL JAW 54	Lab Filename:	
Sample Date:	06/24/1997	Received Date:	06/27/1997
Sample Time:	1155	Prep. Date:	07/03/1997
Matrix:	WATER	Analysis Date:	07/03/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0708TJP6
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	0.47	1.0	ND		UG/L	1
CHLOROMETHANE	0.41	1.0	ND		UG/L	1
VINYL CHLORIDE	0.32	1.0	ND		UG/L	1
BROMOMETHANE	0.12	1.0	ND		UG/L	1
CHLOROETHANE	0.33	1.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	0.28	1.0	ND		UG/L	1
1,1-DICHLOROETHENE	0.27	1.0	ND		UG/L	1
METHYLENE CHLORIDE	0.27	2.0	8.1		UG/L	1
trans-1,2-DICHLOROETHENE	0.33	1.0	ND		UG/L	1
1,1-DICHLOROETHANE	0.20	1.0	ND		UG/L	1
2,2-DICHLOROPROPANE	0.30	1.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.20	1.0	ND		UG/L	1
BROMOCHLOROMETHANE	0.32	1.0	ND		UG/L	1
CHLOROFORM	0.30	1.0	1.9		UG/L	1
1,1,1-TRICHLOROETHANE	0.23	1.0	ND		UG/L	1
1,1-DICHLOROPROPENE	0.32	1.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.29	1.0	ND		UG/L	1
BENZENE	0.17	1.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.17	1.0	ND		UG/L	1
TRICHLOROETHENE	0.18	1.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.21	1.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.25	1.0	ND		UG/L	1
DIBROMOMETHANE	0.30	1.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.24	1.0	ND		UG/L	1
TOLUENE	0.32	1.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.25	1.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	0.35	1.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.31	1.0	ND		UG/L	1
TETRACHLOROETHENE	0.32	1.0	ND		UG/L	1
1,3-DICHLOROPROPANE	0.45	1.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	0.36	1.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H16JAW54010300	ARDL Lab No.:	300576-04 (cont'd)
Desc/Location:	WELL JAW 54	Lab Filename:	
Sample Date:	06/24/1997	Received Date:	06/27/1997
Sample Time:	1155	Prep. Date:	07/03/1997
Matrix:	WATER	Analysis Date:	07/03/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0708TJP6
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.24	1.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	0.34	1.0	ND		UG/L	1
ETHYLBENZENE	0.29	1.0	ND		UG/L	1
m & p-XYLENE	0.69	1.0	ND		UG/L	1
o-XYLENE	0.37	1.0	ND		UG/L	1
STYRENE	0.34	1.0	ND		UG/L	1
2-HEXANONE	2.1	10.0	ND		UG/L	1
BROMOFORM	0.48	1.0	ND		UG/L	1
ISOPROPYLBENZENE	0.40	1.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	0.57	1.0	ND		UG/L	1
BROMOBENZENE	0.39	1.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	0.28	1.0	ND		UG/L	1
n-PROPYLBENZENE	0.35	1.0	ND		UG/L	1
2-CHLOROTOLUENE	0.37	1.0	ND		UG/L	1
4-CHLOROTOLUENE	0.38	1.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	0.39	1.0	ND		UG/L	1
tert-BUTYLBENZENE	0.36	1.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	0.41	1.0	ND		UG/L	1
sec-BUTYLBENZENE	0.34	1.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	0.30	1.0	ND		UG/L	1
1,3-DICHLOROBENZENE	0.46	1.0	ND		UG/L	1
1,4-DICHLOROBENZENE	0.43	1.0	ND		UG/L	1
1,2-DICHLOROBENZENE	0.48	1.0	ND		UG/L	1
n-BUTYLBENZENE	0.31	1.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	0.65	2.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.51	1.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.34	1.0	ND		UG/L	1
NAPHTHALENE	0.45	1.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	0.56	1.0	ND		UG/L	1
ACETONE	8.4	20.0	ND		UG/L	1
2-BUTANONE	4.8	20.0	ND		UG/L	1

1205

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H16JAW54010300	ARDL Lab No.:	300576-04 (cont'd)
Desc/Location:	WELL JAW 54	Lab Filename:	
Sample Date:	06/24/1997	Received Date:	06/27/1997
Sample Time:	1155	Prep. Date:	07/03/1997
Matrix:	WATER	Analysis Date:	07/03/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0708TJP6
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
4-METHYL-2-PENTANONE	1.7	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	72-120	114%
DIBROMOFLUOROMETHANE	79-128	114%
1,2-DICHLOROETHANE-D4	77-124	108%
TOLUENE-D8	86-116	112%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H16JAW54010300

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300576 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300576-04

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: >G3024

Level: (low/med) LOW Date Received: 6/27/97

% Moisture: not dec. --- Date Analyzed: 7/03/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	76131	Ethane, 1,1,2-trichloro- 1,2,2-trifluoro-	3.62	27.	JN
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H16JAW55010300	ARDL Lab No.:	300576-06
Desc/Location:	WELL G55	Lab Filename:	
Sample Date:	06/24/1997	Received Date:	06/27/1997
Sample Time:	1445	Prep. Date:	07/03/1997
Matrix:	WATER	Analysis Date:	07/03/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0708TJP6
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
DICHLORODIFLUOROMETHANE	0.47	1.0	ND		UG/L	1
CHLOROMETHANE	0.41	1.0	ND		UG/L	1
VINYL CHLORIDE	0.32	1.0	ND		UG/L	1
BROMOMETHANE	0.12	1.0	ND		UG/L	1
CHLOROETHANE	0.33	1.0	ND		UG/L	1
TRICHLOROFLUOROMETHANE	0.28	1.0	ND		UG/L	1
1,1-DICHLOROETHENE	0.27	1.0	ND		UG/L	1
METHYLENE CHLORIDE	0.27	2.0	0.41	J	UG/L	1
trans-1,2-DICHLOROETHENE	0.33	1.0	ND		UG/L	1
1,1-DICHLOROETHANE	0.20	1.0	ND		UG/L	1
2,2-DICHLOROPROPANE	0.30	1.0	ND		UG/L	1
cis-1,2-DICHLOROETHENE	0.20	1.0	ND		UG/L	1
BROMOCHLOROMETHANE	0.32	1.0	ND		UG/L	1
CHLOROFORM	0.30	1.0	ND		UG/L	1
1,1,1-TRICHLOROETHANE	0.23	1.0	ND		UG/L	1
1,1-DICHLOROPROPENE	0.32	1.0	ND		UG/L	1
CARBON TETRACHLORIDE	0.29	1.0	ND		UG/L	1
BENZENE	0.17	1.0	ND		UG/L	1
1,2-DICHLOROETHANE	0.17	1.0	ND		UG/L	1
TRICHLOROETHENE	0.18	1.0	ND		UG/L	1
1,2-DICHLOROPROPANE	0.21	1.0	ND		UG/L	1
BROMODICHLOROMETHANE	0.25	1.0	ND		UG/L	1
DIBROMOMETHANE	0.30	1.0	ND		UG/L	1
cis-1,3-DICHLOROPROPENE	0.24	1.0	ND		UG/L	1
TOLUENE	0.32	1.0	ND		UG/L	1
trans-1,3-DICHLOROPROPENE	0.25	1.0	ND		UG/L	1
1,1,2-TRICHLOROETHANE	0.35	1.0	ND		UG/L	1
1,2-DIBROMOETHANE	0.31	1.0	ND		UG/L	1
TETRACHLOROETHENE	0.32	1.0	ND		UG/L	1
1,3-DICHLOROPROPANE	0.45	1.0	ND		UG/L	1
DIBROMOCHLOROMETHANE	0.36	1.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H16JAW55010300	ARDL Lab No.:	300576-06 (cont'd)
Desc/Location:	WELL G55	Lab Filename:	
Sample Date:	06/24/1997	Received Date:	06/27/1997
Sample Time:	1445	Prep. Date:	07/03/1997
Matrix:	WATER	Analysis Date:	07/03/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0708TJP6
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
CHLOROBENZENE	0.24	1.0	ND		UG/L	1
1,1,1,2-TETRACHLOROETHANE	0.34	1.0	ND		UG/L	1
ETHYLBENZENE	0.29	1.0	ND		UG/L	1
m & p-XYLENE	0.69	1.0	ND		UG/L	1
o-XYLENE	0.37	1.0	ND		UG/L	1
STYRENE	0.34	1.0	ND		UG/L	1
2-HEXANONE	2.1	10.0	ND		UG/L	1
BROMOFORM	0.48	1.0	ND		UG/L	1
ISOPROPYLBENZENE	0.40	1.0	ND		UG/L	1
1,1,2,2-TETRACHLOROETHANE	0.57	1.0	ND		UG/L	1
BROMOBENZENE	0.39	1.0	ND		UG/L	1
1,2,3-TRICHLOROPROPANE	0.28	1.0	ND		UG/L	1
n-PROPYLBENZENE	0.35	1.0	ND		UG/L	1
2-CHLOROTOLUENE	0.37	1.0	ND		UG/L	1
4-CHLOROTOLUENE	0.38	1.0	ND		UG/L	1
1,3,5-TRIMETHYLBENZENE	0.39	1.0	ND		UG/L	1
tert-BUTYLBENZENE	0.36	1.0	ND		UG/L	1
1,2,4-TRIMETHYLBENZENE	0.41	1.0	ND		UG/L	1
sec-BUTYLBENZENE	0.34	1.0	ND		UG/L	1
p-ISOPROPYLTOLUENE	0.30	1.0	ND		UG/L	1
1,3-DICHLOROBENZENE	0.46	1.0	ND		UG/L	1
1,4-DICHLOROBENZENE	0.43	1.0	ND		UG/L	1
1,2-DICHLOROBENZENE	0.48	1.0	ND		UG/L	1
n-BUTYLBENZENE	0.31	1.0	ND		UG/L	1
1,2-DIBROMO-3-CHLOROPROPANE	0.65	2.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.51	1.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.34	1.0	ND		UG/L	1
NAPHTHALENE	0.45	1.0	ND		UG/L	1
1,2,3-TRICHLOROBENZENE	0.56	1.0	ND		UG/L	1
ACETONE	8.4	20.0	ND		UG/L	1
2-BUTANONE	4.8	20.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: VOLATILES, GC/MS (8260) (25 mL)
Project No.: 5644V Analytical Method: 8260A
Prep Method: 5030A

Field ID:	H16JAW55010300	ARDL Lab No.:	300576-06 (cont'd)
Desc/Location:	WELL G55	Lab Filename:	
Sample Date:	06/24/1997	Received Date:	06/27/1997
Sample Time:	1445	Prep. Date:	07/03/1997
Matrix:	WATER	Analysis Date:	07/03/1997
Amount Used:	25 mL	Instrument ID:	
Final Volume:	25 mL	QC Batch:	0708TJP6
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
4-METHYL-2-PENTANONE	1.7	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
4-BROMOFLUOROBENZENE	72-120	103%
DIBROMOFLUOROMETHANE	79-128	108%
1,2-DICHLOROETHANE-D4	77-124	103%
TOLUENE-D8	86-116	104%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
H16JAW55010300

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300576 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300576-06

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: >G3025

Level: (low/med) LOW Date Received: 6/27/97

% Moisture: not dec. --- Date Analyzed: 7/03/97

Column:(pack/cap) CAP Dilution Factor: 1.0

Soil extract Volume: --- (uL) Soil Aliquot Volume: --- (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 76131	Ethane, 1,1,2-trichloro-1,2,2-trifluoro-	3.69	2.	JN
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SEMI-VOLATILE ORGANIC COMPOUNDS
(Method 8270)

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-16-A-01-03-00	ARDL Lab No.:	300567-03
Desc/Location:	H16-A	Lab Filename:	
Sample Date:	06/19/1997	Received Date:	06/21/1997
Sample Time:	1650	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	06/30/1997
Amount Used:	1000 mL	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-16-A-01-03-00	ARDL Lab No.:	300567-03 (cont'd)
Desc/Location:	H16-A	Lab Filename:	
Sample Date:	06/19/1997	Received Date:	06/21/1997
Sample Time:	1650	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	06/30/1997
Amount Used:	1000 mL	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	3.3	J	UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	10.9		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-16-A-01-03-00	ARDL Lab No.:	300567-03 (cont'd)
Desc/Location:	H16-A	Lab Filename:	
Sample Date:	06/19/1997	Received Date:	06/21/1997
Sample Time:	1650	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	06/30/1997
Amount Used:	1000 mL	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	74%
2-FLUOROPHENOL	21-110	33%
D5 NITROBENZENE	35-114	73%
2,4,6-TRIBROMOPHENOL	10-123	73%
D5 PHENOL	10-94	26%
D14 TERPHENYL	33-141	72%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-16-A-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300567 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300567-03

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1577

Level: (low/med) LOW Date Received: 6/21/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/24/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/30/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.6

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	7.83	9.	JB
2.	Unknown	8.43	7.	JB
3.	Unknown	9.84	5.	J
4.	Unknown	16.97	14.	J
5.	Unknown	17.82	8.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: SW3510

Field ID:	H-06-F-01-04-00	ARDL Lab No.:	300567-06
Desc/Location:	6-F TASK 6	Lab Filename:	
Sample Date:	06/18/1997	Received Date:	06/21/1997
Sample Time:	1422	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2320
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300560 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-16-B-01-03-00	ARDL Lab No.:	300560-01
Desc/Location:	H16B	Lab Filename:	
Sample Date:	06/16/1997	Received Date:	06/18/1997
Sample Time:	1730	Prep. Date:	06/20/1997
Matrix:	WATER	Analysis Date:	06/23/1997
Amount Used:	1000 mL	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2293
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300560 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-16-B-01-03-00	ARDL Lab No.:	300560-01 (cont'd)
Desc/Location:	H16B	Lab Filename:	
Sample Date:	06/16/1997	Received Date:	06/18/1997
Sample Time:	1730	Prep. Date:	06/20/1997
Matrix:	WATER	Analysis Date:	06/23/1997
Amount Used:	1000 mL	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2293
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300560 Report Date: 06/24/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-16-B-01-03-00	ARDL Lab No.:	300560-01 (cont'd)
Desc/Location:	H16B	Lab Filename:	
Sample Date:	06/16/1997	Received Date:	06/18/1997
Sample Time:	1730	Prep. Date:	06/20/1997
Matrix:	WATER	Analysis Date:	06/23/1997
Amount Used:	1000 mL	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2293
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	85%
2-FLUOROPHENOL	21-110	33%
D5 NITROBENZENE	35-114	76%
2,4,6-TRIBROMOPHENOL	10-123	68%
D5 PHENOL	10-94	21%
D14 TERPHENYL	33-141	87%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO. 1220

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-16-B-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300560 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300560-01

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >W8131

Level: (low/med) LOW Date Received: 6/18/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/20/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/23/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.4

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300563 Report Date: 06/25/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-16-C-01-03-00	ARDL Lab No.:	300563-03
Desc/Location:	H16C	Lab Filename:	
Sample Date:	06/17/1997	Received Date:	06/19/1997
Sample Time:	1225	Prep. Date:	06/20/1997
Matrix:	WATER	Analysis Date:	06/23/1997
Amount Used:	1000 mL	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2295
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300563 Report Date: 06/25/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-16-C-01-03-00	ARDL Lab No.:	300563-03 (cont'd)
Desc/Location:	H16C	Lab Filename:	
Sample Date:	06/17/1997	Received Date:	06/19/1997
Sample Time:	1225	Prep. Date:	06/20/1997
Matrix:	WATER	Analysis Date:	06/23/1997
Amount Used:	1000 mL	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2295
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300563 Report Date: 06/25/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-16-C-01-03-00	ARDL Lab No.:	300563-03 (cont'd)
Desc/Location:	H16C	Lab Filename:	
Sample Date:	06/17/1997	Received Date:	06/19/1997
Sample Time:	1225	Prep. Date:	06/20/1997
Matrix:	WATER	Analysis Date:	06/23/1997
Amount Used:	1000 mL	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2295
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	86%
2-FLUOROPHENOL	21-110	39%
D5 NITROBENZENE	35-114	71%
2,4,6-TRIBROMOPHENOL	10-123	70%
D5 PHENOL	10-94	26%
D14 TERPHENYL	33-141	82%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO. 1224

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-16-C-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300563 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300563-03

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >W8133

Level: (low/med) LOW Date Received: 6/19/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/20/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/23/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300563 Report Date: 06/25/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-16-D-01-03-00	ARDL Lab No.:	300563-01
Desc/Location:	H16D	Lab Filename:	
Sample Date:	06/17/1997	Received Date:	06/19/1997
Sample Time:	1715	Prep. Date:	06/20/1997
Matrix:	WATER	Analysis Date:	06/23/1997
Amount Used:	1000 mL	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2295
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1

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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300563 Report Date: 06/25/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-16-D-01-03-00	ARDL Lab No.:	300563-01 (cont'd)
Desc/Location:	H16D	Lab Filename:	
Sample Date:	06/17/1997	Received Date:	06/19/1997
Sample Time:	1715	Prep. Date:	06/20/1997
Matrix:	WATER	Analysis Date:	06/23/1997
Amount Used:	1000 mL	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2295
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300563 Report Date: 06/25/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-16-D-01-03-00	ARDL Lab No.:	300563-01 (cont'd)
Desc/Location:	H16D	Lab Filename:	
Sample Date:	06/17/1997	Received Date:	06/19/1997
Sample Time:	1715	Prep. Date:	06/20/1997
Matrix:	WATER	Analysis Date:	06/23/1997
Amount Used:	1000 mL	Instrument ID:	
Final Volume:	1 mL	QC Batch:	B2295
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	84%
2-FLUOROPHENOL	21-110	33%
D5 NITROBENZENE	35-114	76%
2,4,6-TRIBROMOPHENOL	10-123	76%
D5 PHENOL	10-94	24%
D14 TERPHENYL	33-141	87%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

EPA SAMPLE NO. 1228

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-16-D-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300563 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300563-01

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >W8132

Level: (low/med) LOW Date Received: 6/19/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/20/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 6/23/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.4

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	18.09	26.	J
2.					
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-16-E-01-03-00	ARDL Lab No.:	300567-01
Desc/Location:	16-E TASK 16	Lab Filename:	
Sample Date:	06/19/1997	Received Date:	06/21/1997
Sample Time:	1445	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-16-E-01-03-00	ARDL Lab No.:	300567-01 (cont'd)
Desc/Location:	16-E TASK 16	Lab Filename:	
Sample Date:	06/19/1997	Received Date:	06/21/1997
Sample Time:	1445	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-16-E-01-03-00	ARDL Lab No.:	300567-01 (cont'd)
Desc/Location:	16-E TASK 16	Lab Filename:	
Sample Date:	06/19/1997	Received Date:	06/21/1997
Sample Time:	1445	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	80%
2-FLUOROPHENOL	21-110	44%
D5 NITROBENZENE	35-114	78%
2,4,6-TRIBROMOPHENOL	10-123	94%
D5 PHENOL	10-94	34%
D14 TERPHENYL	33-141	82%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO. 1232

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-16-E-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300567 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300567-01

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1582

Level: (low/med) LOW Date Received: 6/21/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/24/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 7/01/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.2

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	7.84	11.	JB
2.		Unknown	8.44	7.	JB
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-16-I-01-03-00	ARDL Lab No.:	300567-02
Desc/Location:	H16-I	Lab Filename:	
Sample Date:	06/19/1997	Received Date:	06/21/1997
Sample Time:	2005	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-16-I-01-03-00	ARDL Lab No.:	300567-02 (cont'd)
Desc/Location:	H16-I	Lab Filename:	
Sample Date:	06/19/1997	Received Date:	06/21/1997
Sample Time:	2005	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	2.6	J	UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	5.6	J	UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H-16-I-01-03-00	ARDL Lab No.:	300567-02 (cont'd)
Desc/Location:	H16-I	Lab Filename:	
Sample Date:	06/19/1997	Received Date:	06/21/1997
Sample Time:	2005	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	07/01/1997
Amount Used:	1000 mL	QC Batch:	B2323
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	75%
2-FLUOROPHENOL	21-110	46%
D5 NITROBENZENE	35-114	73%
2,4,6-TRIBROMOPHENOL	10-123	87%
D5 PHENOL	10-94	33%
D14 TERPHENYL	33-141	75%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

EPA SAMPLE NO. 1236

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H-16-I-01-03-00

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300567 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300567-02

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >B1583

Level: (low/med) LOW Date Received: 6/21/97

% Moisture: not dec. --- dec. --- Date Extracted: 6/24/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 7/01/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.4

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	7.84	11.	JB
2.	Unknown	8.44	9.	JB
3.	Unknown	13.30	5.	J
4.	Unknown	16.98	12.	J
5.	Unknown	17.82	5.	J
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/09/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H16JAW53010300	ARDL Lab No.:	300576-03
Desc/Location:	WELL JAW 53	Lab Filename:	
Sample Date:	06/24/1997	Received Date:	06/27/1997
Sample Time:	1010	Prep. Date:	07/01/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2330
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

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Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/09/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H16JAW53010300	ARDL Lab No.:	300576-03 (cont'd)
Desc/Location:	WELL JAW 53	Lab Filename:	
Sample Date:	06/24/1997	Received Date:	06/27/1997
Sample Time:	1010	Prep. Date:	07/01/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2330
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	5.2	J	UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

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Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/09/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H16JAW53010300	ARDL Lab No.:	300576-03 (cont'd)
Desc/Location:	WELL JAW 53	Lab Filename:	
Sample Date:	06/24/1997	Received Date:	06/27/1997
Sample Time:	1010	Prep. Date:	07/01/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2330
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	97%
2-FLUOROPHENOL	21-110	33%
D5 NITROBENZENE	35-114	90%
2,4,6-TRIBROMOPHENOL	10-123	77%
D5 PHENOL	10-94	21%
D14 TERPHENYL	33-141	104%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

1F

EPA SAMPLE NO. 1240

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H16JAW53010300

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300576 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300576-03

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >W8238

Level: (low/med) LOW Date Received: 6/27/97

% Moisture: not dec. --- dec. --- Date Extracted: 7/01/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 7/08/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/09/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H16JAW54010300	ARDL Lab No.:	300576-04
Desc/Location:	WELL JAW 54	Lab Filename:	
Sample Date:	06/24/1997	Received Date:	06/27/1997
Sample Time:	1155	Prep. Date:	07/01/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2330
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

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Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/09/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H16JAW54010300	ARDL Lab No.:	300576-04 (cont'd)
Desc/Location:	WELL JAW 54	Lab Filename:	
Sample Date:	06/24/1997	Received Date:	06/27/1997
Sample Time:	1155	Prep. Date:	07/01/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2330
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	ND		UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/09/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H16JAW54010300	ARDL Lab No.:	300576-04 (cont'd)
Desc/Location:	WELL JAW 54	Lab Filename:	
Sample Date:	06/24/1997	Received Date:	06/27/1997
Sample Time:	1155	Prep. Date:	07/01/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2330
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	97%
2-FLUOROPHENOL	21-110	31%
D5 NITROBENZENE	35-114	90%
2,4,6-TRIBROMOPHENOL	10-123	75%
D5 PHENOL	10-94	19%
D14 TERPHENYL	33-141	97%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H16JAW54010300

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300576 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300576-04

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >W8239

Level: (low/med) LOW Date Received: 6/27/97

% Moisture: not dec. --- dec. --- Date Extracted: 7/01/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 7/08/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.1

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	11.99	46.	J
2.	Unknown	12.85	10.	J
3.	Unknown	19.03	16.	J
4.	Unknown	20.29	27.	J
5.	Unknown	21.49	15.	J
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Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/09/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H16JAW55010300	ARDL Lab No.:	300576-06
Desc/Location:	WELL G55	Lab Filename:	
Sample Date:	06/24/1997	Received Date:	06/27/1997
Sample Time:	1445	Prep. Date:	07/01/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2330
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
PHENOL	1.0	10.0	ND		UG/L	1
BIS(-2-CHLOROETHYL)ETHER	2.2	10.0	ND		UG/L	1
2-CHLOROPHENOL	1.8	10.0	ND		UG/L	1
1,3-DICHLOROBENZENE	2.1	10.0	ND		UG/L	1
1,4-DICHLOROBENZENE	2.5	10.0	ND		UG/L	1
BENZYL ALCOHOL	2.0	10.0	ND		UG/L	1
1,2-DICHLOROBENZENE	2.2	10.0	ND		UG/L	1
2-METHYLPHENOL	1.5	10.0	ND		UG/L	1
2,2'-OXYBIS(1-CHLOROPROPANE)	1.6	10.0	ND		UG/L	1
4-METHYLPHENOL	2.2	10.0	ND		UG/L	1
N-NITROSO-DI-N-PROPYLAMINE	1.9	10.0	ND		UG/L	1
HEXACHLOROETHANE	2.2	10.0	ND		UG/L	1
NITROBENZENE	1.7	10.0	ND		UG/L	1
ISOPHORONE	1.5	10.0	ND		UG/L	1
2-NITROPHENOL	1.7	10.0	ND		UG/L	1
2,4-DIMETHYLPHENOL	1.9	10.0	ND		UG/L	1
BENZOIC ACID	0.81	10.0	ND		UG/L	1
BIS(-2-CHLOROETHOXY)METHANE	1.9	10.0	ND		UG/L	1
2,4-DICHLOROPHENOL	2.0	10.0	ND		UG/L	1
1,2,4-TRICHLOROBENZENE	0.58	10.0	ND		UG/L	1
NAPHTHALENE	2.0	10.0	ND		UG/L	1
4-CHLOROANILINE	2.0	10.0	ND		UG/L	1
HEXACHLOROBUTADIENE	0.77	10.0	ND		UG/L	1
4-CHLORO-3-METHYLPHENOL	1.1	10.0	ND		UG/L	1
2-METHYLNAPHTHALENE	1.7	10.0	ND		UG/L	1
HEXACHLOROCYCLOPENTADIENE	1.4	10.0	ND		UG/L	1
2,4,6-TRICHLOROPHENOL	1.7	10.0	ND		UG/L	1
2,4,5-TRICHLOROPHENOL	2.1	10.0	ND		UG/L	1
2-CHLORONAPHTHALENE	1.7	10.0	ND		UG/L	1
2-NITROANILINE	1.1	10.0	ND		UG/L	1
DIMETHYL PHTHALATE	0.54	10.0	ND		UG/L	1
ACENAPHTHYLENE	1.4	10.0	ND		UG/L	1

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Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/09/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H16JAW55010300	ARDL Lab No.:	300576-06 (cont'd)
Desc/Location:	WELL G55	Lab Filename:	
Sample Date:	06/24/1997	Received Date:	06/27/1997
Sample Time:	1445	Prep. Date:	07/01/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2330
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
2,6-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
3-NITROANILINE	2.2	10.0	ND		UG/L	1
ACENAPHTHENE	1.4	10.0	ND		UG/L	1
2,4-DINITROPHENOL	1.1	10.0	ND		UG/L	1
4-NITROPHENOL	0.70	10.0	ND		UG/L	1
DIBENZOFURAN	1.0	10.0	ND		UG/L	1
2,4-DINITROTOLUENE	2.0	10.0	ND		UG/L	1
DIETHYLPHTHALATE	0.56	10.0	ND		UG/L	1
4-CHLOROPHENYL-PHENYLETHER	1.2	10.0	ND		UG/L	1
FLUORENE	1.1	10.0	ND		UG/L	1
4-NITROANILINE	3.2	10.0	ND		UG/L	1
4,6-DINITRO-2-METHYLPHENOL	0.68	10.0	ND		UG/L	1
N-NITROSODIPHENYLAMINE	1.2	10.0	ND		UG/L	1
4-BROMOPHENYL-PHENYLETHER	0.81	10.0	ND		UG/L	1
PHENANTHRENE	0.57	10.0	ND		UG/L	1
HEXACHLOROBENZENE	0.76	10.0	ND		UG/L	1
PENTACHLOROPHENOL	0.61	10.0	ND		UG/L	1
ANTHRACENE	0.57	10.0	ND		UG/L	1
DI-N-BUTYLPHTHALATE	0.59	10.0	ND		UG/L	1
FLUORANTHENE	0.58	10.0	ND		UG/L	1
PYRENE	0.48	10.0	ND		UG/L	1
BUTYLBENZYLPHTHALATE	0.54	10.0	ND		UG/L	1
3,3'-DICHLOROBENZIDINE	0.61	10.0	ND		UG/L	1
BENZO(a)ANTHRACENE	0.66	10.0	ND		UG/L	1
CHRYSENE	0.99	10.0	ND		UG/L	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.77	10.0	6.4	J	UG/L	1
DI-N-OCTYL PHTHALATE	0.85	10.0	ND		UG/L	1
BENZO(b)FLUORANTHENE	1.2	10.0	ND		UG/L	1
BENZO(k)FLUORANTHENE	1.4	10.0	ND		UG/L	1
BENZO(a)PYRENE	0.69	10.0	ND		UG/L	1
INDENO(1,2,3-cd)PYRENE	0.75	10.0	ND		UG/L	1
DIBENZO(a,h)ANTHRACENE	1.0	10.0	ND		UG/L	1

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/09/1997

Project Name: IOWA ARMY AMM PLANT Analysis: BNA'S (METHOD 8270)
Project No.: 5644V Analytical Method: 8270B
Prep Method: 3510B

Field ID:	H16JAW55010300	ARDL Lab No.:	300576-06 (cont'd)
Desc/Location:	WELL G55	Lab Filename:	
Sample Date:	06/24/1997	Received Date:	06/27/1997
Sample Time:	1445	Prep. Date:	07/01/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	1000 mL	QC Batch:	B2330
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
BENZO(g,h,i)PERYLENE	0.54	10.0	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
2-FLUOROBIPHENYL	43-116	100%
2-FLUOROPHENOL	21-110	33%
D5 NITROBENZENE	35-114	88%
2,4,6-TRIBROMOPHENOL	10-123	77%
D5 PHENOL	10-94	21%
D14 TERPHENYL	33-141	98%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

H16JAW55010300

Lab Name: ARDL, INC. Contract: IAAAP

Lab Code: --- Case No.: 300576 SAS No.: --- SDG No.: ---

Matrix: (soil/water) WATER Lab Sample ID: 300576-06

Sample wt/vol: 1000.0 (g/mL) mL Lab File ID: >W8240

Level: (low/med) LOW Date Received: 6/27/97

% Moisture: not dec. --- dec. --- Date Extracted: 7/01/97

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 7/08/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.4

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
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16.				
17.				
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20.				
21.				
22.				
23.				
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27.				
28.				
29.				
30.				

EXPLOSIVES
(Method 8330)

1250

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-16-A-01-03-00	ARDL Lab No.:	300567-03
Desc/Location:	H16-A	Lab Filename:	
Sample Date:	06/19/1997	Received Date:	06/21/1997
Sample Time:	1650	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	06/27/1997
Amount Used:	770 mL	QC Batch:	B2319
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	2.9		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	4.0		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	2.1		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	79%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300560 Report Date: 06/30/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-16-B-01-03-00	ARDL Lab No.:	300560-01
Desc/Location:	H16B	Lab Filename:	
Sample Date:	06/16/1997	Received Date:	06/18/1997
Sample Time:	1730	Prep. Date:	06/20/1997
Matrix:	WATER	Analysis Date:	06/26/1997
Amount Used:	770 mL	Instrument ID:	
Final Volume:	10 mL	QC Batch:	B2307
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	71%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300563 Report Date: 06/30/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-16-C-01-03-00	ARDL Lab No.:	300563-03
Desc/Location:	H16C	Lab Filename:	
Sample Date:	06/17/1997	Received Date:	06/19/1997
Sample Time:	1225	Prep. Date:	06/20/1997
Matrix:	WATER	Analysis Date:	06/26/1997
Amount Used:	770 mL	Instrument ID:	
Final Volume:	10 mL	QC Batch:	B2308
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	79%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300563 Report Date: 06/30/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-16-D-01-03-00	ARDL Lab No.:	300563-01
Desc/Location:	H16D	Lab Filename:	
Sample Date:	06/17/1997	Received Date:	06/19/1997
Sample Time:	1715	Prep. Date:	06/20/1997
Matrix:	WATER	Analysis Date:	06/26/1997
Amount Used:	770 mL	Instrument ID:	
Final Volume:	10 mL	QC Batch:	B2308
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	85%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-16-E-01-03-00	ARDL Lab No.:	300567-01
Desc/Location:	16-E TASK 16	Lab Filename:	
Sample Date:	06/19/1997	Received Date:	06/21/1997
Sample Time:	1445	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	06/27/1997
Amount Used:	770 mL	Instrument ID:	
Final Volume:	10 mL	QC Batch:	B2319
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	83%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/03/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H-16-I-01-03-00	ARDL Lab No.:	300567-02
Desc/Location:	H16-I	Lab Filename:	
Sample Date:	06/19/1997	Received Date:	06/21/1997
Sample Time:	2005	Prep. Date:	06/24/1997
Matrix:	WATER	Analysis Date:	06/27/1997
Amount Used:	770 mL	Instrument ID:	
Final Volume:	10 mL	QC Batch:	B2319
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	2.2		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	0.47	J	UG/L	1
NITROBENZENE	0.44	1.3	3.8		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	1.3		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	83%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H16JAW53010300	ARDL Lab No.:	300576-03
Desc/Location:	WELL JAW 53	Lab Filename:	
Sample Date:	06/24/1997	Received Date:	06/27/1997
Sample Time:	1010	Prep. Date:	07/01/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	770 mL	QC Batch:	B2340
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	ND		UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	ND		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	89%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H16JAW54010300	ARDL Lab No.:	300576-04
Desc/Location:	WELL JAW 54	Lab Filename:	
Sample Date:	06/24/1997	Received Date:	06/27/1997
Sample Time:	1155	Prep. Date:	07/01/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	770 mL	QC Batch:	B2340
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	10.0		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	10.3	32.5	87.0		UG/L	25
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	10.5	32.5	26.0	J	UG/L	25
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	70.6	260	1500		UG/L	200
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	10.7	32.5	210		UG/L	25
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	83%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/11/1997

Project Name: IOWA ARMY AMM PLANT Analysis: EXPLOSIVES
Project No.: 5644V Analytical Method: 8330
Prep Method: METHOD

Field ID:	H16JAW55010300	ARDL Lab No.:	300576-06
Desc/Location:	WELL G55 JAW 55 ?	Lab Filename:	
Sample Date:	06/24/1997	Received Date:	06/27/1997
Sample Time:	1445	Prep. Date:	07/01/1997
Matrix:	WATER	Analysis Date:	07/08/1997
Amount Used:	770 mL	QC Batch:	B2340
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
1,3,5-TRINITROBENZENE	0.4	1.3	ND		UG/L	1
1,3-DINITROBENZENE	0.33	1.3	ND		UG/L	1
2,4,6-TRINITROTOLUENE	0.38	1.3	ND		UG/L	1
2,4-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2,6-DINITROTOLUENE	0.44	1.3	ND		UG/L	1
2-AMINO-4,6-DINITROTOLUENE	0.41	1.3	ND		UG/L	1
2-NITROTOLUENE	0.37	1.3	ND		UG/L	1
3-NITROTOLUENE	0.27	1.3	ND		UG/L	1
4-AMINO-2,6-DINITROTOLUENE	0.42	1.3	ND		UG/L	1
4-NITROTOLUENE	0.39	1.3	ND		UG/L	1
RDX	0.35	1.3	0.870	J	UG/L	1
NITROBENZENE	0.44	1.3	ND		UG/L	1
HMX	0.43	1.3	3.9		UG/L	1
TETRYL	0.4	1.3	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,4-DINITROBENZENE	4-120	89%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

INORGANICS

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/02/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-16-A-01-03-00 ARDL No: 300567-03
Sampling Loc'n: H16-A Received: 06/21/1997
Sampling Date: 06/19/1997 Matrix: WATER
Sampling Time: 1650 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.08	MG/L	3010	6010A	06/23/97	06/25/97	P2144
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ARSENIC	0.00050	ND	MG/L	3020	7061	06/23/97	06/24/97	BH2716
ARSENIC, DISSOLVED	0.00050	ND	MG/L	3005	7061	06/23/97	06/24/97	BH2715
BARIUM	0.010	0.36	MG/L	3010	6010A	06/23/97	06/25/97	P2144
BARIUM, DISSOLVED	0.010	0.36	MG/L	3005	6010A	06/23/97	06/23/97	P2142
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
CALCIUM	0.10	96.2	MG/L	3010	6010A	06/23/97	06/25/97	P2144
CALCIUM, DISSOLVED	0.10	101	MG/L	3005	6010A	06/23/97	06/23/97	P2142
CHROMIUM	0.0050	0.0077	MG/L	3010	6010A	06/23/97	06/25/97	P2144
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
COBALT	0.0050	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
COPPER	0.010	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
IRON	0.050	2.2	MG/L	3010	6010A	06/23/97	06/25/97	P2144
IRON, DISSOLVED	0.050	1.6	MG/L	3005	6010A	06/23/97	06/23/97	P2142
LEAD	0.0010	ND	MG/L	3020	7421	06/23/97	06/24/97	F2146
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	06/23/97	06/24/97	F2145
MAGNESIUM	0.10	32.8	MG/L	3010	6010A	06/23/97	06/25/97	P2144
MAGNESIUM, DISSOLVED	0.10	35.2	MG/L	3005	6010A	06/23/97	06/23/97	P2142
MANGANESE	0.0050	0.091	MG/L	3010	6010A	06/23/97	06/25/97	P2144
MANGANESE, DISSOLVED	0.0050	0.088	MG/L	3005	6010A	06/23/97	06/23/97	P2142
MERCURY	0.00020	ND	MG/L	7470	7470	06/23/97	06/23/97	C0900
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	06/23/97	06/23/97	C0901
NICKEL	0.020	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
POTASSIUM	1.5	1.7	MG/L	3010	6010A	06/23/97	06/25/97	P2144
POTASSIUM, DISSOLVED	1.5	1.7	MG/L	3005	6010A	06/23/97	06/23/97	P2142
SELENIUM	0.00050	ND	MG/L	3020	7741	06/23/97	06/24/97	BH2718
SELENIUM, DISSOLVED	0.00050	ND	MG/L	3005	7741	06/23/97	06/24/97	BH2717
SILVER	0.0050	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144

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Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/02/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-16-A-01-03-00 ARDL No: 300567-03 (cont'd)
Sampling Loc'n: H16-A Received: 06/21/1997
Sampling Date: 06/19/1997 Matrix: WATER
Sampling Time: 1650 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
SODIUM	0.40	44.6	MG/L	3010	6010A	06/23/97	06/25/97	P2144
SODIUM, DISSOLVED	0.40	48.3	MG/L	3005	6010A	06/23/97	06/23/97	P2142
THALLIUM	0.0010	ND	MG/L	3020	7841	06/23/97	06/24/97	F2148
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	06/23/97	06/23/97	F2147
VANADIUM	0.0050	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ZINC	0.0050	0.12	MG/L	3010	6010A	06/23/97	06/25/97	P2144
ZINC, DISSOLVED	0.0050	0.080	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ALKALINITY	5.0	501	MG/L	NONE	310.1	NA	06/26/97	06274233
CHLORIDE	1.0	1.5	MG/L	NONE	300.0	NA	06/25/97	0630[illegible]
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	06/26/97	06/26/97	06304[illegible]
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/26/97	06/26/97	06304239
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	06/25/97	06304241
pH	0.10	7.6	PH UNITS	NONE	9040A	NA	06/23/97	06274234
SOLIDS, TOTAL DISSOLVED	40.0	461	MG/L	NONE	160.1	NA	06/23/97	06274236
SOLIDS, TOTAL SUSPENDED	2.5	8.6	MG/L	NONE	160.2	NA	06/23/97	06274235
SULFATE	2.5	ND	MG/L	NONE	300.0	NA	06/25/97	06304241
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	06/23/97	06274237
TOTAL ORGANIC CARBON	1.0	3.7	MG/L	NONE	415.1	NA	06/26/97	06274232

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Mt. Vernon, Illinois 62864

Lab Report No: 300560 Report Date: 06/30/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-16-B-01-03-00 ARDL No: 300560-01
Sampling Loc'n: H16B Received: 06/18/1997
Sampling Date: 06/16/1997 Matrix: WATER
Sampling Time: 1730 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	8.1	MG/L	3010	6010A	06/20/97	06/23/97	P2143
ALUMINUM, DISSOLVED	0.050	2.1	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/20/97	06/23/97	P2143
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ARSENIC	0.00050	0.0037	MG/L	3020	7061	06/23/97	06/24/97	BH2716
ARSENIC, DISSOLVED	0.00050	0.00059	MG/L	3005	7061	06/23/97	06/24/97	BH2715
BARIUM	0.010	0.2	MG/L	3010	6010A	06/20/97	06/23/97	P2143
BARIUM, DISSOLVED	0.010	0.12	MG/L	3005	6010A	06/23/97	06/23/97	P2142
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/20/97	06/23/97	P2143
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/20/97	06/23/97	P2143
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
CALCIUM	0.10	79.7	MG/L	3010	6010A	06/20/97	06/23/97	P2143
CALCIUM, DISSOLVED	0.10	68.2	MG/L	3005	6010A	06/23/97	06/23/97	P2142
CHROMIUM	0.0050	0.076	MG/L	3010	6010A	06/20/97	06/23/97	P2143
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
COBALT	0.0050	0.0098	MG/L	3010	6010A	06/20/97	06/23/97	P2143
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
COPPER	0.010	0.016	MG/L	3010	6010A	06/20/97	06/23/97	P2143
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
IRON	0.050	17.6	MG/L	3010	6010A	06/20/97	06/23/97	P2143
IRON, DISSOLVED	0.050	1.4	MG/L	3005	6010A	06/23/97	06/23/97	P2142
LEAD	0.0010	0.0076	MG/L	3020	7421	06/23/97	06/24/97	F2146
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	06/23/97	06/24/97	F2145
MAGNESIUM	0.10	28.7	MG/L	3010	6010A	06/20/97	06/23/97	P2143
MAGNESIUM, DISSOLVED	0.10	26.3	MG/L	3005	6010A	06/23/97	06/23/97	P2142
MANGANESE	0.0050	0.44	MG/L	3010	6010A	06/20/97	06/23/97	P2143
MANGANESE, DISSOLVED	0.0050	0.19	MG/L	3005	6010A	06/23/97	06/23/97	P2142
MERCURY	0.00020	ND	MG/L	7470	7470	06/23/97	06/23/97	C0900
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	06/23/97	06/23/97	C0901
NICKEL	0.020	0.068	MG/L	3010	6010A	06/20/97	06/23/97	P2143
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
POTASSIUM	1.5	2.5	MG/L	3010	6010A	06/20/97	06/23/97	P2143
POTASSIUM, DISSOLVED	1.5	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
SELENIUM	0.00050	0.0011	MG/L	3020	7741	06/23/97	06/24/97	BH2718
SELENIUM, DISSOLVED	0.00050	0.0013	MG/L	3005	7741	06/23/97	06/24/97	BH2717
SILVER	0.0050	ND	MG/L	3010	6010A	06/20/97	06/23/97	P2143

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Lab Report No: 300560 Report Date: 06/30/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-16-B-01-03-00 ARDL No: 300560-01 (cont'd)
Sampling Loc'n: H16B Received: 06/18/1997
Sampling Date: 06/16/1997 Matrix: WATER
Sampling Time: 1730 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
SODIUM	0.40	16.9	MG/L	3010	6010A	06/20/97	06/23/97	P2143
SODIUM, DISSOLVED	0.40	16.4	MG/L	3005	6010A	06/23/97	06/23/97	P2142
THALLIUM	0.0010	ND	MG/L	3020	7841	06/23/97	06/24/97	F2148
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	06/23/97	06/23/97	F2147
VANADIUM	0.0050	0.025	MG/L	3010	6010A	06/20/97	06/23/97	P2143
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ZINC	0.0050	0.052	MG/L	3010	6010A	06/20/97	06/23/97	P2143
ZINC, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ALKALINITY	5.0	329	MG/L	NONE	310.1	NA	06/20/97	06274229
CHLORIDE	1.0	1.9	MG/L	NONE	300.0	NA	06/25/97	063[illegible]
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	06/26/97	06/26/97	0630[illegible]0
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/26/97	06/26/97	06304239
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	06/25/97	06304241
pH	0.10	7.4	PH UNITS	NONE	9040A	NA	06/20/97	06274228
SOLIDS, TOTAL DISSOLVED	40.0	334	MG/L	NONE	160.1	NA	06/20/97	06274231
SOLIDS, TOTAL SUSPENDED	10.0	469	MG/L	NONE	160.2	NA	06/20/97	06234205
SULFATE	2.5	21.2	MG/L	NONE	300.0	NA	06/25/97	06304241
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	06/20/97	06274230
TOTAL ORGANIC CARBON	1.0	ND	MG/L	NONE	415.1	NA	06/19/97	06234207

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Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300563 Report Date: 07/02/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-16-C-01-03-00 ARDL No: 300563-03
Sampling Loc'n: H16C Received: 06/19/1997
Sampling Date: 06/17/1997 Matrix: WATER
Sampling Time: 1225 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.79	MG/L	3010	6010A	06/20/97	06/23/97	P2143
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/20/97	06/23/97	P2143
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ARSENIC	0.00050	0.00052	MG/L	3020	7061	06/23/97	06/24/97	BH2716
ARSENIC, DISSOLVED	0.00050	ND	MG/L	3005	7061	06/23/97	06/24/97	BH2715
BARIUM	0.010	0.14	MG/L	3010	6010A	06/20/97	06/23/97	P2143
BARIUM, DISSOLVED	0.010	0.14	MG/L	3005	6010A	06/23/97	06/23/97	P2142
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/20/97	06/23/97	P2143
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/20/97	06/23/97	P2143
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
CALCIUM	0.10	55.2	MG/L	3010	6010A	06/20/97	06/23/97	P2143
CALCIUM, DISSOLVED	0.10	56.8	MG/L	3005	6010A	06/23/97	06/23/97	P2142
CHROMIUM	0.0050	0.018	MG/L	3010	6010A	06/20/97	06/23/97	P2143
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
COBALT	0.0050	ND	MG/L	3010	6010A	06/20/97	06/23/97	P2143
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
COPPER	0.010	ND	MG/L	3010	6010A	06/20/97	06/23/97	P2143
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
IRON	0.050	2.2	MG/L	3010	6010A	06/20/97	06/23/97	P2143
IRON, DISSOLVED	0.050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
LEAD	0.0010	0.0021	MG/L	3020	7421	06/23/97	06/24/97	F2146
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	06/23/97	06/24/97	F2145
MAGNESIUM	0.10	20.2	MG/L	3010	6010A	06/20/97	06/23/97	P2143
MAGNESIUM, DISSOLVED	0.10	20.8	MG/L	3005	6010A	06/23/97	06/23/97	P2142
MANGANESE	0.0050	0.16	MG/L	3010	6010A	06/20/97	06/23/97	P2143
MANGANESE, DISSOLVED	0.0050	0.13	MG/L	3005	6010A	06/23/97	06/23/97	P2142
MERCURY	0.00020	ND	MG/L	7470	7470	06/23/97	06/23/97	C0900
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	06/23/97	06/23/97	C0901
NICKEL	0.020	ND	MG/L	3010	6010A	06/20/97	06/23/97	P2143
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
POTASSIUM	1.5	1.9	MG/L	3010	6010A	06/20/97	06/23/97	P2143
POTASSIUM, DISSOLVED	1.5	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
SELENIUM	0.00050	ND	MG/L	3020	7741	06/23/97	06/24/97	BH2718
SELENIUM, DISSOLVED	0.00050	ND	MG/L	3005	7741	06/23/97	06/24/97	BH2717
SILVER	0.0050	ND	MG/L	3010	6010A	06/20/97	06/23/97	P2143

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Mt. Vernon, Illinois 62864

Lab Report No: 300563 Report Date: 07/02/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-16-C-01-03-00 ARDL No: 300563-03 (cont'd)
Sampling Loc'n: H16C Received: 06/19/1997
Sampling Date: 06/17/1997 Matrix: WATER
Sampling Time: 1225 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
SODIUM	0.40	18.3	MG/L	3010	6010A	06/20/97	06/23/97	P2143
SODIUM, DISSOLVED	0.40	19.1	MG/L	3005	6010A	06/23/97	06/23/97	P2142
THALLIUM	0.0010	ND	MG/L	3020	7841	06/23/97	06/24/97	F2148
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	06/23/97	06/23/97	F2147
VANADIUM	0.0050	ND	MG/L	3010	6010A	06/20/97	06/23/97	P2143
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ZINC	0.0050	0.023	MG/L	3010	6010A	06/20/97	06/23/97	P2143
ZINC, DISSOLVED	0.0050	0.0073	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ALKALINITY	5.0	259	MG/L	NONE	310.1	NA	06/20/97	06274229
CHLORIDE	1.0	1.3	MG/L	NONE	300.0	NA	06/25/97	063[illegible]1
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	06/26/97	06/26/97	063[illegible]0
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/26/97	06/26/97	06304239
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	06/25/97	06304241
pH	0.10	7.5	PH UNITS	NONE	9040A	NA	06/20/97	06274228
SOLIDS, TOTAL DISSOLVED	40.0	245	MG/L	NONE	160.1	NA	06/20/97	06274231
SOLIDS, TOTAL SUSPENDED	2.5	60.8	MG/L	NONE	160.2	NA	06/20/97	06234205
SULFATE	2.5	4.9	MG/L	NONE	300.0	NA	06/25/97	06304241
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	06/20/97	06274230
TOTAL ORGANIC CARBON	1.0	1.3	MG/L	NONE	415.1	NA	06/19/97	06234207

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Lab Report No: 300563 Report Date: 07/02/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-16-D-01-03-00 ARDL No: 300563-01
Sampling Loc'n: H16D Received: 06/19/1997
Sampling Date: 06/17/1997 Matrix: WATER
Sampling Time: 1715 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	ND	MG/L	3010	6010A	06/20/97	06/23/97	P2143
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/20/97	06/23/97	P2143
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ARSENIC	0.00050	ND	MG/L	3020	7061	06/23/97	06/24/97	BH2716
ARSENIC, DISSOLVED	0.00050	ND	MG/L	3005	7061	06/23/97	06/24/97	BH2715
BARIUM	0.010	0.087	MG/L	3010	6010A	06/20/97	06/23/97	P2143
BARIUM, DISSOLVED	0.010	0.087	MG/L	3005	6010A	06/23/97	06/23/97	P2142
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/20/97	06/23/97	P2143
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/20/97	06/23/97	P2143
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
CALCIUM	0.10	56.0	MG/L	3010	6010A	06/20/97	06/23/97	P2143
CALCIUM, DISSOLVED	0.10	59.3	MG/L	3005	6010A	06/23/97	06/23/97	P2142
CHROMIUM	0.0050	ND	MG/L	3010	6010A	06/20/97	06/23/97	P2143
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
COBALT	0.0050	ND	MG/L	3010	6010A	06/20/97	06/23/97	P2143
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
COPPER	0.010	ND	MG/L	3010	6010A	06/20/97	06/23/97	P2143
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
IRON	0.050	0.13	MG/L	3010	6010A	06/20/97	06/23/97	P2143
IRON, DISSOLVED	0.050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
LEAD	0.0010	0.0016	MG/L	3020	7421	06/23/97	06/24/97	F2146
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	06/23/97	06/24/97	F2145
MAGNESIUM	0.10	20.5	MG/L	3010	6010A	06/20/97	06/23/97	P2143
MAGNESIUM, DISSOLVED	0.10	21.6	MG/L	3005	6010A	06/23/97	06/23/97	P2142
MANGANESE	0.0050	0.11	MG/L	3010	6010A	06/20/97	06/23/97	P2143
MANGANESE, DISSOLVED	0.0050	0.12	MG/L	3005	6010A	06/23/97	06/23/97	P2142
MERCURY	0.00020	ND	MG/L	7470	7470	06/23/97	06/23/97	C0900
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	06/23/97	06/23/97	C0901
NICKEL	0.020	ND	MG/L	3010	6010A	06/20/97	06/23/97	P2143
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
POTASSIUM	1.5	ND	MG/L	3010	6010A	06/20/97	06/23/97	P2143
POTASSIUM, DISSOLVED	1.5	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
SELENIUM	0.00050	ND	MG/L	3020	7741	06/23/97	06/24/97	BH2718
SELENIUM, DISSOLVED	0.00050	0.00062	MG/L	3005	7741	06/23/97	06/24/97	BH2717
SILVER	0.0050	ND	MG/L	3010	6010A	06/20/97	06/23/97	P2143

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Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300563 Report Date: 07/02/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-16-D-01-03-00 ARDL No: 300563-01 (cont'd)
Sampling Loc'n: H16D Received: 06/19/1997
Sampling Date: 06/17/1997 Matrix: WATER
Sampling Time: 1715 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
SODIUM	0.40	14.7	MG/L	3010	6010A	06/20/97	06/23/97	P2143
SODIUM, DISSOLVED	0.40	15.2	MG/L	3005	6010A	06/23/97	06/23/97	P2142
THALLIUM	0.0010	ND	MG/L	3020	7841	06/23/97	06/24/97	F2148
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	06/23/97	06/23/97	F2147
VANADIUM	0.0050	ND	MG/L	3010	6010A	06/20/97	06/23/97	P2143
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ZINC	0.0050	ND	MG/L	3010	6010A	06/20/97	06/23/97	P2143
ZINC, DISSOLVED	0.0050	0.011	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ALKALINITY	5.0	224	MG/L	NONE	310.1	NA	06/20/97	06274229
CHLORIDE	1.0	ND	MG/L	NONE	300.0	NA	07/02/97	0702
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	06/26/97	06/26/97	0630[illegible]
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/26/97	06/26/97	06304239
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	07/02/97	07024244
pH	0.10	7.5	PH UNITS	NONE	9040A	NA	06/20/97	06274228
SOLIDS, TOTAL DISSOLVED	40.0	238	MG/L	NONE	160.1	NA	06/20/97	06274231
SOLIDS, TOTAL SUSPENDED	2.0	3.1	MG/L	NONE	160.2	NA	06/20/97	06234205
SULFATE	2.5	29.1	MG/L	NONE	300.0	NA	07/02/97	07024244
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	06/20/97	06274230
TOTAL ORGANIC CARBON	1.0	ND	MG/L	NONE	415.1	NA	06/19/97	06234207

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Lab Report No: 300567 Report Date: 07/02/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-16-E-01-03-00 ARDL No: 300567-01
Sampling Loc'n: 16-E TASK 16 Received: 06/21/1997
Sampling Date: 06/19/1997 Matrix: WATER
Sampling Time: 1445 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.057	MG/L	3010	6010A	06/23/97	06/25/97	P2144
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ARSENIC	0.00050	ND	MG/L	3020	7061	06/23/97	06/24/97	BH2716
ARSENIC, DISSOLVED	0.00050	ND	MG/L	3005	7061	06/23/97	06/24/97	BH2715
BARIUM	0.010	0.25	MG/L	3010	6010A	06/23/97	06/25/97	P2144
BARIUM, DISSOLVED	0.010	0.26	MG/L	3005	6010A	06/23/97	06/23/97	P2142
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
CALCIUM	0.10	106	MG/L	3010	6010A	06/23/97	06/25/97	P2144
CALCIUM, DISSOLVED	0.10	113	MG/L	3005	6010A	06/23/97	06/23/97	P2142
CHROMIUM	0.0050	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
COBALT	0.0050	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
COPPER	0.010	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
IRON	0.050	0.18	MG/L	3010	6010A	06/23/97	06/25/97	P2144
IRON, DISSOLVED	0.050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
LEAD	0.0010	0.0011	MG/L	3020	7421	06/23/97	06/24/97	F2146
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	06/23/97	06/24/97	F2145
MAGNESIUM	0.10	35.4	MG/L	3010	6010A	06/23/97	06/25/97	P2144
MAGNESIUM, DISSOLVED	0.10	38.5	MG/L	3005	6010A	06/23/97	06/23/97	P2142
MANGANESE	0.0050	0.54	MG/L	3010	6010A	06/23/97	06/25/97	P2144
MANGANESE, DISSOLVED	0.0050	0.57	MG/L	3005	6010A	06/23/97	06/23/97	P2142
MERCURY	0.00020	ND	MG/L	7470	7470	06/23/97	06/23/97	C0900
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	06/23/97	06/23/97	C0901
NICKEL	0.020	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
POTASSIUM	1.5	1.8	MG/L	3010	6010A	06/23/97	06/25/97	P2144
POTASSIUM, DISSOLVED	1.5	1.8	MG/L	3005	6010A	06/23/97	06/23/97	P2142
SELENIUM	0.00050	ND	MG/L	3020	7741	06/23/97	06/24/97	BH2718
SELENIUM, DISSOLVED	0.00050	ND	MG/L	3005	7741	06/23/97	06/24/97	BH2717
SILVER	0.0050	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144

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Mt. Vernon, Illinois 62864

Lab Report No: 300567 Report Date: 07/02/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-16-E-01-03-00 ARDL No: 300567-01 (cont'd)
Sampling Loc'n: 16-E TASK 16 Received: 06/21/1997
Sampling Date: 06/19/1997 Matrix: WATER
Sampling Time: 1445 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
SODIUM	0.40	28.4	MG/L	3010	6010A	06/23/97	06/25/97	P2144
SODIUM, DISSOLVED	0.40	30.9	MG/L	3005	6010A	06/23/97	06/23/97	P2142
THALLIUM	0.0010	ND	MG/L	3020	7841	06/23/97	06/24/97	F2148
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	06/23/97	06/23/97	F2147
VANADIUM	0.0050	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ZINC	0.0050	0.025	MG/L	3010	6010A	06/23/97	06/25/97	P2144
ZINC, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ALKALINITY	5.0	481	MG/L	NONE	310.1	NA	06/26/97	06274233
CHLORIDE	1.0	1.2	MG/L	NONE	300.0	NA	06/25/97	0630[illegible]
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	06/26/97	06/26/97	0630[illegible]
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/26/97	06/26/97	06304239
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	06/25/97	06304241
pH	0.10	7.5	PH UNITS	NONE	9040A	NA	06/23/97	06274234
SOLIDS, TOTAL DISSOLVED	40.0	481	MG/L	NONE	160.1	NA	06/23/97	06274236
SOLIDS, TOTAL SUSPENDED	2.0	ND	MG/L	NONE	160.2	NA	06/23/97	06274235
SULFATE	2.5	21.9	MG/L	NONE	300.0	NA	06/25/97	06304241
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	06/23/97	06274237
TOTAL ORGANIC CARBON	1.0	ND	MG/L	NONE	415.1	NA	06/26/97	06274232

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Lab Report No: 300567 Report Date: 07/02/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-16-I-01-03-00 ARDL No: 300567-02
Sampling Loc'n: H16-1 Received: 06/21/1997
Sampling Date: 06/19/1997 Matrix: WATER
Sampling Time: 2005 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ANTIMONY	0.020	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ARSENIC	0.00050	0.00071	MG/L	3020	7061	06/23/97	06/24/97	BH2716
ARSENIC, DISSOLVED	0.00050	ND	MG/L	3005	7061	06/23/97	06/24/97	BH2715
BARIUM	0.010	0.34	MG/L	3010	6010A	06/23/97	06/25/97	P2144
BARIUM, DISSOLVED	0.010	0.35	MG/L	3005	6010A	06/23/97	06/23/97	P2142
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
CADMIUM	0.0050	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
CALCIUM	0.10	92.6	MG/L	3010	6010A	06/23/97	06/25/97	P2144
CALCIUM, DISSOLVED	0.10	100	MG/L	3005	6010A	06/23/97	06/23/97	P2142
CHROMIUM	0.0050	0.0056	MG/L	3010	6010A	06/23/97	06/25/97	P2144
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
COBALT	0.0050	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
COPPER	0.010	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
IRON	0.050	2.1	MG/L	3010	6010A	06/23/97	06/25/97	P2144
IRON, DISSOLVED	0.050	1.4	MG/L	3005	6010A	06/23/97	06/23/97	P2142
LEAD	0.0010	0.0018	MG/L	3020	7421	06/23/97	06/24/97	F2146
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	06/23/97	06/24/97	F2145
MAGNESIUM	0.10	31.7	MG/L	3010	6010A	06/23/97	06/25/97	P2144
MAGNESIUM, DISSOLVED	0.10	35.0	MG/L	3005	6010A	06/23/97	06/23/97	P2142
MANGANESE	0.0050	0.080	MG/L	3010	6010A	06/23/97	06/25/97	P2144
MANGANESE, DISSOLVED	0.0050	0.079	MG/L	3005	6010A	06/23/97	06/23/97	P2142
MERCURY	0.00020	ND	MG/L	7470	7470	06/23/97	06/23/97	C0900
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	06/23/97	06/23/97	C0901
NICKEL	0.020	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
POTASSIUM	1.5	1.8	MG/L	3010	6010A	06/23/97	06/25/97	P2144
POTASSIUM, DISSOLVED	1.5	1.5	MG/L	3005	6010A	06/23/97	06/23/97	P2142
SELENIUM	0.00050	ND	MG/L	3020	7741	06/23/97	06/24/97	BH2718
SELENIUM, DISSOLVED	0.00050	ND	MG/L	3005	7741	06/23/97	06/24/97	BH2717
SILVER	0.0050	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144

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Lab Report No: 300567 Report Date: 07/02/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H-16-I-01-03-00 ARDL No: 300567-02 (cont'd)
Sampling Loc'n: H16-1 Received: 06/21/1997
Sampling Date: 06/19/1997 Matrix: WATER
Sampling Time: 2005 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
SODIUM	0.40	43.1	MG/L	3010	6010A	06/23/97	06/25/97	P2144
SODIUM, DISSOLVED	0.40	49.8	MG/L	3005	6010A	06/23/97	06/23/97	P2142
THALLIUM	0.0010	ND	MG/L	3020	7841	06/23/97	06/24/97	F2148
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	06/23/97	06/23/97	F2147
VANADIUM	0.0050	ND	MG/L	3010	6010A	06/23/97	06/25/97	P2144
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ZINC	0.0050	0.56	MG/L	3010	6010A	06/23/97	06/25/97	P2144
ZINC, DISSOLVED	0.0050	0.073	MG/L	3005	6010A	06/23/97	06/23/97	P2142
ALKALINITY	5.0	506	MG/L	NONE	310.1	NA	06/26/97	06274233
CHLORIDE	1.0	1.4	MG/L	NONE	300.0	NA	06/25/97	06304[illegible]
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	06/26/97	06/26/97	0630[illegible]
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/26/97	06/26/97	06304239
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	06/25/97	06304241
pH	0.10	7.6	PH UNITS	NONE	9040A	NA	06/23/97	06274234
SOLIDS, TOTAL DISSOLVED	40.0	459	MG/L	NONE	160.1	NA	06/23/97	06274236
SOLIDS, TOTAL SUSPENDED	2.0	5.4	MG/L	NONE	160.2	NA	06/23/97	06274235
SULFATE	2.5	ND	MG/L	NONE	300.0	NA	06/25/97	06304241
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	06/23/97	06274237
TOTAL ORGANIC CARBON	1.0	4.1	MG/L	NONE	415.1	NA	06/26/97	06274232

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Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H16JAW53010300 ARDL No: 300576-03
Sampling Loc'n: WELL JAW 53 Received: 06/27/1997
Sampling Date: 06/24/1997 Matrix: WATER
Sampling Time: 1010 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	0.1	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ANTIMONY	0.020	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ARSENIC	0.00050	0.00078	MG/L	3020	7061	07/01/97	07/02/97	BH2720
ARSENIC, DISSOLVED	0.00050	0.00055	MG/L	3005	7061	07/01/97	07/02/97	BH2719
BARIUM	0.010	0.099	MG/L	3010	6010A	07/01/97	07/02/97	P2160
BARIUM, DISSOLVED	0.010	0.1	MG/L	3005	6010A	07/02/97	07/02/97	P2159
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CADMIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CALCIUM	0.10	56.8	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CALCIUM, DISSOLVED	0.10	61.7	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CHROMIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
COBALT	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
COPPER	0.010	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
IRON	0.050	0.27	MG/L	3010	6010A	07/01/97	07/02/97	P2160
IRON, DISSOLVED	0.050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
LEAD	0.0010	ND	MG/L	3020	7421	07/01/97	07/02/97	F2162
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	07/01/97	07/02/97	F2161
MAGNESIUM	0.10	20.4	MG/L	3010	6010A	07/01/97	07/02/97	P2160
MAGNESIUM, DISSOLVED	0.10	22.2	MG/L	3005	6010A	07/02/97	07/02/97	P2159
MANGANESE	0.0050	0.41	MG/L	3010	6010A	07/01/97	07/02/97	P2160
MANGANESE, DISSOLVED	0.0050	0.38	MG/L	3005	6010A	07/02/97	07/02/97	P2159
MERCURY	0.00020	ND	MG/L	7470	7470	06/30/97	06/30/97	C0905
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	06/30/97	06/30/97	C0906
NICKEL	0.020	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
POTASSIUM	1.5	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
POTASSIUM, DISSOLVED	1.5	1.7	MG/L	3005	6010A	07/02/97	07/02/97	P2159
SELENIUM	0.00050	ND	MG/L	3020	7741	07/01/97	07/02/97	BH2722
SELENIUM, DISSOLVED	0.00050	ND	MG/L	3005	7741	07/01/97	07/02/97	BH2721
SILVER	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160

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Rt. 15E, Mt. Vernon Airport Industrial Park
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Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H16JAW53010300 ARDL No: 300576-03 (cont'd)
Sampling Loc'n: WELL JAW 53 Received: 06/27/1997
Sampling Date: 06/24/1997 Matrix: WATER
Sampling Time: 1010 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
SODIUM	0.40	13.1	MG/L	3010	6010A	07/01/97	07/02/97	P2160
SODIUM, DISSOLVED	0.40	14.2	MG/L	3005	6010A	07/02/97	07/02/97	P2159
THALLIUM	0.0010	ND	MG/L	3020	7841	07/01/97	07/03/97	F2165
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	07/01/97	07/03/97	F2164
VANADIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ZINC	0.0050	0.0075	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ZINC, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ALKALINITY	5.0	262	MG/L	NONE	310.1	NA	07/08/97	07094265
CHLORIDE	1.0	3.3	MG/L	NONE	300.0	NA	07/02/97	07074[illegible]
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	06/30/97	06/30/97	07034[illegible]
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/30/97	06/30/97	07034245
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	07/02/97	07074254
pH	0.10	7.0	PH UNITS	NONE	9040A	NA	06/30/97	07034247
SOLIDS, TOTAL DISSOLVED	40.0	263	MG/L	NONE	160.1	NA	06/30/97	07034248
SOLIDS, TOTAL SUSPENDED	2.0	ND	MG/L	NONE	160.2	NA	06/30/97	07034249
SULFATE	2.5	6.1	MG/L	NONE	300.0	NA	07/02/97	07074254
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	06/30/97	07034250
TOTAL ORGANIC CARBON	1.0	ND	MG/L	NONE	415.1	NA	07/09/97	07104275

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Mt. Vernon, Illinois 62864

Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H16JAW54010300 ARDL No: 300576-04
Sampling Loc'n: WELL JAW 54 Received: 06/27/1997
Sampling Date: 06/24/1997 Matrix: WATER
Sampling Time: 1155 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ANTIMONY	0.020	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ARSENIC	0.00050	ND	MG/L	3020	7061	07/01/97	07/02/97	BH2720
ARSENIC, DISSOLVED	0.00050	ND	MG/L	3005	7061	07/01/97	07/02/97	BH2719
BARIUM	0.010	0.087	MG/L	3010	6010A	07/01/97	07/02/97	P2160
BARIUM, DISSOLVED	0.010	0.091	MG/L	3005	6010A	07/02/97	07/02/97	P2159
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CADMIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CALCIUM	0.10	49.0	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CALCIUM, DISSOLVED	0.10	53.3	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CHROMIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
COBALT	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
COPPER	0.010	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
IRON	0.050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
IRON, DISSOLVED	0.050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
LEAD	0.0010	ND	MG/L	3020	7421	07/01/97	07/02/97	F2162
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	07/01/97	07/02/97	F2161
MAGNESIUM	0.10	20.3	MG/L	3010	6010A	07/01/97	07/02/97	P2160
MAGNESIUM, DISSOLVED	0.10	22.2	MG/L	3005	6010A	07/02/97	07/02/97	P2159
MANGANESE	0.0050	0.01	MG/L	3010	6010A	07/01/97	07/02/97	P2160
MANGANESE, DISSOLVED	0.0050	0.0086	MG/L	3005	6010A	07/02/97	07/02/97	P2159
MERCURY	0.00020	ND	MG/L	7470	7470	06/30/97	06/30/97	C0905
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	06/30/97	06/30/97	C0906
NICKEL	0.020	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
POTASSIUM	1.5	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
POTASSIUM, DISSOLVED	1.5	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
SELENIUM	0.00050	0.0011	MG/L	3020	7741	07/01/97	07/02/97	BH2722
SELENIUM, DISSOLVED	0.00050	0.0011	MG/L	3005	7741	07/01/97	07/02/97	BH2721
SILVER	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160

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Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H16JAW54010300 ARDL No: 300576-04 (cont'd)
Sampling Loc'n: WELL JAW 54 Received: 06/27/1997
Sampling Date: 06/24/1997 Matrix: WATER
Sampling Time: 1155 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
SODIUM	0.40	20.7	MG/L	3010	6010A	07/01/97	07/02/97	P2160
SODIUM, DISSOLVED	0.40	22.4	MG/L	3005	6010A	07/02/97	07/02/97	P2159
THALLIUM	0.0010	ND	MG/L	3020	7841	07/01/97	07/03/97	F2165
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	07/01/97	07/03/97	F2164
VANADIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ZINC	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ZINC, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ALKALINITY	5.0	206	MG/L	NONE	310.1	NA	07/08/97	07094265
CHLORIDE	1.0	10	MG/L	NONE	300.0	NA	07/02/97	07074
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	06/30/97	06/30/97	07034.
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/30/97	06/30/97	07034245
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	07/02/97	07074254
pH	0.10	7.1	PH UNITS	NONE	9040A	NA	06/30/97	07034247
SOLIDS, TOTAL DISSOLVED	40.0	248	MG/L	NONE	160.1	NA	06/30/97	07034248
SOLIDS, TOTAL SUSPENDED	2.0	ND	MG/L	NONE	160.2	NA	06/30/97	07034249
SULFATE	2.5	37.3	MG/L	NONE	300.0	NA	07/02/97	07074254
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	06/30/97	07034250
TOTAL ORGANIC CARBON	1.0	ND	MG/L	NONE	415.1	NA	07/09/97	07104275

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Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H16JAW55010300 ARDL No: 300576-06
Sampling Loc'n: WELL G55 JAW55 Received: 06/27/1997
Sampling Date: 06/24/1997 Matrix: WATER
Sampling Time: 1445 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ALUMINUM	0.050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ALUMINUM, DISSOLVED	0.050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ANTIMONY	0.020	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ANTIMONY, DISSOLVED	0.020	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ARSENIC	0.00050	0.00079	MG/L	3020	7061	07/01/97	07/02/97	BH2720
ARSENIC, DISSOLVED	0.00050	0.00065	MG/L	3005	7061	07/01/97	07/02/97	BH2719
BARIUM	0.010	0.099	MG/L	3010	6010A	07/01/97	07/02/97	P2160
BARIUM, DISSOLVED	0.010	0.1	MG/L	3005	6010A	07/02/97	07/02/97	P2159
BERYLLIUM	0.0010	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
BERYLLIUM, DISSOLVED	0.0010	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CADMIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CADMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CALCIUM	0.10	59.0	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CALCIUM, DISSOLVED	0.10	62.4	MG/L	3005	6010A	07/02/97	07/02/97	P2159
CHROMIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
CHROMIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
COBALT	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
COBALT, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
COPPER	0.010	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
COPPER, DISSOLVED	0.010	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
IRON	0.050	0.075	MG/L	3010	6010A	07/01/97	07/02/97	P2160
IRON, DISSOLVED	0.050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
LEAD	0.0010	ND	MG/L	3020	7421	07/01/97	07/02/97	F2162
LEAD, DISSOLVED	0.0010	ND	MG/L	3005	7421	07/01/97	07/02/97	F2161
MAGNESIUM	0.10	19.5	MG/L	3010	6010A	07/01/97	07/02/97	P2160
MAGNESIUM, DISSOLVED	0.10	20.9	MG/L	3005	6010A	07/02/97	07/02/97	P2159
MANGANESE	0.0050	0.16	MG/L	3010	6010A	07/01/97	07/02/97	P2160
MANGANESE, DISSOLVED	0.0050	0.19	MG/L	3005	6010A	07/02/97	07/02/97	P2159
MERCURY	0.00020	ND	MG/L	7470	7470	06/30/97	06/30/97	C0905
MERCURY, DISSOLVED	0.00020	ND	MG/L	7470	7470	06/30/97	06/30/97	C0906
NICKEL	0.020	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
NICKEL, DISSOLVED	0.020	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
POTASSIUM	1.5	1.8	MG/L	3010	6010A	07/01/97	07/02/97	P2160
POTASSIUM, DISSOLVED	1.5	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
SELENIUM	0.00050	ND	MG/L	3020	7741	07/01/97	07/02/97	BH2722
SELENIUM, DISSOLVED	0.00050	ND	MG/L	3005	7741	07/01/97	07/02/97	BH2721
SILVER	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160

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Lab Report No: 300576 Report Date: 07/10/1997

Project Name: IOWA ARMY AMM PLANT Analysis: Inorganics
Project No: 5644V

Field ID: H16JAW55010300 ARDL No: 300576-06 (cont'd)
Sampling Loc'n: WELL G55 Received: 06/27/1997
Sampling Date: 06/24/1997 Matrix: WATER
Sampling Time: 1445 Moisture: NA

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
SILVER, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
SODIUM	0.40	14.9	MG/L	3010	6010A	07/01/97	07/02/97	P2160
SODIUM, DISSOLVED	0.40	15.3	MG/L	3005	6010A	07/02/97	07/02/97	P2159
THALLIUM	0.0010	ND	MG/L	3020	7841	07/01/97	07/03/97	F2165
THALLIUM, DISSOLVED	0.0010	ND	MG/L	3005	7841	07/01/97	07/03/97	F2164
VANADIUM	0.0050	ND	MG/L	3010	6010A	07/01/97	07/02/97	P2160
VANADIUM, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ZINC	0.0050	0.055	MG/L	3010	6010A	07/01/97	07/02/97	P2160
ZINC, DISSOLVED	0.0050	ND	MG/L	3005	6010A	07/02/97	07/02/97	P2159
ALKALINITY	5.0	252	MG/L	NONE	310.1	NA	07/08/97	07094265
CHLORIDE	1.0	1.9	MG/L	NONE	300.0	NA	07/02/97	0707[illegible]
CYANIDE, DISSOLVED	0.010	ND	MG/L	9012	9012	06/30/97	06/30/97	07034[illegible]5
CYANIDE, TOTAL	0.010	ND	MG/L	9012	9012	06/30/97	06/30/97	07034245
NITRATE-NITRITE	1.5	ND	MG/L	NONE	300.0	NA	07/02/97	07074254
pH	0.10	7.5	PH UNITS	NONE	9040A	NA	06/30/97	07034247
SOLIDS, TOTAL DISSOLVED	40.0	286	MG/L	NONE	160.1	NA	06/30/97	07034248
SOLIDS, TOTAL SUSPENDED	2.0	ND	MG/L	NONE	160.2	NA	06/30/97	07034249
SULFATE	2.5	22.0	MG/L	NONE	300.0	NA	07/02/97	07074254
SULFIDE, TOTAL	1.0	ND	MG/L	NONE	376.1	NA	06/30/97	07034250
TOTAL ORGANIC CARBON	1.0	1.1	MG/L	NONE	415.1	NA	07/09/97	07104275

APPENDIX M
NPDES DATA

O	YEAR	MONTH	DISCH (MGD)	CFS	MAX DISCH	CFS	PARAME	YEAR	MONTH	AVE CONC (mg/l)	FLOW LOAD (MGD)	CFS	LOADING	LOADING(LBS)	PA	YEAR	MONTH	AVE CONC (mg/l)	LOADING	LOAD(LBS)		
12	1997	3	0	0	0.0007	0.0011	RDX+HMX	1997	3	0.0000	0.0007	0.00108	0.0000	0.0000	TNT	1997	3	0.0000	0.0000	0.0000		
		2	0	0.0000	0.0003	0.0005			2	0.0800	0.0003	0.0005	0.0002	0.0056			2	0.0000	0.0000	0.0000		
		1	0	0.0000	0.0023	0.0036			1	0.4500	0.0023	0.0036	0.0086	0.2677			1	0.0600	0.0012	0.0357		
		SUM	0	0.0000	0.0033	0.0051				0.5300	SUM	0.0051	0.0088	0.2733				0.0600	0.0012	0.0357	0.3090	SUM LOAD
		AVE	0	0.0000	0.0011	0.0017				0.1767	AVE	0.0017	0.0029					0.0200	0.0004		0.0003	SUM LOADING
	1996	12	0	0.0000	0.0011	0.0017		1996	12	0.0200	0.0011	0.0017	0.0002	0.0057		1996	12	0.0100	0.0001	0.0028		
		11	0	0.0000	0.002	0.0031			11	0.0400	0.002	0.0031	0.0007	0.0200			11	0.0000	0.0000	0.0000		
		10	0	0.0000	0.0062	0.0096			10	0.1100	0.0062	0.0096	0.0057	0.1764			10	0.0500	0.0026	0.0802		
		9	0.002	0.0031	0.004	0.0062			9	0.0400	0.002	0.0031	0.0007	0.0207			9	0.0000	0.0000	0.0000		
		8	0.0013	0.0020	0.0029	0.0045			8	0.0600	0.0013	0.0020	0.0007	0.0202			8	0.0000	0.0000	0.0000		
		7	0.002	0.0031	0.0038	0.0059			7	0.0435	0.002	0.0031	0.0007	0.0225			7	0.0800	0.0013	0.0414		
		6	0.0008	0.0012	0.0025	0.0039			6	0.0000	0.0008	0.0012	0.0000	0.0000			6	0.0000	0.0000	0.0000		
		5	0.0014	0.0022	0.0053	0.0082			5	0.0200	0.0014	0.0022	0.0002	0.0072			5	0.0000	0.0000	0.0000		
		4	0.0009	0.0014	0.0044	0.0068			4	0.0000	0.0009	0.0014	0.0000	0.0000			4	0.0000	0.0000	0.0000		
		3	0.0003	0.0005	0.0006	0.0009			3	0.0300	0.0003	0.0005	0.0001	0.0023			3	0.0000	0.0000	0.0000		
		2	0.0013	0.0020	0.0043	0.0067			2	0.1100	0.0013	0.0020	0.0012	0.0334			2	0.0000	0.0000	0.0000		
		1	0.0006	0.0009	0.0013	0.0020			1	0.0300	0.0006	0.0009	0.0002	0.0047			1	0.0000	0.0000	0.0000		
		SUM	0.0106	0.0155		0.0574				0.4735	SUM	0.0299	0.0102	0.3132				0.1400	0.0040	0.1244	0.4376	SUM LOAD
		AVE	0.0009	0.0013		0.0048				0.0395	AVE	0.0025	0.0009					0.0117	0.0003		0.0012	SUM LOADING
	1995	12	0.0003	0.0005	0.0006	0.0009		1995	12	0.0000	0.0003	0.0005	0.0000	0.0000		1995	12	0.0000	0.0000	0.0000		
		11	0.0005	0.0008	0.001	0.0015			11	0.0000	0.0005	0.0008	0.0000	0.0000			11	0.0000	0.0000	0.0000		
		10	0.0004	0.0006	0.0011	0.0017			10	0.0100	0.0004	0.0006	0.0000	0.0010			10	0.0000	0.0000	0.0000		
		9	0.0004	0.0006	0.0007	0.0011			9	0.0200	0.0004	0.0006	0.0001	0.0021			9	0.0300	0.0001	0.0031		
		8	0.0004	0.0006	0.0009	0.0014			8	0.0100	0.0004	0.0006	0.0000	0.0010			8	0.0500	0.0002	0.0052		
		7	0.0007	0.0011	0.0021	0.0032			7	0.0250	0.0007	0.0011	0.0001	0.0045			7	0.0930	0.0005	0.0168		
		6	0	0.0000	0.0015	0.0023			6	0.0000	0.0015	0.0023	0.0000	0.0000			6	0.1510	0.0019	0.0567		
		5	0	0.0000	0.0008	0.0012			5	0.0000	0.0008	0.0012	0.0000	0.0000			5	0.0000	0.0000	0.0000		
		4	0	0.0000	0.001	0.0015			4	0.0900	0.001	0.0015	0.0008	0.0225			4	0.0200	0.0002	0.0050		
		3	0	0.0000	0.0057	0.0088			3	0.0616	0.0057	0.0088	0.0029	0.0908			3	0.0120	0.0006	0.0177		
		2	0	0.0000	0.0014	0.0022		1995	2	0.0575	0.0014	0.0022	0.0007	0.0188			2	0.0060	0.0001	0.0020		
		1	0	0.0000	0.003	0.0046			1	0.0923	0.003	0.0046	0.0023	0.0716			1	0.0050	0.0001	0.0039		
		SUM	0.0027	0.0042		0.0260				0.2741	SUM	0.0203	0.0069	0.2125				0.3820	0.0035	0.1104	0.3228	SUM LOAD
		AVE	0.0002	0.0003		0.0022				0.0228	AVE	0.0017	0.0006					0.0302	0.0003		0.0009	SUM LOADING
	1994	12	0	0.0000	0.0008	0.0012		1994	12	0.1020	0.0008	0.0012	0.0007	0.0211		1994	12	0.0090	0.0001	0.0019		
		11	0	0.0000	0.0009	0.0014			11	0.1100	0.0009	0.0014	0.0008	0.0248			11	0.0200	0.0002	0.0045		
		10	0	0.0000	0.0027	0.0042			10	0.0600	0.0027	0.0042	0.0014	0.0419			10	0.0300	0.0007	0.0210		
		9	0	0.0000	0.0009	0.0014			9	0.0700	0.0009	0.0014	0.0005	0.0163			9	0.0300	0.0002	0.0070		
		8	0	0.0000	0.0034	0.0053			8	0.0500	0.0034	0.0053	0.0014	0.0440			8	0.0100	0.0003	0.0088		
		7	0	0.0000	0.0048	0.0074			7	1.9100	0.0048	0.0074	0.0765	2.3716			7	0.1000	0.0040	0.1242		
		6	0	0.0000	0.0033	0.0051			6	0.5900	0.0033	0.0051	0.0162	0.4874			6	0.0400	0.0011	0.0330		
		5	0	0.0000	0.0013	0.0020			5	0.1400	0.0013	0.0020	0.0015	0.0471			5	0.0000	0.0000	0.0000		
		4	0	0.0000	0.0022	0.0034			4	0.1100	0.0022	0.0034	0.0020	0.0606			4	0.0050	0.0001	0.0028		
		3	0	0.0000	0.0021	0.0032			3	0.0735	0.0021	0.0032	0.0013	0.0399			3	0.0110	0.0002	0.0060		
		2	0	0.0000	0.0042	0.0065			2	0.1800	0.0042	0.0065	0.0063	0.1766			2	0.0800	0.0028	0.0785		
		1	0	0.0000	0.0079	0.0122			1	0.0600	0.0079	0.0122	0.0040	0.1226			1	0.0900	0.0059	0.1839		
		SUM	0.0000	0.0000		0.0412				3.3955	SUM	0.0412	0.1126	3.4539				0.3350	0.0096	0.4715	3.9254	SUM LOAD
		AVE	0.0000	0.0000		0.0034				0.2830	AVE	0.0034	0.0094					0.0279	0.0008		0.0102	SUM LOADING
	1993	12	0	0.0000	0.0042	0.0065		1993	12	0.1000	0.0042	0.0065	0.0035	0.1086		1993	12	0.0300	0.0011	0.0326		
		11	0	0.0000	0.0015	0.0023			11	0.2140	0.0015	0.0023	0.0027	0.0804			11	0.0440	0.0006	0.0165		
		10	0	0.0000	0.002	0.0031			10	0.0100	0.002	0.0031	0.0002	0.0052			10	0.0050	0.0001	0.0026		
		9	0	0.0000	0.0022	0.0034			9	0.0000	0.0022	0.0034	0.0000	0.0000			9	0.0000	0.0000	0.0000		
		8	0	0.0000	0.0017	0.0026			8	0.0500	0.0017	0.0026	0.0007	0.0220			8	0.0000	0.0000	0.0000		
		7	0	0.0000	0.0019	0.0029			7	0.0050	0.0019	0.0029	0.0001	0.0025			7	0.0000	0.0000	0.0000		
		6	0	0.0000	0.0039	0.0060			6	0.0300	0.0039	0.0060	0.0010	0.0293			6	0.0160	0.0005	0.0156		
		5	0	0.0000	0.0014	0.0022			5	0.0250	0.0014	0.0022	0.0003	0.0091			5	0.0230	0.0003	0.0083		
		4	0	0.0000	0.0011	0.0017			4	0.0250	0.0011	0.0017	0.0002	0.0069			4	0.0150	0.0001	0.0041		
		3	0	0.0000	0.0015	0.0023			3	0.0940	0.0015	0.0023	0.0012	0.0365			3	0.0220	0.0003	0.0085		
		2	0	0.0000	0.0013	0.0020			2	1.4600	0.0013	0.0020	0.0158	0.4435			2	0.4600	0.0050	0.1397		
		1	0	0.0000	0.0017	0.0026			1	0.2400	0.0017	0.0026	0.0034	0.1055			1	0.0500	0.0007	0.0220		
		SUM	0.0000	0.0000		0.0351				2.0130	SUM	0.0351	0.0291	0.8493				0.6150	0.0079	0.2500	1.0994	SUM LOAD
		AVE	0.0000	0.0000		0.0029				0.1678	AVE	0.0029	0.0024					0.0513	0.0007		0.0031	SUM LOADING
	1992	12	0	0.0000	0.0021	0.0032		1992	12	0.0900	0.0021	0.0032	0.0016	0.0489		1992	12	0.0000	0.0000	0.0000		
		11	0	0.0000	0.0031	0.0048			11	0.1800	0.0031	0.0048	0.0047	0.1397			11	0.0150	0.0004	0.0116		
		10	0	0.0000	0.0033	0.0051			10	0.1800	0.0033	0.0051	0.0050	0.1537			10	0.0700	0.0019	0.0598		
		9	0	0.0000	0.002	0.0031			9	0.0480	0.002	0.0031	0.0008	0.0248			9	0.0000	0.0000	0.0000		
		8	0	0.0000	0.0019	0.0029			8	0.0000	0.0019	0.0029	0.0000	0.0000			8	0.0250	0.0004	0.0123		
		7	0	0.0000	0.0009	0.0014			7	0.0000	0.0009	0.0014	0.0000	0.0000			7	0.0130	0.0001	0.0030		
		6	0	0.0000	0.0032	0.0050			6	0.0600	0.0032	0.0050	0.0018	0.0481			6	0.0300	0.0008	0.0240		

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	5	0	0.0000	0.0013	0.0020			5	0.0000	0.0013	0.0020	0.0000	0.0000			5	0.0000	0.0000	0.0000				
	4	0	0.0000	0.003	0.0046			4	0.0000	0.003	0.0046	0.0000	0.0000			4	0.0000	0.0000	0.0000				
	3	0	0.0000	0.0047	0.0073			3	0.0000	0.0047	0.0073	0.0000	0.0000			3	0.0000	0.0000	0.0000				
	2	0	0.0000	0.0016	0.0025			2	0.0300	0.0016	0.0025	0.0004	0.0112			2	0.0400	0.0005	0.0150				
	1	0	0.0000	0.0011	0.0017			1	0.1900	0.0011	0.0017	0.0017	0.0541			1	0.0000	0.0000	0.0000				
	SUM	0.0000	0.0000		0.0419				0.5880		SUM 0.0419	0.0157	0.4804				0.1930	0.0041	0.1257	0.6061	SUM LOAD		
	AVE	0.0000	0.0000		0.0035				0.0490		AVE 0.0035	0.0013					0.0161	0.0003		0.0017	SUM LOADING		
1991	12	0	0.0000	0.0019	0.0029		1991	12	1.6900	0.0019	0.0029	0.0268	0.8306		1991	12	0.3100	0.0049	0.1524				
	11	0	0.0000	0.009	0.0139			11	1.7600	0.009	0.0139	0.1337	4.0104			11	0.2000	0.0150	0.4506				
	10	0	0.0000	0.0012	0.0019			10	0.7500	0.0012	0.0019	0.0075	0.2328			10	0.0300	0.0003	0.0093				
	9	0	0.0000	0.003	0.0046			9	0.8800	0.003	0.0046	0.0220	0.6829			9	0.0700	0.0018	0.0543				
	8	0.0012	0.0019	0.0033	0.0051			8	0.7200	0.0012	0.0019	0.0072	0.2235			8	0.1500	0.0015	0.0466				
	7	0.0011	0.0017	0.0023	0.0036			7	0.4800	0.0011	0.0017	0.0044	0.1366			7	0.1300	0.0012	0.0370				
	6	0.0015	0.0023	0.0023	0.0036			6	0.1000	0.0015	0.0023	0.0013	0.0376			6	0.0600	0.0008	0.0225				
	5	0.0021	0.0032	0.0028	0.0043			5	0.0000	0.0021	0.0032	0.0000	0.0000			5	0.0000	0.0000	0.0000				
	4	0.002	0.0031	0.0031	0.0048			4	0.0900	0.002	0.0031	0.0015	0.0451			4	0.1000	0.0017	0.0501				
	3	0.0018	0.0028	0.003	0.0046			3	0.0000	0.0018	0.0028	0.0000	0.0000			3	0.0000	0.0000	0.0000				
	2	0.001	0.0015	0.0019	0.0029			2	0.0300	0.001	0.0015	0.0003	0.0070			2	0.0100	0.0001	0.0023				
	1	0.0008	0.0012	0.0014	0.0022			1	0.0000	0.0008	0.0012	0.0000	0.0000			1	0.0200	0.0001	0.0041				
	SUM	0.0115	0.0166		0.0523				6.5200		SUM 0.0399	0.2046	6.2065				1.0600	0.0272	0.8292	7.0357	SUM LOAD		
	AVE	0.0010	0.0014		0.0044				0.5433		AVE 0.0033	0.0171					0.0883	0.0023		0.0193	SUM LOADING		
1990	12	0.0008	0.0012	0.0062	0.0096		1990	12	0.0000	0.0008	0.0012	0.0000	0.0000		1990	12	0.0200	0.0001	0.0041				
	11	0.0007	0.0011	0.0007	0.0011			11	0.0000	0.0007	0.0011	0.0000	0.0000			11	0.0000	0.0000	0.0000				
	10	0.0011	0.0017	0.0075	0.0116			10	0.0000	0.0011	0.0017	0.0000	0.0000			10	0.0000	0.0000	0.0000				
	9	0.001	0.0015	0.0017	0.0026			9	0.0400	0.001	0.0015	0.0003	0.0103			9	0.1100	0.0009	0.0285				
	8	0.0003	0.0005	0.0009	0.0014			8	0.0000	0.0003	0.0005	0.0000	0.0000			8	0.0200	0.0001	0.0016				
	7	0.0002	0.0003	0.0012	0.0019			7	0.0200	0.0002	0.0003	0.0000	0.0010			7	0.0500	0.0001	0.0026				
	6	0.0005	0.0008	0.0025	0.0039			6	0.1000	0.0005	0.0008	0.0004	0.0125			6	0.1400	0.0006	0.0175				
	5	0.0012	0.0019	0.0056	0.0087			5	0.0700	0.0012	0.0019	0.0007	0.0217			5	0.1300	0.0013	0.0404				
	4	0.0009	0.0014	0.0023	0.0036			4	0.0200	0.0009	0.0014	0.0002	0.0045			4	0.0100	0.0001	0.0023				
	3	0.0013	0.0020	0.0045	0.0070			3	0.0200	0.0013	0.0020	0.0002	0.0067			3	0.0100	0.0001	0.0034				
	2	0.0011	0.0017	0.0035	0.0054			2	0.0200	0.0011	0.0017	0.0002	0.0051			2	0.1000	0.0009	0.0257				
	1	0.0011	0.0017	0.0019	0.0029			1	0.7300	0.0011	0.0017	0.0067	0.2077			1	0.0300	0.0003	0.0085				
	SUM	0.0102	0.0141		0.0566				0.2900		SUM 0.0141	0.0067	0.2697				0.5900	0.0042	0.1345	0.4042	SUM LOAD		
	AVE	0.0009	0.0012		0.0047				0.0242		AVE 0.0012	0.0007					0.0492	0.0003		0.0011	SUM LOADING		
1989	12	0.0019	0.0029	0.0029	0.0045		1989	12	0.1500	0.0019	0.0029	0.0024	0.0737		1989	12	0.0100	0.0002	0.0049				
	11	0.0018	0.0028	0.003	0.0046			11	0.0800	0.0018	0.0028	0.0012	0.0360			11	0.0600	0.0009	0.0270				
	10	0.0013	0.0020	0.0017	0.0026			10	0.1800	0.0013	0.0020	0.0020	0.0605			10	0.1400	0.0015	0.0471				
	9	0.0008	0.0012	0.0013	0.0020			9	0.1000	0.0008	0.0012	0.0007	0.0207			9	0.0200	0.0001	0.0041				
	8	0.0011	0.0017	0.0011	0.0017			8	0.0500	0.0011	0.0017	0.0005	0.0142			8	0.0200	0.0002	0.0057				
	7	0.0008	0.0012	0.0008	0.0012			7	0.0200	0.0008	0.0012	0.0001	0.0041			7	0.0100	0.0001	0.0021				
	6	0.0004	0.0006	0.0004	0.0006			6	0.0200	0.0004	0.0006	0.0001	0.0020			6	0.0100	0.0000	0.0010				
	SUM	0.0081	0.0125		0.0172			5	0.0200				0.0000			5	0.0100		0.0000				
	AVE	0.0012	0.0018		0.0025			4	0.0200				0.0000			4	0.0100		0.0000				
								3	0.0200				0.0000			3	0.0100		0.0000				
								2	0.0000				0.0000			2	0.0300		0.0000				
								1	0.0000				0.0000			1	0.0000		0.0000				
								SUM	0.6600		SUM 0.0125	0.0069	0.2114				0.3300	0.0030	0.0919	0.3033	SUM LOAD		
								AVE	0.0550		AVE 0.0018	0.0010	0.0302				0.0275	0.0004	0.0131	0.0014	SUM LOADING		
							1988	12	0.0000						1988	12	0.0000						
								11	0.0000							11	0.0000						
								10	0.1000							10	0.4000						
								9	0.0250							9	0.2000						
								8	0.0200							8	0.0200						
								7	0.0500							7	0.0000						
								6	0.0300							6	0.0000						
								5	0.0000							5	0.0000						
								4	0.0800							4	0.2000						
								3	0.1000							3	0.0500						
								2	0.1800							2	0.2300						
								1	0.8000							1	0.2300						
									0.5850							SUM	1.1000						
									0.04875							AVE	0.0917						
							1987	12	0.1800						1987	12	0.0000						
								11	0.0300							11	0.0300						
								10	0.1800							10	0.1000						
								9	0.3300							9	0.4800						
								8	0.2800							8	0.0800						
								7	0.0500							7	0.0000						

6	0.1300
5	0.0800
4	0.1500
3	0.1800
2	0.1300
1	0.0300
SUM	1.7200
AVE	0.1433

6	0.0000
5	0.0000
4	0.0000
3	0.4500
2	0.4000
1	0.0300
SUM	1.5400
AVE	0.1283

Sheet1

TF	YEAR	MONTH	AVE DISCHARGE (MGD)	CFS	MAX DIS	CFS	ARAMETE	YEAR	MONTH	AVE CONC (mg/l)	FLOW (MGD)	CFS	NPDES LOADING	LOAD(LBS)	AME	YEAR	MONTH	AVE CONC (mg/l)	NPDES FLOW (MGD)	CFS	LOADING	LOAD(LBS)		
021	1997	3	0.0000	0.0000	0.0026	0.0040	RDX+HMX	1997	3	0.0800	0.0026	0.0040	0.0017	0.0538	TNT	1997	3	0.0600	0.0026	0.0040	0.0013	0.0404		
		2	0.0000	0.0000	0.0059	0.0091			2	0.1700	0.0059	0.0091	0.0084	0.2343			2	0.0100	0.0059	0.0091	0.0005	0.0138		
		1	0.0000	0.0000	0.0056	0.0087			1	0.0000	0.0056	0.0087	0.0000	0.0000			1	0.0000	0.0056	0.0087	0.0000	0.0000		
		SUM	0.0000	0.0000	0.0141	0.0218				0.2500	SUM	0.0218	0.0101	0.2882				0.0700	SUM	0.0218	0.0018	0.0541	0.3423	SUM LOAD
		AVE	0.0000	0.0000	0.0047	0.0073				0.0833	AVE	0.0073	0.0034					0.0233	AVE	0.0073	0.0006		0.0040	SUM LOADING
	1996	12	0.0000	0.0000	0.0010	0.0015		1996	12	0.0000	0.0010	0.0015	0.0000	0.0000		1996	12	0.0000	0.0010	0.0015	0.0000	0.0000		
		11	0.0000	0.0000	0.0015	0.0023			11	0.0000	0.0015	0.0023	0.0000	0.0000			11	0.0000	0.0015	0.0023	0.0000	0.0000		
		10	0.0000	0.0000	0.0065	0.0101			10	0.0800	0.0065	0.0101	0.0043	0.1345			10	0.0000	0.0065	0.0101	0.0000	0.0000		
		9	0.0009	0.0014	0.0012	0.0019			9	0.0000	0.0009	0.0014	0.0000	0.0000			9	0.0200	0.0009	0.0014	0.0002	0.0047		
		8	0.0014	0.0022	0.0020	0.0031			8	0.4000	0.0014	0.0022	0.0047	0.1449			8	0.0200	0.0014	0.0022	0.0002	0.0072		
		7	0.0012	0.0019	0.0029	0.0045			7	0.0242	0.0012	0.0019	0.0002	0.0075			7	0.0114	0.0012	0.0019	0.0001	0.0035		
		6	0.0014	0.0022	0.0027	0.0042			6	0.0000	0.0014	0.0022	0.0000	0.0000			6	0.0000	0.0014	0.0022	0.0000	0.0000		
		5	0.0022	0.0034	0.0046	0.0071			5	0.0100	0.0022	0.0034	0.0002	0.0057			5	0.0000	0.0022	0.0034	0.0000	0.0000		
		4	0.0009	0.0014	0.0015	0.0023			4	0.0200	0.0009	0.0014	0.0002	0.0045			4	0.0000	0.0009	0.0014	0.0000	0.0000		
		3	0.0000	0.0000	0.0000	0.0000			3	0.0000	0.0000	0.0000	0.0000	0.0000			3	0.0000	0.0000	0.0000	0.0000	0.0000		
		2	0.0000	0.0000	0.0000	0.0000			2	0.0000	0.0000	0.0000	0.0000	0.0000			2	0.0000	0.0000	0.0000	0.0000	0.0000		
		1	0.0000	0.0000	0.0000	0.0000			1	0.0000	0.0000	0.0000	0.0000	0.0000			1	0.0000	0.0000	0.0000	0.0000	0.0000		
		SUM	0.0080	0.0124	0.0236	0.0370				0.5342	SUM	0.0283	0.0096	0.2871					SUM	0.0283	0.0005	0.0154	0.3125	SUM LOAD
		AVE	0.0007	0.0010	0.0020	0.0031				0.0445	AVE	0.0022	0.0008						AVE	0.0022	0.0000		0.0008	SUM LOADING
	1995	12	0.0000	0.0000	0.0000	0.0000		1995	12	0.0000	0.0000	0.0000	0.0000	0.0000		1995	12	0.0000	0.0000	0.0000	0.0000	0.0000		
		11	0.0000	0.0000	0.0000	0.0000			11	0.0000	0.0000	0.0000	0.0000	0.0000			11	0.0000	0.0000	0.0000	0.0000	0.0000		
		10	0.0000	0.0000	0.0000	0.0000			10	0.0000	0.0000	0.0000	0.0000	0.0000			10	0.0000	0.0000	0.0000	0.0000	0.0000		
		9	0.0000	0.0000	0.0000	0.0000			9	0.0000	0.0000	0.0000	0.0000	0.0000			9	0.0000	0.0000	0.0000	0.0000	0.0000		
		8	0.0000	0.0000	0.0000	0.0000			8	0.0000	0.0000	0.0000	0.0000	0.0000			8	0.0000	0.0000	0.0000	0.0000	0.0000		
		7	0.0016	0.0025	0.0017	0.0026			7	0.0000	0.0016	0.0025	0.0000	0.0000			7	0.0000	0.0016	0.0025	0.0000	0.0000		
		6	0.0000	0.0000	0.0000	0.0000			6	0.0000	0.0000	0.0000	0.0000	0.0000			6	0.0000	0.0000	0.0000	0.0000	0.0000		
		5	0.0000	0.0000	0.0000	0.0000			5	0.0000	0.0000	0.0000	0.0000	0.0000			5	0.0000	0.0000	0.0000	0.0000	0.0000		
		4	0.0000	0.0000	0.0026	0.0040			4	0.1000	0.0026	0.0040	0.0022	0.0651			4	0.0400	0.0026	0.0040	0.0009	0.0260		
		3	0.0000	0.0000	0.0000	0.0000			3	0.0000	0.0000	0.0000	0.0000	0.0000			3	0.0000	0.0000	0.0000	0.0000	0.0000		
		2	0.0000	0.0000	0.0025	0.0039			2	0.1700	0.0025	0.0039	0.0035	0.0993			2	0.0166	0.0025	0.0039	0.0003	0.0097		
		1	0.0000	0.0000	0.0017	0.0026			1	0.1755	0.0017	0.0026	0.0025	0.0772			1	0.0366	0.0017	0.0026	0.0005	0.0161		
		SUM	0.0016	0.0025	0.0086	0.0132				0.4455	SUM	0.0130	0.0092	0.2418					SUM	0.0130	0.0017	0.0519	0.2934	SUM LOAD
		AVE	0.0001	0.0002	0.0007	0.0011				0.0371	AVE	0.0011	0.0007						AVE	0.0011	0.0001		0.0008	SUM LOADING
	1994	12	0.0000	0.0000	0.0022	0.0034		1994	12	0.0975	0.0022	0.0034	0.0018	0.0555		1994	12	0.9000	0.0022	0.0034	0.0165	0.5122		
		11	0.0000	0.0000	0.0017	0.0026			11	0.1000	0.0017	0.0026	0.0014	0.0426			11	0.0025	0.0017	0.0026	0.0000	0.0011		
		10	0.0000	0.0000	0.0016	0.0025			10	0.5900	0.0016	0.0025	0.0079	0.2442			10	0.3200	0.0016	0.0025	0.0043	0.1324		
		9	0.0000	0.0000	0.0018	0.0028			9	0.2400	0.0018	0.0028	0.0036	0.1118			9	0.0400	0.0018	0.0028	0.0006	0.0186		
		8	0.0000	0.0000	0.0018	0.0028			8	0.0600	0.0018	0.0028	0.0009	0.0279			8	0.0000	0.0018	0.0028	0.0000	0.0000		
		7	0.0000	0.0000	0.0012	0.0019			7	0.0400	0.0012	0.0019	0.0004	0.0124			7	0.0000	0.0012	0.0019	0.0000	0.0000		
		6	0.0000	0.0000	0.0019	0.0029			6	0.0580	0.0019	0.0029	0.0009	0.0276			6	0.0060	0.0019	0.0029	0.0001	0.0029		
		5	0.0000	0.0000	0.0015	0.0023			5	0.2229	0.0015	0.0023	0.0028	0.0865			5	0.0800	0.0015	0.0023	0.0010	0.0310		
		4	0.0000	0.0000	0.0015	0.0023			4	0.2262	0.0015	0.0023	0.0028	0.0849			4	0.0562	0.0015	0.0023	0.0007	0.0211		
		3	0.0000	0.0000	0.0016	0.0025			3	0.0000	0.0016	0.0025	0.0000	0.0000			3	0.0000	0.0016	0.0025	0.0000	0.0000		
		2	0.0000	0.0000	0.0016	0.0025			2	0.5000	0.0016	0.0025	0.0067	0.1869			2	0.6000	0.0016	0.0025	0.0080	0.2243		
		1	0.0000	0.0000	0.0018	0.0028			1	0.0400	0.0018	0.0028	0.0006	0.0186			1	0.0000	0.0018	0.0028	0.0000	0.0000		
		SUM	0.0000	0.0000	0.0202	0.0313				2.1746	SUM	0.0313	0.0290	0.6989					SUM	0.0313	0.0312	0.9436	1.6425	SUM LOAD
		AVE	0.0000	0.0000	0.0017	0.0026				0.1812	AVE	0.0026	0.0025						AVE	0.0026	0.0026		0.0051	SUM LOADING
	1993	12	0.0000	0.0000	0.0043	0.0067		1993	12	0.2500	0.0043	0.0067	0.0090	0.2781		1993	12	0.0300	0.0043	0.0067	0.0011	0.0334		
		11	0.0000	0.0000	0.0029	0.0045			11	0.5466	0.0029	0.0045	0.0132	0.3968			11	0.0000	0.0029	0.0045	0.0000	0.0000		
		10	0.0000	0.0000	0.0026	0.0040			10	0.0550	0.0026	0.0040	0.0012	0.0370			10	0.0550	0.0026	0.0040	0.0012	0.0370		
		9	0.0000	0.0000	0.0019	0.0029			9	0.1050	0.0019	0.0029	0.0017	0.0516			9	0.1625	0.0019	0.0029	0.0026	0.0799		
		8	0.0000	0.0000	0.0026	0.0040			8	0.1700	0.0026	0.0040	0.0037	0.1143			8	0.2000	0.0026	0.0040	0.0043	0.1345		
		7	0.0000	0.0000	0.0032	0.0050			7	0.0125	0.0032	0.0050	0.0003	0.0103			7	0.0075	0.0032	0.0050	0.0002	0.0062		
		6	0.0000	0.0000	0.0026	0.0040			6	0.0120	0.0026	0.0040	0.0003	0.0078			6	0.0020	0.0026	0.0040	0.0000	0.0013		
		5	0.0000	0.0000	0.0009	0.0014			5	0.0200	0.0009	0.0014	0.0002	0.0047			5	0.0000	0.0009	0.0014	0.0000	0.0000		
		4	0.0000	0.0000	0.0034	0.0053			4	0.1250	0.0034	0.0053	0.0035	0.1064			4	0.0225	0.0034	0.0053	0.0006	0.0192		
		3	0.0000	0.0000	0.0024	0.0037			3	0.0000	0.0024	0.0037	0.0000	0.0000			3	0.0000	0.0024	0.0037	0.0000	0.0000		
		2	0.0000	0.0000	0.0015	0.0023			2	0.1466	0.0015	0.0023	0.0018	0.0514			2	0.0266	0.0015	0.0023	0.0003	0.0093		
		1	0.0000	0.0000	0.0010	0.0015			1	0.1100	0.0010	0.0015	0.0009	0.0285			1	0.3100	0.0010	0.0015	0.0026	0.0802		
		SUM	0.0000	0.0000	0.0285	0.0453				1.5527	SUM	0.0453	0.0368	1.0869					SUM	0.0453	0.0120	0.4209	1.4828	SUM LOAD
		AVE	0.0000	0.0000	0.0024	0.0038				0.1294	AVE	0.0038	0.0030						AVE	0.0038	0.0011		0.0041	SUM LOADING
	1992	12	0.0000	0.0000	0.0018	0.0028		1992	12	0.0800	0.0018	0.0028	0.0012	0.0373		1992	12	0.0000	0.0018	0.0028	0.0000	0.0000		
		11	0.0000	0.0000	0.0024	0.0037			11	0.0850	0.0024	0.0037	0.0017	0.0511			11	0.1375	0.0024	0.0037	0.0028	0.0826		
		10	0.0000	0.0000	0.0008	0.0012			10	0.0375	0.0008	0.0012	0.0003	0.0078			10	0.0200	0.0008	0.0012	0.0001	0.0041		
		9	0.0000	0.0000	0.0014	0.0022			9	0.0000	0.0014	0.0022	0.0000	0.0000			9	0.0000	0.0014	0.0022	0.0000	0.0000		
		8	0.0000	0.0000	0.0004	0.0006			8	0.0000	0.0004	0.0006	0.0000	0.0000			8	0.0075	0.0004	0.0006	0.0000	0.0008		
		7	0.0000	0.0000	0.0035	0.0054			7	0.0000	0.0035	0.0054	0.0000	0.0000			7	0.0000	0.0035	0.0054	0.0000	0.0000		
		6	0.0000	0.0000	0.0014	0.0022			6	0.0300	0.0014	0.0022	0.0004	0.0105			6	0.0000	0.0014	0.0022	0.0000	0.0000		
		5	0.0000	0.0000	0.0015	0.0023			5	0.0000	0.0015	0.0023	0.0000	0.0000			5	0.0000	0.0015	0.0023	0.0000	0.0000		
		4	0.0000	0.0000	0.0021	0.0032			4	0.0000	0.0021	0.0032	0.0000	0.0000			4	0.0000	0.0021	0.0032	0.0000	0.0000		
		3	0.0000	0.0000	0.0012	0.0019			3	0.0300	0.0012	0.0019	[illegible]	0.0093			3	0.0200	0.0012	0.0019	0.0002	0.0062		

	2	0.0000	0.0000	0.0011	0.0017			2	0.0000	0.0011	0.0017	0.0000	0.0000			2	0.0000	0.0011	0.0017	0.0000	0.0000			
	1	0.0000	0.0000	0.0012	0.0019			1	0.0000	0.0012	0.0019	0.0000	0.0000			1	0.0000	0.0012	0.0019	0.0000	0.0000			
	SUM	0.0000	0.0000	0.0186	0.0281				0.2825	SUM	0.0291	0.0038	0.1159					SUM	0.0281	0.0031	0.0037	0.2095	SUM LOAD	
	AVE	0.0000	0.0000	0.0016	0.0024				0.0219	AVE	0.0024	0.0003						AVE	0.0024	0.0003		0.0008	SUM LOADING	
1991	12	0.0000	0.0000	0.0015	0.0023		1991	12	0.0600	0.0015	0.0023	0.0008	0.0233		1991	12	0.0000	0.0015	0.0023	0.0000	0.0000			
	11	0.0000	0.0000	0.0025	0.0039			11	0.0000	0.0025	0.0039	0.0000	0.0000			11	0.0000	0.0025	0.0039	0.0000	0.0000			
	10	0.0000	0.0000	0.0016	0.0025			10	0.0000	0.0016	0.0025	0.0000	0.0000			10	0.0000	0.0016	0.0025	0.0000	0.0000			
	9	0.0000	0.0000	0.0022	0.0034			9	0.0000	0.0022	0.0034	0.0000	0.0000			9	0.0000	0.0022	0.0034	0.0000	0.0000			
	8	0.0009	0.0014	0.0020	0.0031			8	0.0000	0.0009	0.0014	0.0000	0.0000			8	0.0000	0.0009	0.0014	0.0000	0.0000			
	7	0.0007	0.0011	0.0022	0.0034			7	0.0000	0.0007	0.0011	0.0000	0.0000			7	0.0000	0.0007	0.0011	0.0000	0.0000			
	6	0.0008	0.0009	0.0024	0.0037			6	0.0800	0.0006	0.0009	0.0004	0.0120			6	0.0000	0.0006	0.0009	0.0000	0.0000			
	5	0.0005	0.0008	0.0022	0.0034			5	0.0000	0.0005	0.0008	0.0000	0.0000			5	0.0000	0.0005	0.0008	0.0000	0.0000			
	4	0.0009	0.0014	0.0013	0.0020			4	0.0400	0.0009	0.0014	0.0003	0.0090			4	0.0200	0.0009	0.0014	0.0002	0.0045			
	3	0.0009	0.0014	0.0046	0.0071			3	0.0000	0.0009	0.0014	0.0000	0.0000			3	0.0000	0.0009	0.0014	0.0000	0.0000			
	2	0.0006	0.0009	0.0011	0.0017			2	0.0200	0.0006	0.0009	0.0001	0.0028			2	0.0200	0.0006	0.0009	0.0001	0.0028			
	1	0.0007	0.0011	0.0039	0.0060			1	0.0300	0.0007	0.0011	0.0002	0.0054			1	0.0000	0.0007	0.0011	0.0000	0.0000			
	SUM	0.0058	0.0090	0.0275	0.0426				0.2300	SUM	0.0210	0.0017	0.0525					SUM	0.0210	0.0003	0.0073	0.0599	SUM LOAD	
	AVE	0.0005	0.0007	0.0023	0.0036				0.0192	AVE	0.0018	0.0001						AVE	0.0018	0.0000		0.0002	SUM LOADING	
1990	12	0.0015	0.0023	0.0031	0.0048		1990	12	0.0000	0.0015	0.0023	0.0000	0.0000		1990	12	0.0000	0.0015	0.0023	0.0000	0.0000			
	11	0.0250	0.0387	0.0809	0.1252			11	0.0900	0.0250	0.0387	0.0188	0.5633			11	0.1700	0.0250	0.0387	0.0355	1.0639			
	10	0.0021	0.0032	0.0071	0.0110			10	0.0000	0.0021	0.0032	0.0000	0.0000			10	0.0000	0.0021	0.0032	0.0000	0.0000			
	9	0.0000	0.0000	0.0000	0.0000			9	0.0000	0.0000	0.0000	0.0000	0.0000			9	0.0000	0.0000	0.0000	0.0000	0.0000			
	8	0.0000	0.0000	0.0000	0.0000			8	0.0000	0.0000	0.0000	0.0000	0.0000			8	0.0000	0.0000	0.0000	0.0000	0.0000			
	7	0.0000	0.0000	0.0000	0.0000			7	0.0000	0.0000	0.0000	0.0000	0.0000			7	0.0000	0.0000	0.0000	0.0000	0.0000			
	6	0.0000	0.0000	0.0000	0.0000			6	0.0000	0.0000	0.0000	0.0000	0.0000			6	0.0000	0.0000	0.0000	0.0000	0.0000			
	5	0.0000	0.0000	0.0000	0.0000			5	0.0000	0.0000	0.0000	0.0000	0.0000			5	0.0000	0.0000	0.0000	0.0000	0.0000			
	4	0.0000	0.0000	0.0000	0.0000			4	0.0000	0.0000	0.0000	0.0000	0.0000			4	0.0000	0.0000	0.0000	0.0000	0.0000			
	3	0.0000	0.0000	0.0000	0.0000			3	0.0000	0.0000	0.0000	0.0000	0.0000			3	0.0000	0.0000	0.0000	0.0000	0.0000			
	2	0.0000	0.0000	0.0000	0.0000			2	0.0000	0.0000	0.0000	0.0000	0.0000			2	0.0000	0.0000	0.0000	0.0000	0.0000			
	1	0.0000	0.0000	0.0000	0.0000			1	0.0000	0.0000	0.0000	0.0000	0.0000			1	0.0000	0.0000	0.0000	0.0000	0.0000			
	SUM	0.0286	0.0443	0.0911	0.1410				0.0900	SUM	0.0443	0.0188	0.5633					SUM	0.0443	0.0355	1.0639	1.6272	SUM LOAD	
	AVE	0.0024	0.0037	0.0076	0.0117				0.0075	AVE	0.0037	0.0016						AVE	0.0037	0.0030		0.0045	SUM LOADING	
1989	12	0.0000	0.0000	0.0000	0.0000		1989	12	0.0000	0.0000	0.0000	0.0000	0.0000		1989	12	0.0000	0.0000	0.0000	0.0000	0.0000			
	11	0.0000	0.0000	0.0000	0.0000			11	0.0000	0.0000	0.0000	0.0000	0.0000			11	0.0000	0.0000	0.0000	0.0000	0.0000			
	10	0.0004	0.0006	0.0004	0.0006			10	0.0200	0.0004	0.0006	0.0001	0.0021			10	0.1000	0.0004	0.0006	0.0003	0.0103			
	9	0.0000	0.0000	0.0000	0.0000			9	0.0000	0.0000	0.0000	0.0000	0.0000			9	0.0000	0.0000	0.0000	0.0000	0.0000			
	8	0.0000	0.0000	0.0000	0.0000			8	0.0000	0.0000	0.0000	0.0000	0.0000			8	0.0000	0.0000	0.0000	0.0000	0.0000			
	7	0.0000	0.0000	0.0000	0.0000			7	0.0000	0.0000	0.0000	0.0000	0.0000			7	0.0000	0.0000	0.0000	0.0000	0.0000			
	6	0.0000	0.0000	0.0000	0.0000			6	0.0000	0.0000	0.0000	0.0000	0.0000			6	0.0000	0.0000	0.0000	0.0000	0.0000			
	SUM	0.0004						5	0.0000			0.0000	0.0000			5	0.0000				0.0000			
	AVE	0.0001						4	0.0000			0.0000	0.0000			4	0.0000				0.0000			
								3	0.0000			0.0000	0.0000			3	0.0000				0.0000			
								2	0.0000			0.0000	0.0000			2	0.0000				0.0000			
								1	0.0333			0.0000	0.0000			1	0.0000				0.0000			
								SUM	0.0533	SUM	0.0006	0.0001	0.0021				0.1000		SUM	0.0009	0.0003	0.0103	0.0124	SUM LOAD
								AVE	0.0044	AVE	0.0001	0.0000					0.0083		AVE	0.0001	0.0000		0.0001	SUM LOADING
							1988	12	0.0000			0.0000			1988	12	0.0000							
								11	0.0000			0.0000				11	0.0000							
								10	0.0000			0.0000				10	0.0000							
								9	0.0000			0.0000				9	0.0000							
								8	0.0000			0.0000				8	0.0000							
								7	0.0000			0.0000				7	0.0000							
								6	0.0000			0.0000				6	0.0000							
								5	0.0000			0.0000				5	0.0000							
								4	0.0000			0.0000				4	0.0000							
								3	0.0000			0.0000				3	0.0000							
								2	0.0000			0.0000				2	0.0000							
								1	0.0000			0.0000				1	0.0000							
							1987	12	0.0000			0.0000			1987	12	0.0000							
								11	0.0000							11	0.0000							
								10	0.0000							10	0.0000							
								9	0.0000							9	0.0000							
								8	0.0000							8	0.0000							
								7	0.0000							7	0.0000							
								6	0.0000							6	0.0000							
								5	0.0000							5	0.0000							
								3	0.0000							3	0.0000							
								2	0.0000							2	0.0000							
								1	0.0000							1	0.0000							

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TF	YEAR	MONTH	AVE DISCHARGE (MGD)	CFS	MAX DIS	CFS	PARAMETER	YEAR	MONTH	AVE CONC (mg/l)	NPDES FLOW (MGD)	CFS	NPDES LOADING	LOAD(LBS)	AME	YEAR	MONTH	AVE CONC (mg/l)	NPDES FLOW (MGD)	CFS	NPDES LOADING	LOAD(LBS)		
022	1997	3	0.0000	0.0000	0.0002	0.0003	RDX+HMX	1997	3	0.0000	0.0002	0.0003	0.0000	0.0000	TNT	1997	3	0.0000	0.0002	0.0003	0.0000	0.0000		
		2	0.0000	0.0000	0.0009	0.0014			2	0.0300	0.0009	0.0014	0.0002	0.0063			2	0.0000	0.0009	0.0014	0.0000	0.0000		
		1	0.0000	0.0000	0.0005	0.0008			1	0.0000	0.0005	0.0008	0.0000	0.0000			1	0.0000	0.0005	0.0008	0.0000	0.0000		
		SUM	0.0000	0.0000	0.0016	0.0025				0.0300	SUM	0.0025	0.0002	0.0063				0.0000	SUM	0.0025	0.0000	0.0000	0.0063	SUM LOAD
		AVE	0.0000	0.0000	0.0005	0.0008				0.0100	AVE	0.0008	0.0001					0.0000	AVE	0.0008	0.0000		0.0001	SUM LOAD
	1996	12	0.0000	0.0000	0.0006	0.0009		1996	12	0.0000	0.0006	0.0009	0.0000	0.0000		1996	12	0.0000	0.0006	0.0009	0.0000	0.0000		
		11	0.0000	0.0000	0.0005	0.0008			11	0.0000	0.0005	0.0008	0.0000	0.0000			11	0.0000	0.0005	0.0008	0.0000	0.0000		
		10	0.0000	0.0000	0.0005	0.0008			10	0.0000	0.0005	0.0008	0.0000	0.0000			10	0.0000	0.0005	0.0008	0.0000	0.0000		
		9	0.0005	0.0008	0.0005	0.0008			9	0.0000	0.0005	0.0008	0.0000	0.0000			9	0.0000	0.0005	0.0008	0.0000	0.0000		
		8	0.0006	0.0009	0.0006	0.0009			8	0.0000	0.0006	0.0009	0.0000	0.0000			8	0.0000	0.0006	0.0009	0.0000	0.0000		
		7	0.0001	0.0002	0.0002	0.0003			7	0.0000	0.0001	0.0002	0.0000	0.0000			7	0.0000	0.0001	0.0002	0.0000	0.0000		
		6	0.0006	0.0009	0.0006	0.0009			6	0.0000	0.0006	0.0009	0.0000	0.0000			6	0.0000	0.0006	0.0009	0.0000	0.0000		
		5	0.0008	0.0012	0.0013	0.0020			5	0.0300	0.0008	0.0012	0.0002	0.0062			5	0.0000	0.0008	0.0012	0.0000	0.0000		
		4	0.0006	0.0009	0.0008	0.0012			4	0.0000	0.0006	0.0009	0.0000	0.0000			4	0.0000	0.0006	0.0009	0.0000	0.0000		
		3	0.0011	0.0017	0.0016	0.0025			3	0.8333	0.0011	0.0017	0.0076	0.2371			3	0.6500	0.0011	0.0017	0.0060	0.1850		
		2	0.0005	0.0008	0.0006	0.0009			2	0.0000	0.0005	0.0008	0.0000	0.0000			2	0.0000	0.0005	0.0008	0.0000	0.0000		
		1	0.0005	0.0008	0.0008	0.0009			1	0.0000	0.0005	0.0008	0.0000	0.0000			1	0.0000	0.0005	0.0008	0.0000	0.0000		
		SUM	0.0053	0.0082	0.0084	0.0130				0.8633	SUM	0.0107	0.0078	0.2433				0.6500	SUM	0.0107	0.0060	0.1850	0.4283	SUM LOAD
		AVE	0.0004	0.0007	0.0007	0.0011				0.7119	AVE	0.0009	0.0007					0.0542	AVE	0.0009	0.0005		0.0012	SUM LOAD
	1995	12	0.0000	0.0000	0.0000	0.0000		1995	12	0.0000	0.0000	0.0000	0.0000	0.0000		1995	12	0.0000	0.0000	0.0000	0.0000	0.0000		
		11	0.0006	0.0009	0.0008	0.0012			11	0.0000	0.0006	0.0009	0.0000	0.0000			11	0.0000	0.0006	0.0009	0.0000	0.0000		
		10	0.0000	0.0000	0.0000	0.0000			10	0.0000	0.0000	0.0000	0.0000	0.0000			10	0.0000	0.0000	0.0000	0.0000	0.0000		
		9	0.0008	0.0012	0.0011	0.0017			9	0.0000	0.0008	0.0012	0.0000	0.0000			9	0.0000	0.0008	0.0012	0.0000	0.0000		
		8	0.0007	0.0011	0.0007	0.0011			8	0.0000	0.0007	0.0011	0.0000	0.0000			8	0.0000	0.0007	0.0011	0.0000	0.0000		
		7	0.0141	0.0218	0.0141	0.0218			7	0.0000	0.0141	0.0218	0.0000	0.0000			7	0.0000	0.0141	0.0218	0.0000	0.0000		
		6	0.0000	0.0000	0.0006	0.0009			6	0.4450	0.0006	0.0009	0.0022	0.0668			6	0.2450	0.0006	0.0009	0.0012	0.0368		
		5	0.0000	0.0000	0.0011	0.0017			5	0.0000	0.0011	0.0017	0.0000	0.0000			5	0.0000	0.0011	0.0017	0.0000	0.0000		
		4	0.0000	0.0000	0.0006	0.0009			4	0.0600	0.0006	0.0009	0.0003	0.0090			4	0.0000	0.0006	0.0009	0.0000	0.0000		
		3	0.0000	0.0000	0.0005	0.0008			3	0.0000	0.0005	0.0008	0.0000	0.0000			3	0.0000	0.0005	0.0008	0.0000	0.0000		
		2	0.0000	0.0000	0.0006	0.0009			2	0.0000	0.0006	0.0009	0.0000	0.0000			2	0.0000	0.0006	0.0009	0.0000	0.0000		
		1	0.0000	0.0000	0.0007	0.0011			1	0.0166	0.0007	0.0011	0.0001	0.0030			1	0.0066	0.0007	0.0011	0.0000	0.0012		
		SUM	0.0162	0.0251	0.0208	0.0322				0.5718	SUM	0.0514	0.0028	0.0789				0.2516	SUM	0.0514	0.0013	0.0380	0.1169	SUM LOAD
		AVE	0.0014	0.0021	0.0017	0.0027				0.0435	AVE	0.0026	0.0002					0.0210	AVE	0.0026	0.0001		0.0003	SUM LOAD
	1994	12	0.0000	0.0000	0.0005	0.0008		1994	12	0.0000	0.0005	0.0008	0.0000	0.0000		1994	12	0.0000	0.0005	0.0008	0.0000	0.0000		
		11	0.0000	0.0000	0.0006	0.0009			11	0.1500	0.0006	0.0009	0.0008	0.0225			11	0.0033	0.0006	0.0009	0.0000	0.0005		
		10	0.0000	0.0000	0.0000	0.0000			10	0.0000	0.0000	0.0000	0.0000	0.0000			10	0.0000	0.0000	0.0000	0.0000	0.0000		
		9	0.0000	0.0000	0.0005	0.0008			9	0.0000	0.0005	0.0008	0.0000	0.0000			9	0.0500	0.0005	0.0008	0.0002	0.0065		
		8	0.0000	0.0000	0.0006	0.0009			8	0.0200	0.0006	0.0009	0.0001	0.0031			8	0.0200	0.0006	0.0009	0.0001	0.0031		
		7	0.0000	0.0000	0.0005	0.0008			7	0.0300	0.0005	0.0008	0.0001	0.0039			7	0.0400	0.0005	0.0008	0.0002	0.0052		
		6	0.0000	0.0000	0.0005	0.0008			6	0.0800	0.0005	0.0008	0.0003	0.0075			6	0.0000	0.0005	0.0008	0.0000	0.0000		
		5	0.0000	0.0000	0.0004	0.0006			5	0.0600	0.0004	0.0006	0.0002	0.0062			5	0.0700	0.0004	0.0006	0.0002	0.0072		
		4	0.0000	0.0000	0.0004	0.0006			4	0.0100	0.0004	0.0006	0.0000	0.0010			4	0.0000	0.0004	0.0006	0.0000	0.0000		
		3	0.0000	0.0000	0.0017	0.0026			3	0.1533	0.0017	0.0026	0.0022	0.0674			3	0.1500	0.0017	0.0026	0.0021	0.0660		
		2	0.0000	0.0000	0.0013	0.0020			2	0.0100	0.0013	0.0020	0.0001	0.0030			2	0.0050	0.0013	0.0020	0.0001	0.0015		
		1	0.0000	0.0000	0.0009	0.0014			1	0.0366	0.0009	0.0014	0.0003	0.0085			1	0.0000	0.0009	0.0014	0.0000	0.0000		
		SUM	0.0000	0.0000	0.0079	0.0122				0.5299	SUM	0.0122	0.0040	0.1233				0.3383	SUM	0.0122	0.0023	0.0800	0.2132	SUM LOAD
		AVE	0.0000	0.0000	0.0007	0.0010				0.0442	AVE	0.0010	0.0003					0.0282	AVE	0.0010	0.0002		0.0005	SUM LOAD
	1993	12	0.0000	0.0000	0.0003	0.0005		1993	12	0.0000	0.0003	0.0005	0.0000	0.0000		1993	12	0.0000	0.0003	0.0005	0.0000	0.0000		
		11	0.0000	0.0000	0.0005	0.0008			11	0.0000	0.0005	0.0008	0.0000	0.0000			11	0.0000	0.0005	0.0008	0.0000	0.0000		
		10	0.0000	0.0000	0.0005	0.0008			10	0.0100	0.0005	0.0008	0.0000	0.0013			10	0.0000	0.0005	0.0008	0.0000	0.0000		
		9	0.0000	0.0000	0.0009	0.0014			9	0.0000	0.0009	0.0014	0.0000	0.0000			9	0.0000	0.0009	0.0014	0.0000	0.0000		
		8	0.0000	0.0000	0.0007	0.0011			8	0.0500	0.0007	0.0011	0.0003	0.0091			8	0.0100	0.0007	0.0011	0.0001	0.0018		
		7	0.0000	0.0000	0.0014	0.0022			7	0.0125	0.0014	0.0022	0.0001	0.0045			7	0.0050	0.0014	0.0022	0.0001	0.0018		
		6	0.0000	0.0000	0.0013	0.0020			6	0.0000	0.0013	0.0020	0.0000	0.0000			6	0.0000	0.0013	0.0020	0.0000	0.0000		
		5	0.0000	0.0000	0.0030	0.0046			5	0.0325	0.0030	0.0046	0.0008	0.0252			5	0.0075	0.0030	0.0046	0.0002	0.0058		
		4	0.0000	0.0000	0.0010	0.0015			4	0.0475	0.0010	0.0015	0.0004	0.0119			4	0.0100	0.0010	0.0015	0.0001	0.0025		
		3	0.0000	0.0000	0.0011	0.0017			3	0.0000	0.0011	0.0017	0.0000	0.0000			3	0.0400	0.0011	0.0017	0.0004	0.0114		
		2	0.0000	0.0000	0.0014	0.0022			2	0.0875	0.0014	0.0022	0.0008	0.0221			2	0.0725	0.0014	0.0022	0.0008	0.0237		
		1	0.0000	0.0000	0.0008	0.0012			1	0.1700	0.0008	0.0012	0.0011	0.0352			1	0.2900	0.0008	0.0012	0.0019	0.0600		
		SUM	0.0000	0.0000	0.0128	0.0200				0.3900	SUM	0.0200	0.0038	0.1092				0.4350	SUM	0.0200	0.0035	0.1071	0.2163	SUM LOAD
		AVE	0.0000	0.0000	0.0011	0.0017				0.0325	AVE	0.0017	0.0003					0.0363	AVE	0.0017	0.0003		0.0008	SUM LOAD
	1992	12	0.0000	0.0000	0.0018	0.0028		1992	12	0.3100	0.0018	0.0028	0.0047	0.1443		1992	12	0.2500	0.0018	0.0028	0.0038	0.1164		
		11	0.0000	0.0000	0.0018	0.0028			11	0.0400	0.0018	0.0028	0.0006	0.0180			11	0.0400	0.0018	0.0028	0.0008	0.0180		
		10	0.0000	0.0000	0.0011	0.0017			10	0.0400	0.0011	0.0017	0.0004	0.0114			10	0.0400	0.0011	0.0017	0.0004	0.0114		
		9	0.0000	0.0000	0.0010	0.0015			9	0.0080	0.0010	0.0015	0.0001	0.0016			9	0.0000	0.0010	0.0015	0.0000	0.0000		
		8	0.0000	0.0000	0.0010	0.0015			8	0.0000	0.0010	0.0015	0.0000	0.0000			8	0.0000	0.0010	0.0015	0.0000	0.0000		
		7	0.0000	0.0000	0.0007	0.0011			7	0.0000	0.0007	0.0011	0.0000	0.0000			7	0.0000	0.0007	0.0011	0.0000	0.0000		
		6	0.0000	0.0000	0.0000	0.0000			6	0.0000	0.0000	0.0000	0.0000	0.0000			6	0.0000	0.0000	0.0000	0.0000	0.0000		
		5	0.0000	0.0000	0.0002	0.0003			5	0.0000	0.0002	0.0003	0.0000	0.0000			5	0.0000	0.0002	0.0003	0.0000	0.0000		
		4	0.0000	0.0000	0.0001	0.0002			4	0.0000	0.0001	0.0002	0.0000	0.0000			4	0.0000	0.0001	0.0002	0.0000	0.0000		
		3	0.0000	0.0000	0.0002	0.0003			3	0.0000	0.0002	0.00	0.0000	0.0000			3	0.0000	0.0002	0.0003	0.0000	0.000		

		2	0.0000	0.0000	0.0001	0.0002			2	0.0000	0.0001	0.000	0.0000	0.0000			2	0.0000	0.0001	0.0002	0.0000	0.0000		
		1	0.0000	0.0000	0.0002	0.0003			1	0.0000	0.0002	0.0003	0.0000	0.0000			1	0.0000	0.0002	0.0003	0.0000	0.0000		
		SUM	0.0000	0.0000	0.0082	0.0127				0.3900	SUM	0.0127	0.0057	0.3793				0.3300	SUM	0.0127	0.0047	0.1450	0.3311	SUM LOAD
		AVE	0.0000	0.0000	0.0007	0.0011				0.0330	AVE	0.0011	0.0005					0.0275	AVE	0.0011	0.0004		0.0009	SUM LOAD/
	1991	12	0.0000	0.0000	0.0001	0.0002		1991	12	0.0000	0.0001	0.0002	0.0000	0.0000		1991	12	0.0000	0.0001	0.0002	0.0000	0.0000		
		11	0.0000	0.0000	0.0001	0.0002			11	0.0400	0.0001	0.0002	0.0000	0.0010			11	0.0000	0.0001	0.0002	0.0000	0.0000		
		10	0.0000	0.0000	0.0003	0.0005			10	0.0000	0.0003	0.0005	0.0000	0.0000			10	0.0000	0.0003	0.0005	0.0000	0.0000		
		9	0.0000	0.0000	0.0001	0.0002			9	0.0000	0.0001	0.0002	0.0000	0.0000			9	0.0000	0.0001	0.0002	0.0000	0.0000		
		8	0.0000	0.0000	0.0001	0.0002			8	0.0000	0.0001	0.0002	0.0000	0.0000			8	0.0000	0.0001	0.0002	0.0000	0.0000		
		7	0.0001	0.0002	0.0004	0.0006			7	0.0000	0.0001	0.0002	0.0000	0.0000			7	0.0000	0.0001	0.0002	0.0000	0.0000		
		6	0.0001	0.0002	0.0003	0.0005			6	0.0000	0.0001	0.0002	0.0000	0.0000			6	0.0400	0.0001	0.0002	0.0000	0.0010		
		5	0.0001	0.0002	0.0002	0.0003			5	0.9100	0.0001	0.0002	0.0008	0.0235			5	0.3200	0.0001	0.0002	0.0003	0.0083		
		4	0.0001	0.0002	0.0002	0.0003			4	0.7400	0.0001	0.0002	0.0008	0.0185			4	0.1800	0.0001	0.0002	0.0002	0.0045		
		3	0.0001	0.0002	0.0002	0.0003			3	0.4500	0.0001	0.0002	0.0004	0.0116			3	0.1600	0.0001	0.0002	0.0001	0.0041		
		2	0.0005	0.0008	0.0016	0.0025			2	0.8400	0.0005	0.0008	0.0035	0.0981			2	0.2800	0.0005	0.0008	0.0012	0.0327		
		1	0.0001	0.0002	0.0002	0.0003			1	0.1200	0.0001	0.0002	0.0001	0.0031			1	0.0000	0.0001	0.0002	0.0000	0.0000		
		SUM	0.0011	0.0017	0.0038	0.0059				3.1000	SUM	0.0028	0.0054	0.1559				0.9800	SUM	0.0028	0.0018	0.0506	0.2098	SUM LOAD
		AVE	0.0001	0.0001	0.0003	0.0005				0.2583	AVE	0.0002	0.0004					0.0817	AVE	0.0002	0.0001		0.0006	SUM LOAD/
	1990	12	0.0001	0.0002	0.0001	0.0002		1990	12	0.0700	0.0001	0.0002	0.0001	0.0016		1990	12	0.1700	0.0001	0.0002	0.0001	0.0044		
		11	0.0001	0.0002	0.0001	0.0002			11	0.0000	0.0001	0.0002	0.0000	0.0000			11	0.0500	0.0001	0.0002	0.0000	0.0013		
		10	0.0001	0.0002	0.0003	0.0005			10	0.0400	0.0001	0.0002	0.0000	0.0010			10	0.0300	0.0001	0.0002	0.0000	0.0008		
		9	0.0001	0.0002	0.0001	0.0002			9	0.0500	0.0001	0.0002	0.0000	0.0013			9	0.0500	0.0001	0.0002	0.0000	0.0013		
		8	0.0001	0.0002	0.0002	0.0003			8	0.0200	0.0001	0.0002	0.0000	0.0005			8	0.0300	0.0001	0.0002	0.0000	0.0008		
		7	0.0001	0.0002	0.0002	0.0003			7	0.0300	0.0001	0.0002	0.0000	0.0008			7	0.0200	0.0001	0.0002	0.0000	0.0005		
		6	0.0001	0.0002	0.0003	0.0005			6	0.0200	0.0001	0.0002	0.0000	0.0005			6	0.0100	0.0001	0.0002	0.0000	0.0003		
		5	0.0001	0.0002	0.0004	0.0006			5	0.0200	0.0001	0.0002	0.0000	0.0005			5	0.0100	0.0001	0.0002	0.0000	0.0003		
		4	0.0001	0.0002	0.0003	0.0005			4	0.0200	0.0001	0.0002	0.0000	0.0005			4	0.0100	0.0001	0.0002	0.0000	0.0003		
		3	0.0001	0.0002	0.0002	0.0003			3	0.0200	0.0001	0.0002	0.0000	0.0005			3	0.0100	0.0001	0.0002	0.0000	0.0003		
		2	0.0001	0.0002	0.0008	0.0012			2	0.0300	0.0001	0.0002	0.0000	0.0007			2	0.0500	0.0001	0.0002	0.0000	0.0012		
		1	0.0001	0.0002	0.0001	0.0002			1	0.0200	0.0001	0.0002	0.0000	0.0005			1	0.0800	0.0001	0.0002	0.0001	0.0021		
		SUM	0.0012	0.0019	0.0031	0.0048				0.3400	SUM	0.0018	0.0003	0.0067				0.5200	SUM	0.0018	0.0004	0.0133	0.0220	SUM LOAD
		AVE	0.0001	0.0002	0.0003	0.0004				0.0283	AVE	0.0002	0.0000					0.0433	AVE	0.0002	0.0000		0.0001	SUM LOAD/
	1989	12	0.0001	0.0002	0.0002	0.0003		1989	12	0.1000	0.0001	0.0002	0.0001	0.0026		1989	12	0.4800	0.0001	0.0002	0.0004	0.0124		
		11	0.0001	0.0002	0.0002	0.0003			11	0.0600	0.0001	0.0002	0.0001	0.0015			11	0.0400	0.0001	0.0002	0.0000	0.0010		
		10	0.0001	0.0002	0.0001	0.0002			10	0.0800	0.0001	0.0002	0.0001	0.0021			10	0.0400	0.0001	0.0002	0.0000	0.0010		
		9	0.0001	0.0002	0.0001	0.0002			9	0.0200	0.0001	0.0002	0.0000	0.0005			9	0.0100	0.0001	0.0002	0.0000	0.0003		
		8	0.0001	0.0002	0.0001	0.0002			8	0.0200	0.0001	0.0002	0.0000	0.0005			8	0.0100	0.0001	0.0002	0.0000	0.0003		
		7	0.0001	0.0002	0.0001	0.0002			7	0.0200	0.0001	0.0002	0.0000	0.0005			7	0.0100	0.0001	0.0002	0.0000	0.0003		
		6	0.0001	0.0002	0.0001	0.0002			6	0.0200	0.0001	0.0002	0.0000	0.0005			6	0.0200	0.0001	0.0002	0.0000	0.0005		
		SUM	0.0007	0.0011	0.0009	0.0014			5	0.0200		0	0	0.0068			5	0.0500		0.0000	0.0000	0.0000		
		AVE	0.0001	0.0002	0.0001	0.0002			4	0.0200				0.0000			4	0.0500		0.0000	0.0000	0.0000		
									3	0.0200				0.0000			3	0.0100		0.0000	0.0000	0.0000		
									2	0.0200				0.0000			2	0.0000		0.0000	0.0000	0.0000		
									1	0.2000				0.0000			1	0.2250		0.0000	0.0000	0.0000		
									SUM	0.5000	SUM	0.0029	0.0009	0.0170			SUM	0.8450	SUM	0.0011	0.0009	0.0167	0.0227	SUM LOAD
									AVE	0.0500	AVE	0.0002	0.0000				AVE	0.0788	AVE	0.0001	0.0000		0.0001	SUM LOAD/
								1988	12	0.0250						1988	12	0.1000		0.0000	0.0000			
									11	0.0000							11	0.0500		0.0000	0.0000			
									10	0.2000							10	1.0000		0.0000	0.0000			
									9	0.6500							9	0.5500		0.0000	0.0000			
									8	2.5000							8	0.1200		0.0000	0.0000			
									7	0.9000							7	0.1200		0.0000	0.0000			
									6	0.5000							6	0.1300		0.0000	0.0000			
									5	0.3800							5	0.0800		0.0000	0.0000			
									4	0.1500							4	0.0800		0.0000	0.0000			
									3	0.2800							3	0.0300		0.0000	0.0000			
									2	0.5300							2	0.2300		0.0000	0.0000			
									1	0.3800							1	0.1000		0.0000	0.0000			
									SUM	8.4950							SUM	2.5800			0.0000			
									AVE	0.5413							AVE	0.7158						
								1987	12	0.2500						1987	12	0.0500		0.0000	0.0000			
									11	0.0000							11	0.0000		0.0000	0.0000			
									10	0.1300							10	0.0000		0.0000	0.0000			
									9	0.1500							9	0.0000		0.0000	0.0000			
									8	0.4800							8	0.0000		0.0000	0.0000			
									7	0.3800							7	0.1000		0.0000	0.0000			
									6	0.2300							6	0.1800		0.0000	0.0000			
									5	0.3000							5	0.0000		0.0000	0.0000			
									4	0.7000							4	0.0800		0.0000	0.0000			
									3	1.3000							3	0.3000		0.0000	0.0000			
									2	0.2000							2	0.0500		0.0000	0.0000			
									1	0.0500							1	0.0500		0.0000	0.0000			

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									SUM	4.1700							SUM	0.8100				0.0000			
									AVE	0.3475							AVE	0.0675							

TF	YEAR	MONTH	AVE DISCHARGE (MGD)	CFS	MAX DISCHARGE	CFS	ARAMETE	YEAR	MONTH	AVE CONC (mg/l)	FLOW (MGD)	CFS	LOADING	LOAD(LBS)	AME	YEAR	MONTH	AVE CONC (mg/l)	NPDES FLOW (MGD)	CFS	NPDES LOADING	LOAD(LBS)		
032	1997	3	0.0000	0.0000	0.0000	0.0000	RDX+HMX	1997	3	0.0000	0.0000	0.0000	0.0000	0.0000	TNT	1997	3	0.0000	0.0000	0.0000	0.0000	0.0000		
		2	0.0000	0.0000	0.0000	0.0000			2	0.0000	0.0000	0.0000	0.0000	0.0000			2	0.0000	0.0000	0.0000	0.0000	0.0000		
		1	0.0000	0.0000	0.0157	0.0243			1	0.0000	0.0157	0.0243	0.0000	0.0000			1	0.0900	0.0157	0.0243	0.0118	0.3655		
		SUM	0.0000	0.0000	0.0157	0.0243				0.0000		SUM	0.0243	0.0000	0.0000			0.0900		SUM	0.0243	0.0118	0.3655	0.3655 SUM LOAD
		AVE	0.0000	0.0000	0.0052	0.0081						AVE	0.0081	0.0000				0.0300		AVE	0.0081	0.0039		0.0039 SUM LOADING
	1996	12	0.0000	0.0000	0.0000	0.0000		1996	12	0.0000	0.0000	0.0000	0.0000	0.0000		1996	12	0.0000	0.0000	0.0000	0.0000	0.0000		
		11	0.0000	0.0000	0.0000	0.0000			11	0.0000	0.0000	0.0000	0.0000	0.0000			11	0.0000	0.0000	0.0000	0.0000	0.0000		
		10	0.0000	0.0000	0.0000	0.0000			10	0.0000	0.0000	0.0000	0.0000	0.0000			10	0.0000	0.0000	0.0000	0.0000	0.0000		
		9	0.0000	0.0000	0.0000	0.0000			9	0.0000	0.0000	0.0000	0.0000	0.0000			9	0.0000	0.0000	0.0000	0.0000	0.0000		
		8	0.0000	0.0000	0.0000	0.0000			8	0.0000	0.0000	0.0000	0.0000	0.0000			8	0.0000	0.0000	0.0000	0.0000	0.0000		
		7	0.0000	0.0000	0.0000	0.0000			7	0.0000	0.0000	0.0000	0.0000	0.0000			7	0.0000	0.0000	0.0000	0.0000	0.0000		
		6	0.0000	0.0000	0.0000	0.0000			6	0.0000	0.0000	0.0000	0.0000	0.0000			6	0.0000	0.0000	0.0000	0.0000	0.0000		
		5	0.0000	0.0000	0.0000	0.0000			5	0.0000	0.0000	0.0000	0.0000	0.0000			5	0.0000	0.0000	0.0000	0.0000	0.0000		
		4	0.0000	0.0000	0.0000	0.0000			4	0.0000	0.0000	0.0000	0.0000	0.0000			4	0.0000	0.0000	0.0000	0.0000	0.0000		
		3	0.0000	0.0000	0.0000	0.0000			3	0.0000	0.0000	0.0000	0.0000	0.0000			3	0.0000	0.0000	0.0000	0.0000	0.0000		
		2	0.0000	0.0000	0.0000	0.0000			2	0.0000	0.0000	0.0000	0.0000	0.0000			2	0.0000	0.0000	0.0000	0.0000	0.0000		
		1	0.0000	0.0000	0.0000	0.0000			1	0.0000	0.0000	0.0000	0.0000	0.0000			1	0.0000	0.0000	0.0000	0.0000	0.0000		
		SUM	0.0000	0.0000	0.0000	0.0000				0.0000		SUM	0.0000	0.0000	0.0000			0.0000		SUM	0.0000	0.0000	0.0000	0.0000 SUM LOAD
		AVE	0.0000	0.0000	0.0000	0.0000				0.0000		AVE	0.0000	0.0000				0.0000		AVE	0.0000	0.0000		0.0000 SUM LOADING
	1995	12	0.0000	0.0000	0.0000	0.0000		1995	12	0.0000	0.0000	0.0000	0.0000	0.0000		1995	12	0.0000	0.0000	0.0000	0.0000	0.0000		
		11	0.0000	0.0000	0.0000	0.0000			11	0.0000	0.0000	0.0000	0.0000	0.0000			11	0.0000	0.0000	0.0000	0.0000	0.0000		
		10	0.0000	0.0000	0.0000	0.0000			10	0.0000	0.0000	0.0000	0.0000	0.0000			10	0.0000	0.0000	0.0000	0.0000	0.0000		
		9	0.0000	0.0000	0.0000	0.0000			9	0.0000	0.0000	0.0000	0.0000	0.0000			9	0.0000	0.0000	0.0000	0.0000	0.0000		
		8	0.0000	0.0000	0.0000	0.0000			8	0.0000	0.0000	0.0000	0.0000	0.0000			8	0.0000	0.0000	0.0000	0.0000	0.0000		
		7	0.0000	0.0000	0.0000	0.0000			7	0.0000	0.0000	0.0000	0.0000	0.0000			7	0.0000	0.0000	0.0000	0.0000	0.0000		
		6	0.0000	0.0000	0.0000	0.0000			6	0.0000	0.0000	0.0000	0.0000	0.0000			6	0.0000	0.0000	0.0000	0.0000	0.0000		
		5	0.0000	0.0000	0.0000	0.0000			5	0.0000	0.0000	0.0000	0.0000	0.0000			5	0.0000	0.0000	0.0000	0.0000	0.0000		
		4	0.0000	0.0000	0.0000	0.0000			4	0.0000	0.0000	0.0000	0.0000	0.0000			4	0.0000	0.0000	0.0000	0.0000	0.0000		
		3	0.0000	0.0000	0.0008	0.0012			3	1.4100	0.0008	0.0012	0.0006	0.0172			3	2.5400	0.0008	0.0012	0.0170	0.5256		
		2	0.0000	0.0000	0.0082	0.0127			2	0.1309	0.0082	0.0127	0.0046	0.1276			2	0.0509	0.0082	0.0127	0.0035	0.0975		
		1	0.0000	0.0000	0.0015	0.0023			1	0.0760	0.0015	0.0023	0.0034	0.1048			1	0.0100	0.0015	0.0023	0.0001	0.0039		
		SUM	0.0000	0.0000	0.0105	0.0162				1.6169		SUM	0.0162	0.0085	0.2495			2.5008		SUM	0.0162	0.0206	0.6270	0.8765 SUM LOAD
		AVE	0.0000	0.0000	0.0008	0.0014				0.1347		AVE	0.0014	0.0007				0.2167		AVE	0.0014	0.0017		0.0024 SUM LOADING
	1994	12	0.0000	0.0000	0.0024	0.0037		1994	12	0.0833	0.0024	0.0037	0.0120	0.3725		1994	12	0.0122	0.0024	0.0037	0.0002	0.0076		
		11	0.0000	0.0000	0.0019	0.0029			11	0.0666	0.0019	0.0029	0.0005	0.0143			11	0.0216	0.0019	0.0029	0.0003	0.0103		
		10	0.0000	0.0000	0.0023	0.0036			10	0.2700	0.0023	0.0036	0.0010	0.0297			10	0.1900	0.0023	0.0036	0.0036	0.1130		
		9	0.0000	0.0000	0.0026	0.0040			9	0.6000	0.0026	0.0040	0.0010	0.0320			9	0.4300	0.0026	0.0040	0.0093	0.2892		
		8	0.0000	0.0000	0.0034	0.0053			8	0.0300	0.0034	0.0053	0.0156	0.4837			8	0.0300	0.0034	0.0053	0.0009	0.0264		
		7	0.0000	0.0000	0.0018	0.0028			7	0.0500	0.0018	0.0028	0.0075	0.2328			7	0.0500	0.0018	0.0028	0.0008	0.0233		
		6	0.0000	0.0000	0.0019	0.0029			6	0.0476	0.0019	0.0029	0.0030	0.0904			6	0.1100	0.0019	0.0029	0.0017	0.0523		
		5	0.0000	0.0000	0.0028	0.0043			5	0.5500	0.0028	0.0043	0.0059	0.1822			5	0.4400	0.0028	0.0043	0.0103	0.3187		
		4	0.0000	0.0000	0.0025	0.0039			4	0.5000	0.0025	0.0039	0.0010	0.0313			4	0.3800	0.0025	0.0039	0.0079	0.2378		
		3	0.0000	0.0000	0.0026	0.0040			3	0.1900	0.0026	0.0040	0.0015	0.0471			3	0.3600	0.0026	0.0040	0.0078	0.2421		
		2	0.0000	0.0000	0.0034	0.0053			2	0.2515	0.0034	0.0053	0.0113	0.3178			2	0.2353	0.0034	0.0053	0.0067	0.1869		
		1	0.0000	0.0000	0.0026	0.0040			1	0.0500	0.0026	0.0040	0.0005	0.0151			1	0.0392	0.0026	0.0040	0.0009	0.0264		
		SUM	0.0000	0.0000	0.0302	0.0467				2.6890		SUM	0.0467	0.0809	1.8482			2.2983		SUM	0.0467	0.0605	1.5340	3.3822 SUM LOAD
		AVE	0.0000	0.0000	0.0025	0.0039				0.2241		AVE	0.0039	0.0051				0.1915		AVE	0.0039	0.0042		0.0093 SUM LOADING
	1993	12	0.0000	0.0000	0.0033	0.0051		1993	12	0.0700	0.0033	0.0051	0.0003	0.0102		1993	12	0.0200	0.0033	0.0051	0.0006	0.0171		
		11	0.0000	0.0000	0.0038	0.0059			11	0.4000	0.0038	0.0059	0.0412	1.2367			11	0.0260	0.0038	0.0059	0.0008	0.0247		
		10	0.0000	0.0000	0.0029	0.0045			10	0.0225	0.0029	0.0045	0.0486	1.5079			10	0.0525	0.0029	0.0045	0.0013	0.0394		
		9	0.0000	0.0000	0.0023	0.0036			9	0.0120	0.0023	0.0036	0.0113	0.3510			9	0.0140	0.0023	0.0036	0.0003	0.0083		
		8	0.0000	0.0000	0.0026	0.0040			8	1.3000	0.0026	0.0040	0.0044	0.1362			8	0.1800	0.0026	0.0040	0.0039	0.1211		
		7	0.0000	0.0000	0.0025	0.0039			7	2.0100	0.0025	0.0039	0.0043	0.1342			7	0.3000	0.0025	0.0039	0.0063	0.1940		
		6	0.0000	0.0000	0.0025	0.0039			6	0.5900	0.0025	0.0039	0.0058	0.1752			6	0.0500	0.0025	0.0039	0.0010	0.0313		
		5	0.0000	0.0000	0.0031	0.0048			5	0.2025	0.0031	0.0048	0.0016	0.0481			5	0.0175	0.0031	0.0048	0.0005	0.0140		
		4	0.0000	0.0000	0.0028	0.0043			4	0.2075	0.0028	0.0043	0.0005	0.0140			4	0.1000	0.0028	0.0043	0.0023	0.0701		
		3	0.0000	0.0000	0.0020	0.0031			3	0.2800	0.0020	0.0031	0.0097	0.3001			3	0.2000	0.0020	0.0031	0.0033	0.1035		
		2	0.0000	0.0000	0.0021	0.0032			2	0.0600	0.0021	0.0032	0.0023	0.0650			2	0.0825	0.0021	0.0032	0.0014	0.0405		
		1	0.0000	0.0000	0.0018	0.0028			1	0.0200	0.0018	0.0028	0.0063	0.1956			1	0.0500	0.0018	0.0028	0.0008	0.0233		
		SUM	0.0000	0.0000	0.0317	0.0490				6.1745		SUM	0.0490	0.1364	4.1742			1.0925		SUM	0.0490	0.0224	0.6872	4.8614 SUM LOAD
		AVE	0.0000	0.0000	0.0026	0.0041				0.4313		AVE	0.0041	0.0114				0.0919		AVE	0.0041	0.0019		0.0132 SUM LOADING
	1992	12	0.0000	0.0000	0.0025	0.0039		1992	12	0.5800	0.0025	0.0039	0.0004	0.0122		1992	12	0.1400	0.0025	0.0039	0.0029	0.0905		
		11	0.0000	0.0000	0.0017	0.0026			11	0.1325	0.0017	0.0026	0.0007	0.0213			11	0.0475	0.0017	0.0026	0.0007	0.0202		
		10	0.0000	0.0000	0.0012	0.0019			10	0.4200	0.0012	0.0019	0.0000	0.0000			10	0.2000	0.0012	0.0019	0.0020	0.0621		
		9	0.0000	0.0000	0.0011	0.0017			9	0.0188	0.0011	0.0017	0.0003	0.0085			9	0.0460	0.0011	0.0017	0.0004	0.0131		
		8	0.0000	0.0000	0.0034	0.0053			8	0.0500	0.0034	0.0053	0.0096	0.2990			8	0.0800	0.0034	0.0053	0.0023	0.0704		
		7	0.0000	0.0000	0.0014	0.0022			7	0.0000	0.0014	0.0022	0.0011	0.0326			7	0.0450	0.0014	0.0022	0.0005	0.0163		
		6	0.0000	0.0000	0.0012	0.0019			6	0.0300	0.0012	0.0019	0.0000	0.0000			6	0.0400	0.0012	0.0019	0.0004	0.0120		
		5	0.0000	0.0000	0.0018	0.0028			5	0.3400	0.0018	0.0028	0.0000	0.0000			5	0.2900	0.0018	0.0028	0.0044	0.1350		
		4	0.0000	0.0000	0.0032	0.0050			4	0.0900	0.0032	0.0050	0.0000	0.0000			4	0.0800	0.0032	0.0050	0.0021	0.0641		
		3	0.0000	0.0000	0.0004	0.0006			3	0.0000	0.0004	0.0006	0.0001	0.0041			3	0.0000	0.0004	0.0006	0.0000	0.0000		

	2	0.0000	0.0000	0.0048	0.0074			2	0.0000	0.0048	0.0074	0.0000	0.0000			2	0.0000	0.0048	0.0074	0.0000	0.0000			
	1	0.0000	0.0000	0.0004	0.0006			1	0.0000	0.0004	0.0006	0.0000	0.0000			1	0.0000	0.0004	0.0006	0.0000	0.0000			
	SUM	0.0000	0.0000	0.0231	0.0357				1.5613	SUM	0.0357	0.0127	0.3777				0.9685	SUM	0.0357	0.0157	0.4837	0.8515	SUM LOAD	
	AVE	0.0000	0.0000	0.0019	0.0030				0.1384	AVE	0.0030	0.0010					0.0807	AVE	0.0030	0.0013		0.0523	SUM LOADING	
1991	12	0.0000	0.0000	0.0013	0.0020		1991	12	0.0400	0.0013	0.0020	0.0000	0.0000		1991	12	0.0300	0.0013	0.0020	0.0003	0.0101			
	11	0.0000	0.0000	0.0006	0.0009			11	0.0000	0.0006	0.0009	0.0000	0.0000			11	0.0200	0.0006	0.0009	0.0001	0.0030			
	10	0.0000	0.0000	0.0008	0.0012			10	0.0000	0.0008	0.0012	0.0000	0.0000			10	0.0200	0.0008	0.0012	0.0001	0.0041			
	9	0.0000	0.0000	0.0009	0.0014			9	0.0000	0.0009	0.0014	0.0000	0.0000			9	0.0000	0.0009	0.0014	0.0000	0.0000			
	8	0.0000	0.0000	0.0025	0.0039			8	0.0000	0.0025	0.0039	0.0058	0.1811			8	0.0300	0.0025	0.0039	0.0006	0.0194			
	7	0.0011	0.0017	0.0029	0.0045			7	0.0000	0.0011	0.0017	0.0000	0.0000			7	0.0400	0.0011	0.0017	0.0004	0.0114			
	6	0.0012	0.0019	0.0019	0.0029			6	0.0000	0.0012	0.0019	0.0000	0.0000			6	0.0200	0.0012	0.0019	0.0002	0.0060			
	5	0.0003	0.0005	0.0015	0.0023			5	0.2800	0.0003	0.0005	0.0002	0.0047			5	0.0200	0.0003	0.0005	0.0001	0.0016			
	4	0.0002	0.0003	0.0003	0.0005			4	0.0000	0.0002	0.0003	0.0000	0.0000			4	0.0000	0.0002	0.0003	0.0000	0.0000			
	3	0.0003	0.0005	0.0037	0.0057			3	0.0000	0.0003	0.0005	0.0000	0.0000			3	0.0200	0.0003	0.0005	0.0001	0.0016			
	2	0.0018	0.0028	0.0049	0.0076			2	0.0600	0.0018	0.0028	0.0000	0.0000			2	0.0100	0.0018	0.0028	0.0002	0.0042			
	1	0.0008	0.0012	0.0020	0.0031			1	0.0000	0.0008	0.0012	0.0007	0.0207			1	0.0200	0.0008	0.0012	0.0001	0.0041			
	SUM	0.0067	0.0098	0.0231	0.0361				0.3800	SUM	0.0181	0.0067	0.2064				0.2300	SUM	0.0183	0.0021	0.0865	0.2719	SUM LOAD	
	AVE	0.0005	0.0007	0.0018	0.0030				0.0317	AVE	0.0015	0.0006					0.0192	AVE	0.0015	0.0002		0.0007	SUM LOADING	
1990	12	0.0006	0.0009	0.0015	0.0023		1990	12	0.0000	0.0006	0.0009	0.0006	0.0171		1990	12	0.0000	0.0008	0.0009	0.0000	0.0000			
	11	0.0011	0.0017	0.0027	0.0042			11	0.0000	0.0011	0.0017	0.0008	0.0248			11	0.0000	0.0011	0.0017	0.0000	0.0000			
	10	0.0013	0.0020	0.0039	0.0060			10	0.1000	0.0013	0.0020	0.0005	0.0168			10	0.0900	0.0013	0.0020	0.0010	0.0303			
	9	0.0007	0.0011	0.0008	0.0012			9	0.1100	0.0007	0.0011	0.0002	0.0072			9	0.0500	0.0007	0.0011	0.0003	0.0091			
	8	0.0006	0.0009	0.0019	0.0029			8	0.0900	0.0006	0.0009	0.0001	0.0031			8	0.0600	0.0006	0.0009	0.0003	0.0093			
	7	0.0007	0.0011	0.0023	0.0036			7	0.0500	0.0007	0.0011	0.0001	0.0036			7	0.0300	0.0007	0.0011	0.0002	0.0054			
	6	0.0006	0.0009	0.0020	0.0031			6	0.0400	0.0006	0.0009	0.0001	0.0030			6	0.0100	0.0006	0.0009	0.0001	0.0015			
	5	0.0007	0.0011	0.0018	0.0026			5	0.0200	0.0007	0.0011	0.0005	0.0145			5	0.0700	0.0007	0.0011	0.0004	0.0127			
	4	0.0008	0.0012	0.0030	0.0046			4	0.0200	0.0008	0.0012	0.0001	0.0040			4	0.0400	0.0008	0.0012	0.0003	0.0080			
	3	0.0004	0.0006	0.0018	0.0028			3	0.0200	0.0004	0.0006	0.0003	0.0103			3	0.1000	0.0004	0.0006	0.0003	0.0103			
	2	0.0010	0.0015	0.0025	0.0039			2	0.0800	0.0010	0.0015	0.0002	0.0047			2	0.1500	0.0010	0.0015	0.0013	0.0350			
	1	0.0006	0.0009	0.0008	0.0012			1	0.0200	0.0006	0.0009	0.0001	0.0031			1	0.0800	0.0006	0.0009	0.0004	0.0124			
	SUM	0.0081	0.0141	0.0258	0.0387				0.5500	SUM	0.0141	0.0037	0.1123				0.8600	SUM	0.0141	0.0045	0.1341	0.2483	SUM LOAD	
	AVE	0.0008	0.0012	0.0021	0.0032				0.0458	AVE	0.0012	0.0003					0.0567	AVE	0.0012	0.0004		0.0007	SUM LOADING	
1989	12	0.0006	0.0009	0.0007	0.0011		1989	12	0.1000	0.0006	0.0009	0.0001	0.0031		1989	12	0.1000	0.0006	0.0009	0.0005	0.0155			
	11	0.0007	0.0011	0.0013	0.0020			11	0.0200	0.0007	0.0011	0.0046	0.1367			11	0.0400	0.0007	0.0011	0.0002	0.0070			
	10	0.0007	0.0011	0.0010	0.0015			10	0.0200	0.0007	0.0011	0.0022	0.0688			10	0.0200	0.0007	0.0011	0.0001	0.0036			
	9	0.0009	0.0014	0.0011	0.0017			9	0.0200	0.0009	0.0014	0.0002	0.0047			9	0.0200	0.0009	0.0014	0.0002	0.0047			
	8	0.0009	0.0014	0.0009	0.0014			8	0.7800	0.0009	0.0014	0.0023	0.0698			8	0.7800	0.0009	0.0014	0.0059	0.1816			
	7	0.0010	0.0015	0.0010	0.0015			7	0.3800	0.0010	0.0015	0.0002	0.0052			7	0.0800	0.0010	0.0015	0.0007	0.0207			
	6	0.0013	0.0020	0.0013	0.0020			6	0.0200	0.0013	0.0020	0.0239	0.7160			6	0.0500	0.0013	0.0020	0.0005	0.0163			
	SUM	0.0081	0.0094	0.0073	0.0113			5	0.3000				0.0000			5	0.1000				0.0000			
	AVE	0.0009	0.0012	0.0010	0.0016			4	0.0200				0.0000			4	0.0100				0.0000			
								3	2.2000				0.0000			3	0.1000				0.0000			
								2	0.3200				0.0000			2	0.0300				0.0000			
								1	0.0250				0.0000			1	0.0500				0.0000			
									4.2050	SUM	0.0094	0.0333	1.0042				1.3800	SUM	0.0094	0.0091	0.2494	1.2536	SUM LOAD	
									0.3504	AVE	0.0013	0.0048					0.1150	AVE	0.0013	0.0012		0.0059	SUM LOADING	
							1988	12	0.0000						1988	12	0.0000							
								11	0.0000							11	0.1000							
								10	0.0000							10	0.0000							
								9	0.0000							9	0.0250							
								8	0.0000							8	0.0000							
								7	0.0000							7	0.0000							
								6	0.0000							6	0.0000							
								5	0.0000							5	0.0000							
								4	0.2000							4	0.0500							
								3	0.0000							3	0.0500							
								2	0.0800							2	0.0500							
								1	0.0000							1	0.1800							
								SUM	0.2800							SUM	0.4950							
								AVE	0.0233							AVE	0.0379							
							1987	12	0.0000						1987	12	0.2000							
								11	0.0000							11	0.2000							
								10	0.0000							10	0.1000							
								9	0.0000							9	0.1800							
								8	0.0300							8	0.4300							
								7	0.0000							7	0.2000							
								6	0.0000							6	0.0500							
								5	0.0000							5	0.0000							
								4	0.0000							4	0.0000							
								3	0.0000							3	0.0000							
								2	0.0300							2	0.0500							
								1	0.0000							1	0.0000							

SUM	0.0500	SUM	1.4100
AVE	0.0050	AVE	0.1176

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TF	YEAR	MONTH	AVE DISCH (MGD)	CFS	MAX DISCHARGE	CFS	ARAMETE	YEAR	MONTH	AVE CONC (mg/l)	FLOW (MGD)	CFS	LOADING	LOAD(LBS)	RAME	YEAR	MONTH	VE CONC (mg	OW (M	CFS	LOADING	AD(LBS)		
033	1997	3	0.0000	0.0000	0.0056	0.0087	RDX+HMX	1997	3	0.0100	0.0056	0.0087	0.0005	0.0145	TNT	1997	3	0.0400	0.0056	0.0087	0.0019	0.0579		
		2	0.0000	0.0000	0.0042	0.0065			2	0.0400	0.0042	0.0065	0.0014	0.0393			2	0.0100	0.0042	0.0065	0.0004	0.0098		
		1	0.0000	0.0000	0.0063	0.0097			1	0.0000	0.0063	0.0097	0.0000	0.0000			1	0.3200	0.0063	0.0097	0.0168	0.5215		
		SUM	0.0000	0.0000	0.0161	0.0249				0.0500		SUM	0.0249	0.0019	0.0537			0.3700		SUM	0.0249	0.0190	0.6893	0.6430	SUM LOAD
		AVE	0.0000	0.0000	0.0033	0.0053				0.0167		AVE	0.0083	0.0006				0.1233		AVE	0.0083	0.0007		0.0214	UM LOADIN
	1996	12	0.0000	0.0000	0.0061	0.0094		1996	12	0.0300	0.0061	0.0094	0.0015	0.0473		1996	12	0.0100	0.0061	0.0094	0.0005	0.0158		
		11	0.0000	0.0000	0.0021	0.0032			11	0.0100	0.0021	0.0032	0.0002	0.0053			11	0.0000	0.0021	0.0032	0.0000	0.0000		
		10	0.0000	0.0000	0.0021	0.0032			10	0.0200	0.0021	0.0032	0.0004	0.0109			10	0.0000	0.0021	0.0032	0.0000	0.0000		
		9	0.0012	0.0019	0.0019	0.0029			9	0.0200	0.0012	0.0019	0.0002	0.0062			9	0.0000	0.0012	0.0019	0.0000	0.0000		
		8	0.0009	0.0014	0.0027	0.0042			8	0.0000	0.0009	0.0014	0.0000	0.0000			8	0.0000	0.0009	0.0014	0.0000	0.0000		
		7	0.0010	0.0015	0.0022	0.0034			7	0.0100	0.0010	0.0015	0.0001	0.0026			7	0.0000	0.0010	0.0015	0.0000	0.0000		
		6	0.0009	0.0014	0.0014	0.0022			6	0.0600	0.0009	0.0014	0.0005	0.0135			6	0.0100	0.0009	0.0014	0.0001	0.0023		
		5	0.0010	0.0015	0.0017	0.0026			5	0.0000	0.0010	0.0015	0.0000	0.0000			5	0.0100	0.0010	0.0015	0.0001	0.0026		
		4	0.0014	0.0022	0.0034	0.0053			4	0.0000	0.0014	0.0022	0.0000	0.0000			4	0.0000	0.0014	0.0022	0.0000	0.0000		
		3	0.0011	0.0017	0.0018	0.0028			3	0.0300	0.0011	0.0017	0.0003	0.0085			3	0.0000	0.0011	0.0017	0.0000	0.0000		
		2	0.0010	0.0015	0.0010	0.0015			2	0.0000	0.0010	0.0015	0.0000	0.0000			2	0.0000	0.0010	0.0015	0.0000	0.0000		
		1	0.0006	0.0009	0.0006	0.0009			1	0.0000	0.0006	0.0009	0.0000	0.0000			1	0.0000	0.0006	0.0009	0.0000	0.0000		
		SUM	0.0091	0.0141	0.0270	0.0418				0.1800		SUM	0.0360	0.0031	0.0943			0.0300		SUM	0.0300	0.0007	0.0208	0.1149	SUM LOAD
		AVE	0.0008	0.0012	0.0023	0.0035				0.0150		AVE	0.0025	0.0003				0.0100		AVE	0.0100	0.0001		0.0003	UM LOADIN
	1995	12	0.0000	0.0000	0.0000	0.0000		1995	12	0.0000	0.0000	0.0000	0.0000	0.0000		1995	12	0.0000	0.0000	0.0000	0.0000	0.0000		
		11	0.0006	0.0009	0.0015	0.0023			11	0.0000	0.0006	0.0009	0.0000	0.0000			11	0.0000	0.0006	0.0009	0.0000	0.0000		
		10	0.0008	0.0012	0.0016	0.0025			10	0.0000	0.0008	0.0012	0.0000	0.0000			10	0.1000	0.0008	0.0012	0.0007	0.0207		
		9	0.0000	0.0000	0.0000	0.0000			9	0.0000	0.0000	0.0000	0.0000	0.0000			9	0.0000	0.0000	0.0000	0.0000	0.0000		
		8	0.0010	0.0015	0.0017	0.0026			8	0.0000	0.0010	0.0015	0.0000	0.0000			8	0.0900	0.0010	0.0015	0.0008	0.0233		
		7	0.0012	0.0019	0.0022	0.0034			7	0.0000	0.0012	0.0019	0.0000	0.0000			7	0.0000	0.0012	0.0019	0.0000	0.0000		
		6	0.0000	0.0000	0.0012	0.0019			6	0.0000	0.0012	0.0019	0.0000	0.0000			6	0.0275	0.0012	0.0019	0.0003	0.0083		
		5	0.0000	0.0000	0.0007	0.0011			5	0.0000	0.0007	0.0011	0.0000	0.0000			5	0.0000	0.0007	0.0011	0.0000	0.0000		
		4	0.0000	0.0000	0.0007	0.0011			4	0.0700	0.0007	0.0011	0.0004	0.0123			4	0.0100	0.0007	0.0011	0.0001	0.0018		
		3	0.0000	0.0000	0.0111	0.0172			3	0.0000	0.0111	0.0172	0.0000	0.0000			3	0.0000	0.0111	0.0172	0.0000	0.0000		
		2	0.0000	0.0000	0.0007	0.0011			2	0.0800	0.0007	0.0011	0.0005	0.0131			2	0.0200	0.0007	0.0011	0.0001	0.0033		
		1	0.0000	0.0000	0.0009	0.0014			1	0.0850	0.0009	0.0014	0.0006	0.0198			1	0.0100	0.0009	0.0014	0.0001	0.0023		
		SUM	0.0038	0.0058	0.0123	0.0195				0.2350		SUM	0.0292	0.0015	0.0451			0.2575		SUM	0.0292	0.0019	0.0688	0.1047	SUM LOAD
		AVE	0.0003	0.0005	0.0010	0.0016				0.0196		AVE	0.0024	0.0001				0.0658		AVE	0.0027	0.0002		0.0003	UM LOADIN
	1994	12	0.0000	0.0000	0.0023	0.0036		1994	12	0.0550	0.0023	0.0036	0.0011	0.0327		1994	12	0.0150	0.0023	0.0036	0.0003	0.0089		
		11	0.0000	0.0000	0.0021	0.0032			11	0.0400	0.0021	0.0032	0.0007	0.0210			11	0.0235	0.0021	0.0032	0.0004	0.0124		
		10	0.0000	0.0000	0.0017	0.0026			10	0.0725	0.0017	0.0026	0.0010	0.0319			10	0.0300	0.0017	0.0026	0.0004	0.0132		
		9	0.0000	0.0000	0.0023	0.0036			9	0.0200	0.0023	0.0036	0.0004	0.0118			9	0.0300	0.0023	0.0036	0.0006	0.0178		
		8	0.0000	0.0000	0.0006	0.0009			8	0.0000	0.0006	0.0009	0.0000	0.0000			8	0.0167	0.0006	0.0009	0.0001	0.0026		
		7	0.0000	0.0000	0.0198	0.0306			7	0.0000	0.0198	0.0306	0.0000	0.0000			7	0.0800	0.0198	0.0306	0.0132	0.4098		
		6	0.0000	0.0000	0.0003	0.0005			6	0.0000	0.0003	0.0005	0.0000	0.0000			6	0.0200	0.0003	0.0005	0.0001	0.0015		
		5	0.0000	0.0000	0.0005	0.0008			5	0.0200	0.0005	0.0008	0.0001	0.0026			5	0.0200	0.0005	0.0008	0.0001	0.0026		
		4	0.0000	0.0000	0.0003	0.0005			4	0.0000	0.0003	0.0005	0.0000	0.0000			4	0.0200	0.0003	0.0005	0.0001	0.0015		
		3	0.0000	0.0000	0.0004	0.0006			3	0.0000	0.0004	0.0006	0.0000	0.0000			3	0.0400	0.0004	0.0006	0.0001	0.0041		
		2	0.0000	0.0000	0.0000	0.0000			2	0.0000	0.0000	0.0000	0.0000	0.0000			2	0.0000	0.0000	0.0000	0.0000	0.0000		
		1	0.0000	0.0000	0.0005	0.0008			1	0.0000	0.0005	0.0008	0.0000	0.0000			1	0.0450	0.0005	0.0008	0.0002	0.0058		
		SUM	0.0000	0.0000	0.0308	0.0477				0.2075		SUM	0.0477	0.0093	0.1061			0.3402		SUM	0.0477	0.0159	0.4902	0.5803	SUM LOAD
		AVE	0.0000	0.0000	0.0026	0.0040				0.0173		AVE	0.0040	0.0003				0.1134		AVE	0.0159	0.0013		0.0016	UM LOADIN
	1993	12	0.0000	0.0000	0.0006	0.0009		1993	12	1.4000	0.0006	0.0009	0.0070	0.2173		1993	12	0.0300	0.0006	0.0009	0.0002	0.0047		
		11	0.0000	0.0000	0.0000	0.0000			11	0.0000	0.0000	0.0000	0.0000	0.0000			11	0.0000	0.0000	0.0000	0.0000	0.0000		
		10	0.0000	0.0000	0.0000	0.0000			10	0.0000	0.0000	0.0000	0.0000	0.0000			10	0.0000	0.0000	0.0000	0.0000	0.0000		
		9	0.0000	0.0000	0.0012	0.0019			9	0.0000	0.0012	0.0019	0.0000	0.0000			9	0.1800	0.0012	0.0019	0.0018	0.0559		
		8	0.0000	0.0000	0.0014	0.0022			8	0.0400	0.0014	0.0022	0.0005	0.0145			8	0.0400	0.0014	0.0022	0.0005	0.0145		
		7	0.0000	0.0000	0.0008	0.0012			7	0.0400	0.0008	0.0012	0.0003	0.0083			7	0.0600	0.0008	0.0012	0.0004	0.0124		
		6	0.0000	0.0000	0.0016	0.0025			6	0.0233	0.0016	0.0025	0.0003	0.0093			6	0.0833	0.0016	0.0025	0.0011	0.0334		
		5	0.0000	0.0000	0.0060	0.0093			5	0.0000	0.0060	0.0093	0.0000	0.0000			5	0.1550	0.0060	0.0093	0.0078	0.2406		
		4	0.0000	0.0000	0.0006	0.0009			4	0.0950	0.0006	0.0009	0.0005	0.0143			4	0.0250	0.0006	0.0009	0.0001	0.0038		
		3	0.0000	0.0000	0.0008	0.0012			3	0.0000	0.0008	0.0012	0.0000	0.0000			3	0.0000	0.0008	0.0012	0.0000	0.0000		
		2	0.0000	0.0000	0.0008	0.0012			2	0.0366	0.0008	0.0012	0.0002	0.0068			2	0.0433	0.0008	0.0012	0.0003	0.0081		
		1	0.0000	0.0000	0.0012	0.0019			1	0.0000	0.0012	0.0019	0.0000	0.0000			1	0.1300	0.0012	0.0019	0.0013	0.0404		
		SUM	0.0000	0.0000	0.0160	0.0232				1.6349		SUM	0.0232	0.0088	0.2705			0.7485		SUM	0.0232	0.0124	0.4135	0.6541	SUM LOAD
		AVE	0.0000	0.0000	0.0013	0.0019				0.1362		AVE	0.0019	0.0007				0.2488		AVE	0.0077	0.0011		0.0018	UM LOADIN
	1992	12	0.0000	0.0000	0.0005	0.0008		1992	12	0.0500	0.0005	0.0008	0.0002	0.0065		1992	12	0.0000	0.0005	0.0008	0.0000	0.0000		
		11	0.0000	0.0000	0.0012	0.0019			11	0.1600	0.0012	0.0019	0.0016	0.0481			11	0.0000	0.0012	0.0019	0.0000	0.0000		
		10	0.0000	0.0000	0.0012	0.0019			10	0.0800	0.0012	0.0019	0.0008	0.0248			10	0.0240	0.0012	0.0019	0.0002	0.0075		
		9	0.0000	0.0000	0.0006	0.0009			9	0.0910	0.0006	0.0009	0.0005	0.0141			9	0.0920	0.0006	0.0009	0.0005	0.0143		
		8	0.0000	0.0000	0.0027	0.0042			8	0.0000	0.0027	0.0042	0.0000	0.0000			8	0.0150	0.0027	0.0042	0.0003	0.0105		
		7	0.0000	0.0000	0.0013	0.0020			7	0.0000	0.0013	0.0020	0.0000	0.0000			7	0.0000	0.0013	0.0020	0.0000	0.0000		
		6	0.0000	0.0000	0.0027	0.0042			6	0.0200	0.0027	0.0042	0.0005	0.0135			6	0.0300	0.0027	0.0042	0.0007	0.0203		
		5	0.0000	0.0000	0.0003	0.0005			5	0.0000	0.0003	0.0005	0.0000	0.0000			5	0.0000	0.0003	0.0005	0.0000	0.0000		
		4	0.0000	0.0000	0.0001	0.0002			4	0.0000	0.0001	0.0002	0.0000	0.0000			4	0.0160	0.0001	0.0002	0.0000	0.0004		
		3	0.0000	0.0000	0.0001	0.0002			3	0.0000	0.0001	[illegible]	0.0000	0.0000			3	0.0000	0.0001	0.0002	0.0000	0.0000		

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		2	0.0000	0.0000	0.0003	0.0005			2	0.0000	0.0003	0.0	0.0000	0.0000			2	0.0000	0.0003	0.0005	0.0000	0.0000			
		1	0.0000	0.0000	0.0003	0.0005			1	0.0000	0.0003	0.0005	0.0000	0.0000			1	0.0000	0.0003	0.0005	0.0000	0.0000			
		SUM	0.0000	0.0000	0.0113	0.0175				0.4010		SUM	0.0175	0.0035	0.1070				0.1720	SUM	0.0175	0.0017	0.0529	0.1589	SUM LOAD
		AVE	0.0000	0.0000	0.0009	0.0015				0.0334		AVE	0.0015	0.0003					0.0590	AVE	0.0058	0.0001		0.0004	UM LOADIN
	1991	12	0.0000	0.0000	0.0007	0.0011		1991	12	0.0000	0.0007	0.0011	0.0000	0.0000		1991	12	0.0600	0.0007	0.0011	0.0004	0.0109			
		11	0.0000	0.0000	0.0006	0.0009			11	0.0400	0.0006	0.0009	0.0002	0.0060			11	0.0400	0.0006	0.0009	0.0002	0.0060			
		10	0.0000	0.0000	0.0006	0.0009			10	0.0700	0.0006	0.0009	0.0004	0.0109			10	0.0200	0.0006	0.0009	0.0001	0.0031			
		9	0.0000	0.0000	0.0003	0.0005			9	0.0000	0.0003	0.0005	0.0000	0.0000			9	0.0200	0.0003	0.0005	0.0001	0.0016			
		8	0.0000	0.0000	0.0048	0.0074			8	0.0000	0.0048	0.0074	0.0000	0.0000			8	0.0600	0.0048	0.0074	0.0024	0.0745			
		7	0.0011	0.0017	0.0017	0.0026			7	0.0000	0.0011	0.0017	0.0000	0.0000			7	0.0400	0.0011	0.0017	0.0004	0.0114			
		6	0.0015	0.0023	0.0020	0.0031			6	0.0600	0.0015	0.0023	0.0008	0.0225			6	0.0600	0.0015	0.0023	0.0008	0.0225			
		5	0.0002	0.0003	0.0012	0.0019			5	0.0000	0.0002	0.0003	0.0000	0.0000			5	0.0200	0.0002	0.0003	0.0000	0.0010			
		4	0.0002	0.0003	0.0005	0.0008			4	0.0500	0.0002	0.0003	0.0001	0.0025			4	0.0400	0.0002	0.0003	0.0001	0.0020			
		3	0.0001	0.0002	0.0003	0.0005			3	0.1200	0.0001	0.0002	0.0001	0.0031			3	0.0500	0.0001	0.0002	0.0000	0.0013			
		2	0.0008	0.0012	0.0019	0.0028			2	0.0000	0.0008	0.0012	0.0000	0.0000			2	0.0000	0.0008	0.0012	0.0000	0.0000			
		1	0.0002	0.0003	0.0029	0.0045			1	0.0000	0.0002	0.0003	0.0000	0.0000			1	0.0000	0.0002	0.0003	0.0000	0.0000			
		SUM	0.0041	0.0059	0.0175	0.0271				0.3400		SUM	0.0172	0.0015	0.0450				0.4100	SUM	0.0172	0.0044	0.1343	0.1793	SUM LOAD
		AVE	0.0003	0.0005	0.0015	0.0023				0.0283		AVE	0.0014	0.0001					0.1367	AVE	0.0057	0.0004		0.0005	UM LOADIN
	1990	12	0.0006	0.0009	0.0015	0.0023		1990	12	0.0000	0.0006	0.0009	0.0000	0.0000		1990	12	0.0300	0.0006	0.0009	0.0002	0.0047			
		11	0.0012	0.0019	0.0031	0.0048			11	0.0000	0.0012	0.0019	0.0000	0.0000			11	0.0000	0.0012	0.0019	0.0000	0.0000			
		10	0.0007	0.0011	0.0016	0.0025			10	0.0000	0.0007	0.0011	0.0000	0.0000			10	0.0000	0.0007	0.0011	0.0000	0.0000			
		9	0.0004	0.0006	0.0004	0.0006			9	0.0300	0.0004	0.0006	0.0001	0.0031			9	0.0000	0.0004	0.0006	0.0000	0.0000			
		8	0.0003	0.0005	0.0004	0.0006			8	0.0000	0.0003	0.0005	0.0000	0.0000			8	0.0000	0.0003	0.0005	0.0000	0.0000			
		7	0.0001	0.0002	0.0002	0.0003			7	0.0200	0.0001	0.0002	0.0000	0.0005			7	0.0600	0.0001	0.0002	0.0001	0.0016			
		6	0.0003	0.0005	0.0003	0.0005			6	0.0200	0.0003	0.0005	0.0001	0.0015			6	0.3300	0.0003	0.0005	0.0008	0.0248			
		5	0.0003	0.0005	0.0007	0.0011			5	0.0200	0.0003	0.0005	0.0001	0.0016			5	0.0500	0.0003	0.0005	0.0001	0.0039			
		4	0.0010	0.0015	0.0050	0.0077			4	0.0200	0.0010	0.0015	0.0002	0.0050			4	0.0600	0.0010	0.0015	0.0005	0.0150			
		3	0.0004	0.0006	0.0010	0.0015			3	0.0200	0.0004	0.0006	0.0001	0.0021			3	0.0800	0.0004	0.0006	0.0003	0.0083			
		2	0.0008	0.0012	0.0008	0.0012			2	0.0200	0.0008	0.0012	0.0001	0.0037			2	0.0800	0.0008	0.0012	0.0005	0.0150			
		1	0.0006	0.0009	0.0008	0.0012			1	0.0200	0.0006	0.0009	0.0001	0.0031			1	0.3600	0.0006	0.0009	0.0018	0.0559			
		SUM	0.0067	0.0104	0.0159	0.0244				0.1700		SUM	0.0104	0.0007	0.0208				1.0900	SUM	0.0104	0.0043	0.1280	0.1496	SUM LOAD
		AVE	0.0006	0.0009	0.0013	0.0020				0.0142		AVE	0.0009	0.0001					0.3500	AVE	0.0035	0.0004		0.0004	UM LOADIN
	1989	12	0.0002	0.0003	0.0003	0.0005		1989	12	0.0200	0.0002	0.0003	0.0000	0.0010		1989	12	0.1000	0.0002	0.0003	0.0002	0.0052			
		11	0.0004	0.0006	0.0006	0.0009			11	0.0200	0.0004	0.0006	0.0001	0.0020			11	0.0400	0.0004	0.0006	0.0001	0.0040			
		10	0.0004	0.0006	0.0010	0.0015			10	0.0300	0.0004	0.0006	0.0001	0.0031			10	0.0500	0.0004	0.0006	0.0002	0.0052			
		9	0.0002	0.0003	0.0004	0.0006			9	0.0200	0.0002	0.0003	0.0000	0.0010			9	0.0500	0.0002	0.0003	0.0001	0.0026			
		8	0.0003	0.0005	0.0003	0.0005			8	0.0200	0.0003	0.0005	0.0001	0.0016			8	0.0200	0.0003	0.0005	0.0001	0.0016			
		7	0.0002	0.0003	0.0002	0.0003			7	0.0200	0.0002	0.0003	0.0000	0.0010			7	0.0100	0.0002	0.0003	0.0000	0.0005			
		6	0.0002	0.0003	0.0002	0.0003			6	0.0200	0.0002	0.0003	0.0000	0.0010			6	0.0100	0.0002	0.0003	0.0000	0.0005			
		SUM	0.0019	0.0029	0.0030	0.0046			5	0.0200				0.0000			5	0.0100		0.0000	0.0000	0.0000			
		AVE	0.0003	0.0004	0.0004	0.0007			4	0.0200				0.0000			4	0.4000		0.0000	0.0000	0.0000			
									3	0.0200				0.0000			3	0.1800		0.0000	0.0000	0.0000			
									2	0.1200				0.0000			2	0.1800		0.0000	0.0000	0.0000			
									1	0.0000				0.0000			1	0.2000		0.0000	0.0000	0.0000			
										0.3300		SUM	0.0029	0.0004	0.0108				1.2500	SUM	0.0029	0.0006	0.0195	0.0304	SUM LOAD
										0.0275		AVE	0.0004	0.0001					0.1042	AVE	0.0004	0.0001		0.0001	UM LOADIN
							1988	12	0.0000							1988	12	0.1300		0.0000	0.0000				
								11	0.0000								11	0.7000		0.0000	0.0000				
								10	0.0000								10	0.1000		0.0000	0.0000				
								9	0.0000								9	0.1000		0.0000	0.0000				
								8	0.0800								8	0.0000		0.0000	0.0000				
								7	0.0200								7	0.1200		0.0000	0.0000				
								6	0.0000								6	0.0000		0.0000	0.0000				
								5	0.0000								5	0.0300		0.0000	0.0000				
								4	0.0500								4	0.3800		0.0000	0.0000				
								3	0.0500								3	0.0500		0.0000	0.0000				
								2	0.0800								2	0.2000		0.0000	0.0000				
								1	0.0000								1	0.1800		0.0000	0.0000				
								SUM	0.2800								SUM	1.9900			0.0000				
								AVE	0.0233								AVE	0.1658							
							1987	12	0.0000							1987	12	0.2300		0.0000	0.0000				
								11	0.0000								11	0.0800		0.0000	0.0000				
								10	0.0000								10	0.0000		0.0000	0.0000				
								9	0.0000								9	0.0800		0.0000	0.0000				
								8	0.0000								8	0.0000		0.0000	0.0000				
								7	0.0000								7	0.0000		0.0000	0.0000				
								6	0.0000								6	0.0300		0.0000	0.0000				
								5	0.0800								5	0.1300		0.0000	0.0000				
								4	0.0000								4	0.2000		0.0000	0.0000				
								3	0.0000								3	2.0000		0.0000	0.0000				
								2	0.0000								2	0.2000		0.0000	0.0000				
								1	0.1300								1	0.1500		0.0000	0.0000				

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								SUM	0.2100							SUM	3.1000			0.0000			
								AVE	0.0175							AVE	0.2583						

TF	YEAR	MONTH	Ave DISCH (MGD)	CFS	MAX DIS	CFS	CODE	ARAMETE	YEAR	MONTH	AVE CONC (mg/l)	CODE	FLOW (MGD)	CFS	NP...	...OADING	LOAD(LBS)	AME	YEAR	MONTH	AVE CONC (mg/l)	CODE	FLOW (MGD)	CFS	LOADING	LOAD(LBS)		
034	1997	3	0.0000	0.0000	0.0000	0.0000	3	RDX+HMX	1997	3	0.0000	3	0.0000	0.0000	0.0000	0.0000	0.0000	TNT	1997	3	0.0000	5	0.0000	0.0000	0.0000	0.0000		
		2	0.0000	0.0000	0.0012	0.0019	0			2	0.0800	0	0.0012	0.0019	0.0008	0.0224				2	0.0000	5	0.0012	0.0019	0.0000	0.0000		
		1	0.0000	0.0000	0.0068	0.0105	0			1	0.0000	5	0.0068	0.0105	0.0000	0.0000				1	0.0600	0	0.0068	0.0105	0.0034	0.1055		
		SUM	0.0000	0.0000	0.0080	0.0124					0.0800		SUM	0.0124	0.0008	0.0224					0.0600		SUM	0.0124	0.0034	0.1055	0.1280	SUM LOAD
		AVE	0.0000	0.0000	0.0027	0.0041							AVE	0.0041	0.0003								AVE	0.0041	0.0011		0.0014	SUM LOADING
	1996	12	0.0000	0.0000	0.0016	0.0025	0		1996	12	0.0000	5	0.0016	0.0025	0.0000	0.0000			1996	12	0.0000	0	0.0016	0.0025	0.0000	0.0000		
		11	0.0000	0.0000	0.0046	0.0071	0			11	0.0000	5	0.0046	0.0071	0.0000	0.0000				11	0.0000	5	0.0046	0.0071	0.0000	0.0000		
		10	0.0000	0.0000	0.0057	0.0088	0			10	0.0000	5	0.0057	0.0088	0.0000	0.0000				10	0.1300	5	0.0057	0.0088	0.0062	0.1917		
		9	0.0058	0.0090	0.0203	0.0314	0			9	0.1100	0	0.0058	0.0090	0.0053	0.1650				9	0.0200	0	0.0058	0.0090	0.0010	0.0300		
		8	0.0057	0.0088	0.0170	0.0263	0			8	0.1300	0	0.0057	0.0088	0.0062	0.1917				8	0.0000	0	0.0057	0.0088	0.0000	0.0000		
		7	0.0085	0.0132	0.0223	0.0345	0			7	0.1100	0	0.0085	0.0132	0.0078	0.2419				7	0.0000	0	0.0085	0.0132	0.0000	0.0000		
		6	0.0074	0.0114	0.0176	0.0272	0			6	0.1300	0	0.0074	0.0114	0.0080	0.2408				6	0.0100	0	0.0074	0.0114	0.0006	0.0185		
		5	0.0091	0.0141	0.0317	0.0490	0			5	0.0200	0	0.0091	0.0141	0.0015	0.0471				5	0.0200	0	0.0091	0.0141	0.0015	0.0471		
		4	0.0349	0.0540	0.0408	0.0631	0			4	2.6800	0	0.0349	0.0540	0.7805	23.4145				4	0.6400	0	0.0349	0.0540	0.1864	5.5915		
		3	0.0359	0.0555	0.0631	0.0976	0			3	0.9000	0	0.0359	0.0555	0.2696	8.3580				3	0.1200	0	0.0359	0.0555	0.0359	1.1144		
		2	0.0083	0.0128	0.0132	0.0204	0			2	0.1800	0	0.0083	0.0128	0.0125	0.3491				2	0.0300	0	0.0083	0.0128	0.0021	0.0582		
		1	0.0111	0.0172	0.0244	0.0378	0			1	0.2200	0	0.0111	0.0172	0.0204	0.6317				1	0.0400	0	0.0111	0.0172	0.0037	0.1149		
		SUM	0.1287	0.1960	0.2623	0.4058					4.4800		SUM	0.2144	1.1118	33.6398					1.0100		SUM	0.2144	0.2374	7.1663	40.8060	SUM LOAD
		AVE	0.0106	0.0163	0.0219	0.0338							AVE	0.0179	0.0926								AVE	0.0179	0.0196		0.1124	SUM LOADING
	1995	12	0.0058	0.0090	0.0067	0.0104	0		1995	12	0.6500	0	0.0058	0.0090	0.0315	0.9752			1995	12	0.2800	0	0.0058	0.0090	0.0140	0.4351		
		11	0.0064	0.0099	0.0077	0.0119	0			11	0.3066	0	0.0064	0.0099	0.0164	0.4912				11	0.1016	0	0.0064	0.0099	0.0054	0.1628		
		10	0.0711	0.1100	0.0723	0.1119	0			10	0.2200	0	0.0711	0.1100	0.1305	4.0463				10	0.1800	0	0.0711	0.1100	0.1068	3.3106		
		9	0.0762	0.1179	0.0853	0.1320	0			9	0.0300	0	0.0762	0.1179	0.0191	0.5913				9	0.1500	0	0.0762	0.1179	0.0954	2.9567		
		8	0.0691	0.1069	0.0742	0.1148	0			8	0.0000	5	0.0691	0.1069	0.0000	0.0000				8	0.1300	0	0.0691	0.1069	0.0750	2.3237		
		7	0.0081	0.0125	0.0136	0.0210	0			7	0.0000	5	0.0081	0.0125	0.0000	0.0000				7	0.0100	0	0.0081	0.0125	0.0007	0.0210		
		6	0.0000	0.0000	0.0109	0.0169	0			6	0.1170	0	0.0109	0.0169	0.0106	0.3193				6	0.0240	0	0.0109	0.0169	0.0022	0.0655		
		5	0.0000	0.0000	0.0121	0.0187	0			5	0.0000	5	0.0121	0.0187	0.0000	0.0000				5	0.0073	0	0.0121	0.0187	0.0007	0.0228		
		4	0.0000	0.0000	0.0123	0.0190	0			4	0.0500	0	0.0123	0.0190	0.0051	0.1540				4	0.0071	3	0.0123	0.0190	0.0007	0.0219		
		3	0.0000	0.0000	0.0111	0.0172	0			3	0.7100	0	0.0111	0.0172	0.0658	2.0387				3	0.0225	3	0.0111	0.0172	0.0021	0.0646		
		2	0.0000	0.0000	0.0071	0.0110	0			2	0.5333	0	0.0071	0.0110	0.0316	0.8847				2	0.0033	3	0.0071	0.0110	0.0002	0.0055		
		1	0.0000		0.0000		3			1	0.0000	3								1	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		SUM	0.2367	0.3662	0.3133	0.4848					2.6169		SUM	0.4490	0.4032	9.5007					0.9258		SUM	0.4490	0.3032	9.3902	18.8909	SUM LOAD
		AVE	0.0197	0.0305	0.0261	0.0404							AVE	0.0374	0.0336								AVE	0.0374	0.0253		0.0589	SUM LOADING
	1994	12	0.0000	0.0000	0.0000	0.0000	3		1994	12	0.0000	3	0.0000	0.0000	0.0000	0.0000			1994	12	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		11	0.0000	0.0000	0.0000	0.0000	3			11	0.0000	3	0.0000	0.0000	0.0000	0.0000				11	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		10	0.0000	0.0000	0.0000	0.0000	3			10	0.0000	3	0.0000	0.0000	0.0000	0.0000				10	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		9	0.0000	0.0000	0.0000	0.0000	3			9	0.0000	3	0.0000	0.0000	0.0000	0.0000				9	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		8	0.0000	0.0000	0.0000	0.0000	3			8	0.0000	3	0.0000	0.0000	0.0000	0.0000				8	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		7	0.0000	0.0000	0.0000	0.0000	3			7	0.0000	3	0.0000	0.0000	0.0000	0.0000				7	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		6	0.0000	0.0000	0.0000	0.0000	3			6	0.0000	3	0.0000	0.0000	0.0000	0.0000				6	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		5	0.0000	0.0000	0.0000	0.0000	3			5	0.0000	3	0.0000	0.0000	0.0000	0.0000				5	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		4	0.0000	0.0000	0.0000	0.0000	3			4	0.0000	3	0.0000	0.0000	0.0000	0.0000				4	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		3	0.0000	0.0000	0.0000	0.0000	3			3	0.0000	3	0.0000	0.0000	0.0000	0.0000				3	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		2	0.0000	0.0000	0.0000	0.0000	3			2	0.0000	3	0.0000	0.0000	0.0000	0.0000				2	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		1	0.0000	0.0000	0.0000	0.0000	3			1	0.0000	3	0.0000	0.0000	0.0000	0.0000				1	0.0000	3	0.0000	0.0000	0.0000	0.0000		
											0.0000				0.0000	0.0000					0.0000				0.0000	0.0000		
	1993	12	0.0000	0.0000	0.0000	0.0000	3		1993	12	0.0000	3	0.0000	0.0000	0.0000	0.0000			1993	12	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		11	0.0000	0.0000	0.0000	0.0000	3			11	0.0000	3	0.0000	0.0000	0.0000	0.0000				11	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		10	0.0000	0.0000	0.0000	0.0000	3			10	0.0000	3	0.0000	0.0000	0.0000	0.0000				10	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		9	0.0000	0.0000	0.0000	0.0000	3			9	0.0000	3	0.0000	0.0000	0.0000	0.0000				9	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		8	0.0000	0.0000	0.0000	0.0000	3			8	0.0000	3	0.0000	0.0000	0.0000	0.0000				8	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		7	0.0000	0.0000	0.0000	0.0000	3			7	0.0000	3	0.0000	0.0000	0.0000	0.0000				7	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		6	0.0000	0.0000	0.0000	0.0000	3			6	0.0000	3	0.0000	0.0000	0.0000	0.0000				6	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		5	0.0000	0.0000	0.0000	0.0000	3			5	0.0000	3	0.0000	0.0000	0.0000	0.0000				5	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		4	0.0000	0.0000	0.0000	0.0000	3			4	0.0000	3	0.0000	0.0000	0.0000	0.0000				4	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		3	0.0000	0.0000	0.0000	0.0000	3			3	0.0000	3	0.0000	0.0000	0.0000	0.0000				3	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		2	0.0000	0.0000	0.0000	0.0000	3			2	0.0000	3	0.0000	0.0000	0.0000	0.0000				2	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		1	0.0000	0.0000	0.0000	0.0000	3			1	0.0000	3	0.0000	0.0000	0.0000	0.0000				1	0.0000	3	0.0000	0.0000	0.0000	0.0000		
											0.0000				0.0000	0.0000					0.0000				0.0000	0.0000		
	1992	12	0.0000	0.0000	0.0000	0.0000	3		1992	12	0.0000	3	0.0000	0.0000	0.0000	0.0000			1992	12	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		11	0.0000	0.0000	0.0000	0.0000	3			11	0.0000	3	0.0000	0.0000	0.0000	0.0000				11	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		10	0.0000	0.0000	0.0000	0.0000	3			10	0.0000	3	0.0000	0.0000	0.0000	0.0000				10	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		9	0.0000	0.0000	0.0000	0.0000	3			9	0.0000	3	0.0000	0.0000	0.0000	0.0000				9	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		8	0.0000	0.0000	0.0000	0.0000	3			8	0.0000	3	0.0000	0.0000	0.0000	0.0000				8	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		7	0.0000	0.0000	0.0000	0.0000	3			7	0.0000	3	0.0000	0.0000	0.0000	0.0000				7	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		6	0.0000	0.0000	0.0000	0.0000	3			6	0.0000	3	0.0000	0.0000	0.0000	0.0000				6	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		5	0.0000	0.0000	0.0000	0.0000	3			5	0.0000	3	0.0000	0.0000	0.0000	0.0000				5	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		4	0.0000	0.0000	0.0000	0.0000	3			4	0.0000	3	0.0000	0.0000	0.0000	0.0000				4	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		3	0.0000	0.0000	0.0000	0.0000	3			3	0.0000	3	0.0000	0.0000	0.0000	0.0000				3	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		2	0.0000	0.0000	0.0000	0.0000	3			2	0.0000	3	0.0000	0.0000	0.0000	0.0000				2	0.0000	3	0.0000	0.0000	0.0000	0.0000		
		1	0.0000	0.0000	0.0000	0.0000	3			1	0.0000	3	0.0000	0.0000	0.0000	0.0000				1	0.0000	3	0.0000	0.0000	0.0000	0.0000		

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										0.0000				0.0000	0.0000				0.0000				0.0000	0.0000			
	1991	12	0.0000	0.0000	0.0000	0.0000	3		1991	12	0.0000	3	0.0000	0.0000	0.0000	0.0000		1991	12	0.0000	3	0.0000	0.0000	0.0000	0.0000			
		11	0.0000	0.0000	0.0000	0.0000	3			11	0.0000	3	0.0000	0.0000	0.0000	0.0000			11	0.0000	3	0.0000	0.0000	0.0000	0.0000			
		10	0.0000	0.0000	0.0000	0.0000	3			10	0.0000	3	0.0000	0.0000	0.0000	0.0000			10	0.0000	3	0.0000	0.0000	0.0000	0.0000			
		9	0.0000	0.0000	0.0000	0.0000	3			9	0.0000	3	0.0000	0.0000	0.0000	0.0000			9	0.0000	3	0.0000	0.0000	0.0000	0.0000			
		8	0.0000	0.0000	0.0000	0.0000	3			8	0.0000	3	0.0000	0.0000	0.0000	0.0000			8	0.0000	3	0.0000	0.0000	0.0000	0.0000			
		7	0.0000	0.0000	0.0000	0.0000	3			7	0.0000	3	0.0000	0.0000	0.0000	0.0000			7	0.0000	3	0.0000	0.0000	0.0000	0.0000			
		6	0.0000	0.0000	0.0000	0.0000	3			6	0.0000	3	0.0000	0.0000	0.0000	0.0000			6	0.0000	3	0.0000	0.0000	0.0000	0.0000			
		5	0.0000	0.0000	0.0000	0.0000	3			5	0.0000	3	0.0000	0.0000	0.0000	0.0000			5	0.0000	3	0.0000	0.0000	0.0000	0.0000			
		4	0.0000	0.0000	0.0000	0.0000	3			4	0.0000	3	0.0000	0.0000	0.0000	0.0000			4	0.0000	3	0.0000	0.0000	0.0000	0.0000			
		3	0.0000	0.0000	0.0000	0.0000	3			3	0.0000	3	0.0000	0.0000	0.0000	0.0000			3	0.0000	3	0.0000	0.0000	0.0000	0.0000			
		2	0.0000	0.0000	0.0000	0.0000	3			2	0.0000	3	0.0000	0.0000	0.0000	0.0000			2	0.0000	3	0.0000	0.0000	0.0000	0.0000			
		1	0.0000	0.0000	0.0000	0.0000	3			1	0.0000	3	0.0000	0.0000	0.0000	0.0000			1	0.0000	0	0.0000	0.0000	0.0000	0.0000			
											0.0000				0.0000	0.0000				0.0000				0.0000	0.0000			
	1990	12	0.0000	0.0000	0.0000	0.0000	3		1990	12	0.0000	3	0.0000	0.0000	0.0000	0.0000		1990	12	0.0000	0	0.0000	0.0000	0.0000	0.0000			
		11	0.0000	0.0000	0.0000	0.0000	3			11	0.0000	3	0.0000	0.0000	0.0000	0.0000			11	0.0000	0	0.0000	0.0000	0.0000	0.0000			
		10	0.0028	0.0043	0.0057	0.0088	0			10	0.0400	0	0.0028	0.0043	0.0009	0.0290			10	0.0900	0	0.0028	0.0043	0.0021	0.0652			
		9	0.0022	0.0034	0.0026	0.0040	0			9	0.0000	5	0.0022	0.0034	0.0000	0.0000			9	0.0400	0	0.0022	0.0034	0.0007	0.0228			
		8	0.0005	0.0008	0.0041	0.0063	0			8	0.0000	5	0.0005	0.0008	0.0000	0.0000			8	0.0200	0	0.0005	0.0008	0.0001	0.0026			
		7	0.0022	0.0034	0.0038	0.0059	0			7	0.0200	0	0.0022	0.0034	0.0004	0.0114			7	0.0600	0	0.0022	0.0034	0.0011	0.0341			
		6	0.0010	0.0015	0.0028	0.0043	0			6	0.1300	0	0.0010	0.0015	0.0011	0.0325			6	0.1000	0	0.0010	0.0015	0.0008	0.0250			
		5	0.0006	0.0009	0.0012	0.0019	0			5	0.0200	0	0.0006	0.0009	0.0001	0.0031			5	0.0300	0	0.0006	0.0009	0.0002	0.0047			
		4	0.0014	0.0022	0.0030	0.0046	0			4	0.0700	0	0.0014	0.0022	0.0008	0.0245			4	0.0200	0	0.0014	0.0022	0.0002	0.0070			
		3	0.0005	0.0008	0.0014	0.0022	0			3	0.2200	0	0.0005	0.0008	0.0009	0.0285			3	0.0300	3	0.0005	0.0008	0.0001	0.0039			
		2	0.0006	0.0009	0.0019	0.0029	0			2	1.6000	0	0.0006	0.0009	0.0080	0.2243			2	0.1300	3	0.0006	0.0009	0.0007	0.0182			
		1	0.0010	0.0015	0.0014	0.0022	0			1	1.2000	0	0.0010	0.0015	0.0100	0.3104			1	0.1000	3	0.0010	0.0015	0.0008	0.0259			
		SUM	0.0128	0.0198	0.0279	0.0432					3.3000		SUM	0.0198	0.0222	0.6637				0.6200		SUM	0.0198	0.0069	0.2094	0.8731	SUM LOAD	
		AVE	0.0011	0.0017	0.0023	0.0036							AVE	0.0017	0.0019							AVE	0.0017	0.0006		0.0024	SUM LOADING	
	1989	12	0.0000	0.0000	0.0000	0.0000	3		1989	12	0.0000	3	0.0000	0.0000	0.0000	0.0000		1989	12	0.0000	3	0.0000	0.0000	0.0000	0.0000			
		11	0.0000	0.0000	0.0000	0.0000	3			11	0.0000	3	0.0000	0.0000	0.0000	0.0000			11	0.0000	3	0.0000	0.0000	0.0000	0.0000			
		10	0.0000	0.0000	0.0000	0.0000	3			10	0.0000	3	0.0000	0.0000	0.0000	0.0000			10	0.0000	3	0.0000	0.0000	0.0000	0.0000			
		9	0.0000	0.0000	0.0000	0.0000	3			9	0.0000	3	0.0000	0.0000	0.0000	0.0000			9	0.0000	3	0.0000	0.0000	0.0000	0.0000			
		8	0.0000	0.0000	0.0000	0.0000	3			8	0.0000	3	0.0000	0.0000	0.0000	0.0000			8	0.0000	3	0.0000	0.0000	0.0000	0.0000			
		7	0.0000	0.0000	0.0000	0.0000	3			7	0.0000	3	0.0000	0.0000	0.0000	0.0000			7	0.0000	3	0.0000	0.0000	0.0000	0.0000			
		6	0.0000	0.0000	0.0000	0.0000	3			6	0.0000	3	0.0000	0.0000	0.0000	0.0000			6	0.0000	3	0.0000	0.0000	0.0000	0.0000			
										5	0.0000	3				0.0000			5	0.0000	3							
										4	0.0000	3				0.0000			4	0.0000	3							
										3	0.0000	3				0.0000			3	0.0000	3							
										2	0.0000	3				0.0000			2	0.0000	3							
										1	0.0000	3				0.0000			1	0.0000	3							
											0.0000				0.0000	0.0000				0.0000								
									1988	12	0.0000	3						1988	12	0.0000	3							
										11	0.0000	3							11	0.0000	3							
										10	0.0000	3							10	0.0000	3							
										9	0.0000	3							9	0.0000	3							
										8	0.0000	3							8	0.0000	3							
										7	0.0000	3							7	0.0000	3							
										6	0.0000	3							6	0.0000	3							
										5	0.0000	3							5	0.0000	0							
										4	0.0000	3							4	0.0000	3							
										3	0.0000	3							3	0.0000	0							
										2	0.8000	0							2	0.1000	0							
										1	0.0000	3							1	0.0000	0							
											0.8000																	
									1987	12	0.1500	0						1987	12	0.0800	3							
										11	0.9000	0							11	0.2800	3							
										10	0.2500	0							10	0.1000	3							
										9	0.0000	3							9	0.0000	3							
										8	0.0000	3							8	0.0000	3							
										7	0.0000	3							7	0.0000	0							
										6	0.0000	3							6	0.0000	0							
										5	0.0000	3							5	0.0000	0							
										3	0.4500	0							3	0.1800	3							
										2	0.2000	0							2	0.1000	3							
										1	0.5000	0							1	0.2000	3							
											2.4500																	

TF	YEAR	MONTH	AVE DISCHARGE (MGD)	CODE	ARAMETE	YEAR	MONTH	AVE CONC (mg/l)	FLOW (MGD)	CFS	LOADING	AME	YEAR	MON	AVE CONC (mg/l)	FLOW (MGD)	CFS	AVG NPDES LOADING
035	1997	3	0.0000	3	RDX+HMX	1997	3	0.0000	0.0000	0.0000	0.0000	TNT	1997	3	0.0000	0.0000	0.0000	0.0000
		2	0.0000	3			2	0.0000	0.0000	0.0000	0.0000			2	0.0000	0.0000	0.0000	0.0000
		1	0.0000	3			1	0.0000	0.0000	0.0000	0.0000			1	0.0000	0.0000	0.0000	0.0000
	1996	12	0.0000	3		1996	12	0.0000	0.0000	0.0000	0.0000		1996	12	0.0000	0.0000	0.0000	0.0000
		11	0.0000	3			11	0.0000	0.0000	0.0000	0.0000			11	0.0000	0.0000	0.0000	0.0000
		10	0.0000	3			10	0.0000	0.0000	0.0000	0.0000			10	0.0000	0.0000	0.0000	0.0000
		9	0.0000	3			9	0.0000	0.0000	0.0000	0.0000			9	0.0000	0.0000	0.0000	0.0000
		8	0.0000	3			8	0.0000	0.0000	0.0000	0.0000			8	0.0000	0.0000	0.0000	0.0000
		7	0.0000	3			7	0.0000	0.0000	0.0000	0.0000			7	0.0000	0.0000	0.0000	0.0000
		6	0.0000	3			6	0.0000	0.0000	0.0000	0.0000			6	0.0000	0.0000	0.0000	0.0000
		5	0.0000	3			5	0.0000	0.0000	0.0000	0.0000			5	0.0000	0.0000	0.0000	0.0000
		4	0.0000	3			4	0.0000	0.0000	0.0000	0.0000			4	0.0000	0.0000	0.0000	0.0000
		3	0.0000	3			3	0.0000	0.0000	0.0000	0.0000			3	0.0000	0.0000	0.0000	0.0000
		2	0.0000	3			2	0.0000	0.0000	0.0000	0.0000			2	0.0000	0.0000	0.0000	0.0000
		1	0.0000	3			1	0.0000	0.0000	0.0000	0.0000			1	0.0000	0.0000	0.0000	0.0000
	1995	12	0.0000	3		1995	12	0.0000	0.0000	0.0000	0.0000		1995	12	0.0000	0.0000	0.0000	0.0000
		11	0.0000	3			11	0.0000	0.0000	0.0000	0.0000			11	0.0000	0.0000	0.0000	0.0000
		10	0.0000	3			10	0.0000	0.0000	0.0000	0.0000			10	0.0000	0.0000	0.0000	0.0000
		9	0.0000	3			9	0.0000	0.0000	0.0000	0.0000			9	0.0000	0.0000	0.0000	0.0000
		8	0.0000	3			8	0.0000	0.0000	0.0000	0.0000			8	0.0000	0.0000	0.0000	0.0000
		7	0.0000	3			7	0.0000	0.0000	0.0000	0.0000			7	0.0000	0.0000	0.0000	0.0000
		6	0.0000	3			6	0.0000	0.0000	0.0000	0.0000			6	0.0000	0.0000	0.0000	0.0000
		5	0.0000	3			5	0.0000	0.0000	0.0000	0.0000			5	0.0000	0.0000	0.0000	0.0000
		4	0.0000	3			4	0.0000	0.0000	0.0000	0.0000			4	0.0000	0.0000	0.0000	0.0000
		3	0.0000	3			3	0.0000	0.0000	0.0000	0.0000			3	0.0000	0.0000	0.0000	0.0000
		2	0.0000	3			2	0.0000	0.0000	0.0000	0.0000			2	0.0000	0.0000	0.0000	0.0000
		1	0.0000	3			1	0.0000	0.0000	0.0000	0.0000			1	0.0000	0.0000	0.0000	0.0000
	1994	12	0.0000	3		1994	12	0.0000	0.0000	0.0000	0.0000		1994	12	0.0000	0.0000	0.0000	0.0000
		11	0.0000	3			11	0.0000	0.0000	0.0000	0.0000			11	0.0000	0.0000	0.0000	0.0000
		10	0.0000	3			10	0.0000	0.0000	0.0000	0.0000			10	0.0000	0.0000	0.0000	0.0000
		9	0.0000	3			9	0.0000	0.0000	0.0000	0.0000			9	0.0000	0.0000	0.0000	0.0000
		8	0.0000	3			8	0.0000	0.0000	0.0000	0.0000			8	0.0000	0.0000	0.0000	0.0000
		7	0.0000	3			7	0.0000	0.0000	0.0000	0.0000			7	0.0000	0.0000	0.0000	0.0000
		6	0.0000	3			6	0.0000	0.0000	0.0000	0.0000			6	0.0000	0.0000	0.0000	0.0000
		5	0.0000	3			5	0.0000	0.0000	0.0000	0.0000			5	0.0000	0.0000	0.0000	0.0000
		4	0.0000	3			4	0.0000	0.0000	0.0000	0.0000			4	0.0000	0.0000	0.0000	0.0000
		3	0.0000	3			3	0.0000	0.0000	0.0000	0.0000			3	0.0000	0.0000	0.0000	0.0000
		2	0.0000	3			2	0.0000	0.0000	0.0000	0.0000			2	0.0000	0.0000	0.0000	0.0000
		1	0.0000	3			1	0.0000	0.0000	0.0000	0.0000			1	0.0000	0.0000	0.0000	0.0000
	1993	12	0.0000	3		1993	12	0.0000	0.0000	0.0000	0.0000		1993	12	0.0000	0.0000	0.0000	0.0000
		11	0.0000	3			11	0.0000	0.0000	0.0000	0.0000			11	0.0000	0.0000	0.0000	0.0000
		10	0.0000	3			10	0.0000	0.0000	0.0000	0.0000			10	0.0000	0.0000	0.0000	0.0000
		9	0.0000	3			9	0.0000	0.0000	0.0000	0.0000			9	0.0000	0.0000	0.0000	0.0000
		8	0.0000	3			8	0.0000	0.0000	0.0000	0.0000			8	0.0000	0.0000	0.0000	0.0000
		7	0.0000	3			7	0.0000	0.0000	0.0000	0.0000			7	0.0000	0.0000	0.0000	0.0000
		6	0.0000	3			6	0.0000	0.0000	0.0000	0.0000			6	0.0000	0.0000	0.0000	0.0000
		5	0.0000	3			5	0.0000	0.0000	0.0000	0.0000			5	0.0000	0.0000	0.0000	0.0000
		4	0.0000	3			4	0.0000	0.0000	0.0000	0.0000			4	0.0000	0.0000	0.0000	0.0000
		3	0.0000	3			3	0.0000	0.0000	0.0000	0.0000			3	0.0000	0.0000	0.0000	0.0000
		2	0.0000	3			2	0.0000	0.0000	0.0000	0.0000			2	0.0000	0.0000	0.0000	0.0000
		1	0.0000	3			1	0.0000	0.0000	0.0000	0.0000			1	0.0000	0.0000	0.0000	0.0000
	1992	12	0.0000	3		1992	12	0.0000	0.0000	0.0000	0.0000		1992	12	0.0000	0.0000	0.0000	0.0000
		11	0.0000	3			11	0.0000	0.0000	0.0000	0.0000			11	0.0000	0.0000	0.0000	0.0000
		10	0.0000	3			10	0.0000	0.0000	0.0000	0.0000			10	0.0000	0.0000	0.0000	0.0000
		9	0.0000	3			9	0.0000	0.0000	0.0000	0.0000			9	0.0000	0.0000	0.0000	0.0000
		8	0.0000	3			8	0.0000	0.0000	0.0000	0.0000			8	0.0000	0.0000	0.0000	0.0000
		7	0.0000	3			7	0.0000	0.0000	0.0000	0.0000			7	0.0000	0.0000	0.0000	0.0000
		6	0.0000	3			6	0.0000	0.0000	0.0000	0.0000			6	0.0000	0.0000	0.0000	0.0000
		5	0.0000	3			5	0.0000	0.0000	0.0000	0.0000			5	0.0000	0.0000	0.0000	0.0000
		4	0.0000	3			4	0.0000	0.0000	0.0000	0.0000			4	0.0000	0.0000	0.0000	0.0000
		3	0.0000	3			3	0.0000	0.0000	0.0000	0.0000			3	0.0000	0.0000	0.0000	0.0000
		2	0.0000	3			2	0.0000	0.0000	0.0000	0.0000			2	0.0000	0.0000	0.0000	0.0000
		1	0.0000	3			1	0.0000	0.0000	0.0000	0.0000			1	0.0000	0.0000	0.0000	0.0000
	1991	12	0.0000	3		1991	12	0.0000	0.0000	0.0000	0.0000		1991	12	0.0000	0.0000	0.0000	0.0000
		11	0.0000	3			11	0.0000	0.0000	0.0000	0.0000			11	0.0000	0.0000	0.0000	0.0000
		10	0.0000	3			10	0.0000	0.0000	0.0000	0.0000			10	0.0000	0.0000	0.0000	0.0000
		9	0.0000	3			9	0.0000	0.0000	0.0000	0.0000			9	0.0000	0.0000	0.0000	0.0000
		8	0.0000	3			8	0.0000	0.0000	0.0000	0.0000			8	0.0000	0.0000	0.0000	0.0000
		7	0.0000	3			7	0.0000	0.0000	0.0000	0.0000			7	0.0000	0.0000	0.0000	0.0000
		6	0.0000	3			6	0.0000	0.0000	0.0000	0.0000			6	0.0000	0.0000	0.0000	0.0000
		5	0.0000	3			5	0.0000	0.0000	0.0000	0.0000			5	0.0000	0.0000	0.0000	0.0000

		4	0.0000	3			4	0.0000	0.0000	0.0000	0.0000			4	0.0000	0.0000	0.0000	0.0000
		3	0.0000	3			3	0.0000	0.0000	0.0000	0.0000			3	0.0000	0.0000	0.0000	0.0000
		2	0.0000	3			2	0.0000	0.0000	0.0000	0.0000			2	0.0000	0.0000	0.0000	0.0000
		1	0.0000	3			1	0.0000	0.0000	0.0000	0.0000			1	0.0000	0.0000	0.0000	0.0000
	1990	12	0.0000	3		1990	12	0.0000	0.0000	0.0000	0.0000		1990	12	0.0000	0.0000	0.0000	0.0000
		11	0.0000	3			11	0.0000	0.0000	0.0000	0.0000			11	0.0000	0.0000	0.0000	0.0000
		10	0.0000	3			10	0.0000	0.0000	0.0000	0.0000			10	0.0000	0.0000	0.0000	0.0000
		9	0.0000	3			9	0.0000	0.0000	0.0000	0.0000			9	0.0000	0.0000	0.0000	0.0000
		8	0.0000	3			8	0.0000	0.0000	0.0000	0.0000			8	0.0000	0.0000	0.0000	0.0000
		7	0.0000	3			7	0.0000	0.0000	0.0000	0.0000			7	0.0000	0.0000	0.0000	0.0000
		6	0.0000	3			6	0.0000	0.0000	0.0000	0.0000			6	0.0000	0.0000	0.0000	0.0000
		5	0.0000	3			5	0.0000	0.0000	0.0000	0.0000			5	0.0000	0.0000	0.0000	0.0000
		4	0.0000	3			4	0.0000	0.0000	0.0000	0.0000			4	0.0000	0.0000	0.0000	0.0000
		3	0.0000	3			3	0.0000	0.0000	0.0000	0.0000			3	0.0000	0.0000	0.0000	0.0000
		2	0.0000	3			2	0.0000	0.0000	0.0000	0.0000			2	0.0000	0.0000	0.0000	0.0000
		1	0.0000	3			1	0.0000	0.0000	0.0000	0.0000			1	0.0000	0.0000	0.0000	0.0000
	1989	12	0.0000	3		1989	12	0.0000	0.0000	0.0000	0.0000		1989	12	0.0000	0.0000	0.0000	0.0000
		11	0.0000	3			11	0.0000	0.0000	0.0000	0.0000			11	0.0000	0.0000	0.0000	0.0000
		10	0.0000	3			10	0.0000	0.0000	0.0000	0.0000			10	0.0000	0.0000	0.0000	0.0000
		9	0.0000	3			9	0.0000	0.0000	0.0000	0.0000			9	0.0000	0.0000	0.0000	0.0000
		8	0.0001 (MAX ALSO)	0			8	0.0500	0.0001	0.0002	0.0000			8	0.0100	0.0001	0.0002	0.0000
		7	0.0001 (MAX ALSO)	0			7	0.0200	0.0001	0.0002	0.0000			7	0.0100	0.0001	0.0002	0.0000
		6	0.0001 (MAX ALSO)	0			8	0.0200	0.0001	0.0002	0.0000			6	0.0100	0.0001	0.0002	0.0000
							5	0.0200						5	0.0100		0.0000	0.0000
							4	0.0200						4	0.0100		0.0000	0.0000
							3	0.0500						3	0.0200		0.0000	0.0000
							2	0.0200						2	0.0000		0.0000	0.0000
							1	0.0250						1	0.1250		0.0000	0.0000
							SUM	0.2250						SUM	0.1950			
						1988	12	0.4500					1988	12	0.3800		0.0000	0.0000
							11	1.2000						11	0.3800		0.0000	0.0000
							10	0.6000						10	0.2000		0.0000	0.0000
							9	0.9750						9	0.2000		0.0000	0.0000
							8	0.0000						8	0.0000		0.0000	0.0000
							7	0.0000						7	0.0000		0.0000	0.0000
							6	0.0000						6	0.0000		0.0000	0.0000
							5	0.0000						5	0.0000		0.0000	0.0000
							4	0.1700						4	0.1000		0.0000	0.0000
							3	0.0000						3	0.1300		0.0000	0.0000
							2	0.0300						2	0.0800		0.0000	0.0000
							1	0.0000						1	0.4000		0.0000	0.0000
							SUM	3.4250						SUM	1.8700			
						1987	12	0.0000					1987	12	0.2000		0.0000	0.0000
							11	0.0000						11	0.0800		0.0000	0.0000
							10	0.0300						10	0.2300		0.0000	0.0000
							9	0.0000						9	0.0300		0.0000	0.0000
							8	0.2000						8	0.3000		0.0000	0.0000
							7	0.0000						7	0.2300		0.0000	0.0000
							6	0.0500						6	0.1300		0.0000	0.0000
							5	0.1000						5	0.0000		0.0000	0.0000
							4	0.0800						4	0.0500		0.0000	0.0000
							3	0.0000						3	0.1000		0.0000	0.0000
							2	0.0300						2	0.0500		0.0000	0.0000
							1	0.0000						1	0.0800		0.0000	0.0000
							SUM	0.4900						SUM	1.4800			

1	2	3	4	5	MGD	CFS	MGD	CFS	10	11	12	13	2	3	4	5	6	7	8	9	10	11	12	13	pdes FLOW MGAL	CFS	AVG NPDES LOADING	2	3	4	5	6	7	8	9	#	#	#	13	avg npdes disch	CFS	AVG N.	LOADING
082	FLOW	1997	3	0	0.0000	0.0000	0.0000	0.0000	0	0	0	3	RDX+HMX	1997	3	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000	TNT	1997	3	0	0.0000	1	0.000	0	0	1	0	3				
			2	0	0.0000	0.0000	0.0000	0.0000	0	0	0	3			2	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			2	0	0.0000	1	0.000	0	0	1	0	3				
			1	0	0.0000	0.0000	0.0000	0.0000	0	0	0	3			1	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			1	0	0.0000	1	0.000	0	0	1	0	5				
		1996	12	0	0.0000	0.0000	0.0000	0.0000	0	0	0	3		1996	12	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000		1996	12	0	0.0000	1	0.000	0	0	1	0	5				
			11	0	0.0000	0.0000	0.0000	0.0000	0	0	0	3			11	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			11	0	0.0000	1	0.000	0	0	1	0	5				
			10	0	0.0000	0.0000	0.0587	0.0908	0	0	0	0			10	1	0.0000	2	0.000	1	0	2	0	5	0.0000	0.0000	0.0000			10	0	0.0000	1	0.000	0	0	1	0	3				
			9	0	0.0265	0.0410	0.0720	0.1114	0	0	0	0			9	1	0.0000	2	0.000	1	0	2	0	5	0.0265	0.0410	0.0000			9	0	0.0000	1	0.000	0	0	1	0	3				
			8	0	0.0360	0.0557	0.0540	0.0836	0	0	0	0			8	1	0.0000	2	0.000	1	0	2	0	5	0.0360	0.0557	0.0000			8	0	0.0000	1	0.000	0	0	1	0	3				
			7	0	0.0000	0.0000	0.0000	0.0000	0	0	0	3			7	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			7	0	0.0000	1	0.000	0	0	1	0	3				
			6	0	0.0000	0.0000	0.0000	0.0000	0	0	0	3			6	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			6	0	0.0000	1	0.000	0	0	1	0	3				
			5	0	0.0000	0.0000	0.0000	0.0000	0	0	0	3			5	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			5	0	0.0000	1	0.000	0	0	1	0	3				
			4	0	0.0000	0.0000	0.0000	0.0000	0	0	0	3			4	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			4	0	0.0000	1	0.000	0	0	1	0	3				
			3	0	0.0000	0.0000	0.0000	0.0000	0	0	0	3			3	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			3	0	0.0000	1	0.000	0	0	1	0	3				
			2	0	0.0000	0	0.0000	0	0	0	0	3			2	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			2	0	0.0000	1	0.000	0	0	1	0	3				
			1	0	0.0000	0	0.0000	0	0	0	0	3			1	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			1	0	0.0000	1	0.000	0	0	1	0	3				
		1995	12	0	0.0000	0	0.0000	0	0	0	0	3		1995	12	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000		1995	12	0	0.0000	1	0.000	0	0	1	0	3				
			11	0	0.0000	0	0.0000	0	0	0	0	3			11	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			11	0	0.0000	1	0.000	0	0	1	0	3				
			10	0	0.0000	0	0.0000	0	0	0	0	3			10	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			10	0	0.0000	1	0.000	0	0	1	0	3				
			9	0	0.0000	0	0.0000	0	0	0	0	3			9	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			9	0	0.0000	1	0.000	0	0	1	0	3				
			8	0	0.0000	0	0	0	0	0	0	3			8	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			8	0	0.0000	1	0.000	0	0	1	0	3				
			7	0	0.0000	0	0	0	0	0	0	3			7	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			7	0	0.0000	1	0.000	0	0	1	0	3				
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			6	1	0.0000	1	0.000	0	0	1	0	3				
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			5	1	0.0000	1	0.000	0	0	1	0	3				
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			4	1	0.0000	1	0.000	0	0	1	0	3				
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			3	1	0.0000	1	0.000	0	0	1	0	3				
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			2	1	0.0000	1	0.000	0	0	1	0	3				
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			1	1	0.0000	1	0.000	0	0	1	0	3				
		1994	12	0	0.0000	0	0	0	0	0	0	3		1994	12	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		1994	12	1	0.0000	1	0.000	0	0	1	0	3				
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			11	1	0.0000	1	0.000	0	0	1	0	3				
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			10	1	0.0000	1	0.000	0	0	1	0	3				
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			9	1	0.0000	1	0.000	0	0	1	0	3				
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			8	1	0.0000	1	0.000	0	0	1	0	3				
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			7	1	0.0000	1	0.000	0	0	1	0	3				
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			6	1	0.0000	1	0.000	0	0	1	0	3				
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			5	1	0.0000	1	0.000	0	0	1	0	3				
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			4	1	0.0000	1	0.000	0	0	1	0	3				
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			3	1	0.0000	1	0.000	0	0	1	0	3				
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			2	1	0.0000	1	0.000	0	0	1	0	3				
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			1	1	0.0000	1	0.000	0	0	1	0	3				
		1993	12	0	0.0000	0	0	0	0	0	0	3		1993	12	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		1993	12	1	0.0000	1	0.000	0	0	1	0	3				
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			11	1	0.0000	1	0.000	0	0	1	0	3				
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			10	1	0.0000	1	0.000	0	0	1	0	3				
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			9	1	0.0000	1	0.000	0	0	1	0	3				
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			8	1	0.0000	1	0.000	0	0	1	0	3				
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			7	1	0.0000	1	0.000	0	0	1	0	3				
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			6	1	0.0000	1	0.000	0	0	1	0	3				
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			5	1	0.0000	1	0.000	0	0	1	0	3				
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			4	1	0.0000	1	0.000	0	0	1	0	3				
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			3	1	0.0000	1	0.000	0	0	1	0	3				
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			2	1	0.0000	1	0.000	0	0	1	0	3				
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			1	1	0.0000	1	0.000	0	0	1	0	3				
		1992	12	0	0.0000	0	0	0	0	0	0	3		1992	12	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		1992	12	1	0.0000	1	0.000	0	0	1	0	3				
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			11	1	0.0000	1	0.000	0	0	1	0	3				
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			10	1	0.0000	1	0.000	0	0	1	0	3				
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			9	1	0.0000	1	0.000	0	0	1	0	3				
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			8	1	0.0000	1	0.000	0	0	1	0	3				
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			7	1	0.0000	1	0.000	0	0	1	0	3				
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			6	1	0.0000	1	0.000	0	0	1	0	3				
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			5	1	0.0000	1	0.000	0	0	1	0	3				
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			4	1	0.0000	1	0.000	0	0	1	0	3				
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			3	1	0.0000	1	0.000	0	0	1	0	3				
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			2	1	0.0000	1	0.000	0	0	1	0	3				
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			1	1	0.0000	1	0.000	0	0	1	0	3				
		1991	12	0	0.0000	0	0	0	0	0	0	3		1991	12	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		1991	12	1	0.0000	1	0.000	0	0	1	0	3				
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			11	1	0.0000	1	0.000	0	0	1	0	3				
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			10	1	0.0000	1	0.000	0	0	1	0	3				
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			9	1	0.0000	1	0.000	0	0	1	0	3				
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			8	1	0.0000	1	0.000	0	0	1	0	3				
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			7	1	0.0000	1	0.000	0	0	1	0	3				
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			6	1	0.0000	1	0.000	0	0	1	0	3				
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			5	1	0.0000	1	0.000	0	0	1	0	3				

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	4	0	0.0000	0	0	0	0	0	0	3		4	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		4	1	0.0000	1	0.000	0	0	1	0	3
	3	0	0.0000	0	0	0	0	0	0	3		3	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		3	1	0.0000	1	0.000	0	0	1	0	3
	2	0	0.0000	0	0	0	0	0	0	3		2	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		2	1	0.0000	1	0.000	0	0	1	0	3
	1	0	0.0000	0	0	0	0	0	0	3		1	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		1	1	0.0000	1	0.000	0	0	1	0	3
1990	12	0	0.0000	0	0	0	0	0	0	3	1990	12	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000	1990	12	1	0.0000	1	0.000	0	0	1	0	3
	11	0	0.0000	0	0	0	0	0	0	3		11	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		11	1	0.0000	1	0.000	0	0	1	0	3
	10	0	0.0000	0	0	0	0	0	0	3		10	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		10	1	0.0000	1	0.000	0	0	1	0	3
	9	0	0.0000	0	0	0	0	0	0	3		9	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		9	1	0.0000	1	0.000	0	0	1	0	3
	8	0	0.0000	0	0	0	0	0	0	3		8	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		8	1	0.0000	1	0.000	0	0	1	0	3
	7	0	0.0000	0	0	0	0	0	0	3		7	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		7	1	0.0000	1	0.000	0	0	1	0	3
	6	0	0.0000	0	0	0	0	0	0	3		6	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		6	1	0.0000	1	0.000	0	0	1	0	3
	5	0	0.0000	0	0	0	0	0	0	3		5	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		5	1	0.0000	1	0.000	0	0	1	0	3
	4	0	0.0000	0	0	0	0	0	0	3		4	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		4	1	0.0000	1	0.000	0	0	1	0	3
	3	0	0.0000	0	0	0	0	0	0	3		3	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		3	1	0.0000	1	0.000	0	0	1	0	3
	2	0	0.0000	0	0	0	0	0	0	3		2	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		2	1	0.0000	1	0.000	0	0	1	0	3
	1	0	0.0000	0	0	0	0	0	0	3		1	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		1	1	0.0000	1	0.000	0	0	1	0	3
1989	12	0	0.0000	0	0	0	0	0	0	3	1989	12	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000	1989	12	1	0.0000	1	0.000	0	0	1	0	3
	11	0	0.0000	0	0	0	0	0	0	3		11	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		11	1	0.0000	1	0.000	0	0	1	0	3
	10	0	0.0000	0	0	0	0	0	0	3		10	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		10	1	0.0000	1	0.000	0	0	1	0	3
	9	0	0.0000	0	0	0	0	0	0	3		9	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		9	1	0.0000	1	0.000	0	0	1	0	3
	8	0	0.0000	0	0	0	0	0	0	3		8	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		8	1	0.0000	1	0.000	0	0	1	0	3
	7	0	0.0000	0	0	0	0	0	0	3		7	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		7	1	0.0000	1	0.000	0	0	1	0	3
	6	0	0.0000	0	0	0	0	0	0	3		6	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		6	1	0.0000	1	0.000	0	0	0	0	3
												5	2	0.0000	5	0.000	1	0	2	0	3					5	1	0.0000	1	0.000	0	0	0	0	3
												4	2	0.0000	5	0.000	1	0	2	0	3					4	1	0.0000	1	0.000	0	0	0	0	3
												3	2	0.0000	5	0.000	1	0	2	0	3					3	1	0.0000	1	0.000	0	0	0	0	3
												2	2	0.0000	5	0.000	1	0	2	0	3					2	1	0.0000	1	0.000	0	0	0	0	3
												1	2	0.0000	5	0.000	1	0	2	0	3					1	1	0.0000	1	0.000	0	0	0	0	3
											1988	12	2	0.0000	5	0.000	1	0	2	0	3				1988	12	1	0.0000	1	0.000	0	0	0	0	3
												11	2	0.0000	5	0.000	1	0	2	0	3					11	1	0.0000	1	0.000	0	0	0	0	3
												10	2	0.0000	5	0.000	1	0	2	0	3					10	1	0.0000	1	0.000	0	0	0	0	3
												9	2	0.0000	5	0.000	1	0	2	0	3					9	1	0.0000	1	0.000	0	0	0	0	3
												8	2	0.0000	5	0.000	1	0	2	0	3					8	1	0.0000	1	0.000	0	0	0	0	3
												7	2	0.0000	5	0.000	1	0	2	0	3					7	1	0.0000	1	0.000	0	0	0	0	3
												6	2	0.0000	5	0.000	1	0	2	0	3					6	1	0.0000	1	0.000	0	0	0	0	3
												5	2	0.0000	5	0.000	1	0	2	0	3					5	1	0.0000	1	0.000	0	0	0	0	3
												4	2	0.0000	5	0.000	1	0	2	0	3					4	1	0.0000	1	0.000	0	0	0	0	3
												3	2	0.0000	5	0.000	1	0	2	0	3					3	1	0.0000	1	0.000	0	0	0	0	3
												2	2	0.0000	5	0.000	1	0	2	0	3					2	1	0.0000	1	0.000	0	0	0	0	3
												1	2	0.0000	5	0.000	1	0	2	0	3					1	1	0.0000	1	0.000	0	0	0	0	3
											1987	12	2	0.0000	5	0.000	1	0	2	0	3				1987	12	1	0.0000	1	0.000	0	0	0	0	3
												11	2	0.0000	5	0.000	1	0	2	0	3					11	1	0.0000	1	0.000	0	0	0	0	3
												10	2	0.0000	5	0.000	1	0	2	0	3					10	1	0.0000	1	0.000	0	0	0	0	3
												9	2	0.0000	5	0.000	1	0	2	0	3					9	1	0.0000	1	0.000	0	0	0	0	3
												8	2	0.0000	5	0.000	1	0	2	0	3					8	1	0.0000	1	0.000	0	0	0	0	3
												7	2	0.0000	5	0.000	1	0	2	0	3					7	1	0.0000	1	0.000	0	0	0	0	0
												6	2	0.0000	5	0.000	1	0	2	0	3					6	1	0.0000	1	0.000	0	0	0	0	3
												5	2	0.0000	5	0.000	1	0	2	0	3					5	1	0.0000	1	0.000	0	0	0	0	3
												3	2	0.0000	5	0.000	1	0	2	0	0					3	1	0.0000	1	0.000	0	0	0	0	
												2	2	0.0000	5	0.000	1	0	2	0	3					2	1	0.0000	1	0.000	0	0	0	0	
												1	2	0.0000	5	0.000	1	0	2	0	3					1	1	0.0000							

OUTFALL	PARAMETER	YEAR	MONTH	AVE DISCHARGE (MGD)	DISCHARGE (MGAL)	PARAMETER	YEAR	MONTH	AVE CO[illegible]/l)	AVG NPDES FLOW (MGD)	CFS	AVG NPDES LOADING (LBS/DAY)	PARAMETER	YEAR	MONTH	AVE [illegible] mg/l)
009	FLOW	1997	4	0.262						0.2620	0.4054					
			3	0.379						0.3790	0.5864					
			2	0.355						0.3550	0.5493					
			1	0.381						0.3810	0.5895					
		1996	12	0.314						0.3140	0.4858					
			11	0.331						0.3310	0.5121					
			10	0.351						0.3510	0.5431					
			9	0.286						0.2860	0.4425					
			8	0.000						0.0000	0.0000					
			7	0.311	2.486					0.3110	0.4812					
			6	0.344	5.161					0.3440	0.5323					
			5	0.371	6.905					0.3710	0.5740					
			4	0.370	4.804					0.3700	0.5725					
			3	0.362	3.979					0.3620	0.5601					
			2	0.363	5.802					0.3630	0.5616					
			1	0.368	8.258					0.3680	0.5694					
		1995	12	0.365						0.3650	0.5647					
			11	0.3695						0.3695	0.5717					
			10	0.2720						0.2720	0.4209					
			9	0.0000						0.0000	0.0000					
			8	0.3386						0.3386	0.5239					
			7	0.3080						0.3080	0.4766					
			6	0.3760		FE	1995	6	0.1100	0.3760	0.5818	0.3451	PO4	1995	6	0.150
			5	0.3760				5	0.2400	0.3760	0.5818	0.7530			5	0.040
			4	0.3721				4	0.5200	0.3721	0.5757	1.6146			4	0.030
			3	0.3679				3	0.4800	0.3679	0.5692	1.4736			3	0.070
			2	0.2769				2	1.5000	0.2769	0.4284	3.4659			2	0.050
			1	0.3476				1	1.2600	0.3476	0.5378	3.6547			1	0.120
		1994	12	0.3605			1994	12	0.6800	0.3605	0.5578	2.0456		1994	12	0.070
			11	0.3495				11	0.7800	0.3495	0.5408	2.2748			11	0.050
			10	0.0000				10	0.0000	0.0000	0.0000	0.0000			10	0.000
			9					9	0.0000						9	0.000
			8					8	0.1600						8	0.060
			7					7	0.0000						7	0.000
			6					6	0.0000						6	0.000
			5					5	0.8900						5	0.290
			4					4	0.3500						4	0.900
			3					3	0.6500						3	0.720
			2					2	0.0800						2	0.450
			1					1	0.2100						1	0.330
		1993	12	0.2620			1993	12	0.2800	0.2620	0.4054	0.6122		1993	12	0.740
			11	0.3023				11	0.1600	0.3023	0.4677	0.4036			11	0.060
			10	0.3162				10	0.0700	0.3162	0.4892	0.1847			10	0.030
			9	0.3467				9	0.2200	0.3467	0.5364	0.6365			9	0.040
			8	0.3300				8	0.1400	0.3300	0.5106	0.3855			8	0.040
			7	0.3020				7	0.3100	0.3020	0.4673	0.7812			7	0.040
			6	1.5970				6	0.4000	1.5970	2.4709	5.3305			6	0.070
			5	0.3150				5	0.3300	0.3150	0.4874	0.8674			5	0.150
			4	0.3400				4	0.7500	0.3400	0.5261	2.1279			4	0.100
			3	0.3680				3	1.0900	0.3680	0.5694	3.3472			3	1.400
			2	0.2920				2	0.3100	0.2920	0.4518	0.7554			2	0.290
			1					1	0.9800						1	0.070
							1992	12	0.2600					1992	12	0.150
								11	0.6800						11	0.170
								10	0.1600						10	0.120
								9	0.0000						9	0.000
								8	0.1600						8	0.070
								7	0.1200						7	0.040
								6	0.7000						6	0.090
								5	0.3800						5	0.270
								4	0.4100						4	0.070

1269

								3	0.3400							3	0.270
								2	0.2800							2	0.060
								1	0.6900							1	0.150
							1991	12	0.6300						1991	12	0.050
								11	0.4000							11	0.050
								10	0.3900							10	0.100
								9	0.0000							9	0.000
								8	0.0000							8	0.000
								7	0.0000							7	0.000
								6	0.2800							6	0.040
								5	0.5000							5	0.150
								4	0.2500							4	0.240
								3	0.1600							3	0.050
								2	0.5100							2	0.200
								1	0.3700							1	0.920
							1990	12	0.6000						1990	12	0.060
								11	1.2100							11	0.090
								10	0.3100							10	0.090
								9	0.0500							9	0.020
								8	0.3500							8	0.080
								7	0.3200							7	0.070
								6	0.4500							6	0.490
								5	0.0800							5	0.400
								4	0.1200							4	0.160
								3	0.3800							3	0.200
								2	0.8400							2	0.030
								1	0.2000							1	0.100
							1989	12	0.3000						1989	12	0.200
								11	0.0100							11	0.045
								10	0.0100							10	0.400
								9	0.0100							9	0.300
								8	0.0100							8	0.200
								7	0.0100							7	0.300
								6	0.0100							6	0.050
								5	0.0000							5	0.000
								4	0.0100							4	0.060
								3	0.1900							3	0.060
								2	0.1900							2	0.060
								1	0.0100							1	0.055
							1988	12	0.0000						1988	12	0.000
								11	0.0000							11	0.000
								10	0.0000							10	0.000
								9	0.0000							9	0.000
								8	0.0000							8	0.000
								7	0.0000							7	0.000
								6	0.0000							6	0.000
								5	0.0000							5	0.000
								4	0.2500							4	0.400
								3	0.3000							3	0.250
								2	0.2500							2	0.100
								1	0.8000							1	0.100
							1987	12	0.1500						1987	12	0.800
								11	0.0000							11	0.000
								10	0.0000							10	0.000
								9	0.0000							9	0.000
								8	0.0000							8	0.000
								7	0.0000							7	0.000
								6	0.0000							6	0.000
								5	0.0000							5	0.000
								4	0.1000							4	0.200
								3	0.1000							3	0.200
								2	0.1000							2	0.500

S'

									1		0.0000						1		0.000

AVG NPDES FLOW MGAL/DAY	CFS	AVG NPDES LOADING (LBS/DAY)
0.3760	0.5818	0.4706
0.3721	0.5757	0.1242
0.3679	0.5692	0.0921
0.2769	0.4284	0.1617
0.3476	0.5378	0.1450
0.3605	0.5578	0.3610
0.3495	0.5408	0.2041
0.0000	0.0000	0.0000
0.2620	0.4054	1.6178
0.3023	0.4677	0.1514
0.3162	0.4892	0.0792
0.3467	0.5364	0.1157
0.3300	0.5106	0.1101
0.3020	0.4673	0.1008
1.5970	2.4709	0.9328
0.3150	0.4874	0.3943
0.3400	0.5261	0.2837
0.3680	0.5694	4.2991
0.2920	0.4518	0.7066

1	2	3	4	5	6	7	8	9	10	11	12	13	2	3	4	5	6	7	8	9	10	11	12	13	pdes FLOW MGAL	CFS	AVG STREAM	AVG NPDES LOADING	2	3	4	5	6	7	8	9	#	#	#	13	avg npdes disch	CFS	A	REAM
041	FLOW	1995	6	0	0.0000	0	0	0	0	0	0	3	RDX	1995	6	2	0.0000	5	0.000	0	0	0	0	3																				
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	0	0	0	0	3																				
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	0	0	0	0	3																				
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	0	0	0	0	3																				
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	0	0	0	0	3																				
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	0	0	0	0	3																				
		1994	12	0	0.0000	0	0	0	0	0	0	3		1994	12	2	0.0000	5	0.000	0	0	0	0	3																				
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	0	0	0	0	3																				
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	0	0	0	0	3																				
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	0	0	0	0	3																				
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	0	0	0	0	3																				
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	0	0	0	0	3																				
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	0	0	0	0	3																				
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	0	0	0	0	3																				
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	0	0	0	0	3																				
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	0	0	0	0	3																				
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	0	0	0	0	3																				
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	0	0	0	0	3																				
		1993	12	0	0.0000	0	0	0	0	0	0	3		1993	12	2	0.0000	5	0.000	0	0	0	0	3																				
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	0	0	0	0	3																				
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	0	0	0	0	3																				
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	0	0	0	0	3																				
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	0	0	0	0	3																				
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	0	0	0	0	3																				
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	0	0	0	0	3																				
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	0	0	0	0	3																				
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	0	0	0	0	3																				
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	0	0	0	0	3																				
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	0	0	0	0	3																				
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	0	0	0	0	3																				
		1992	12	0	0.0000	0	0	0	0	0	0	3		1992	12	2	0.0000	5	0.000	0	0	0	0	3																				
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	0	0	0	0	3																				
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	0	0	0	0	3																				
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	0	0	0	0	3																				
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	0	0	0	0	3																				
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	0	0	0	0	3																				
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	0	0	0	0	3																				
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	0	0	0	0	3																				
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	0	0	0	0	3																				
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	0	0	0	0	3																				
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	0	0	0	0	3																				
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	0	0	0	0	3																				
		1991	12	0	0.0000	0	0	0	0	0	0	3		1991	12	2	0.0000	5	0.000	0	0	0	0	3																				
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	0	0	0	0	3																				
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	0	0	0	0	3																				
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	0	0	0	0	3																				
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	0	0	0	0	3																				
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	0	0	0	0	3																				
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	0	0	0	0	3																				
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	0	0	0	0	3																				
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	0	0	0	0	3																				
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	0	0	0	0	3																				
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	0	0	0	0	3																				
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	0	0	0	0	3																				
		1990	12	0	0.0000	0	0	0	0	0	0	3		1990	12	2	0.0000	5	0.000	0	0	0	0	3																				
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	0	0	0	0	3																				
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	0	0	0	0	3																				
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	0	0	0	0	3																				
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	0	0	0	0	3																				
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	0	0	0	0	3																				
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	0	0	0	0	3																				
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	0	0	0	0	3																				
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	0	0	0	0	3																				
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	0	0	0	0	3																				
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	0	0	0	0	3																				
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	0	0	0	0	3																				
		1989	12	0	0.0000	0	0	0	0	0	0	3		1989	12	2	0.0000	5	0.000	0	0	0	0	3																				
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	0	0	0	0	3																				
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	0	0	0	0	3																				
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	0	0	0	0	3																				
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	0	0	0	0	3																				

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			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	0	0	0	0	3
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	0	0	0	0	3
															5	2	0.0000	5	0.000	0	0	0	0	3
															4	2	0.0000	5	0.000	0	0	0	0	3
															3	2	0.0000	5	0.000	0	0	0	0	3
															2	2	0.0000	5	0.000	0	0	0	0	3
															1	2	0.0000	5	0.000	0	0	0	0	3
														1988	12	2	0.0000	5	0.000	0	0	0	0	3
															11	2	0.0000	5	0.000	0	0	0	0	3
															10	2	0.0000	5	0.000	0	0	0	0	3
															9	2	0.0000	5	0.000	0	0	0	0	3
															8	2	0.0000	5	0.000	0	0	0	0	3
															7	2	0.0000	5	0.000	0	0	0	0	3
															6	2	0.0000	5	0.000	0	0	0	0	3
															5	2	0.0000	5	0.000	0	0	0	0	3
															4	2	0.0000	5	0.000	0	0	0	0	3
															3	2	0.0000	5	0.000	0	0	0	0	3
															2	2	0.0000	5	0.000	0	0	0	0	3
															1	2	0.0000	5	0.000	0	0	0	0	3
														1987	12	2	0.0000	5	0.000	0	0	0	0	3
															11	2	0.0000	5	0.000	0	0	0	0	3
															10	2	0.0000	5	0.000	0	0	0	0	3
															9	2	0.0000	5	0.000	0	0	0	0	3
															8	2	0.0000	5	0.000	0	0	0	0	3
															7	2	0.0000	5	0.000	0	0	0	0	3
															6	2	0.0000	5	0.000	0	0	0	0	3
															5	2	0.0000	5	0.000	0	0	0	0	3
															3	2	0.0000	5	0.000	0	0	0	0	1
															2	2	0.0000	5	0.000	0	0	0	0	3
															1	2	0.0000	5	0.000	0	0	0	0	3

1	2	3	4	5	6	7	8	9	10	11	12	13	2	3	4	5	6	7	8	9	10	11	12	13	pdes FLOW MG.	CFS	AVG STREAM	AVG NPDES LOADING	2	3	4	5	6	7	8	9	#	#	#	13	avg npdes disch	CFS	TREAM
042	FLOW	1995	6	0	0.0000	0	0	0	0	0	0	3	RDX	1995	6	2	0.0000	5	0.000	0	0	0	0	3																			
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	0	0	0	0	3																			
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	0	0	0	0	3																			
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	0	0	0	0	3																			
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	0	0	0	0	3																			
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	0	0	0	0	3																			
		1994	12	0	0.0000	0	0	0	0	0	0	3		1994	12	2	0.0000	5	0.000	0	0	0	0	3																			
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	0	0	0	0	3																			
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	0	0	0	0	3																			
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	0	0	0	0	3																			
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	0	0	0	0	3																			
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	0	0	0	0	3																			
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	0	0	0	0	3																			
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	0	0	0	0	3																			
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	0	0	0	0	3																			
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	0	0	0	0	3																			
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	0	0	0	0	3																			
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	0	0	0	0	3																			
		1993	12	0	0.0000	0	0	0	0	0	0	3		1993	12	2	0.0000	5	0.000	0	0	0	0	3																			
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	0	0	0	0	3																			
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	0	0	0	0	3																			
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	0	0	0	0	3																			
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	0	0	0	0	3																			
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	0	0	0	0	3																			
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	0	0	0	0	3																			
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	0	0	0	0	3																			
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	0	0	0	0	3																			
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	0	0	0	0	3																			
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	0	0	0	0	3																			
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	0	0	0	0	3																			
		1992	12	0	0.0000	0	0	0	0	0	0	3		1992	12	2	0.0000	5	0.000	0	0	0	0	3																			
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	0	0	0	0	3																			
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	0	0	0	0	3																			
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	0	0	0	0	3																			
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	0	0	0	0	3																			
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	0	0	0	0	3																			
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	0	0	0	0	3																			
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	0	0	0	0	3																			
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	0	0	0	0	3																			
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	0	0	0	0	3																			
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	0	0	0	0	3																			
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	0	0	0	0	3																			
		1991	12	0	0.0000	0	0	0	0	0	0	3		1991	12	2	0.0000	5	0.000	0	0	0	0	3																			
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	0	0	0	0	3																			
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	0	0	0	0	3																			
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	0	0	0	0	3																			
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	0	0	0	0	3																			
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	0	0	0	0	3																			
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	0	0	0	0	3																			
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	0	0	0	0	3																			
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	0	0	0	0	3																			
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	0	0	0	0	3																			
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	0	0	0	0	3																			
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	0	0	0	0	3																			
		1990	12	0	0.0000	0	0	0	0	0	0	3		1990	12	2	0.0000	5	0.000	0	0	0	0	3																			
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	0	0	0	0	3																			
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	0	0	0	0	3																			
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	0	0	0	0	3																			
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	0	0	0	0	3																			
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	0	0	0	0	3																			
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	0	0	0	0	3																			
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	0	0	0	0	3																			
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	0	0	0	0	3																			
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	0	0	0	0	3																			
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	0	0	0	0	3																			
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	0	0	0	0	3																			
		1989	12	0	0.0000	0	0	0	0	0	0	3		1989	12	2	0.0000	5	0.000	0	0	0	0	3																			
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	0	0	0	0	3																			
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	0	0	0	0	3																			
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	0	0	0	0	3																			
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	0	0	0	0	3																			

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			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	0	0	0	0	3									
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	0	0	0	0	3									
															5	2	0.0000	5	0.000	0	0	0	0	3									
															4	2	0.0000	5	0.000	0	0	0	0	3									
															3	2	0.0000	5	0.000	0	0	0	0	3									
															2	2	0.0000	5	0.000	0	0	0	0	3									
															1	2	0.0000	5	0.000	0	0	0	0	3									
														1988	12	2	0.0000	5	0.000	0	0	0	0	3									
															11	2	0.0000	5	0.000	0	0	0	0	3									
															10	2	0.0000	5	0.000	0	0	0	0	3									
															9	2	0.0000	5	0.000	0	0	0	0	3									
															8	2	0.0000	5	0.000	0	0	0	0	3									
															7	2	0.0000	5	0.000	0	0	0	0	3									
															6	2	0.0000	5	0.000	0	0	0	0	3									
															5	2	0.0000	5	0.000	0	0	0	0	3									
															4	2	0.0000	5	0.000	0	0	0	0	3									
															3	2	0.0000	5	0.000	0	0	0	0	3									
															2	2	0.0000	5	0.000	0	0	0	0	3									
															1	2	0.0000	5	0.000	0	0	0	0	3									
														1987	12	2	0.0000	5	0.000	0	0	0	0	3									
															11	2	0.0000	5	0.000	0	0	0	0	3									
															10	2	0.0000	5	0.000	0	0	0	0	3									
															9	2	0.0000	5	0.000	0	0	0	0	3									
															8	2	0.0000	5	0.000	0	0	0	0	3									
															7	2	0.0000	5	0.000	0	0	0	0	3									
															6	2	0.0000	5	0.000	0	0	0	0	3									
															5	2	0.0000	5	0.000	0	0	0	0	3									
															3	2	0.0000	5	0.000	0	0	0	0	1								3	
															2	2	0.0000	5	0.000	0	0	0	0	3								3	
															1	2	0.0000	5	0.000	0	0	0	0	3		1	0.000	0	0	1	0	3	

1	2	3	4	5	6	7	8	9	10	11	12	13	2	3	4	5	6	7	8	9	10	11	12	13	pdes FLOW MGM	CFS	AVG STREAM	AVG NPDES LOADING	2	3	4	5	6	7	8	9	#	#	#	13	avg npdes disch	CFS	STREAM
051	FLOW	1997	3	0	0.0000	0	0	0	0	0	0	3	RDX+HMX	1997	3	1	0.0000	2	0.000	1	0	2	0	3					TNT	1997	3	0	0	1	0.000	0	0	1	0	3			
			2	0	0.0000	0	0	0	0	0	0	3			2	1	0.0000	2	0.000	1	0	2	0	3							2	0	0	1	0.000	0	0	1	0	3			
			1	0	0.0000	0	0	0	0	0	0	3			1	1	0.0000	2	0.000	1	0	2	0	3							1	0	0	1	0.000	0	0	1	0	3			
		1996	12	0	0.0000	0	0	0	0	0	0	3		1996	12	1	0.0000	2	0.000	1	0	2	0	3						1996	12	0	0	1	0.000	0	0	1	0	3			
			11	0	0.0000	0	0	0	0	0	0	3			11	1	0.0000	2	0.000	1	0	2	0	3							11	0	0	1	0.000	0	0	1	0	3			
			10	0	0.0000	0	0	0	0	0	0	3			10	1	0.0000	2	0.000	1	0	2	0	3							10	0	0	1	0.000	0	0	1	0	3			
			9	0	0.0000	0	0	0	0	0	0	3			9	1	0.0000	2	0.000	1	0	2	0	3							9	0	0	1	0.000	0	0	1	0	3			
			8	0	0.0000	0	0	0	0	0	0	3			8	1	0.0000	2	0.000	1	0	2	0	3							8	0	0	1	0.000	0	0	1	0	3			
			7	0	0.0000	0	0	0	0	0	0	3			7	1	0.0000	2	0.000	1	0	2	0	3							7	0	0	1	0.000	0	0	1	0	3			
			6	0	0.0000	0	0	0	0	0	0	3			6	1	0.0000	2	0.000	1	0	2	0	3							6	0	0	1	0.000	0	0	1	0	3			
			5	0	0.0000	0	0	0	0	0	0	3			5	1	0.0000	2	0.000	1	0	2	0	3							5	0	0	1	0.000	0	0	1	0	3			
			4	0	0.0000	0	0	0	0	0	0	3			4	1	0.0000	2	0.000	1	0	2	0	3							4	0	0	1	0.000	0	0	1	0	3			
			3	0	0.0000	0	0	0	0	0	0	3			3	1	0.0000	2	0.000	1	0	2	0	3							3	0	0	1	0.000	0	0	1	0	3			
			2	0	0.0000	0	0	0	0	0	0	3			2	1	0.0000	2	0.000	1	0	2	0	3							2	0	0	1	0.000	0	0	1	0	3			
			1	0	0.0000	0	0	0	0	0	0	3			1	1	0.0000	2	0.000	1	0	2	0	3							1	0	0	1	0.000	0	0	1	0	3			
		1995	12	0	0.0000	0	0	0	0	0	0	3		1995	12	1	0.0000	2	0.000	1	0	2	0	3						1995	12	0	0	1	0.000	0	0	1	0	3			
			11	0	0.0000	0	0	0	0	0	0	3			11	1	0.0000	2	0.000	1	0	2	0	3							11	0	0	1	0.000	0	0	1	0	3			
			10	0	0.0000	0	0	0	0	0	0	3			10	1	0.0000	2	0.000	1	0	2	0	3							10	0	0	1	0.000	0	0	1	0	3			
			9	0	0.0000	0	0	0	0	0	0	3			9	1	0.0000	2	0.000	1	0	2	0	3							9	0	0	1	0.000	0	0	1	0	3			
			8	0	0.0000	0	0	0	0	0	0	3			8	1	0.0000	2	0.000	1	0	2	0	3							8	0	0	1	0.000	0	0	1	0	3			
			7	0	0.0000	0	0	0	0	0	0	3			7	1	0.0000	2	0.000	1	0	2	0	3							7	0	0	1	0.000	0	0	1	0	3			
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	2	0	4	0	3							6	1	0	1	0.000	0	0	1	0	3			
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	2	0	4	0	3							5	1	0	1	0.000	0	0	1	0	3			
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	2	0	4	0	3							4	1	0	1	0.000	0	0	1	0	3			
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	2	0	4	0	3							3	1	0	1	0.000	0	0	1	0	3			
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	2	0	4	0	3							2	1	0	1	0.000	0	0	1	0	3			
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	2	0	4	0	3							1	1	0	1	0.000	0	0	1	0	3			
		1994	12	0	0.0000	0	0	0	0	0	0	3		1994	12	2	0.0000	5	0.000	2	0	4	0	3						1994	12	1	0	1	0.000	0	0	1	0	3			
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	2	0	4	0	3							11	1	0	1	0.000	0	0	1	0	3			
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	2	0	4	0	3							10	1	0	1	0.000	0	0	1	0	3			
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	2	0	4	0	3							9	1	0	1	0.000	0	0	1	0	3			
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	2	0	4	0	3							8	1	0	1	0.000	0	0	1	0	3			
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	2	0	4	0	3							7	1	0	1	0.000	0	0	1	0	3			
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	2	0	4	0	3							6	1	0	1	0.000	0	0	1	0	3			
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	2	0	4	0	3							5	1	0	1	0.000	0	0	1	0	3			
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	2	0	4	0	3							4	1	0	1	0.000	0	0	1	0	3			
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	2	0	4	0	3							3	1	0	1	0.000	0	0	1	0	3			
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	2	0	4	0	3							2	1	0	1	0.000	0	0	1	0	3			
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	2	0	4	0	3							1	1	0	1	0.000	0	0	1	0	3			
		1993	12	0	0.0000	0	0	0	0	0	0	3		1993	12	2	0.0000	5	0.000	2	0	4	0	3						1993	12	1	0	1	0.000	0	0	1	0	3			
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	2	0	4	0	3							11	1	0	1	0.000	0	0	1	0	3			
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	2	0	4	0	3							10	1	0	1	0.000	0	0	1	0	3			
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	2	0	4	0	3							9	1	0	1	0.000	0	0	1	0	3			
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	2	0	4	0	3							8	1	0	1	0.000	0	0	1	0	3			
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	2	0	4	0	3							7	1	0	1	0.000	0	0	1	0	3			
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	2	0	4	0	3							6	1	0	1	0.000	0	0	1	0	3			
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	2	0	4	0	3							5	1	0	1	0.000	0	0	1	0	3			
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	2	0	4	0	3							4	1	0	1	0.000	0	0	1	0	3			
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	2	0	4	0	3							3	1	0	1	0.000	0	0	1	0	3			
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	2	0	4	0	3							2	1	0	1	0.000	0	0	1	0	3			
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	2	0	4	0	3							1	1	0	1	0.000	0	0	1	0	3			
		1992	12	0	0.0000	0	0	0	0	0	0	3		1992	12	2	0.0000	5	0.000	2	0	4	0	3						1992	12	1	0	1	0.000	0	0	1	0	3			
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	2	0	4	0	3							11	1	0	1	0.000	0	0	1	0	3			
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	2	0	4	0	3							10	1	0	1	0.000	0	0	1	0	3			
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	2	0	4	0	3							9	1	0	1	0.000	0	0	1	0	3			
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	2	0	4	0	3							8	1	0	1	0.000	0	0	1	0	3			
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	2	0	4	0	3							7	1	0	1	0.000	0	0	1	0	3			
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	2	0	4	0	3							6	1	0	1	0.000	0	0	1	0	3			
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	2	0	4	0	3							5	1	0	1	0.000	0	0	1	0	3			
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	2	0	4	0	3							4	1	0	1	0.000	0	0	1	0	3			
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	2	0	4	0	3							3	1	0	1	0.000	0	0	1	0	3			
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	2	0	4	0	3							2	1	0	1	0.000	0	0	1	0	3			
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	2	0	4	0	3							1	1	0	1	0.000	0	0	1	0	3			
		1991	12	0	0.0000	0	0	0	0	0	0	3		1991	12	2	0.0000	5	0.000	2	0	4	0	3						1991	12	1	0	1	0.000	0	0	1	0	3			
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	2	0	4	0	3							11	1	0	1	0.000	0	0	1	0	3			
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	2	0	4	0	3							10	1	0	1	0.000	0	0	1	0	3			
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	2	0	4	0	3							9	1	0	1	0.000	0	0	1	0	3			
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	2	0	4	0	3							8	1	0	1	0.000	0	0	1	0	3			
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	2	0	4	0	3							7	1	0	1	0.000	0	0	1	0	3			
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	2	0	4	0	3							6	1	0	1	0.000	0	0	1	0	3			
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	2	0	4	0	3							5	1	0	1	0.000	0	0	1	0	3			

1 of 7

	4	0	0.0000	0	0	0	0	0	0	3		4	2	0.0000	5	0.000	2	0	4	0	3		4	1	0	1	0.000	0	0	1	0	3
	3	0	0.0000	0	0	0	0	0	0	3		3	2	0.0000	5	0.000	2	0	4	0	3		3	1	0	1	0.000	0	0	1	0	3
	2	0	0.0000	0	0	0	0	0	0	3		2	2	0.0000	5	0.000	2	0	4	0	3		2	1	0	1	0.000	0	0	1	0	3
	1	0	0.0000	0	0	0	0	0	0	3		1	2	0.0000	5	0.000	2	0	4	0	3		1	1	0	1	0.000	0	0	1	0	3
1990	12	0	0.0000	0	0	0	0	0	0	3	1990	12	2	0.0000	5	0.000	2	0	4	0	3	1990	12	1	0	1	0.000	0	0	1	0	3
	11	0	0.0000	0	0	0	0	0	0	3		11	2	0.0000	5	0.000	2	0	4	0	3		11	1	0	1	0.000	0	0	1	0	3
	10	0	0.0000	0	0	0	0	0	0	3		10	2	0.0000	5	0.000	2	0	4	0	3		10	1	0	1	0.000	0	0	1	0	3
	9	0	0.0000	0	0	0	0	0	0	3		9	2	0.0000	5	0.000	2	0	4	0	3		9	1	0	1	0.000	0	0	1	0	3
	8	0	0.0000	0	0	0	0	0	0	3		8	2	0.0000	5	0.000	2	0	4	0	3		8	1	0	1	0.000	0	0	1	0	3
	7	0	0.0000	0	0	0	0	0	0	3		7	2	0.0000	5	0.000	2	0	4	0	3		7	1	0	1	0.000	0	0	1	0	3
	6	0	0.0000	0	0	0	0	0	0	3		6	2	0.0000	5	0.000	2	0	4	0	3		6	1	0	1	0.000	0	0	1	0	3
	5	0	0.0000	0	0	0	0	0	0	3		5	2	0.0000	5	0.000	2	0	4	0	3		5	1	0	1	0.000	0	0	1	0	3
	4	0	0.0000	0	0	0	0	0	0	3		4	2	0.0000	5	0.000	2	0	4	0	3		4	1	0	1	0.000	0	0	1	0	3
	3	0	0.0000	0	0	0	0	0	0	3		3	2	0.0000	5	0.000	2	0	4	0	3		3	1	0	1	0.000	0	0	1	0	3
	2	0	0.0000	0	0	0	0	0	0	3		2	2	0.0000	5	0.000	2	0	4	0	3		2	1	0	1	0.000	0	0	1	0	3
	1	0	0.0000	0	0	0	0	0	0	3		1	2	0.0000	5	0.000	2	0	4	0	3		1	1	0	1	0.000	0	0	1	0	3
1989	12	0	0.0000	0	0	0	0	0	0	3	1989	12	2	0.0000	5	0.000	2	0	4	0	3	1989	12	1	0	1	0.000	0	0	1	0	3
	11	0	0.0000	0	0	0	0	0	0	3		11	2	0.0000	5	0.000	2	0	4	0	3		11	1	0	1	0.000	0	0	1	0	3
	10	0	0.0000	0	0	0	0	0	0	3		10	2	0.0000	5	0.000	2	0	4	0	3		10	1	0	1	0.000	0	0	1	0	3
	9	0	0.0000	0	0	0	0	0	0	3		9	2	0.0000	5	0.000	2	0	4	0	3		9	1	0	1	0.000	0	0	1	0	3
	8	0	0.0000	0	0	0	0	0	0	3		8	2	0.0000	5	0.000	2	0	4	0	3		8	1	0	1	0.000	0	0	1	0	3
	7	0	0.0000	0	0	0	0	0	0	3		7	2	0.0000	5	0.000	2	0	4	0	3		7	1	0	1	0.000	0	0	1	0	3
	6	0	0.0000	0	0	0	0	0	0	3		6	2	0.0000	5	0.000	2	0	4	0	3		6	1	0	1	0.000	0	0	0	0	3
												5	2	0.0000	5	0.000	0	0	1	0	3		5	1	0	1	0.000	0	0	0	0	3
												4	2	0.0000	5	0.000	0	0	1	0	3		4	1	0	1	0.000	0	0	0	0	3
												3	2	0.0000	5	0.000	0	0	1	0	3		3	1	0	1	0.000	0	0	0	0	3
												2	2	0.0000	5	0.000	0	0	1	0	3		2	1	0	1	0.000	0	0	0	0	3
												1	2	0.0000	5	0.000	0	0	1	0	3		1	1	0	1	0.000	0	0	0	0	3
											1988	12	2	0.0000	5	0.000	0	0	1	0	3	1988	12	1	0	1	0.000	0	0	0	0	3
												11	2	0.0000	5	0.000	0	0	1	0	3		11	1	0	1	0.000	0	0	0	0	3
												10	2	0.0000	5	0.000	0	0	1	0	3		10	1	0	1	0.000	0	0	0	0	3
												9	2	0.0000	5	0.000	0	0	1	0	3		9	1	0	1	0.000	0	0	0	0	3
												8	2	0.0000	5	0.000	0	0	1	0	3		8	1	0	1	0.000	0	0	0	0	3
												7	2	0.0000	5	0.000	0	0	1	0	3		7	1	0	1	0.000	0	0	0	0	3
												6	2	0.0000	5	0.000	0	0	1	0	3		6	1	0	1	0.000	0	0	0	0	3
												5	2	0.0000	5	0.000	0	0	1	0	3		5	1	0	1	0.000	0	0	0	0	3
												4	2	0.0000	5	0.000	0	0	1	0	3		4	1	0	1	0.000	0	0	0	0	3
												3	2	0.0000	5	0.000	0	0	1	0	3		3	1	0	1	0.000	0	0	0	0	0
												2	2	0.0000	5	0.000	0	0	1	0	3		2	1	0	1	0.000	0	0	0	0	0
												1	2	0.0000	5	0.000	0	0	1	0	3		1	1	0	1	0.000	0	0	0	0	0
											1987	12	2	0.0000	5	0.000	0	0	1	0	0	1987	12	1	0	1	0.000	0	0	0	0	3
												11	2	0.0000	5	0.000	0	0	1	0	0		11	1	0	1	0.000	0	0	0	0	3
												10	2	0.0000	5	0.000	0	0	1	0	0		10	1	0	1	0.000	0	0	0	0	0
												9	2	0.0000	5	0.000	0	0	1	0	3		9	1	0	1	0.000	0	0	0	0	0
												8	2	0.0000	5	0.000	0	0	1	0	3		8	1	0	1	0.000	0	0	0	0	0
												7	2	0.0000	5	0.000	0	0	1	0	0		7	1	0	1	0.000	0	0	0	0	0
												6	2	0.0000	5	0.000	0	0	1	0	0		6	1	0	1	0.000	0	0	0	0	1
												5	2	0.0000	5	0.000	0	0	1	0	0		5	1	0	1	0.000	0	0	0	0	3
												4	2	0.0000	5	0.000	0	0	1	0	0		4	1	0	1	0.000	0	0	0	0	3
												3	2	0.0000	5	0.000	0	0	1	0	0		3	1	0	1	0.000	0	0	0	0	3
												2	2	0.0000	5	0.000	0	0	1	0	3		2	1	0	1	0.000	0	0	0	0	3
												1	2	0.0000	5	0.000	0	0	1	0	3		1	1	0	1	0.000	0	0	1	0	3

1	2	3	4	5	6	7	8	9	10	11	12	13	2	3	4	5	6	7	8	9	10	11	12	13	pdes FLOW MGAL	CFS	AVG STREAM	AVG NPDES LOADING	2	3	4	5	6	7	8	9	#	#	#	13	avg npdes disch	CFS	AVG STREAM
052	FLOW	1997	3	0	0.0000	0	0	0	0	0	0	3	RDX+HMX	1997	3	1	0.0000	2	0.000	1	0	2	0	3					TNT	1997	3	0	0	1	0.000	0	0	1	0	3			
			2	0	0.0000	0	0	0	0	0	0	3			2	1	0.0000	2	0.000	1	0	2	0	3							2	0	0	1	0.000	0	0	1	0	3			
			1	0	0.0000	0	0	0	0	0	0	3			1	1	0.0000	2	0.000	1	0	2	0	3							1	0	0	1	0.000	0	0	1	0	3			
		1996	12	0	0.0000	0	0	0	0	0	0	3		1996	12	1	0.0000	2	0.000	1	0	2	0	3						1996	12	0	0	1	0.000	0	0	1	0	3			
			11	0	0.0000	0	0	0	0	0	0	3			11	1	0.0000	2	0.000	1	0	2	0	3							11	0	0	1	0.000	0	0	1	0	3			
			10	0	0.0000	0	0	0	0	0	0	3			10	1	0.0000	2	0.000	1	0	2	0	3							10	0	0	1	0.000	0	0	1	0	3			
			9	0	0.0000	0	0	0	0	0	0	3			9	1	0.0000	2	0.000	1	0	2	0	3							9	0	0	1	0.000	0	0	1	0	3			
			8	0	0.0000	0	0	0	0	0	0	3			8	1	0.0000	2	0.000	1	0	2	0	3							8	0	0	1	0.000	0	0	1	0	3			
			7	0	0.0000	0	0	0	0	0	0	3			7	1	0.0000	2	0.000	1	0	2	0	3							7	0	0	1	0.000	0	0	1	0	3			
			6	0	0.0000	0	0	0	0	0	0	3			6	1	0.0000	2	0.000	1	0	2	0	3							6	0	0	1	0.000	0	0	1	0	3			
			5	0	0.0000	0	0	0	0	0	0	3			5	1	0.0000	2	0.000	1	0	2	0	3							5	0	0	1	0.000	0	0	1	0	3			
			4	0	0.0000	0	0	0	0	0	0	3			4	1	0.0000	2	0.000	1	0	2	0	3							4	0	0	1	0.000	0	0	1	0	3			
			3	0	0.0000	0	0	0	0	0	0	3			3	1	0.0000	2	0.000	1	0	2	0	3							3	0	0	1	0.000	0	0	1	0	3			
			2	0	0.0000	0	0	0	0	0	0	3			2	1	0.0000	2	0.000	1	0	2	0	3							2	0	0	1	0.000	0	0	1	0	3			
			1	0	0.0000	0	0	0	0	0	0	3			1	1	0.0000	2	0.000	1	0	2	0	3							1	0	0	1	0.000	0	0	1	0	3			
		1995	12	0	0.0000	0	0	0	0	0	0	3		1995	12	1	0.0000	2	0.000	1	0	2	0	3						1995	12	0	0	1	0.000	0	0	1	0	3			
			11	0	0.0000	0	0	0	0	0	0	3			11	1	0.0000	2	0.000	1	0	2	0	3							11	0	0	1	0.000	0	0	1	0	3			
			10	0	0.0000	0	0	0	0	0	0	3			10	1	0.0000	2	0.000	1	0	2	0	3							10	0	0	1	0.000	0	0	1	0	3			
			9	0	0.0000	0	0	0	0	0	0	3			9	1	0.0000	2	0.000	1	0	2	0	3							9	0	0	1	0.000	0	0	1	0	3			
			8	0	0.0000	0	0	0	0	0	0	3			8	1	0.0000	2	0.000	1	0	2	0	3							8	0	0	1	0.000	0	0	1	0	3			
			7	0	0.0000	0	0	0	0	0	0	3			7	1	0.0000	2	0.000	1	0	2	0	3							7	0	0	1	0.000	0	0	1	0	3			
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	2	0	4	0	3							6	1	0	1	0.000	0	0	1	0	3			
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	2	0	4	0	3							5	1	0	1	0.000	0	0	1	0	3			
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	2	0	4	0	3							4	1	0	1	0.000	0	0	1	0	3			
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	2	0	4	0	3							3	1	0	1	0.000	0	0	1	0	3			
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	2	0	4	0	3							2	1	0	1	0.000	0	0	1	0	3			
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	2	0	4	0	3							1	1	0	1	0.000	0	0	1	0	3			
		1994	12	0	0.0000	0	0	0	0	0	0	3		1994	12	2	0.0000	5	0.000	2	0	4	0	3						1994	12	1	0	1	0.000	0	0	1	0	3			
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	2	0	4	0	3							11	1	0	1	0.000	0	0	1	0	3			
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	2	0	4	0	3							10	1	0	1	0.000	0	0	1	0	3			
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	2	0	4	0	3							9	1	0	1	0.000	0	0	1	0	3			
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	2	0	4	0	3							8	1	0	1	0.000	0	0	1	0	3			
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	2	0	4	0	3							7	1	0	1	0.000	0	0	1	0	3			
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	2	0	4	0	3							6	1	0	1	0.000	0	0	1	0	3			
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	2	0	4	0	3							5	1	0	1	0.000	0	0	1	0	3			
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	2	0	4	0	3							4	1	0	1	0.000	0	0	1	0	3			
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	2	0	4	0	3							3	1	0	1	0.000	0	0	1	0	3			
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	2	0	4	0	3							2	1	0	1	0.000	0	0	1	0	3			
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	2	0	4	0	3							1	1	0	1	0.000	0	0	1	0	3			
		1993	12	0	0.0000	0	0	0	0	0	0	3		1993	12	2	0.0000	5	0.000	2	0	4	0	3						1993	12	1	0	1	0.000	0	0	1	0	3			
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	2	0	4	0	3							11	1	0	1	0.000	0	0	1	0	3			
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	2	0	4	0	3							10	1	0	1	0.000	0	0	1	0	3			
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	2	0	4	0	3							9	1	0	1	0.000	0	0	1	0	3			
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	2	0	4	0	3							8	1	0	1	0.000	0	0	1	0	3			
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	2	0	4	0	3							7	1	0	1	0.000	0	0	1	0	3			
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	2	0	4	0	3							6	1	0	1	0.000	0	0	1	0	3			
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	2	0	4	0	3							5	1	0	1	0.000	0	0	1	0	3			
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	2	0	4	0	3							4	1	0	1	0.000	0	0	1	0	3			
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	2	0	4	0	3							3	1	0	1	0.000	0	0	1	0	3			
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	2	0	4	0	3							2	1	0	1	0.000	0	0	1	0	3			
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	2	0	4	0	3							1	1	0	1	0.000	0	0	1	0	3			
		1992	12	0	0.0000	0	0	0	0	0	0	3		1992	12	2	0.0000	5	0.000	2	0	4	0	3						1992	12	1	0	1	0.000	0	0	1	0	3			
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	2	0	4	0	3							11	1	0	1	0.000	0	0	1	0	3			
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	2	0	4	0	3							10	1	0	1	0.000	0	0	1	0	3			
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	2	0	4	0	3							9	1	0	1	0.000	0	0	1	0	3			
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	2	0	4	0	3							8	1	0	1	0.000	0	0	1	0	3			
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	2	0	4	0	3							7	1	0	1	0.000	0	0	1	0	3			
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	2	0	4	0	3							6	1	0	1	0.000	0	0	1	0	3			
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	2	0	4	0	3							5	1	0	1	0.000	0	0	1	0	3			
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	2	0	4	0	3							4	1	0	1	0.000	0	0	1	0	3			
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	2	0	4	0	3							3	1	0	1	0.000	0	0	1	0	3			
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	2	0	4	0	3							2	1	0	1	0.000	0	0	1	0	3			
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	2	0	4	0	3							1	1	0	1	0.000	0	0	1	0	3			
		1991	12	0	0.0000	0	0	0	0	0	0	3		1991	12	2	0.0000	5	0.000	2	0	4	0	3						1991	12	1	0	1	0.000	0	0	1	0	3			
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	2	0	4	0	3							11	1	0	1	0.000	0	0	1	0	3			
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	2	0	4	0	3							10	1	0	1	0.000	0	0	1	0	3			
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	2	0	4	0	3							9	1	0	1	0.000	0	0	1	0	3			
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	2	0	4	0	3							8	1	0	1	0.000	0	0	1	0	3			
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	2	0	4	0	3							7	1	0	1	0.000	0	0	1	0	3			
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	2	0	4	0	3							6	1	0	1	0.000	0	0	1	0	3			
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	2	0	4	0	3							5	1	0	1	0.000	0	0	1	0	3			

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	4	0	0.0000	0	0	0	0	0	0	3		4	2	0.0000	5	0.000	2	0	4	0	3		4	1	0	1	0.000	0	0	1	0	3
	3	0	0.0000	0	0	0	0	0	0	3		3	2	0.0000	5	0.000	2	0	4	0	3		3	1	0	1	0.000	0	0	1	0	3
	2	0	0.0000	0	0	0	0	0	0	3		2	2	0.0000	5	0.000	2	0	4	0	3		2	1	0	1	0.000	0	0	1	0	3
	1	0	0.0000	0	0	0	0	0	0	3		1	2	0.0000	5	0.000	2	0	4	0	3		1	1	0	1	0.000	0	0	1	0	3
1990	12	0	0.0000	0	0	0	0	0	0	3	1990	12	2	0.0000	5	0.000	2	0	4	0	3	1990	12	1	0	1	0.000	0	0	1	0	3
	11	0	0.0000	0	0	0	0	0	0	3		11	2	0.0000	5	0.000	2	0	4	0	3		11	1	0	1	0.000	0	0	1	0	3
	10	0	0.0000	0	0	0	0	0	0	3		10	2	0.0000	5	0.000	2	0	4	0	3		10	1	0	1	0.000	0	0	1	0	3
	9	0	0.0000	0	0	0	0	0	0	3		9	2	0.0000	5	0.000	2	0	4	0	3		9	1	0	1	0.000	0	0	1	0	3
	8	0	0.0000	0	0	0	0	0	0	3		8	2	0.0000	5	0.000	2	0	4	0	3		8	1	0	1	0.000	0	0	1	0	3
	7	0	0.0000	0	0	0	0	0	0	3		7	2	0.0000	5	0.000	2	0	4	0	3		7	1	0	1	0.000	0	0	1	0	3
	6	0	0.0000	0	0	0	0	0	0	3		6	2	0.0000	5	0.000	2	0	4	0	3		6	1	0	1	0.000	0	0	1	0	3
	5	0	0.0000	0	0	0	0	0	0	3		5	2	0.0000	5	0.000	2	0	4	0	3		5	1	0	1	0.000	0	0	1	0	3
	4	0	0.0000	0	0	0	0	0	0	3		4	2	0.0000	5	0.000	2	0	4	0	3		4	1	0	1	0.000	0	0	1	0	3
	3	0	0.0000	0	0	0	0	0	0	3		3	2	0.0000	5	0.000	2	0	4	0	3		3	1	0	1	0.000	0	0	1	0	3
	2	0	0.0000	0	0	0	0	0	0	3		2	2	0.0000	5	0.000	2	0	4	0	3		2	1	0	1	0.000	0	0	1	0	3
	1	0	0.0000	0	0	0	0	0	0	3		1	2	0.0000	5	0.000	2	0	4	0	3		1	1	0	1	0.000	0	0	1	0	3
1989	12	0	0.0000	0	0	0	0	0	0	3	1989	12	2	0.0000	5	0.000	2	0	4	0	3	1989	12	1	0	1	0.000	0	0	1	0	3
	11	0	0.0000	0	0	0	0	0	0	3		11	2	0.0000	5	0.000	2	0	4	0	3		11	1	0	1	0.000	0	0	1	0	3
	10	0	0.0000	0	0	0	0	0	0	3		10	2	0.0000	5	0.000	2	0	4	0	3		10	1	0	1	0.000	0	0	1	0	3
	9	0	0.0000	0	0	0	0	0	0	3		9	2	0.0000	5	0.000	2	0	4	0	3		9	1	0	1	0.000	0	0	1	0	3
	8	0	0.0000	0	0	0	0	0	0	3		8	2	0.0000	5	0.000	2	0	4	0	3		8	1	0	1	0.000	0	0	1	0	3
	7	0	0.0000	0	0	0	0	0	0	3		7	2	0.0000	5	0.000	2	0	4	0	3		7	1	0	1	0.000	0	0	1	0	3
	6	0	0.0000	0	0	0	0	0	0	3		6	2	0.0000	5	0.000	2	0	4	0	3		6	1	0	1	0.000	0	0	0	0	3
												5	2	0.0000	5	0.000	0	0	1	0	3		5	1	0	1	0.000	0	0	0	0	3
												4	2	0.0000	5	0.000	0	0	1	0	3		4	1	0	1	0.000	0	0	0	0	3
												3	2	0.0000	5	0.000	0	0	1	0	3		3	1	0	1	0.000	0	0	0	0	3
												2	2	0.0000	5	0.000	0	0	1	0	3		2	1	0	1	0.000	0	0	0	0	3
												1	2	0.0000	5	0.000	0	0	1	0	3		1	1	0	1	0.000	0	0	0	0	3
											1988	12	2	0.0000	5	0.000	0	0	1	0	3	1988	12	1	0	1	0.000	0	0	0	0	3
												11	2	0.0000	5	0.000	0	0	1	0	3		11	1	0	1	0.000	0	0	0	0	3
												10	2	0.0000	5	0.000	0	0	1	0	3		10	1	0	1	0.000	0	0	0	0	3
												9	2	0.0000	5	0.000	0	0	1	0	3		9	1	0	1	0.000	0	0	0	0	3
												8	2	0.0000	5	0.000	0	0	1	0	3		8	1	0	1	0.000	0	0	0	0	3
												7	2	0.0000	5	0.000	0	0	1	0	3		7	1	0	1	0.000	0	0	0	0	3
												6	2	0.0000	5	0.000	0	0	1	0	3		6	1	0	1	0.000	0	0	0	0	3
												5	2	0.0000	5	0.000	0	0	1	0	3		5	1	0	1	0.000	0	0	0	0	3
												4	2	0.0000	5	0.000	0	0	1	0	3		4	1	0	1	0.000	0	0	0	0	3
												3	2	0.0000	5	0.000	0	0	1	0	3		3	1	0	1	0.000	0	0	0	0	3
												2	2	0.0000	5	0.000	0	0	1	0	3		2	1	0	1	0.000	0	0	0	0	3
												1	2	0.0000	5	0.000	0	0	1	0	3		1	1	0	1	0.000	0	0	0	0	3
											1987	12	2	0.0000	5	0.000	0	0	1	0	3	1987	12	1	0	1	0.000	0	0	0	0	3
												11	2	0.0000	5	0.000	0	0	1	0	3		11	1	0	1	0.000	0	0	0	0	3
												10	2	0.0000	5	0.000	0	0	1	0	3		10	1	0	1	0.000	0	0	0	0	3
												9	2	0.0000	5	0.000	0	0	1	0	3		9	1	0	1	0.000	0	0	0	0	3
												8	2	0.0000	5	0.000	0	0	1	0	3		8	1	0	1	0.000	0	0	0	0	3
												7	2	0.0000	5	0.000	0	0	1	0	3		7	1	0.0000	1	0.000	0	0	0	0	0
												6	2	0.0000	5	0.000	0	0	1	0	3		6	1	0.0000	1	0.000	0	0	0	0	3
												5	2	0.0000	5	0.000	0	0	1	0	3		5	1	0.0000	1	0.000	0	0	0	0	3
												3	2	0.0000	5	0.000	0	0	1	0	0		3	1	0.0000	1	0.000	0	0	0	0	3
												2	2	0.0000	5	0.000	0	0	1	0	3		2	1	0.0000	1	0.000	0	0	0	0	3
												1	2	0.0000	5	0.000	0	0	1	0	3		1	1	0.0000	0	0.000	0	0	0	0	3

1	2	3	5	6	7	8	9	10	11	12	13	2	3	4	5	6	7	8	9	10	11	12	13	pdes FLOW MR	FS	AVG NPDES LOADING	2	3	4	5	6	7	8	9	#	#	#	13	avg npdes disch	CFS	AVG NPDES LO
081												CR(T)	1989	5	0	0.0000	0	0.000	0	0	0	0	3				CU	1989	5	0	0.0000	0	0.000	0	0	0	0	3			
														4	0	0.0000	0	0.000	0	0	0	0	3						4	0	0.0000	0	0.000	0	0	0	0	3			
														3	0	0.0000	0	0.000	0	0	0	0	3						3	0	0.0000	0	0.000	0	0	0	0	3			
														2	0	0.0000	0	0.000	0	0	0	0	3						2	0	0.0000	0	0.000	0	0	0	0	3			
														1	0	0.0000	0	0.000	0	0	0	0	3						1	0	0.0000	0	0.000	0	0	0	0	3			
													1988	12	0	0.0000	0	0.000	0	0	0	0	3					1988	12	0	0.0000	0	0.000	0	0	0	0	3			
														11	0	0.0000	0	0.000	0	0	0	0	3						11	0	0.0000	0	0.000	0	0	0	0	3			
														10	0	0.0000	0	0.000	0	0	0	0	3						10	0	0.0000	0	0.000	0	0	0	0	3			
														9	0	0.0000	0	0.000	0	0	0	0	3						9	0	0.0000	0	0.000	0	0	0	0	3			
														8	0	0.0000	0	0.000	0	0	0	0	3						8	0	0.0000	0	0.000	0	0	0	0	3			
														7	0	0.0000	0	0.000	0	0	0	0	3						7	0	0.0000	0	0.000	0	0	0	0	3			
														6	0	0.0000	0	0.000	0	0	0	0	3						6	0	0.0000	0	0.000	0	0	0	0	3			
														5	0	0.0000	0	0.000	0	0	0	0	3						5	0	0.0000	0	0.000	0	0	0	0	3			
														4	0	0.0000	0	0.000	0	0	0	0	3						4	0	0.0000	0	0.000	0	0	0	0	3			
														3	0	0.0000	0	0.000	0	0	0	0	3						3	0	0.0000	0	0.000	0	0	0	0	3			
														2	0	0.0000	0	0.000	0	0	0	0	3						2	0	0.0000	0	0.000	0	0	0	0	3			
														1	0	0.0000	0	0.000	0	0	0	0	3						1	0	0.0000	0	0.000	0	0	0	0	3			
													1987	12	0	0.0000	0	0.000	0	0	0	0	3					1987	12	0	0.0000	0	0.000	0	0	0	0	3			
														11	0	0.0000	0	0.000	0	0	0	0	3						11	0	0.0000	0	0.000	0	0	0	0	3			
														10	0	0.0000	0	0.000	0	0	0	0	3						10	0	0.0000	0	0.000	0	0	0	0	3			
														9	0	0.0000	0	0.000	0	0	0	0	3						9	0	0.0000	0	0.000	0	0	0	0	3			
														8	0	0.0000	0	0.000	0	0	0	0	3						8	0	0.0000	0	0.000	0	0	0	0	3			
														7	0	0.0000	0	0.000	0	0	0	0	3						7	0	0.0000	0	0.000	0	0	0	0	0			
														6	0	0.0000	0	0.000	0	0	0	0	3						6	0	0.0000	0	0.000	0	0	0	0	3			
														5	0	0.0000	0	0.000	0	0	0	0	3						5	0	0.0000	0	0.000	0	0	0	0	3			
														3	0	0.0000	0	0.000	0	0	0	0	0						3	0	0.0000	0	0.000	0	0	0	0	3			
														2	0	0.0000	0	0.000	0	0	0	0	3						2	0	0.0000	0	0.000	0	0	0	0	3			
														1	0	0.0000	0	0.000	0	0	0	0	3						1	0	0.0000	1	0.000	0	0	1	0	3			

																	0	2	0	0	0
																	0	2	0	0	0
																	0	2	0	0	0
																	0	2	0	0	0
							0	0	0	0	0	3	ZN	1989	5	1	0	2	0	0	0
							0	0	0	0	0	3			4	1	0	2	0	0	0
							0	0	0	0	0	3			3	1	0	2	0	0	0
	PB	1989	5	0	0	0	0	0	0	0	0	3			2	1	0	2	0	0	0
			4	0	0	0	0	0	0	0	0	3			1	1	0	2	0	0	0
			3	0	0	0	0	0	0	0	0	3		1988	12	1	0	2	0	0	0
			2	0	0	0	0	0	0	0	0	3			11	1	0	2	0	0	0
			1	0	0	0	0	0	0	0	0	3			10	1	0	2	0	0	0
		1988	12	0	0	0	0	0	0	0	0	3			9	1	0	2	0	0	0
			11	0	0	0	0	0	0	0	0	3			8	1	0	2	0	0	0
			10	0	0	0	0	0	0	0	0	3			7	1	0	2	0	0	0
			9	0	0	0	0	0	0	0	0	3			6	1	0	2	0	0	0
			8	0	0	0	0	0	0	0	0	3			5	1	0	2	0	0	0
			7	0	0	0	0	0	0	0	0	3			4	1	0	2	0	0	0
			6	0	0	0	0	0	0	0	0	3			3	1	0	2	0	0	0
			5	0	0	0	0	0	0	0	0	3			2	1	0	2	0	0	0
			4	0	0	0	0	0	0	0	0	3			1	1	0	2	0	0	0
			3	0	0	0	0	0	0	0	0	3		1987	12	1	0	2	0	0	0
			2	0	0	0	0	0	0	0	0	3			11	1	0	2	0	0	0
			1	0	0	0	0	0	0	0	0	3			10	1	0	2	0	0	0
		1987	12	0	0	0	0	0	0	0	0	3			9	1	0	2	0	0	0
			11	0	0	0	0	0	0	0	0	3			8	1	0	2	0	0	0
			10	0	0	0	0	0	0	0	0	3			7	1	0	2	0	0	0
			9	0	0	0	0	0	0	0	0	3			6	1	0	2	0	0	0
			8	0	0	0	0	0	0	0	0	3			5	1					
			7	0	0	0	0	0	0	0	0	0			3	1					
			6	0	0	0	0	0	0	0	0	3			2	1					
			5	0	0	0	0	0	0	0	0	3			1	1					

1	2	3	4	5	6	7	8	9	10	11	12	13	2	3	4	5	6	7	8	9	10	11	12	13	pdes FLOW MGAL	CFS	AVG NPDES LOADING	2	3	4	5	6	7	8	9	#	#	#	13	avg npdes disch	CFS	AVG NPDES LOADING
082	FLOW	1997	3	0	0.0000	0	0.0000	0	0	0	0	3	RDX+HMX	1997	3	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000	TNT	1997	3	0	0.0000	1	0.000	0	0	1	0	3			
			2	0	0.0000	0	0.0000	0	0	0	0	3			2	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			2	0	0.0000	1	0.000	0	0	1	0	3			
			1	0	0.0000	0	0.0000	0	0	0	0	3			1	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			1	0	0.0000	1	0.000	0	0	1	0	5			
		1996	12	0	0.0000	0	0.0000	0	0	0	0	3		1996	12	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000		1996	12	0	0.0000	1	0.000	0	0	1	0	5			
			11	0	0.0000	0	0.0000	0	0	0	0	3			11	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			11	0	0.0000	1	0.000	0	0	1	0	5			
			10	0	0.0000	0	0.0587	0	0	0	0	0			10	1	0.0000	2	0.000	1	0	2	0	5	0.0000	0.0000	0.0000			10	0	0.0000	1	0.000	0	0	1	0	3			
			9	0	0.0265	0	0.0720	0	0	0	0	0			9	1	0.0000	2	0.000	1	0	2	0	5	0.0265	0.0410	0.0000			9	0	0.0000	1	0.000	0	0	1	0	3			
			8	0	0.0360	0	0.0540	0	0	0	0	0			8	1	0.0000	2	0.000	1	0	2	0	5	0.0360	0.0557	0.0000			8	0	0.0000	1	0.000	0	0	1	0	3			
			7	0	0.0000	0	0.0000	0	0	0	0	3			7	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			7	0	0.0000	1	0.000	0	0	1	0	3			
			6	0	0.0000	0	0.0000	0	0	0	0	3			6	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			6	0	0.0000	1	0.000	0	0	1	0	3			
			5	0	0.0000	0	0.0000	0	0	0	0	3			5	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			5	0	0.0000	1	0.000	0	0	1	0	3			
			4	0	0.0000	0	0.0000	0	0	0	0	3			4	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			4	0	0.0000	1	0.000	0	0	1	0	3			
			3	0	0.0000	0	0.0000	0	0	0	0	3			3	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			3	0	0.0000	1	0.000	0	0	1	0	3			
			2	0	0.0000	0	0.0000	0	0	0	0	3			2	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			2	0	0.0000	1	0.000	0	0	1	0	3			
			1	0	0.0000	0	0.0000	0	0	0	0	3			1	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			1	0	0.0000	1	0.000	0	0	1	0	3			
		1995	12	0	0.0000	0	0.0000	0	0	0	0	3		1995	12	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000		1995	12	0	0.0000	1	0.000	0	0	1	0	3			
			11	0	0.0000	0	0.0000	0	0	0	0	3			11	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			11	0	0.0000	1	0.000	0	0	1	0	3			
			10	0	0.0000	0	0.0000	0	0	0	0	3			10	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			10	0	0.0000	1	0.000	0	0	1	0	3			
			9	0	0.0000	0	0.0000	0	0	0	0	3			9	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			9	0	0.0000	1	0.000	0	0	1	0	3			
			8	0	0.0000	0	0	0	0	0	0	3			8	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			8	0	0.0000	1	0.000	0	0	1	0	3			
			7	0	0.0000	0	0	0	0	0	0	3			7	1	0.0000	2	0.000	1	0	2	0	3	0.0000	0.0000	0.0000			7	0	0.0000	1	0.000	0	0	1	0	3			
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			6	1	0.0000	1	0.000	0	0	1	0	3			
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			5	1	0.0000	1	0.000	0	0	1	0	3			
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			4	1	0.0000	1	0.000	0	0	1	0	3			
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			3	1	0.0000	1	0.000	0	0	1	0	3			
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			2	1	0.0000	1	0.000	0	0	1	0	3			
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			1	1	0.0000	1	0.000	0	0	1	0	3			
		1994	12	0	0.0000	0	0	0	0	0	0	3		1994	12	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		1994	12	1	0.0000	1	0.000	0	0	1	0	3			
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			11	1	0.0000	1	0.000	0	0	1	0	3			
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			10	1	0.0000	1	0.000	0	0	1	0	3			
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			9	1	0.0000	1	0.000	0	0	1	0	3			
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			8	1	0.0000	1	0.000	0	0	1	0	3			
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			7	1	0.0000	1	0.000	0	0	1	0	3			
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			6	1	0.0000	1	0.000	0	0	1	0	3			
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			5	1	0.0000	1	0.000	0	0	1	0	3			
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			4	1	0.0000	1	0.000	0	0	1	0	3			
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			3	1	0.0000	1	0.000	0	0	1	0	3			
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			2	1	0.0000	1	0.000	0	0	1	0	3			
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			1	1	0.0000	1	0.000	0	0	1	0	3			
		1993	12	0	0.0000	0	0	0	0	0	0	3		1993	12	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		1993	12	1	0.0000	1	0.000	0	0	1	0	3			
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			11	1	0.0000	1	0.000	0	0	1	0	3			
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			10	1	0.0000	1	0.000	0	0	1	0	3			
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			9	1	0.0000	1	0.000	0	0	1	0	3			
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			8	1	0.0000	1	0.000	0	0	1	0	3			
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			7	1	0.0000	1	0.000	0	0	1	0	3			
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			6	1	0.0000	1	0.000	0	0	1	0	3			
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			5	1	0.0000	1	0.000	0	0	1	0	3			
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			4	1	0.0000	1	0.000	0	0	1	0	3			
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			3	1	0.0000	1	0.000	0	0	1	0	3			
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			2	1	0.0000	1	0.000	0	0	1	0	3			
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			1	1	0.0000	1	0.000	0	0	1	0	3			
		1992	12	0	0.0000	0	0	0	0	0	0	3		1992	12	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		1992	12	1	0.0000	1	0.000	0	0	1	0	3			
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			11	1	0.0000	1	0.000	0	0	1	0	3			
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			10	1	0.0000	1	0.000	0	0	1	0	3			
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			9	1	0.0000	1	0.000	0	0	1	0	3			
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			8	1	0.0000	1	0.000	0	0	1	0	3			
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			7	1	0.0000	1	0.000	0	0	1	0	3			
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			6	1	0.0000	1	0.000	0	0	1	0	3			
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			5	1	0.0000	1	0.000	0	0	1	0	3			
			4	0	0.0000	0	0	0	0	0	0	3			4	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			4	1	0.0000	1	0.000	0	0	1	0	3			
			3	0	0.0000	0	0	0	0	0	0	3			3	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			3	1	0.0000	1	0.000	0	0	1	0	3			
			2	0	0.0000	0	0	0	0	0	0	3			2	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			2	1	0.0000	1	0.000	0	0	1	0	3			
			1	0	0.0000	0	0	0	0	0	0	3			1	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			1	1	0.0000	1	0.000	0	0	1	0	3			
		1991	12	0	0.0000	0	0	0	0	0	0	3		1991	12	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		1991	12	1	0.0000	1	0.000	0	0	1	0	3			
			11	0	0.0000	0	0	0	0	0	0	3			11	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			11	1	0.0000	1	0.000	0	0	1	0	3			
			10	0	0.0000	0	0	0	0	0	0	3			10	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			10	1	0.0000	1	0.000	0	0	1	0	3			
			9	0	0.0000	0	0	0	0	0	0	3			9	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			9	1	0.0000	1	0.000	0	0	1	0	3			
			8	0	0.0000	0	0	0	0	0	0	3			8	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			8	1	0.0000	1	0.000	0	0	1	0	3			
			7	0	0.0000	0	0	0	0	0	0	3			7	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			7	1	0.0000	1	0.000	0	0	1	0	3			
			6	0	0.0000	0	0	0	0	0	0	3			6	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			6	1	0.0000	1	0.000	0	0	1	0	3			
			5	0	0.0000	0	0	0	0	0	0	3			5	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000			5	1	0.0000	1	0.000	0	0	1	0	3			

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	4	0	0.0000	0	0	0	0	0	0	3		4	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		4	1	0.0000	1	0.000	0	0	1	0	3
	3	0	0.0000	0	0	0	0	0	0	3		3	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		3	1	0.0000	1	0.000	0	0	1	0	3
	2	0	0.0000	0	0	0	0	0	0	3		2	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		2	1	0.0000	1	0.000	0	0	1	0	3
	1	0	0.0000	0	0	0	0	0	0	3		1	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		1	1	0.0000	1	0.000	0	0	1	0	3
1990	12	0	0.0000	0	0	0	0	0	0	3	1990	12	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000	1990	12	1	0.0000	1	0.000	0	0	1	0	3
	11	0	0.0000	0	0	0	0	0	0	3		11	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		11	1	0.0000	1	0.000	0	0	1	0	3
	10	0	0.0000	0	0	0	0	0	0	3		10	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		10	1	0.0000	1	0.000	0	0	1	0	3
	9	0	0.0000	0	0	0	0	0	0	3		9	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		9	1	0.0000	1	0.000	0	0	1	0	3
	8	0	0.0000	0	0	0	0	0	0	3		8	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		8	1	0.0000	1	0.000	0	0	1	0	3
	7	0	0.0000	0	0	0	0	0	0	3		7	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		7	1	0.0000	1	0.000	0	0	1	0	3
	6	0	0.0000	0	0	0	0	0	0	3		6	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		6	1	0.0000	1	0.000	0	0	1	0	3
	5	0	0.0000	0	0	0	0	0	0	3		5	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		5	1	0.0000	1	0.000	0	0	1	0	3
	4	0	0.0000	0	0	0	0	0	0	3		4	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		4	1	0.0000	1	0.000	0	0	1	0	3
	3	0	0.0000	0	0	0	0	0	0	3		3	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		3	1	0.0000	1	0.000	0	0	1	0	3
	2	0	0.0000	0	0	0	0	0	0	3		2	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		2	1	0.0000	1	0.000	0	0	1	0	3
	1	0	0.0000	0	0	0	0	0	0	3		1	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		1	1	0.0000	1	0.000	0	0	1	0	3
1989	12	0	0.0000	0	0	0	0	0	0	3	1989	12	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000	1989	12	1	0.0000	1	0.000	0	0	1	0	3
	11	0	0.0000	0	0	0	0	0	0	3		11	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		11	1	0.0000	1	0.000	0	0	1	0	3
	10	0	0.0000	0	0	0	0	0	0	3		10	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		10	1	0.0000	1	0.000	0	0	1	0	3
	9	0	0.0000	0	0	0	0	0	0	3		9	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		9	1	0.0000	1	0.000	0	0	1	0	3
	8	0	0.0000	0	0	0	0	0	0	3		8	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		8	1	0.0000	1	0.000	0	0	1	0	3
	7	0	0.0000	0	0	0	0	0	0	3		7	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		7	1	0.0000	1	0.000	0	0	1	0	3
	6	0	0.0000	0	0	0	0	0	0	3		6	2	0.0000	5	0.000	2	0	4	0	3	0.0000	0.0000	0.0000		6	1	0.0000	1	0.000	0	0	0	0	3
												5	2	0.0000	5	0.000	1	0	2	0	3					5	1	0.0000	1	0.000	0	0	0	0	3
												4	2	0.0000	5	0.000	1	0	2	0	3					4	1	0.0000	1	0.000	0	0	0	0	3
												3	2	0.0000	5	0.000	1	0	2	0	3					3	1	0.0000	1	0.000	0	0	0	0	3
												2	2	0.0000	5	0.000	1	0	2	0	3					2	1	0.0000	1	0.000	0	0	0	0	3
												1	2	0.0000	5	0.000	1	0	2	0	3					1	1	0.0000	1	0.000	0	0	0	0	3
											1988	12	2	0.0000	5	0.000	1	0	2	0	3				1988	12	1	0.0000	1	0.000	0	0	0	0	3
												11	2	0.0000	5	0.000	1	0	2	0	3					11	1	0.0000	1	0.000	0	0	0	0	3
												10	2	0.0000	5	0.000	1	0	2	0	3					10	1	0.0000	1	0.000	0	0	0	0	3
												9	2	0.0000	5	0.000	1	0	2	0	3					9	1	0.0000	1	0.000	0	0	0	0	3
												8	2	0.0000	5	0.000	1	0	2	0	3					8	1	0.0000	1	0.000	0	0	0	0	3
												7	2	0.0000	5	0.000	1	0	2	0	3					7	1	0.0000	1	0.000	0	0	0	0	3
												6	2	0.0000	5	0.000	1	0	2	0	3					6	1	0.0000	1	0.000	0	0	0	0	3
												5	2	0.0000	5	0.000	1	0	2	0	3					5	1	0.0000	1	0.000	0	0	0	0	3
												4	2	0.0000	5	0.000	1	0	2	0	3					4	1	0.0000	1	0.000	0	0	0	0	3
												3	2	0.0000	5	0.000	1	0	2	0	3					3	1	0.0000	1	0.000	0	0	0	0	3
												2	2	0.0000	5	0.000	1	0	2	0	3					2	1	0.0000	1	0.000	0	0	0	0	3
												1	2	0.0000	5	0.000	1	0	2	0	3					1	1	0.0000	1	0.000	0	0	0	0	3
											1987	12	2	0.0000	5	0.000	1	0	2	0	3				1987	12	1	0.0000	1	0.000	0	0	0	0	3
												11	2	0.0000	5	0.000	1	0	2	0	3					11	1	0.0000	1	0.000	0	0	0	0	3
												10	2	0.0000	5	0.000	1	0	2	0	3					10	1	0.0000	1	0.000	0	0	0	0	3
												9	2	0.0000	5	0.000	1	0	2	0	3					9	1	0.0000	1	0.000	0	0	0	0	3
												8	2	0.0000	5	0.000	1	0	2	0	3					8	1	0.0000	1	0.000	0	0	0	0	3
												7	2	0.0000	5	0.000	1	0	2	0	3					7	1	0.0000	1	0.000	0	0	0	0	0
												6	2	0.0000	5	0.000	1	0	2	0	3					6	1	0.0000	1	0.000	0	0	0	0	3
												5	2	0.0000	5	0.000	1	0	2	0	3					5	1	0.0000	1	0.000	0	0	0	0	3
												3	2	0.0000	5	0.000	1	0	2	0	0					3	1	0.0000	1	0.000	0	0	0	0	
												2	2	0.0000	5	0.000	1	0	2	0	3					2	1	0.0000	1	0.000	0	0	0	0	
												1	2	0.0000	5	0.000	1	0	2	0	3					1	1	0.0000							

APPENDIX N
PROPOSED PRG TABULATION

Summary of Potential Chemical-Specific Cleanup Requirements for Groundwater Selected Remedial Technologies Iowa Army Ammunition Plant, Middletown, Iowa

Contaminant Constituent	MCL[1] (µg/L)	MCLG[1] (µg/L)	HAL[1] (µg/L)	10^{-4} Cancer Risk[1] (µg/L)	PRG[2] (Region IX) Tap Water (µg/L)	RDA or RI[3] (µg/day)	Proposed Cleanup	
							Level (µg/L)	Basis
INORGANICS								
Aluminum	N/A	N/A	N/A	N/A	37000 nc	N/A	37000	PRG
Antimony	6	6	3	N/A	15 nc	N/A	3	HAL
Arsenic	50	N/A	N/A	2	0.045 ca	N/A	50	MCL
Barium	2000	2000	2,000	N/A	2600 nc	N/A	2000	HAL
Beryllium	4	4	N/A	0.8	0.016 ca	N/A	4	MCL
Cadmium	5	5	5	N/A	18 nc	N/A	5	HAL
Calcium	N/A	N/A	N/A	N/A	N/A	800000-1200000	600000	RDA
Chromium (total)	100	100	100	N/A	180 nc (VI)	50-200	100	HAL
Copper (at tap)	1300[4]	1300	N/A	N/A	1400 nc	1500-3000	1300	MCL
Cyanide	200	200	200	N/A	730 nc	N/A	200	HAL
Iron	N/A	N/A	N/A	N/A	N/A	10000-12000	6000	RDA
Lead (at tap)	15[4]	0	N/A	N/A	4 nc	N/A	15	MCL
Magnesium	N/A	N/A	N/A	N/A	N/A	280000-300000	150000	RDA
Manganese	N/A	N/A	N/A	N/A	1700 nc	200-500	1700	PRG
Mercury	2	2	2	N/A	11 nc[6]	N/A	2	HAL
Nickel	100[5]	100[5]	100	N/A	730 nc	N/A	100	HAL
Potassium	N/A	N/A	N/A	N/A	N/A	1950000-5850000	2925000	RDA
Selenium	50	50	N/A	N/A	180 nc	45-55	50	MCL
Silver	N/A	N/A	100	N/A	180 nc	N/A	100	HAL
Sodium	N/A	N/A	N/A	N/A	N/A	10000000	5000000	RDA
Thallium	0.5	0.5	0.5	N/A	2.9 nc	N/A	0.5	HAL
Vanadium	N/A	N/A	N/A	N/A	260 nc	N/A	260	PRG
Zinc	N/A	N/A	2000	N/A	11000 nc	12000 (women)	2000	HAL
VOLATILE ORGANICS								
Acetone	N/A	N/A	N/A	N/A	610 nc	N/A	610	PRG
Benzene	5	N/A	N/A	100	0.39 ca	N/A	5	MCL
n-Butyl benzene	N/A	N/A	N/A	N/A	N/A	N/A		
sec-Butyl benzene	N/A	N/A	N/A	N/A	61 nc[6]	N/A	61	PRG
Carbon disulfide	N/A	N/A	N/A	N/A	21 nc	N/A	21	PRG
Carbon tetrachloride	5	0	N/A	30	0.17 ca	N/A	5	MCL
Chlorobenzene	100	100	N/A	N/A	39 nc	N/A	100	MCL
Chloroform	100	N/A	N/A	600	0.16 ca	N/A	100	MCL

Summary of Potential Chemical-Specific Cleanup Requirements for Groundwater Selected Remedial Technologies Iowa Army Ammunition Plant, Middletown, Iowa

(CONTINUED)

Contaminant Constituent	MCL[1] (μg/L)	MCLG[1] (μg/L)	HAL[1] (μg/L)	10^{-6} Cancer Risk[1] (μg/L)	PRG[2] (Region IX) Tap Water (μg/L)	RDA or RI[3] (μg/day)	Proposed Cleanup	
							Level (μg/L)	Basis
1,2 Dichlorobenzene	600	600	600	N/A	370 nc	N/A	600	HAL
1,4-Dichlorobenzene	75	75	75	N/A	0.47 ca	N/A	75	HAL
1,1-Dichloroethane	N/A	N/A	N/A	N/A	790 nc	N/A	790	PRG
1,1,2-Dichloroethane	5	0	N/A	N/A	N/A	N/A	5	MCL
1,1-Dichloroethene	7	7	7	N/A	0.046 ca	N/A	7	HAL
1,2-Dichloroethane	5	0	N/A	40	0.12 ca	N/A	5	MCL
cis- 1,2-Dichloroethene	70	70	70	N/A	61 nc	N/A	70	HAL
Ethylbenzene	700	700	700	N/A	1300 nc	N/A	700	HAL
Isopropyl Benzene	N/A	N/A	N/A	N/A	N/A	N/A		
Methylene chloride	5	N/A	N/A	N/A	4.3 ca	N/A	5	MCL
Methylethyl ketone	N/A	N/A	N/A	N/A	1900 nc	N/A	1900	PRG
Methyl isobutyl ketone	N/A	N/A	N/A	N/A	160 nc	N/A	160	PRG
n-Propylbenzene	N/A	N/A	N/A	N/A	N/A	N/A		
Tetrachloroethylene	5	0	N/A	70	1.1 c	N/A	5	MCL
Toluene	1000	1000	1000	N/A	720 nc	N/A	1000	HAL
Trichloroethene	5	0	N/A	300	1.6 ca	N/A	5	MCL
1,1,1-Trichloroethane	200	200	200	N/A	1300 nc	N/A	200	HAL
1,1,2-Trichloroethane	5	3	3	N/A	0.2 CA	N/A	3	HAL
1,1,2-Trichlorotrifluoroethane	N/A	N/A	N/A	N/A	59000 nc	N/A	59000	PRG
Trimethylbenzene	N/A	N/A	N/A	N/A	N/A	N/A		
1,2,4-Trimethybenzene	N/A	N/A	N/A	N/A	3 nc[6]	N/A	3	PRG
1,3,5-Trimethybenzene	N/A	N/A	N/A	N/A	2.4 nc[6]	N/A	2.4	PRG
Vinyl chloride	2	0	NA	1.5	0.02 ca	N/A	2	MCL
Xylenes (Total)	10000	10000	10000	N/A	1400 nc	N/A	10000	HAL
SEMI-VOLATILE ORGANICS								
2-Methylphenol	N/A	N/A	N/A	N/A	1800 nc	N/A	1800	PRG
Fluorene	N/A	N/A	N/A	N/A	240 nc	N/A	240	PRG
Naphthalene	N/A	N/A	20	N/A	240 nc	N/A	20	HAL
Phenanthrene	N/A	N/A	N/A	N/A	N/A	N/A		
Bis(2-ethylhexyl)phthalate	6	N/A	N/A	N/A	4.8 ca	N/A	6	MCL
Di-n- butylphthalate	N/A	N/A	N/A	N/A	N/A	N/A		

Summary of Potential Chemical-Specific Cleanup Requirements for Groundwater Selected Remedial Technologies Iowa Army Ammunition Plant, Middletown, Iowa

(CONTINUED)

Contaminant Constituent	MCL[1] (µg/L)	MCLG[1] (µg/L)	HAL[1] (µg/L)	10^{-4} Cancer Risk[1] (µg/L)	PRG[2] (Region IX) Tap Water (µg/L)	RDA or RI[3] (µg/day)	Proposed Cleanup	
							Level (µg/L)	Basis
Diethylphthlate	N/A	N/A	5000	N/A	29000 nc	N/A	5000	HAL
Phenol/Carbolic Acid	N/A	N/A	4000	N/A	22000 nc	N/A	4000	HAL
EXPLOSIVES								
1,3,5-Trinitrobenzene(TNB)	N/A	N/A	N/A	N/A	1.8 nc	N/A	1.8	PRG
1,3-Dinitrobenzene(DNB)	N/A	N/A	1	N/A	3.7 nc	N/A	1	HAL
2,4-Dinitrotoluene(24DNT)	N/A	N/A	N/A	5	73 nc	N/A	5	10^{-4} Cancer Risk
2,6-Dinitrotoluene(26DNT)	N/A	N/A	N/A	5	37 nc	N/A	5	10^{-4} Cancer Risk
2,4,6-Trinitrotoluene (TNT)	N/A	N/A	2	1	2.2 ca	N/A	2	HAL
4-Amino-2,6-dinitrotoluene	N/A	N/A	N/A	N/A	N/A	N/A		
2-Amino-4,6-dinitrotoluene	N/A	N/A	N/A	N/A	N/A	N/A		
HMX	N/A	N/A	400	N/A	1800 nc	N/A	400	HAL
Nitrobenzene (NB)	N/A	N/A	N/A	N/A	3.4 nc	N/A	3.4	PRG
Nitrotoluene (NT)	N/A	N/A	N/A	N/A	370 nc	N/A	370	PRG
2-Nitrotoluene (2NT)	N/A	N/A	N/A	N/A	370 nc	N/A	370	PRG
3-Nitrotoluene (3NT)	N/A	N/A	N/A	N/A	370 nc	N/A	370	PRG
4-Nitrotoluene (4NT)	N/A	N/A	N/A	N/A	370 nc	N/A	370	PRG
RDX	N/A	N/A	2	30	0.61 ca	N/A	2	HAL
Tetryl	N/A	N/A	N/A	N/A	N/A	N/A		
RADIONUCLIDES (Units - pCi/L)								
Alpha gross	15	N/A	N/A	15	N/A	N/A	15	MCL
Radium 226	5	N/A	N/A	20	N/A	N/A	5	MCL

[1] Drinking Water Regulations and Health advisories, Office of Water, U.S. Environmental Protection Agency, October 1996.

[2] Preliminary Remedial Goals (PRGS), EPA Region IX., 1996. From Stanford J. Smucker, Ph.D., Regional Toxicologist, August 1, 1996.

[3] Risk Assessment Handbook Human Health Evaluation, Vol. I: Human Health Evaluation, USACE, EM 200-1-4, 30 June 1995. RDA = Recommended Daily Allowance, RI = Recommended Intake. The maximum concentration at the site is multiplied times 2 L/day, the adult intake of drinking water, resulting in a concentration (µg/L). If the resulting concentration is less than the RDA, the chemical is not of concern. The RDAs for calcium, iron, magnesium, selenium and zinc are from the National Research Council (1989). The values for copper, chromium, and manganese are Estimaed Safe and Adequate Daily Intake Needs from the National Research Council (1989). Potassium is the Usual (adult) intake(50-150 mEq/day), Remington Pharmaceutical Sciences, 15th Ed. (1975), and the average adult sodium intake is from Nelson's Textbook of Pediatrics, 14th Ed. (1992).

Summary of Potential Chemical-Specific Cleanup Requirements for Groundwater Selected Remedial Technologies Iowa Army Ammunition Plant, Middletown, Iowa

(CONTINUED)

[4]Lead and copper are listed in the MCLs as TT, or treatment technique. The treatment technique requirements can be triggered by lead or copper action levels measured in samples collected at consumers' taps. The lead and copper action levels are exceeded if the concentration of more than 10 percent of tap water samples collected during any monitoring period are greater than 15 µg/L for lead or 1300 µg/L for copper. Control of Lead and Copper, 40 CFR 141.80(c)(1), General Requirements.

[5]Being remanded.

[6]Value is from the USEPA Region III PRGs, Risk-Based Concentration Table, January-June 1995. From Roy L Smith, Ph.D., Senior Toxicologist, March 7, 1995. (Value not available in the Region IX PRGs.).
Need to decide if some of the background wells are thrown out, changes background numbers.

N/A = No numeric standard.

RESPONSE TO COMMENTS

DRAFT-FINAL SUPPLEMENTAL GROUNDWATER RI REPORT

Dated
December 1, 1997

Prepared for:

U. S. Army Corps of Engineers
Omaha District

Prepared by:

MWH
MONTGOMERY WATSON HARZA

August 31, 2001

Comments Provided by Scott Marquess, USEPA, February 5, 1998

GENERAL COMMENTS

1. The possibility of off-site groundwater contamination needs to be addressed. It is our understanding that the Army has agreed to pursue an additional operable unit (OU) at the IAAP to address this issue, among other topics. The nature of tasks to be addressed in this OU should be discussed and defined jointly by the parties to our Federal Facility Agreement (FFA). We are especially concerned with identifying the source of contamination detected in groundwater at the southern boundary of IAAP. Prior to finalizing this Supplemental Groundwater RI, the Army should provide a written commitment to defining this additional OU, along with an acceptable date by which a schedule for FFA deliverables will be provided.

> ***Response:*** *Off-site groundwater contamination is beyond the scope of this Supplemental RI, but has been pursued subsequently and is continuing. These studies are referenced in the revised Draft-Final report. However, no specific changes are made in response to this comment.*

2. This Supplemental RI suggests that NPDES discharges could be significant contributors to surface water contamination at the IAAP. Further, surface water is defined as the significant mechanism for the transport of contaminants off-site. Given this information, EPA reiterates our recommendation that the Army take actions to control NPDES discharges to levels which are protective of human health. We intend to share the information in this RI with representatives of the Iowa Department of Natural Resources, as well as the U.S. Fish and Wildlife Service, for their consideration.

> ***Response:*** *The contribution of NPDES discharges to contamination has been pursued further following this supplemental RI. Some of these studies are referenced in the revised Draft-Final report. However, no specific changes are made in response to this comment.*

3. We believe you may have overlooked information regarding the Baseline Risk Assessment in the summary provided in the RI. An additional exposure scenario associated with groundwater was evaluated in which the use of groundwater from on-site wells by potential future on-site workers was evaluated. In addition, although risks to off-site groundwater users is depicted to be less than 1E(-4), exposures to site-related contaminants at levels exceeding Health Advisories have been documented. Further, the Baseline Risk Assessment does not evaluate potential risks to off-site groundwater users presuming no response actions are taken at the IAAP. Under baseline conditions, releases to groundwater would continue, potentially increasing risks to off-site residents in the future. This is pertinent to assessing risks due to groundwater at the IAAP. Shortcomings with the ICAIR risk assessment were left unaddressed in some instances, based on agreements reached in a February 1996 Dispute Resolution (see attached).

Section 7.2 discusses the Ecological Risk Assessment, which is currently under revision subject to comments provided by EPA and the US Fish and Wildlife Service. It was our understanding

that the FFA parties agreed to address ecological risks in an additional OU. It would be appropriate to clarify this in the RI.

> ***Response**: The revised Draft-Final report has been modified to reference the on-going basewide Ecological Risk Assessment, which will be reported separately.*

4. Based on discussions at our January 22 project managers meeting, the FFA parties agree that additional data is required to define the nature and extent of contamination, along with evaluating potential contaminant transport mechanisms at the former Line 800 Pinkwater Lagoon. The FFA parties agreed to proceed with completing the Groundwater OU Feasibility Study (FS), Proposed Plan, and ROD according to current FFA schedules, but will withhold the Line 800 site from such documents, until additional data can be collected. The assessment of Line 800 would be included in the Groundwater OU documents upon completion. Please provide information as to the schedule for additional investigations at Line 800 as it becomes available.

Additional discussions at the January 22 meeting concerned information discussed in section 6.0 of the RI regarding contaminant fate and transport. It was our understanding that the transport modeling referenced from the JAYCOR RI report would be revised by Harza and the Army Corps of Engineers in the Groundwater FS. However, it would be appropriate that such revisions be carried back to the RI so that the RI and FS are consistent. A greater level of detail in the transport modeling should be provided in future documentation. Such detail should include the basis and applicability of the transport model used and any assumptions or parameters used in the model. A sensitivity analysis involving significant model parameters / assumptions may also be appropriate to demonstrate the applicability of possible remedial alternatives based on conclusions from the model. In addition, we are not certain that sufficient data is available to define potential bedrock transport pathways for purposes of defining remedial alternatives in the FS and wish to discuss this matter further. It may be instructive to further develop conceptual models for each of the subsites to illustrate the predominant transport routes.

> ***Response**: This comment has been overtaken by events with completion of supplemental RI at Line 800/Pink Water Lagoon and other studies such as the contaminant sources to surface water technical memorandum. These are referenced in the revised Draft-Final report. However, no specific changes are made in response to this comment.*

5. EPA has previously encouraged the Army to utilize groundwater monitoring data collected by Mason and Hanger to supplement the existing groundwater data base. Such data was incorporated in the Draft Final RI, however, it is unclear which data was used in the presentation of site characteristics - JAYCOR data, Harza data, or Mason and Hanger data. The nature of the data used in defining site characteristics should be established. Has all data utilized in this RI been evaluated to show it is of known and usable quality?

> ***Response**: The priority of use for analytical data in the Supplemental RI report is Harza's data, followed by Mason & Hanger Data, followed by Jaycor. Generally, we've used the most current data, supplemented by other sources where necessary. No specific validation process was*

completed by Harza on the Mason & Hanger or Jaycor data. However, the Jaycor data represents the RI and presumably was evaluated at that time.

6. Preliminary Remediation Goals for surface water and sediments based on protection of human health should be developed during the RI/FS process.

***Response**: We understand the ongoing basewide ecological risk assessment will lead to development of PRGs for sediment and surface water.*

SPECIFIC COMMENTS

1. Page 2-4, section 2.3.2 - Please clarify that all temporary monitoring wells associated with this RI have been or will be properly abandoned.

***Response**: All temporary wells have been properly abandoned. Construction drawings for temporary wells in Appendix D provide dates corresponding to abandonment.*

2. Page 3-43, paragraph 2 - Please clarify. Is Brush Creek recharged by groundwater at the extreme southern boundary of the IAAP? At what point does Brush Creek transition to a losing stream?

***Response**: Brush Creek appears to be recharged by groundwater within the IAAAP boundary. The transition appears to occur as the creek exits the Skunk River bluff onto the adjoining flood plain. This issue is being evaluated as part of separate off-site groundwater investigations.*

3. Page 5-1, section 5.2 - Please clarify why PRGs for DNT have been established at 1E(-4) risk levels rather than more conservative 1E(-6) levels.

***Response**: The revised Draft-Final report has been modified to levels available from USEPA for DNT are HALS equivalent to the 10-4 cancer risk and Region IX PRGs for non-carcinogenic effects. The HAL is lower than the Region IX PRG and was selected.*

4. Page 5-4, Figure 5-3 - Please clarify that Figure 5-3 represents the North Burn Pads Landfill.

***Response**: The figure title has been corrected to identify the North Burn Pads Landfill.*

5. Page 5-5, West Burn Pads - A well placed north of JAW-24 may be more in line with the direction of contaminant travel and could reveal higher levels of contaminant discharge to the creek than at JAW-24.

***Response**: No field investigations were conducted at the West Burn Pads in this Supplemental RI. In any event, this comment has been overcome by events with subsequent completion of investigations by USACE and a removal action.*

6. Page 5-6, Fire Training Area - The extent of the groundwater plume from the Fire Training Area appears to extend to the creek located south of the area. It was our understanding that the creek would be sampled as part of the removal action at the site this spring. Please clarify.

> ***Response**: No field investigations were conducted at the Fire Training Area in this Supplemental RI. This comment also appears to have been overcome by events with subsequent completion of investigations by USACE and a removal action.*

7. Page 5-12, Line 9 - It would appear that the extent of the VOC plume at Line 9 could be substantially larger than depicted. Since Freon has been identified as a sinker, has the vertical extent been adequately defined? Please clarify potential impacts to the development of alternatives in the FS.

> ***Response**: The text concedes that the extent of contamination at this site has not been fully delineated. Subsequent documents, such as the Groundwater Monitoring Program, indicate further investigation would be required at this site.*

8. Page 5-13, Yard L - The details of the groundwater contamination at well G-49 are unclear. We were unable to locate well G-49 on the basewide figure. Upon review of the 1992 Phase I RI Workplans (JAYCOR), it appears that well G-49 may have originally been defined as a background well. The source of contamination to G-49 should be defined. Is this a task which could reasonably be addressed as part of the "off-site groundwater" OU?

> ***Response**: G-49 is just south of Yard "L", south of Road "B", and northwest of Line 1. The report has been revised to more clearly indicate the location of the well. The source of any contamination in this well was not evaluated in this supplemental RI. However, it is noted that no PRGs were exceeded in subsequent (Fall 1999) sampling of this well.*

9. Page 5-15, Line 3A - Based on the presence of RDX in groundwater at 20-40 ppb, are additional monitoring wells needed to define the extent of the plume potentially migrating beyond IAAP boundaries? Does the absence of such wells negatively impact the development of alternatives in the FS?

> ***Response**: No field investigations were conducted at Line 3A in this Supplemental RI. Additional wells may be required to fully define the extent of contamination. However, subsequent off-site investigations along the base of the adjacent Skunk River Valley bluff in part address this item.*

10. Table 6-1 - The source /basis of the model parameters listed in the table should be presented and discussed in the text to validate your assumptions.

> ***Response**: The limited fate modeling in the Supplemental RI supplements that in the Jaycor RI and has largely been superceded by the subsequent Contaminant Source to Surface Water technical memorandum and planned modeling in the RI.*

11. Page 6-6, last paragraph - Are you stating that transport of contaminants thru bedrock and ultimate discharge to surface water is a more significant transport pathway than transport thru shallow groundwater and subsequent surface water discharge? Please clarify.

> ***Response**: There is no intent to suggest this. It is not completely clear which portion of the cited text suggests this conclusion. There is a statement that flow velocity may be greater in the bedrock (because of the nature of fracture flow). However, this does not impact evaluation of basewide contaminant transport, since most groundwater contamination is in the shallow system. No changes have been made specifically in response to this comment.*

12. Page 6-8, section 6.6 - For modeling purposes, it is inappropriate to assume that the sources of the releases responsible for groundwater contamination at the site(s) have been abated. The relationship between sources and groundwater plumes has not been clearly illustrated. Model assumptions should be revised accordingly to present a conservative assessment of potential transport. We suggest that the Soils OU Interim ROD (and related documents) be evaluated to identify the source areas which may be associated with the groundwater contaminant plumes shown in the Groundwater RI.

> ***Response**: This comment has been overcome by events with subsequent completion of the Contaminant Sources to Surface Water technical memorandum. These issues also are planned to be addressed further by modeling in the groundwater FS.*

13. Page 6-12, first paragraph – The point at which Brush Creek transitions from a gaining to a losing stream should be defined in the "off site groundwater" OU.

> ***Response**: Agree. No changes to the revised Draft-Final report are required in response to this comment.*

Comments Provided by Doug Pendrell (USACE), December 15, 1997

1. Section 1; Still need to delete all the references to Harza doing the work if it can be done without hurting the meaning of the discussion.

***Response**: Additional references to Harza have been deleted.*

2. 2.1, p.2-2; Check appendix numbering. Filter pack is in Appendix D. Well development s forms are in Appx. C.

***Response**: References to appendices have been corrected. Well Construction Drawings, including the Filter Pack, is in Appendix C and Well Development Forms in Appendix D.*

3. Figures 4-1 and 4-2; Locations of Sections not shown on 4-1. Correct legend on 4-2. Heavy line should be top of bedrock.

***Response**: These Figures have been revised to correct reference to section locations on Figure 4-4, rather than 4-1.*

4. 5.2.1, p.5-4; Are the bedrock wells referenced here, as well as other places throughout the report, screened entirely in the bedrock?

***Response**: Data available for the Supplemental RI are not sufficient to clearly answer this question in all cases. Subsequent data, such as from the West Burn Pads, suggest some wells may span the bedrock/drift contact. However, any bedrock wells or piezometers installed by Harza in the RI are entirely in the bedrock.*

5. 5.2.1, p. 5-5; Check figure numbering from here to end of report. Correct as necessary.

***Response**: Figure numbers have been checked and corrected, if necessary.*

6. 5.2.1, p.5-7, Table 5-6; Table appears to show 4 samples. Text suggests 2 samples. Please clarify.

***Response**: Text was revised to clarify that PRGs were slightly exceeded in two of the four samples listed in the table.*

7. 5.3.1, p.5-11; Edit the first sentence after Table 5-10. It is not very well written.

***Response**: Paragraph was revised.*

8. 5.3.1, p.5-12; G57 appears to be north of lagoon, not south. Please clarify.

***Response**: G57 has been corrected to G47, south of the lagoon.*

9. 5.3.1, p.5-12; Is location of G7 shown on figure?

***Response**: G7 was corrected to F7 in the text. F7 is shown on the drawing.*

10. 5.6, p.5-17; Should show locations of off-site wells in this document.

***Response**: At the time of this supplemental RI, well locations were not available to Harza.*

11. Figure 5-5; How come groundwater elevation for JAW-23 is not presented? Excuse my chemistry ignorance, but how can total explosives results be less than RDX concentration?

***Response**: A note has been added to the figure explaining that the tape was obstructed at the time of the measurements and no water level is available. The total explosives number has been corrected.*

12. Figures 5-10 & 5-11; Why were groundwater elevations left off these figures?

***Response**: Notes have been added to these figures referencing the potentiometric maps for these sites in other sections.*

13. Figure 5-1; Can the site names be made a bit darker? It is almost impossible to read some of the names, particularly Line 800.

***Response**: We have attempted to darken all site names.*

14. Figure 5-13; Identify H11F symbols in the legend.

***Response**: Direct push and temporary well symbols have been added to the legend.*

15. Responses to some previous comments indicate changes were made when in fact no changes were made. A couple of examples are responses to previous comments 32. b), 33, and 35. Although these were not major comments, written responses should reflect what gets incorporated into the text.

***Response**: These comments have been reviewed and additional revisions made where necessary.*