

**Pre-Design Investigation Data Summary Report
Terminal Railroad Association Soil Spoils Area
FUSRAP St. Louis Downtown Site
St. Louis, Missouri**

**Total Environmental Restoration Contract
Contract No. DACW41-98-D-9006
Task Order No. 0011**

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**Revision 0
August 6, 2008**

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Table of Contents

List of Tables	ii
List of Figures	ii
List of Appendices	ii
List of Abbreviations and Acronyms	iii
1.0 Introduction	1-1
2.0 Pre-Design Investigation Activities and Methods	2-1
2.1 Historical Information Review	2-2
2.2 Gamma Walkover Survey	2-3
2.3 Soil Borings	2-4
2.4 Investigation-Derived Waste	2-5
2.5 Inaccessible Areas	2-5
3.0 Pre-Design Investigation Results	3-1
3.1 Historical Information Results	3-1
3.2 Walkover Survey Results	3-2
3.3 Pre-Design Investigation Analytical Results	3-3
3.4 Geology, Hydrogeology, and Hydrology	3-4
4.0 Evaluation of Pre-Design Investigation Results	4-1
4.1 Data Quality Assessment	4-3
5.0 Summary and Conclusions	5-1
6.0 References	6-1

List of Tables

Table	Title
3-1	Terminal Railroad Association Soil Spoils Area Summary of Radionuclide Contaminants of Concern, Analytical Results with Radiological Contamination
3-2	Terminal Railroad Association Soil Spoils Area Pre-Design Investigation Radiological Data Results
4-1	Summary of Data Quality Assessment for the Terminal Railroad Association Soil Spoils Area Pre-Design Investigation
4-1A	Split Precision for Alpha Spec. Analyses for the Terminal Railroad Association Soil Spoils Area Pre-Design Investigation
4-1B	Duplicate Precision for Alpha Spec. Analyses for the Terminal Railroad Association Soil Spoils Area Pre-Design Investigation
4-1C	Split Precision for Gamma Spec. Analyses for the Terminal Railroad Association Soil Spoils Area Pre-Design Investigation
4-1D	Duplicate Precision for Gamma Spec. Analyses for the Terminal Railroad Association Soil Spoils Area Pre-Design Investigation

List of Figures

Figure	Title
1	Cover Sheet
2	Sample Locations
3	Walkover Survey Map
4A	Estimated Extent of Contamination (Sheet 1 of 2)
4B	Estimated Extent of Contamination (Sheet 2 of 2)

List of Appendices

Appendix	Title
A	Terminal Railroad Association Soil Spoils Area Boring Logs

List of Abbreviations and Acronyms

Acronym	Title
Ac	actinium
AEC	Atomic Energy Commission
ASTM	ASTM International
bgs	below ground surface
BNI	Bechtel National, Inc.
BNSF	Burlington Normal/Santa Fe
COCs	contaminants of concern
cpm	counts per minute
DOE	U.S. Department of Energy
DQO(s)	data quality objective(s)
FSSE	Final Status Survey Evaluation
FUSRAP	Formerly Utilized Sites Remedial Action Program
HTZ/HTR	alphabetical sample designations
HU	hydrostratigraphic unit
IT	International Technology Corporation
Mallinckrodt	Mallinckrodt Inc.
MED	Manhattan Engineer District
msl	mean sea level
NaI	sodium iodide
NFS	Norfolk Southern
Pa	protactinium
pCi/g	picocuries(s) per gram
PDI	pre-design investigation
PDIR	Pre-Design Investigation Data Summary Report
Ra	radium
ROD	Record of Decision
SAG	Sampling and Analysis Guide
SAIC	Science Applications International Corporation
Shaw	Shaw Environmental, Inc.
SLDS	St. Louis Downtown Site
SOR	sum-of-ratios
SOR _{net}	sum-of-ratios net
Th	thorium

List of Abbreviations and Acronyms (continued)_____

TRRA	Terminal Railroad Association
U	uranium
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey

1.0 Introduction

This Pre-Design Investigation Data Summary Report (PDIR) documents the results of a pre-design investigation (PDI) at the Terminal Railroad Association Soil Spoils Area (TRRA Soil Spoils Area). The TRRA Soil Spoils Area is bounded to the north by Branch Street, to the east by the Grossman Iron and Strategic Materials Company, to the south by North Market Street, and to the west by the St. Louis Produce Market Inc. property (Produce Row) and the United Fruit Produce Company property (Figure 1).

The PDI activities at the TRRA Soil Spoils Area were completed in accordance with the *Pre-Design Investigation Work Description, FUSRAP St. Louis Downtown Site, St. Louis, Missouri* (Work Description) (Shaw, 2004) as amended by an appendix to the Work Description published separately, entitled *Appendix B.6 Pre-Design Investigation Work Scope for the Terminal Railroad Association (TRRA) Soil Spoils Area Vicinity Properties (Appendix B.6)* (Shaw Environmental, Inc. [Shaw], 2007). In addition, the PDI activities were performed in accordance with the *Sampling and Analysis Guide for the St. Louis Sites, St. Louis, Missouri* (SAG) (USACE, 2000). The purpose of the PDI activities at the TRRA Soil Spoils Area was to evaluate the potential for radiological contamination to be present and/or associated with subsurface features that may have harbored or transported radiological contaminants of concern (COCs), further delineate the horizontal and vertical extent of areas of radiological contamination that were identified during the gamma walkover survey activities, and, as appropriate, complete final status survey sampling.

Through the direction of the U. S. Army Corps of Engineers (USACE), Science Applications International Corporation (SAIC) performed a gamma walkover survey and collected biased soil samples throughout the TRRA Soil Spoils Area between May and June 2006. Based on the results of the gamma walkover surveys and biased sampling, the USACE directed that PDI activities be completed for the TRRA Soil Spoils Area. The PDI activities were performed between April and August of 2007 by Shaw. The PDI activities were conducted through the Formerly Utilized Sites Remedial Action Program (FUSRAP). The FUSRAP was developed in 1974 by the Atomic Energy Commission (AEC) (now the U.S. Department of Energy [DOE]) to identify and clean up or otherwise control sites where radioactive materials remained from activities carried out under contract to the Manhattan Engineer District (MED) and the AEC during the early years of the nation's atomic energy program (Bechtel National, Inc. [BNI], 1994). Subsequently, Congress transferred responsibility for the FUSRAP to the USACE.

The *Record of Decision for the St. Louis Downtown Site, St. Louis, Missouri* (ROD) (USACE, 1998) identified the St. Louis Downtown Site (SLDS) as requiring remediation of radiological and chemical contamination. In the context of this PDIR, radiological contamination is defined as the presence of radiological COCs in an individual soil sample or group of samples at net concentrations (above the background concentrations) that exceed the ROD remediation criteria. The background concentrations used for the evaluations in this PDIR are defined by the arithmetic mean of the distribution of background measurements that were reported in the *Background Soils Characterization Report for the St. Louis Downtown Site* (USACE, 1999).

Note that the presence of COCs at concentrations that exceed the ROD remediation criteria in an individual sample or group of samples might not exceed ROD remedial goals, as ROD remedial goals are based on the average concentration of the SLDS COCs within the entire population of data that are above the site background distribution for a 100-square-meter area. The determination of whether ROD remedial goals are exceeded is not part of this PDIR. This determination will be completed as part of the Final Status Survey Evaluation (FSSE) to be conducted in accordance with the *Final Status Survey Plan for Accessible Soil Within Mallinckrodt Property and Vicinity Properties, Excluding Plants 1, 2 and the City Property at the St. Louis Downtown Site, St. Louis, Missouri* (USACE, 2002).

As identified by the ROD, the radiological COCs at the SLDS consist of uranium (U)-238 and its daughters, especially thorium (Th)-230 and radium (Ra)-226, U-235 and its decay products including protactinium (Pa)-231 and actinium (Ac)-227, and Th-232 and its progeny. The SLDS consists of the Mallinckrodt Inc. (Mallinckrodt) plant (a chemical manufacturer) and surrounding vicinity properties. The TRRA Soil Spoils Area was included as a SLDS vicinity property as part of the non-significant changes to the ROD (USACE, 2005). According to information obtained from the City of St. Louis Department of Property Records, the TRRA Soil Spoils Area consists of several land parcels that are owned by the Norfolk Southern Railroad (NFS), the City of St. Louis, and the Terminal Railroad Association (Figure 1).

The investigation activities conducted at the TRRA Soil Spoils Area and the radiological results obtained during these activities are described in this PDIR. Achievement of remedial goals for the SLDS COCs will be confirmed as part of the FSSE for this property, and the results will be included in the Post-Remedial-Action Report.

2.0 Pre-Design Investigation Activities and Methods

Activities performed as part of the PDI consisted of a historical information review, review of walkover surveys and biased soil results, and the collection of potential Class 2, potential Class 3, and PDI soil samples and subsequent data review. Note: the use of the phrase “potential Class 2” and “potential Class 3” denotes sample locations that were initially used for PDI purposes, but may also be used for FSSE purposes if the associated SOR_{net} value is less than 1.0. The PDI activities and their associated method(s) of implementation are summarized in the following subsections. Discussions of investigation-derived waste and inaccessible areas are also summarized.

Soil samples were collected from sample locations throughout the TRRA Soil Spoils Area as part of the PDI (see Figure 2). The soil sample locations included 29 potential Class 2 sample locations, 13 potential Class 3 sample locations, 20 PDI sample locations, 21 HTZ sample locations, and 6 HTR sample locations (Note: HTZ and HTR samples are biased walkover survey samples exhibiting elevated count rates based on 2x2 sodium iodide [NaI] detector readings). The term “sample location” is defined as a soil boring location (via hand auger or drill rig) or a surface sample location from which soil samples were obtained. The specific sampling method used at a respective sample location is specified on the soil boring logs in Appendix A (with the exception of HTZ/HTR and surface-sample-only locations for which boring logs are not required).

Soil samples were submitted to the St. Louis FUSRAP Laboratory and analyzed by gamma and alpha spectroscopy for the SLDS radiological COCs. After completing the analyses, the results were used as the input for interpretation of the PDI results. The gross radiological soil sample results (not corrected for the arithmetic mean site background concentrations) for each sample were imported into a working database. Analytical data tables (see Section 3.0) were then generated using the working database. These data tables contain the gross analytical results and associated sum-of-ratios_{net} (SOR_{net}) value for each sample after correction for contribution from background. The equations used to calculate the SOR_{net} values for samples from 0 to 0.5 feet below ground surface (bgs) and samples from greater than 0.5 feet bgs are as follows:

Samples from 0 to 0.5 feet bgs (the ground surface begins at the topographic surface):

$$SOR_{net} = \frac{\text{Greater of Ra-226 or Th-230}}{5 \text{ pCi/g}} + \frac{\text{Greater of Ra-228 or Th-232}}{5 \text{ pCi/g}} + \frac{U-238}{50 \text{ pCi/g}}$$

Where pCi/g = picocuries per gram

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Samples greater than 0.5 feet bgs:

$$\text{SOR}_{\text{net}} = \frac{\text{Greater of Ra-226 or Th-230}}{15 \text{ pCi/g}} + \frac{\text{Greater of Ra-228 or Th-232}}{15 \text{ pCi/g}} + \frac{\text{U-238}}{50 \text{ pCi/g}}$$

Where pCi/g = picocuries per gram

The calculated SOR_{net} value for each sample was compared to the ROD remediation criteria (USACE, 1998) to determine if radiological contamination was present. A sample with an SOR_{net} value greater than or equal to 1.0 was assumed to be contaminated. If contamination was identified, the available data and information were evaluated further to estimate the vertical and horizontal extent of radiological contamination. The term “contamination”, as defined in Section 1.0 and used herein, differs from the remedial goals usage in that the remedial goals are based on the average concentration of SLDS COCs within the entire population of data that are above the site background distribution for a 100-square-meter area.

The evaluation of the estimated extent of contamination was performed considering adjacent sample analytical data and information pertaining to historical or geological features controlling the soil or contaminant deposition in the sample location area. Also considered was information pertaining to nearby structural features or barriers that might limit or influence the path of migration of contamination in a preferred direction. It should be noted that when radiological contamination was detected within a sample from a particular sample interval (e.g., from 0 to 0.5 feet bgs) it was conservatively assumed that the depth of the contamination at that location extended to the top of the next sampled interval that did not contain radiological contamination, or to the top of a structural or geological barrier. Upon completion of this evaluation, contours depicting an estimation of the extent of contamination were developed.

2.1 Historical Information Review

A review of available historical information sources and documents was performed as part of the planning for the PDI in order to gain insight as to when land development activities and/or related physical changes may have occurred at the TRRA Soil Spoils Area and surrounding properties. These land development activities/changes included the placement of fill material, earth movement activities that may have altered the topography, and the addition, removal, or modification of man-made structural elements. Historical drainage/erosional features, if present, were also identified. Land development activities and the locations of drainage/erosional features were then compared with Mallinckrodt operational activities and their associated time frames to identify features that may harbor radiological contamination and/or exceed the ROD remediation goals (USACE, 1998). Consideration was given to the identification of changes to the topographic surface at the TRRA Soil Spoils Area before, during, and following MED/AEC

operations in order to identify buried or topographically elevated soil horizons that may contain SLDS COCs.

In general, the topographic surface and subsurface at the SLDS consists mostly of fill material overlying alluvial deposits referred to as the “natural, in situ soil horizon.” This natural, in situ soil horizon serves as a marker horizon because its homogeneity across the SLDS makes it easily identifiable during subsurface investigations. It also provides a reference horizon that indicates that the subsurface investigation is below the topographic surface that would have been present during and after Mallinckrodt’s MED/AEC operational activities. Historical features for the TRRA Soil Spoils Area were identified utilizing the following historical information sources and documents:

- Historical topographic maps (U. S. Geological Survey [USGS], 1933, 1935, 1937, 1940, 1950, 1954, 1968, 1993)
- Eighty-six aerial photographs covering approximately 36 dates provided by the USACE, Geospatial Engineering Branch (USACE, 2001)

The historical information review also included an evaluation of the investigation activities described in the *Radiological, Chemical, and Hydrogeological Characterization Report for the St. Louis Downtown Site in St. Louis, Missouri* (Characterization Report) (BNI, 1990), the *Remedial Investigation Report for the St. Louis Downtown Site, St. Louis, Missouri* (Remedial Investigation Report) (BNI, 1994), and the *Remedial Investigation Addendum for the St. Louis Downtown Site, St. Louis, Missouri* (Remedial Investigation Report Addendum) (SAIC, 1995). The results of these reports were reviewed and evaluated in light of the investigation activities that were conducted along the portions of the Terminal Railroad, Norfolk Southern Railroad, and the Burlington Northern/Santa Fe Railroad lines that traverse through the SLDS.

2.2 Gamma Walkover Survey

Between May and June, 2006, an initial gamma walkover survey was performed by SAIC in accordance with the *Multi-Agency Radiation Survey and Site Investigation Manual* (U.S. Nuclear Regulatory Commission, et al., 2000) to determine if areas of elevated radiological activity were present on the TRRA Soil Spoils Area. The walkover surveys were completed utilizing a 2x2 sodium iodide (NaI) detector together with a global positioning system. Additionally, walkover surveys were performed during the April through August 2007 PDI activities to determine if elevated radiological activity was present at locations that were unavailable for walkover surveys in 2006 and to help locate elevated radiological areas within features of interest that were identified during the development of the Work Description (Shaw, 2004).

2.3 Soil Borings

The PDI soil borings were drilled using a Central Mine Equipment 75 drill rig equipped with 3.25-inch inside diameter hollow stem augers. Soil samples were collected using a 2-foot-long by 3-inch outside diameter steel split-spoon sampling device. The split spoon was driven in advance of the hollow stem auger using a 140-pound automatic drop hammer through a 30-inch drop height. After each 2-foot evaluation length was collected, the augers were advanced 2 feet to the bottom of the previous sample interval and the procedure repeated until boring completion.

Where conditions would not allow the use of a drill rig (e.g., overhead power lines, proximity of structures, etc.), soil borings were completed using a 0.5-foot-long by 3-inch outside diameter steel auger. Extensions for the hand auger shaft allowed for the collection of soil samples to a depth of 6 feet bgs. Hand-augered borings were advanced at 0.5-foot increments with a pre-cleaned or decontaminated steel sample bucket. The sample bucket was slowly lowered to the bottom of the borehole to prevent dislodging of sidewall material from the borehole. The depth of penetration of the auger was closely monitored via tape measure to ensure that the retrieved soil sample was representative of the appropriate sample interval.

The soil cores were field screened for radiological activity using a Ludlum Model 2221 together with a Ludlum Model 44-10 (2x2 NaI detector). During drilling activities, soil was screened for volatile organic compounds within the breathing zone for health and safety purposes using either a photoionization or flame ionization detector. The field geologist identified and lithologically described the soil using ASTM International (ASTM) Method D2488-06, "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)" (ASTM, 2006). The field geologist also determined whether more than 33 percent of the soil in a given 2-foot evaluation length was unrecoverable. If the field geologist determined that the soil within the given evaluation length was not sufficiently recovered or was "slough" material originating from upper intervals, a soil sample from the same depth at an adjacent location was collected. The lithology, recovery information, and screening results were recorded on the soil boring log at the time of boring advancement. If applicable during logging, particular attention was paid to identifying the existence of remnant surface soil horizons, erosional zones, or other historical indicators (e.g., debris zones). The boring logs for drilling and/or hand augering at the TRRA Soil Spoils Area are included in Appendix A. The equipment used to collect soil samples was cleaned and decontaminated in accordance with the SAG (USACE, 2000).

Soil samples collected from the 0.5-foot interval of interest were placed in 1-quart containers with tight-fitting lids and submitted for analysis of the SLDS radiological COCs. These samples were submitted to the St. Louis FUSRAP Laboratory under chain-of-custody, in accordance with

SAG procedures (USACE, 2000). Soil boring samples collected for archiving were placed in sealable plastic bags. The archived samples were then transported to the on-site storage trailer under chain-of-custody in accordance with SAG procedures.

Upon completion, each boring was backfilled in accordance with the SAG (USACE, 2000) or as directed by the USACE. Subsequent to backfilling the soil borings, each location was either civil surveyed or its distance measured from a known point (nearby surveyed feature).

2.4 Investigation-Derived Waste

Investigation-derived waste generated during the PDI activities included personal protective equipment, soil cores or cuttings, disposable sampling equipment, decontamination fluids, and plastic sheeting. As specified in the SAG (USACE, 2000), waste generated during field activities was containerized at the site for future disposal by the USACE.

2.5 Inaccessible Areas

Working within the framework of the ROD, inaccessible areas at the SLDS (which include the TRRA Soil Spoils Area) comprise those areas beneath existing buildings and other permanent structures such as active roads, active rail lines, and the levee (USACE, 1998). The inaccessible areas at the TRRA Soil Spoils Area include the active rail lines, the rail beds, and the areas that are adjacent to the active rail lines that are within 10 feet of each outermost rail (see Figure 1). These areas were not part of this PDI and are not included here.

3.0 Pre-Design Investigation Results

Pre-design investigation results include the soil analytical results, radiological walkover survey results, the results from the historical information review, and the geological and hydrogeological conditions of the TRRA Soil Spoils Area. Analytical results for those soil samples that exhibited radiological contamination are summarized in Table 3-1. Analytical results for all soil samples collected are presented in Table 3-2.

3.1 Historical Information Results

BNI/SAIC performed a remedial investigation at the SLDS between 1986 and 1992 to “...determine the extent of radioactive contamination, to delineate any chemical contamination associated with such radioactive contamination, and to characterize the properties geological and hydrogeological features” (BNI, 1994). The overall assessment of the historical analytical soil sample results that were collected during the remedial investigation was that “Characterization results for soil samples collected at SLDS indicate that contamination is widespread across the property. Radioactive material is present in areas near or beneath buildings that were associated with MED/AEC operations. The radioactive contaminants at SLDS are U-238, Ra-226, Th-232, and Th-230. Depths of contamination ranges from the surface to 7 m (23 feet)” (BNI, 1994). Although the overall assessment of the remedial investigation was that contamination was widespread across the SLDS to depths ranging from surface to 23 feet, no soil samples were collected during the remedial investigation activities on the properties that comprise the TRRA Soil Spoils Area.

Based on a review of the aerial photographs (USACE, 2001), the TRRA Soil Spoils Area appears to have been used primarily as a railroad switching yard for the three main rail lines that traverse the SLDS (the TRRA, the Norfolk Southern Railroad [NFS], and the Burlington Northern/Santa Fe Railroad [BNSF]) and a loading and unloading area for railway-transported goods since at least 1941. The three rail lines mentioned above converge in the northern portion of the TRRA Soil Spoils Area before continuing to the south. Loading and unloading activities appear to have been conducted primarily along the western edge of the TRRA Soil Spoils Area. Between 1990 and 1992, railcar loading and unloading activities appear to have decreased. In the 1992 aerial photograph, and subsequent photographs, the areas that previously appeared to be loading and or unloading areas appear to be paved over (areas along the western edge of the TRRA Soil Spoils Area) or appear to be covered with vegetation. Rail-line switching activities for the TRRA, NFS, and BNSF Rail roads still continue to-date.

3.2 Walkover Survey Results

As depicted on Figure 3, areas of elevated radiological activity indicated primarily by the areas of red and black coloration were observed at various locations throughout the TRRA Soil Spoils Area. Based on the results from the walkover survey, 12 areas were identified within the TRRA Soil Spoils Area that appeared to have elevated radiological activity. Five areas of elevated radiological activity were within the northern third of the TRRA Soil Spoils Area; three were within the central third; and four within the southern third (see Figure 3). To determine if these areas contained radiological COCs that exceed ROD (USACE, 1998) remedial goals, biased surface soil samples (HTZxxxxx) were collected and submitted for radiological analysis.

Thirteen HTZ sample locations were identified and sampled within the five radiologically elevated areas in the northern third of the TRRA Soil Spoils Area. Four sample locations (HTZ94850, HTZ94882, HTZ94883, and HTZ94916) were identified between the NFS and TRRA lines; six sample locations (HTZ94840, HTZ94841, HTZ94842, HTZ94843, HTZ94844, and HTZ94845) were identified near the western edge of the active portion of the NFS rail line; and three sample locations (HTZ94849, HTZ94881, and HTZ94917) were located near the abandoned rail spur located to the west of the active NFS rail line (see Figures 2 and 3). Based on the results from these 13 HTZ sample locations, only two indicated the presence of radiological COCs that exceed ROD remediation criteria; HTZ94881 ($SOR_{net}=56$) and HTZ94883 ($SOR_{net}=1.3$) (see Table 3-1). The radiological results for the remaining HTZ soil samples located in the northern third of the TRRA Soil Spoils Area are given in Table 3-2.

Three HTZ sample locations were identified and sampled within the radiologically elevated areas in the central third of the TRRA Soil Spoils Area, one within each of the radiologically elevated areas. One sample location was identified within an area located adjacent to the western edge of TRRA/NFS rail lines (HTZ94846); one sample location was identified within an area located to the southwest of HTZ94846 (HTZ94847); and the third sample location was identified within an area located on the southwestern edge of the central third of the TRRA Soil Spoils Area (HTZ94848) (see Figures 2 and 3). Radiological results of each HTZ sample location indicated that radiological COCs were not present at concentration levels that would result in SOR_{net} values that were greater than or equal to 1.0. The radiological results for these sample locations can be found in Table 3-2.

Five HTZ sample locations were identified and sampled within the radiologically elevated areas in the southern third of the TRRA Soil Spoils Area. One sample location, located in the northeastern edge of this area, was identified within an area located adjacent to the western edge of the TRRA/NFS rail lines (HTZ94912); two sample locations were identified to the southwest

of HTZ94912 (HTZ94913 and HTZ94914); and two sample locations were identified within the southern portion of the TRRA Soil Spoils Area (HTZ94911 and HTZ94915) (see Figures 2 and 3). None of the HTZ sample results indicated the presence of radiological COCs with an SOR_{net} value that was greater than or equal to 1.0. The radiological results for these sample locations are given in Table 3-2.

3.3 Pre-Design Investigation Analytical Results

The results from HTZ sample locations HTZ94881 and HTZ94883 mentioned in Section 3.2 indicate that radiological COCs are present at the TRRA Soil Spoils Area at concentration levels that result in SOR_{net} values that are greater than or equal to 1.0. These sample locations are located in the northern third of the TRRA Soil Spoils Area. Sample location HTZ94881 is located along an abandoned rail spur on the western edge of the TRRA Soil Spoils Area (Area 1 on Figure 4A), and sample location HTZ94883 is located between the NFS and TRRA rail lines on the eastern edge of the TRRA Soil Spoils Area (Area 2 on Figure 4A). To delineate the vertical and horizontal extent of radiological contamination in these two areas, additional soil sample locations were identified and sampled to 6.0 feet bgs. Four sample locations (SLD101312, SLD101316, SLD101320, and SLD101324) were used to delineate the area around HTZ94881, and five sample locations (SLD101198, SLD101202, SLD101226, SLD101230, and SLD101234) were used to delineate the area around HTZ94883. Three of the delineation sample locations indicated that radiological COCs were present at concentration levels that resulted in SOR_{net} values that were greater than 1.0; one within Area 1 (SLD101312) and two within Area 2 (SLD101202 and SLD101234) (see Table 3-1).

The sample results from SLD101312 indicate that radiological contamination within the Area 1 soils appears to extend from the surface to a depth of approximately 2.5 feet bgs (see Table 3-1). Radiological COC concentrations appear to decrease with depth at this location as indicated by the radiological results from the 5.0 to 5.5-foot bgs interval, which has a resultant SOR_{net} value less than 1.0 (see Table 3-1). The remaining three delineation sample locations for Area 1 indicate that radiological COCs are at concentration levels that result in SOR_{net} values that are less than 1.0 (see Table 3-2).

The sample results from SLD101202 and SLD101234 indicate that radiological contamination within the Area 2 soils appears to extend from the surface to a depth of approximately 0.5 foot bgs (see Table 3-1). Radiological COC concentrations appear to decrease with depth at these sample locations as indicated by the radiological results from the 0.5 to 1.0-foot bgs sample interval at SLD101202 and by the 1.5 to 2.0-foot bgs sample interval at SLD101234. Both sample intervals had resultant SOR_{net} values that were less than 1.0 (see Table 3-1). The

remaining three delineation sample locations for Area 2 indicate that radiological COCs are at concentration levels that result in SOR_{net} values that are less than 1.0 (see Table 3-2).

In addition to Areas 1 and 2, two potential Class 2 sample locations (SLD101278 and SLD101284) were identified as containing concentration levels of radiological COCs that resulted in SOR_{net} values that were greater than 1.0 (see Table 3-1). Both sample locations are located in the southern portion of the TRRA Soil Spoils Area, within the parcel that is owned by the City of St. Louis (see Figures 2, 3, and 4B). The radiological results for sample location SLD101278 (Area 3) indicate that radiological contamination extends from the surface to approximately 1.0 feet bgs, and the radiological results for sample location SLD101284 (Area 4) indicate that radiological contamination extends from the surface to approximately 0.5 feet bgs. Radiological results of subsurface samples of SLD101278 and SLD101284 indicate that radiological COC concentrations decrease with depth and result in SOR_{net} values that are less than 1.0 (see Table 3-1).

To determine the lateral extent of radiological contamination within Areas 3 and 4, three biased HTR sample locations were identified, and soil samples were collected within each Area. Biased sample locations HTR105391, HTR105392, and HTR105393 were used to delineate around SLD101278 (Area 3), and sample locations HTR105394, HTR105395, and HTR105396 were used to delineate around SLD101284 (Area 4) (see Figures 2, 3, and 4B). The sample results from these biased sample locations indicate no radiological COCs present at concentration levels that would result in SOR_{net} values that would be greater than or equal to 1.0 (see Table 3-2).

3.4 Geology, Hydrogeology, and Hydrology

The current topographic ground surface of the TRRA Soil Spoils Area consists of approximately 80 percent unconsolidated cover materials. The remainder of the property consists of consolidated cover material (primarily concrete). The concrete-covered area is located along the western side of the property, adjacent to St. Louis Produce Market, Inc.

The regional geological setting of the subsurface soils at the SLDS is generally characterized from surface to the top of bedrock by a fill layer which overlays alluvial sediments (USACE, 1998). The fill, discernable as multiple horizons at most locations, has an average thickness of 13 feet and may contain concrete, brick, glass, coal cinders, slag material, and/or other miscellaneous material that was placed on top of the original flood plain sediments in the late 1800s and early 1900s (USACE, 1998). The alluvial flood plain deposits underlying the fill material consist of stratified clays, silts, sands, and gravels that range in thickness from 5 to 30 feet.

The geological setting of the subsurface soils at the TRRA Soil Spoils Area can be characterized to 6 feet bgs as primarily urban fill material with some soil components. The urban fill material was characterized as consisting primarily of coarse sand to fine gravel size cinders and slag, with intermittent layers of bricks and wood. In addition to the urban fill material, silty sand and silty clay soils were also identified as being intermingled within the matrix of these fill material layers. The natural, in situ soil horizon was not readily identified at the sampled locations.

Ground water at the SLDS has been identified within three hydrostratigraphic units (HU): HU-A, HU-B, and HU-C. HU-A comprises the fill material and the upper portion of the underlying alluvial deposits. HU-B, also called the Mississippi Alluvial Aquifer, comprises the lower portions of the alluvial deposits and consists of sands and silty sands. HU-C is located within the limestone bedrock. Ground water in the St. Louis area is generally of poor quality and does not meet drinking water standards without treatment (USACE, 1998). The PDI drilling and sampling activities for the TRRA Soil Spoils Area were within the HU-A, however, ground water was not encountered.

According to data that were compiled and reported by the USGS, four Mississippi River flood events occurred during the years that the MED/AEC was operating at Mallinckrodt. These flood events had peak flow elevations that were at or above 419 feet mean sea level (msl) (USGS, 2004) and would have resulted in floodwaters inundating unprotected areas of Mallinckrodt and surrounding vicinity properties that were at or below the respective flood elevations. These flood events occurred in 1943 and 1944, both with peak river elevations of 419 feet msl, and in 1947 and 1951, both with peak river elevations of 420 feet msl. A 1933 topographic map (USGS, 1933) with a 5-foot contour interval indicates that the topographic elevation for the TRRA Soil Spoils Area was between 420 feet msl along the eastern side of the area and 425 feet msl on the western side of the area. Two aerial photographs, one taken on July 3, 1947, and the second an oblique aerial photograph from 1951 (taken most likely in July) depict the approximate areal extents of the Mississippi River flood events that occurred during the two respective years. Although the 1951 aerial photograph does not provide coverage of the TRRA Soil Spoils Area, it is noted that the floodwater extents from both flooding events appeared to be similar. In both the 1947 and the 1951 aerial photographs, floodwaters are observed along streets, railroad lines, and unprotected areas. In the 1947 aerial photograph, floodwaters are observed up to the eastern edge of the TRRA Soil Spoils Area. The floodwaters appear to extend to, but not beyond, the edge of the TRRA rail line that traverses north-south along the eastern boundary of the TRRA Soil Spoils Area.

4.0 Evaluation of Pre-Design Investigation Results

The walkover survey and analytical results from the PDI of the TRRA Soil Spoils Area were evaluated in conjunction with the relevant geological and historical data to determine if radiological COCs were present at concentrations that would result in SOR_{net} values that were greater than or equal to 1.0 and if so, determine the estimated extent of radiological contamination. Based on this evaluation, four areas within the TRRA Soil Spoils Area were identified as containing radiological contamination (see Figures 4A and 4B). Two of the areas were identified in the northern half of the TRRA Soil Spoils Area (see Figure 4A) and two were located in the southern half (see Figure 4B).

As discussed in Section 3.2, the two northern areas were identified during the walkover survey activities. Based on the results from the walkover survey and the PDI activities, both areas appear to be vertically and horizontally delineated. Radiological contamination identified within Area 1 appears to be limited to a relatively small area along an abandoned rail spur. The area of radiological contamination identified within Area 2 appears to be slightly larger and is located between the active rail lines of the NSF and the TRRA (see Figure 4A).

Area 1 was initially identified during the gamma walkover survey. Biased sample HTZ94881, collected from 0.0 to 0.5 feet bgs, had a resultant SOR_{net} value of 56. This SOR_{net} value confirmed the presence of radiological COCs. During the PDI activities, four soil borings were drilled and sampled around HTZ94881 in order to delineate the extent of radiological contamination. One PDI soil boring (SLD101312) was drilled at or near the location of HTZ94881 in order to determine the vertical extent of contamination, and the remaining PDI borings (SLD101316, SLD101320, and SLD101324) were drilled in order to determine the horizontal extent of contamination. Based on the results from these soil borings, radiological contamination appears to extend vertically to at least 2.5 feet bgs. Subsurface sample SLD101314, from location SLD101312, had a resultant SOR_{net} value of 2.6. Radiological contamination does not appear to extend beyond 5.5 feet bgs as evident from the sample results from SLD101315 ($SOR_{net} = 0.09$).

To help bound the horizontal extent of contamination around HTZ94881 and SLD101312, the 2x2 NaI detector was used to identify where the elevated radiological activity began to decrease. Utilizing the NaI detector, sample locations SLD101316, SLD101320, and SLD101324 were identified. The analytical results from these sample locations indicate no radiological COCs present at concentration levels that would result in SOR_{net} values that were greater than or equal

to 1.0. Based on the results from the delineation sample locations, the area of radiological contamination identified in Area 1 was delineated horizontally and vertically (see Figure 4A).

Area 2 was also identified during the initial gamma walkover survey, and the biased HTZ sample (HTZ94883), collected from 0.0 to 0.5 feet bgs, had a resultant SOR_{net} value of 1.3. During the PDI activities, five PDI soil borings were drilled and sampled around HTZ94883 to delineate the extent of radiological contamination. One PDI soil boring (SLD101198) was drilled at or near the location of HTZ94883 in order to determine the vertical extent of contamination, and the remaining PDI borings (SLD101202, SLD101226, SLD101230, and SLD101234) were drilled in order to determine the horizontal extent of contamination. Additionally, two potential Class 2 sample locations (SLD101218 and SLD101246) were also used to help delineate the extent of radiological contamination in this area. Based on the results from the walkover survey and biased soil sample results, radiological contamination appeared to be within the first 0.5 feet of the ground surface.

To help bound the extent of contamination in Area 2, the 2x2 NaI detector was used to identify where the elevated radiological activity began to decrease. Based on the information obtained from the 2x2 NaI detector, PDI sample locations SLD101202, SLD101226, SLD101230, and SLD101234, were identified and sampled. The surface samples collected from sample locations SLD101202 and SLD101234 had resultant SOR_{net} values of 1.4 and 1.1, respectively, and sample location SLD101198, which was used to help determine the vertical extent of HTZ94883, had a resultant SOR_{net} value of 0.70. Subsurface samples collected from 0.5 to 1.0 foot bgs at sample locations SLD101198 and SLD101202 had resultant SOR_{net} values of 0.36 and 0.20, respectively. The subsurface radiological results obtained from 1.5 to 2.0 feet bgs at sample locations SLD101218, SLD101226, SLD101230, SLD101234 and SLD101246, indicated that the concentrations of radiological COCs were at or near background concentration levels. Utilizing the information obtained from the soil borings, and the results of their associated soil samples, the vertical extent of radiological contamination appears to extend to a depth of approximately 1.0 feet bgs.

The horizontal extent of contamination was determined using the results of the walkover survey, the soil information and sample results obtained from the soil borings, and information obtained from the historical review. As discussed in Section 3.1, historical aerial photographs indicate that the TRRA Soil Spoils Area was used as a railroad switch yard and loading/unloading area for railway-transported goods from about 1941 until 1992. From these aerial photographs, several rail lines having a north-northwest orientation were identified near Area 2. The walkover survey results for Area 2 also indicate that the area of elevated radiological activity has a north-

northwest orientation (see Figure 3). Based on this information and the information obtained from the soil borings, the horizontal extent of contamination in Area 2 appears to be situated in an area that is 12 feet wide by 100 feet long (see Figure 4A).

The two southern areas of radiological contamination were identified based on the analytical results from potential Class 2 sample locations SLD101278 (Area 3) and SLD101284 (Area 4) (see Figure 4B). The radiological results from the surface samples at these locations had resultant SOR_{net} values of 1.1 for SLD101278 and 2.5 for SLD101284 (see Table 3-1). The ground surface area where these samples were collected consisted of silt with cinders and fine gravel and sand. The subsurface sample result from sample location SLD101278, from 1.0 to 1.5 feet bgs, had a resultant SOR_{net} value of 0.17 and the subsurface sample result from sample location SLD101284, from 0.5 to 1.0, had a resultant SOR_{net} value of 0.00. Based on the results from these soil borings, radiological contamination does not appear to extend beyond 1.0 foot bgs in Area 3 and 0.5 foot bgs in Area 4. To help bound the horizontal extent of contamination around SLD101278 and SLD101284, the 2x2 NaI detector was used to identify where the elevated radiological activity began to decrease. Based on the readings from the NaI detector, six HTR sample locations were identified and sampled: three for SLD101278 (HTR105391, HTR105392, and HTR105393) and three for SLD101284 (HTR105394, SLD105395, SLD105396). The analytical results from these sample locations and two HTZ sample locations near SLD101278 (HTZ94913 and HTZ94914) indicated no radiological COCs present at concentration levels that would result in SOR_{net} values that were greater than or equal to 1.0 (see Table 3-2). Utilizing the results from the above sample locations and the walkover survey results, the horizontal extent of radiological contamination was determined for Area 3 and Area 4 (see Figures 3 and 4B).

4.1 Data Quality Assessment

Data quality objectives (DQOs) were established for the PDI of the TRRA Soil Spoils Area in accordance with U.S. Environmental Protection Agency guidance (U.S. Environmental Protection Agency, 2000). The DQOs provide qualitative statements that clarify the analytical project objectives based on the end use of the data being collected. The data quality assessment results for the TRRA Soil Spoils Area are presented in Table 4-1.

5.0 Summary and Conclusions

The PDI activities at the TRRA Soil Spoils Area were conducted to determine whether radiological contamination (as defined in Section 1.0) exists at the vicinity property, to assess whether geological and historical features are associated with or harbor radiological contamination, and to determine the extent of radiological contamination, if identified. The PDI activities at the TRRA Soil Spoils Area were performed between May and June 2006 (walkover survey and biased soil sampling) and April through August 2007 (PDI sampling). Field activities included gamma walkover survey and biased soil sampling of accessible areas, and the collection of soil samples for analysis of the SLDS radiological COCs from 90 sample locations. Based on the results of the gamma walkover survey and subsequent soil sampling activities, four areas were identified as containing concentrations of radiological COCs with resultant SOR_{net} values that were greater than or equal to 1.0. Two of the areas (Area 1 and Area 2) were identified in the northern portion of the TRRA Soil Spoils Area (see Figure 4A) and two areas (Area 3 and Area 4) were identified in the southern portion (see Figure 4B). Radiological activity concentrations in soils at each area were vertically and horizontally delineated using the results of the walkover surveys and subsequent biased and PDI soil sampling activities.

As discussed in Section 3.2, the two northern areas were initially identified during the walkover survey and subsequent biased sampling activities. During the PDI activities, these two areas were delineated to determine the vertical and horizontal extent of radiological contamination. Four PDI soil borings were used to delineate Area 1 and five PDI and two potential Class 2 soil borings were used to delineate Area 2 (see Figure 4A). Based on the available data, the areal extent of contamination in Area 1 appears to be confined to an area approximately 20 feet by 25 feet along an abandoned rail spur and extends vertically to a depth of approximately 5 feet bgs (see Figure 4A). The estimated extent of radiological contamination depicted on Figure 4A for Area 1 represents approximately 93 bank cubic yards of soil.

Based on the soil sample radiological results, the walkover survey, and the historical aerial photographs, the estimated vertical extent of radiological contamination in Area 2 was determined to be approximately 1.0 foot bgs, and the horizontal extent of Area 2 appears to be confined to an area approximately 100 feet long by 12 feet wide (see Figure 4A). The estimated extent of radiological contamination depicted on Figure 4A for Area 2 represents approximately 44 bank cubic yards of soil.

Radiological contamination identified in the southern portion of the TRRA Soil Spoils Area (Area 3 and Area 4) appears to be confined to relatively small areas around SLD101278 (Area 3)

and SLD101284 (Area 4). Based on the radiological results from the respective soil borings, the vertical extent of radiological contamination is approximately 1.0 feet bgs in Area 3 and approximately 0.5 feet bgs in Area 4 (see Figure 4B). Using the radiological results from the biased sample locations, the horizontal extent of radiological contamination for Areas 3 and 4 was determined to be approximately 10 feet in diameter around sample locations SLD101278 and SLD101284, respectively.

The soil borings that were drilled and sampled within the TRRA Soil Spoils Area were drilled to approximately 6 feet bgs and ground water was not encountered. Based on Mississippi River elevation data compiled by the USGS, a review of the 1947 and 1951 aerial photographs and the 1933 topographic map, it does not appear that the TRRA Soil Spoils Area was inundated by the floodwaters of the Mississippi River during the 1943, 1944, 1947, or 1951 flood events.

6.0 References

- ASTM International, 2006, "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)," Method D 2488-06, active standard, West Conshohocken, Pennsylvania.
- Bechtel National, Incorporated, 1990, *Radiological, Chemical, and Hydrogeological Characterization Report for the St. Louis Downtown Site in St. Louis, Missouri*, Revision 1, DOE/OR/20722-258, Oak Ridge, Tennessee, September.
- Bechtel National, Incorporated, 1994, *Remedial Investigation Report for the St. Louis Downtown Site, St. Louis, Missouri*, DOE/OR/21949-280, Oak Ridge, Tennessee, January.
- IT Corporation, 2001, *Pre-Design Investigation Work Description, Vicinity Properties, St. Louis Downtown Site, St. Louis, Missouri*, St. Louis, Missouri, Revision 1, March 26.
- Science Applications International Corporation, 1995, *Remedial Investigation Addendum for the St. Louis Site, St. Louis, Missouri*, DOE/OR/21950-132, St. Louis, Missouri, Final, September.
- Shaw Environmental, Inc., 2004, *Pre-Design Investigation Work Description, FUSRAP St. Louis Downtown Site, St. Louis, Missouri*, Hazelwood, Missouri, Revision 0, September 9.
- Shaw Environmental, Inc., 2007, *Appendix B.6 Pre-Design Investigation Work Scope for the Terminal Railroad Association (TRRA) Soil Spoils Area*, Hazelwood, Missouri, March 28.
- U.S. Army Corps of Engineers, 1998, *Record of Decision for the St. Louis Downtown Site, St. Louis, Missouri, Formerly Utilized Sites Remedial Action Program (FUSRAP), St. Louis, Missouri*, St. Louis, Missouri, Final, October.
- U.S. Army Corps of Engineers, 1999, *Background Soils Characterization Report for the St. Louis Downtown Site*, St. Louis, Missouri.
- U.S. Army Corps of Engineers, St. Louis District, 2000, *Sampling and Analysis Guide for the St. Louis Sites, St. Louis, Missouri, Formerly Utilized Sites Remedial Action Program*, St. Louis, Missouri, Final, September.
- U.S. Army Corps of Engineers, 2001, Collection of 86 Aerial Photographs of the Downtown St. Louis, Missouri Area: 1941, 1945, 1947, 1949, 1951-1955, 1958, 1962(?), 1968, 1971, 1973, 1974, 1976, 1979, 1980, 1983, 1986, 1988-1990, 1992, 1994-1996, 1998, and undated, provided to IT Corporation by Mr. Dave Kreigbaum, USACE Geospatial Engineering Branch, St. Louis, Missouri, November.
- U.S. Army Corps of Engineers, St. Louis District, 2002, *Final Status Survey Plan for Accessible Soil Within Mallinckrodt Property and Vicinity Properties, Excluding Plants 1, 2, and the City Property at the St. Louis Downtown Site*, St. Louis, Missouri, Revision 2, February.

U.S. Army Corps of Engineers, St. Louis District, 2005, CEMVS-PM-R Memorandum for Record, Subject: Non-significant Change to the Record of Decision for the St. Louis Downtown Site, March. 31.

U.S. Environmental Protection Agency, 2000, *Guidance for the Data Quality Objectives Process*, EPA QA/G-4, EPA/600/R-96/055, Washington, DC, August.

U.S. Geological Survey, 1933, Missouri Granite City Quadrangle Map, Scale 1:24,000, Reston, Virginia.

U.S. Geological Survey, 1935, Illinois-Missouri Granite City Quadrangle Map, Scale 1:24,000, Reston, Virginia.

U.S. Geological Survey, 1937, Missouri-Illinois St. Louis Quadrangle Map, Edition of April 1904, Reprinted 1937, Scale 1:62,500, Reston, Virginia.

U.S. Geological Survey, 1940, Illinois-Missouri Granite City Quadrangle Map, Scale 1:24,000, Reston, Virginia.

U.S. Geological Survey, 1950, Illinois-Missouri Granite City Quadrangle Map, Edition of 1940, Reprinted 1950 with Corrections, Scale 1:24,000, Reston, Virginia.

U.S. Geological Survey, 1954, Granite City Quadrangle, Illinois-Missouri, 7.5-Minute Series (Topographic) Map, Scale 1:24,000, Reston, Virginia.

U.S. Geological Survey, 1968, Granite City Quadrangle, Illinois-Missouri, 7.5-Minute Series (Topographic) Map, 1954 Map Photorevised 1968, Scale 1:24,000, Reston, Virginia.

U.S. Geological Survey, 1993, Granite City Quadrangle, Illinois-Missouri, 7.5-Minute Series (Topographic) Map, Scale 1:24,000, Reston, Virginia.

U.S. Geological Survey, 2004, *Peak Streamflow for Missouri: USGS 07010000 Mississippi River at St. Louis, MO*, <http://waterdata.usgs.gov/mo/nwis/peak?site_no=07010000&agency_cd=USGS&format=html> (February 2005).

U.S. Nuclear Regulatory Commission, U.S. Environmental Protection Agency, U.S. Department of Energy, and U.S. Department of Defense, 2000, *Multi-Agency Radiation Survey and Site Investigation Manual*, NUREG-1575, EPA 402-R-97-016, DOE/EH-0624, Revision 1, including August 2002 updates, U.S. Nuclear Regulatory Commission, Washington, D.C.

4.0 Evaluation of Pre-Design Investigation Results

The walkover survey and analytical results from the PDI of the TRRA Soil Spoils Area were evaluated in conjunction with the relevant geological and historical data to determine if radiological COCs were present at concentrations that would result in SOR_{net} values that were greater than or equal to 1.0 and if so, determine the estimated extent of radiological contamination. Based on this evaluation, four areas within the TRRA Soil Spoils Area were identified as containing radiological contamination (see Figures 4A and 4B). Two of the areas were identified in the northern half of the TRRA Soil Spoils Area (see Figure 4A) and two were located in the southern half (see Figure 4B).

As discussed in Section 3.2, the two northern areas were identified during the walkover survey activities. Based on the results from the walkover survey and the PDI activities, both areas appear to be vertically and horizontally delineated. Radiological contamination identified within Area 1 appears to be limited to a relatively small area along an abandoned rail spur. The area of radiological contamination identified within Area 2 appears to be slightly larger and is located between the active rail lines of the NSF and the TRRA (see Figure 4A).

Area 1 was initially identified during the gamma walkover survey. Biased sample HTZ94881, collected from 0.0 to 0.5 feet bgs, had a resultant SOR_{net} value of 56. This SOR_{net} value confirmed the presence of radiological COCs. During the PDI activities, four soil borings were drilled and sampled around HTZ94881 in order to delineate the extent of radiological contamination. One PDI soil boring (SLD101312) was drilled at or near the location of HTZ94881 in order to determine the vertical extent of contamination, and the remaining PDI borings (SLD101316, SLD101320, and SLD101324) were drilled in order to determine the horizontal extent of contamination. Based on the results from these soil borings, radiological contamination appears to extend vertically to at least 2.5 feet bgs. Subsurface sample SLD101314, from location SLD101312, had a resultant SOR_{net} value of 2.6. Radiological contamination does not appear to extend beyond 5.5 feet bgs as evident from the sample results from SLD101315 ($SOR_{net} = 0.09$).

To help bound the horizontal extent of contamination around HTZ94881 and SLD101312, the 2x2 NaI detector was used to identify where the elevated radiological activity began to decrease. Utilizing the NaI detector, sample locations SLD101316, SLD101320, and SLD101324 were identified. The analytical results from these sample locations indicate no radiological COCs present at concentration levels that would result in SOR_{net} values that were greater than or equal

to 1.0. Based on the results from the delineation sample locations, the area of radiological contamination identified in Area 1 was delineated horizontally and vertically (see Figure 4A).

Area 2 was also identified during the initial gamma walkover survey, and the biased HTZ sample (HTZ94883), collected from 0.0 to 0.5 feet bgs, had a resultant SOR_{net} value of 1.3. During the PDI activities, five PDI soil borings were drilled and sampled around HTZ94883 to delineate the extent of radiological contamination. One PDI soil boring (SLD101198) was drilled at or near the location of HTZ94883 in order to determine the vertical extent of contamination, and the remaining PDI borings (SLD101202, SLD101226, SLD101230, and SLD101234) were drilled in order to determine the horizontal extent of contamination. Additionally, two potential Class 2 sample locations (SLD101218 and SLD101246) were also used to help delineate the extent of radiological contamination in this area. Based on the results from the walkover survey and biased soil sample results, radiological contamination appeared to be within the first 0.5 feet of the ground surface.

To help bound the extent of contamination in Area 2, the 2x2 NaI detector was used to identify where the elevated radiological activity began to decrease. Based on the information obtained from the 2x2 NaI detector, PDI sample locations SLD101202, SLD101226, SLD101230, and SLD101234, were identified and sampled. The surface samples collected from sample locations SLD101202 and SLD101234 had resultant SOR_{net} values of 1.4 and 1.1, respectively, and sample location SLD101198, which was used to help determine the vertical extent of HTZ94883, had a resultant SOR_{net} value of 0.70. Subsurface samples collected from 0.5 to 1.0 foot bgs at sample locations SLD101198 and SLD101202 had resultant SOR_{net} values of 0.36 and 0.20, respectively. The subsurface radiological results obtained from 1.5 to 2.0 feet bgs at sample locations SLD101218, SLD101226, SLD101230, SLD101234 and SLD101246, indicated that the concentrations of radiological COCs were at or near background concentration levels. Utilizing the information obtained from the soil borings, and the results of their associated soil samples, the vertical extent of radiological contamination appears to extend to a depth of approximately 1.0 feet bgs.

The horizontal extent of contamination was determined using the results of the walkover survey, the soil information and sample results obtained from the soil borings, and information obtained from the historical review. As discussed in Section 3.1, historical aerial photographs indicate that the TRRA Soil Spoils Area was used as a railroad switch yard and loading/unloading area for railway-transported goods from about 1941 until 1992. From these aerial photographs, several rail lines having a north-northwest orientation were identified near Area 2. The walkover survey results for Area 2 also indicate that the area of elevated radiological activity has a north-

northwest orientation (see Figure 3). Based on this information and the information obtained from the soil borings, the horizontal extent of contamination in Area 2 appears to be situated in an area that is 12 feet wide by 100 feet long (see Figure 4A).

The two southern areas of radiological contamination were identified based on the analytical results from potential Class 2 sample locations SLD101278 (Area 3) and SLD101284 (Area 4) (see Figure 4B). The radiological results from the surface samples at these locations had resultant SOR_{net} values of 1.1 for SLD101278 and 2.5 for SLD101284 (see Table 3-1). The ground surface area where these samples were collected consisted of silt with cinders and fine gravel and sand. The subsurface sample result from sample location SLD101278, from 1.0 to 1.5 feet bgs, had a resultant SOR_{net} value of 0.17 and the subsurface sample result from sample location SLD101284, from 0.5 to 1.0, had a resultant SOR_{net} value of 0.00. Based on the results from these soil borings, radiological contamination does not appear to extend beyond 1.0 foot bgs in Area 3 and 0.5 foot bgs in Area 4. To help bound the horizontal extent of contamination around SLD101278 and SLD101284, the 2x2 NaI detector was used to identify where the elevated radiological activity began to decrease. Based on the readings from the NaI detector, six HTR sample locations were identified and sampled: three for SLD101278 (HTR105391, HTR105392, and HTR105393) and three for SLD101284 (HTR105394, SLD105395, SLD105396). The analytical results from these sample locations and two HTZ sample locations near SLD101278 (HTZ94913 and HTZ94914) indicated no radiological COCs present at concentration levels that would result in SOR_{net} values that were greater than or equal to 1.0 (see Table 3-2). Utilizing the results from the above sample locations and the walkover survey results, the horizontal extent of radiological contamination was determined for Area 3 and Area 4 (see Figures 3 and 4B).

4.1 Data Quality Assessment

Data quality objectives (DQOs) were established for the PDI of the TRRA Soil Spoils Area in accordance with U.S. Environmental Protection Agency guidance (U.S. Environmental Protection Agency, 2000). The DQOs provide qualitative statements that clarify the analytical project objectives based on the end use of the data being collected. The data quality assessment results for the TRRA Soil Spoils Area are presented in Table 4-1.

5.0 Summary and Conclusions

The PDI activities at the TRRA Soil Spoils Area were conducted to determine whether radiological contamination (as defined in Section 1.0) exists at the vicinity property, to assess whether geological and historical features are associated with or harbor radiological contamination, and to determine the extent of radiological contamination, if identified. The PDI activities at the TRRA Soil Spoils Area were performed between May and June 2006 (walkover survey and biased soil sampling) and April through August 2007 (PDI sampling). Field activities included gamma walkover survey and biased soil sampling of accessible areas, and the collection of soil samples for analysis of the SLDS radiological COCs from 90 sample locations. Based on the results of the gamma walkover survey and subsequent soil sampling activities, four areas were identified as containing concentrations of radiological COCs with resultant SOR_{net} values that were greater than or equal to 1.0. Two of the areas (Area 1 and Area 2) were identified in the northern portion of the TRRA Soil Spoils Area (see Figure 4A) and two areas (Area 3 and Area 4) were identified in the southern portion (see Figure 4B). Radiological activity concentrations in soils at each area were vertically and horizontally delineated using the results of the walkover surveys and subsequent biased and PDI soil sampling activities.

As discussed in Section 3.2, the two northern areas were initially identified during the walkover survey and subsequent biased sampling activities. During the PDI activities, these two areas were delineated to determine the vertical and horizontal extent of radiological contamination. Four PDI soil borings were used to delineate Area 1 and five PDI and two potential Class 2 soil borings were used to delineate Area 2 (see Figure 4A). Based on the available data, the areal extent of contamination in Area 1 appears to be confined to an area approximately 20 feet by 25 feet along an abandoned rail spur and extends vertically to a depth of approximately 5 feet bgs (see Figure 4A). The estimated extent of radiological contamination depicted on Figure 4A for Area 1 represents approximately 93 bank cubic yards of soil.

Based on the soil sample radiological results, the walkover survey, and the historical aerial photographs, the estimated vertical extent of radiological contamination in Area 2 was determined to be approximately 1.0 foot bgs, and the horizontal extent of Area 2 appears to be confined to an area approximately 100 feet long by 12 feet wide (see Figure 4A). The estimated extent of radiological contamination depicted on Figure 4A for Area 2 represents approximately 44 bank cubic yards of soil.

Radiological contamination identified in the southern portion of the TRRA Soil Spoils Area (Area 3 and Area 4) appears to be confined to relatively small areas around SLD101278 (Area 3)

and SLD101284 (Area 4). Based on the radiological results from the respective soil borings, the vertical extent of radiological contamination is approximately 1.0 feet bgs in Area 3 and approximately 0.5 feet bgs in Area 4 (see Figure 4B). Using the radiological results from the biased sample locations, the horizontal extent of radiological contamination for Areas 3 and 4 was determined to be approximately 10 feet in diameter around sample locations SLD101278 and SLD101284, respectively.

The soil borings that were drilled and sampled within the TRRA Soil Spoils Area were drilled to approximately 6 feet bgs and ground water was not encountered. Based on Mississippi River elevation data compiled by the USGS, a review of the 1947 and 1951 aerial photographs and the 1933 topographic map, it does not appear that the TRRA Soil Spoils Area was inundated by the floodwaters of the Mississippi River during the 1943, 1944, 1947, or 1951 flood events.

6.0 References

- ASTM International, 2006, "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)," Method D 2488-06, active standard, West Conshohocken, Pennsylvania.
- Bechtel National, Incorporated, 1990, *Radiological, Chemical, and Hydrogeological Characterization Report for the St. Louis Downtown Site in St. Louis, Missouri*, Revision 1, DOE/OR/20722-258, Oak Ridge, Tennessee, September.
- Bechtel National, Incorporated, 1994, *Remedial Investigation Report for the St. Louis Downtown Site, St. Louis, Missouri*, DOE/OR/21949-280, Oak Ridge, Tennessee, January.
- IT Corporation, 2001, *Pre-Design Investigation Work Description, Vicinity Properties, St. Louis Downtown Site, St. Louis, Missouri*, St. Louis, Missouri, Revision 1, March 26.
- Science Applications International Corporation, 1995, *Remedial Investigation Addendum for the St. Louis Site, St. Louis, Missouri*, DOE/OR/21950-132, St. Louis, Missouri, Final, September.
- Shaw Environmental, Inc., 2004, *Pre-Design Investigation Work Description, FUSRAP St. Louis Downtown Site, St. Louis, Missouri*, Hazelwood, Missouri, Revision 0, September 9.
- Shaw Environmental, Inc., 2007, *Appendix B.6 Pre-Design Investigation Work Scope for the Terminal Railroad Association (TRRA) Soil Spoils Area*, Hazelwood, Missouri, March 28.
- U.S. Army Corps of Engineers, 1998, *Record of Decision for the St. Louis Downtown Site, St. Louis, Missouri, Formerly Utilized Sites Remedial Action Program (FUSRAP), St. Louis, Missouri*, St. Louis, Missouri, Final, October.
- U.S. Army Corps of Engineers, 1999, *Background Soils Characterization Report for the St. Louis Downtown Site*, St. Louis, Missouri.
- U.S. Army Corps of Engineers, St. Louis District, 2000, *Sampling and Analysis Guide for the St. Louis Sites, St. Louis, Missouri, Formerly Utilized Sites Remedial Action Program*, St. Louis, Missouri, Final, September.
- U.S. Army Corps of Engineers, 2001, Collection of 86 Aerial Photographs of the Downtown St. Louis, Missouri Area: 1941, 1945, 1947, 1949, 1951-1955, 1958, 1962(?), 1968, 1971, 1973, 1974, 1976, 1979, 1980, 1983, 1986, 1988-1990, 1992, 1994-1996, 1998, and undated, provided to IT Corporation by Mr. Dave Kreigbaum, USACE Geospatial Engineering Branch, St. Louis, Missouri, November.
- U.S. Army Corps of Engineers, St. Louis District, 2002, *Final Status Survey Plan for Accessible Soil Within Mallinckrodt Property and Vicinity Properties, Excluding Plants 1, 2, and the City Property at the St. Louis Downtown Site*, St. Louis, Missouri, Revision 2, February.

U.S. Army Corps of Engineers, St. Louis District, 2005, CEMVS-PM-R Memorandum for Record, Subject: Non-significant Change to the Record of Decision for the St. Louis Downtown Site, March. 31.

U.S. Environmental Protection Agency, 2000, *Guidance for the Data Quality Objectives Process*, EPA QA/G-4, EPA/600/R-96/055, Washington, DC, August.

U.S. Geological Survey, 1933, Missouri Granite City Quadrangle Map, Scale 1:24,000, Reston, Virginia.

U.S. Geological Survey, 1935, Illinois-Missouri Granite City Quadrangle Map, Scale 1:24,000, Reston, Virginia.

U.S. Geological Survey, 1937, Missouri-Illinois St. Louis Quadrangle Map, Edition of April 1904, Reprinted 1937, Scale 1:62,500, Reston, Virginia.

U.S. Geological Survey, 1940, Illinois-Missouri Granite City Quadrangle Map, Scale 1:24,000, Reston, Virginia.

U.S. Geological Survey, 1950, Illinois-Missouri Granite City Quadrangle Map, Edition of 1940, Reprinted 1950 with Corrections, Scale 1:24,000, Reston, Virginia.

U.S. Geological Survey, 1954, Granite City Quadrangle, Illinois-Missouri, 7.5-Minute Series (Topographic) Map, Scale 1:24,000, Reston, Virginia.

U.S. Geological Survey, 1968, Granite City Quadrangle, Illinois-Missouri, 7.5-Minute Series (Topographic) Map, 1954 Map Photorevised 1968, Scale 1:24,000, Reston, Virginia.

U.S. Geological Survey, 1993, Granite City Quadrangle, Illinois-Missouri, 7.5-Minute Series (Topographic) Map, Scale 1:24,000, Reston, Virginia.

U.S. Geological Survey, 2004, *Peak Streamflow for Missouri: USGS 07010000 Mississippi River at St. Louis, MO*, <http://waterdata.usgs.gov/mo/nwis/peak?site_no=07010000&agency_cd=USGS&format=html> (February 2005).

U.S. Nuclear Regulatory Commission, U.S. Environmental Protection Agency, U.S. Department of Energy, and U.S. Department of Defense, 2000, *Multi-Agency Radiation Survey and Site Investigation Manual*, NUREG-1575, EPA 402-R-97-016, DOE/EH-0624, Revision 1, including August 2002 updates, U.S. Nuclear Regulatory Commission, Washington, D.C.

TABLES

Table 3-1
Terminal Railroad Association Soil Spoils Area
Summary of Radionuclide Contaminants of Concern
Analytical Results with Radiological Contamination
Page 1 of 3

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
HTZ94881	HTZ94881	07/27/06	0	0.5		Radium-226	4.55	1.30	0.46	55.58
						Radium-228	2.60	0.35	0.53	
						Thorium-230	260.40	49.44	51.88	
						Thorium-232	2.60	0.35	0.53	
						Uranium-238	179.30	11.08	5.15	
HTZ94883	HTZ94883	07/27/06	0	0.5		Radium-226	4.49	1.05	0.09	1.30
						Radium-228	1.08	0.10	0.12	
						Thorium-230	7.84	2.08	0.16	
						Thorium-232	0.34	0.29	0.15	
						Uranium-238	6.01	0.86	0.70	
SLD101202	SLD101202	04/03/07	0	0.5		Radium-226	6.24	1.54	0.23	1.41
						Radium-228	4.06	0.25	0.28	
						Thorium-230	5.31	1.51	0.28	
						Thorium-232	4.30	1.30	0.28	
						Uranium-238	5.39	2.07	1.77	
	SLD101203	04/03/07	0.5	1.0		Radium-226	4.66	1.20	0.23	0.20
						Radium-228	1.29	0.19	0.31	
						Thorium-230	3.80	1.22	0.16	
						Thorium-232	1.58	0.69	0.16	
	SLD101204	04/03/07	3	3.5		Uranium-238	3.51	1.60	1.67	
						Radium-226	3.20	0.76	0.08	0.14
						Radium-228	1.20	0.08	0.10	
						Thorium-230	3.56	1.06	0.13	
	SLD101205	04/03/07	4.5	5.0		Thorium-232	1.31	0.55	0.13	
						Uranium-238	2.14	0.53	0.54	
						Radium-226	1.38	0.48	0.30	0.03
						Radium-228	0.65	0.47	0.67	
						Thorium-230	1.18	0.69	0.23	
SLD101234	SLD101234	04/05/07	0	0.5		Thorium-232	0.75	0.53	0.23	
						Uranium-238	2.91	1.81	1.81	
						Radium-226	6.81	1.59	0.10	1.10
						Radium-228	1.37	0.09	0.14	
						Thorium-230	6.77	1.78	0.31	
	SLD101235	04/05/07	1.5	2.0		Thorium-232	1.51	0.63	0.14	
						Uranium-238	3.99	0.96	0.79	
						Radium-226	1.74	0.44	0.07	0.01
						Radium-228	0.49	0.06	0.08	
						Thorium-230	2.11	0.85	0.32	
	SLD101236	04/05/07	2	2.5		Thorium-232	0.81	0.48	0.17	
						Uranium-238	1.09	0.48	0.51	
						Radium-226	1.75	0.43	0.06	0.02
						Radium-228	0.87	0.06	0.08	
						Thorium-230	1.71	0.66	0.13	
	SLD101237	04/05/07	4	4.5		Thorium-232	1.46	0.60	0.13	
						Uranium-238	1.39	0.49	0.46	
						Radium-226	1.62	0.40	0.06	0.00
						Radium-228	0.78	0.06	0.08	
						Thorium-230	1.18	0.53	0.29	
						Thorium-232	0.58	0.35	0.13	
						Uranium-238	1.03	0.41	0.46	

Table 3-1
Terminal Railroad Association Soil Spoils Area
Summary of Radionuclide Contaminants of Concern
Analytical Results with Radiological Contamination
Page 2 of 3

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101278	SLD101278	04/10/07	0	0.5		Radium-226	7.00	1.77	0.23	1.08
						Radium-228	1.62	0.22	0.30	
						Thorium-230	6.37	1.77	0.29	
						Thorium-232	1.31	0.61	0.15	
						Uranium-238	4.64	3.67	3.42	
	SLD101279	04/10/07	1	1.5		Radium-226	3.79	0.95	0.11	0.17
						Radium-228	1.06	0.10	0.13	
						Thorium-230	3.24	1.00	0.24	
						Thorium-232	1.96	0.72	0.13	
						Uranium-238	2.66	1.34	1.46	
	SLD101280	04/10/07	3.5	4.0		Radium-226	3.89	1.05	0.21	0.09
						Radium-228	1.22	0.21	0.26	
						Thorium-230	2.86	0.92	0.24	
						Thorium-232	1.20	0.53	0.13	
						Uranium-238	1.53	1.84	3.25	
	SLD101281	04/10/07	5.4	5.9		Radium-226	1.85	0.49	0.10	0.01
						Radium-228	0.84	0.09	0.12	
						Thorium-230	1.87	0.73	0.14	
						Thorium-232	1.01	0.51	0.14	
						Uranium-238	2.03	1.35	1.24	
SLD101284	SLD101284	04/11/07	0	0.5		Radium-226	1.82	0.51	0.15	2.46
						Radium-228	0.51	0.14	0.19	
						Thorium-230	14.24	3.14	0.13	
						Thorium-232	0.51	0.32	0.13	
						Uranium-238	0.94	0.75	1.42	
	SLD101285	04/11/07	0.5	1.0		Radium-226	1.26	0.32	0.06	0.00
						Radium-228	0.35	0.05	0.09	
						Thorium-230	1.31	0.58	0.14	
						Thorium-232	0.16	0.18	0.14	
						Uranium-238	0.94	0.52	0.41	
SLD101312	SLD101312	05/15/07	0	0.5		Radium-226	9.25	2.29	0.31	12.49
						Radium-228	1.53	0.24	0.43	
						Thorium-230	58.45	11.86	0.26	
						Thorium-232	1.08	0.52	0.14	
						Uranium-238	55.19	4.94	3.08	
	SLD101313	05/15/07	1.3	1.8		Radium-226	7.57	1.87	0.25	0.51
						Radium-228	1.15	0.19	0.34	
						Thorium-230	5.88	1.63	0.15	
						Thorium-232	1.37	0.61	0.15	
						Uranium-238	10.04	2.40	1.92	
	SLD101314	05/15/07	2	2.5		Radium-226	6.49	1.63	0.23	2.58
						Radium-228	1.37	0.20	0.32	
						Thorium-230	31.97	6.79	0.14	
						Thorium-232	1.00	0.50	0.14	
						Uranium-238	28.97	3.56	2.38	
	SLD101315	05/15/07	5	5.5		Radium-226	3.17	0.80	0.08	0.09
						Radium-228	0.88	0.08	0.10	
						Thorium-230	3.07	1.00	0.26	
						Thorium-232	0.61	0.38	0.14	
						Uranium-238	2.09	0.77	0.73	

Table 3-1
Terminal Railroad Association Soil Spoils Area
Summary of Radionuclide Contaminants of Concern
Analytical Results with Radiological Contamination
Page 3 of 3

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
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¹ ft - feet

² bgs - below ground surface

³ Analytical data includes background values (i.e., concentrations reflect gross radionuclide values)

⁴ pCi/g - Picocuries per gram

⁵ Prior to calculating the SOR, background values for each radionuclide were subtracted from their respective gross radionuclide values

Background Values:

Radium-226 =	2.78 pCi/g
Radium-228 =	.95 pCi/g
Thorium-230 =	1.94 pCi/g
Thorium-232 =	1.09 pCi/g
Uranium-238 =	1.44 pCi/g

Data presented in this Table were used solely for the purpose of delineating, vertically and horizontally, radiological COCs within the surface and subsurface soils.

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 1 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
HTR105391	HTR105391	08/30/07	0	0.5		Actinium-227	0.24	0.09	0.29	0.75
						Americium-241	0.04	0.04	0.06	
						Cesium-137	0.04	0.02	0.03	
						Potassium-40	11.40	0.74	0.27	
						Protactinium-231	0.75	0.55	0.86	
						Radium-226	4.62	1.08	0.07	
						Radium-228	1.17	0.07	0.10	
						Thorium-228	1.46	0.71	0.44	
						Thorium-230	4.98	1.58	0.18	
						Thorium-232	1.57	0.73	0.18	
						Uranium-235	0.23	0.23	0.39	
						Uranium-238	3.78	0.64	0.53	
HTR105392	HTR105392	08/30/07	0	0.5		Actinium-227	0.34	0.19	0.31	0.88
						Americium-241	0.02	0.04	0.06	
						Cesium-137	0.04	0.02	0.02	
						Potassium-40	11.05	0.70	0.26	
						Protactinium-231	0.79	0.55	0.84	
						Radium-226	6.39	1.47	0.07	
						Radium-228	1.13	0.07	0.10	
						Thorium-228	1.99	0.90	0.49	
						Thorium-230	3.94	1.40	0.20	
						Thorium-232	1.57	0.77	0.44	
						Uranium-235	0.33	0.30	0.40	
						Uranium-238	4.38	0.69	0.53	
HTR105393	HTR105393	08/30/07	0	0.5		Actinium-227	0.04	0.20	0.29	0.90
						Americium-241	0.04	0.04	0.05	
						Cesium-137	0.05	0.02	0.02	
						Potassium-40	10.89	0.67	0.24	
						Protactinium-231	0.45	0.52	0.79	
						Radium-226	6.13	1.41	0.07	
						Radium-228	1.05	0.06	0.09	
						Thorium-228	2.15	0.86	0.17	
						Thorium-230	5.48	1.65	0.17	
						Thorium-232	1.77	0.76	0.31	
						Uranium-235	0.41	0.29	0.39	
						Uranium-238	4.42	0.62	0.52	
HTR105394	HTR105394	08/30/07	0	0.5		Actinium-227	-0.21	0.15	0.23	0.34
						Americium-241	0.01	0.03	0.04	
						Cesium-137	0.18	0.02	0.02	
						Potassium-40	6.97	0.52	0.21	
						Protactinium-231	0.53	0.44	0.68	
						Radium-226	3.13	0.73	0.06	
						Radium-228	0.72	0.05	0.07	
						Thorium-228	1.04	0.51	0.14	
						Thorium-230	3.53	1.11	0.26	
						Thorium-232	0.92	0.48	0.26	
						Uranium-235	0.21	0.19	0.31	
						Uranium-238	2.38	0.46	0.43	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 2 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
HTR105395	HTR105395	08/30/07	0	0.5		Actinium-227	0.15	0.17	0.25	0.13
						Americium-241	0.03	0.03	0.05	
						Cesium-137	0.51	0.04	0.02	
						Potassium-40	11.69	0.69	0.21	
						Protactinium-231	0.47	0.46	0.71	
						Radium-226	3.15	0.74	0.06	
						Radium-228	0.76	0.05	0.08	
						Thorium-228	1.21	0.57	0.32	
						Thorium-230	2.38	0.86	0.15	
						Thorium-232	1.23	0.57	0.27	
						Uranium-235	0.15	0.18	0.31	
						Uranium-238	2.42	0.42	0.42	
HTR105396	HTR105396	08/30/07	0	0.5		Actinium-227	0.13	0.13	0.22	0.01
						Americium-241	0.02	0.03	0.04	
						Cesium-137	0.28	0.03	0.02	
						Potassium-40	8.34	0.56	0.19	
						Protactinium-231	0.24	0.39	0.59	
						Radium-226	2.14	0.51	0.06	
						Radium-228	0.58	0.05	0.07	
						Thorium-228	0.89	0.48	0.15	
						Thorium-230	1.62	0.69	0.15	
						Thorium-232	0.65	0.41	0.28	
						Uranium-235	-0.02	0.17	0.27	
						Uranium-238	1.70	0.41	0.37	
HTZ94840	HTZ94840	07/11/06	0	0.5		Actinium-227	-0.02	0.16	0.26	0.24
						Americium-241	-0.01	0.04	0.05	
						Cesium-137	0.03	0.02	0.03	
						Potassium-40	17.30	1.03	0.23	
						Protactinium-231	0.21	0.50	0.75	
						Radium-226	1.80	0.44	0.07	
						Radium-228	1.04	0.07	0.09	
						Thorium-228	1.21	0.57	0.15	
						Thorium-230	2.15	0.81	0.15	
						Thorium-232	2.09	0.80	0.15	
						Uranium-235	0.13	0.20	0.34	
						Uranium-238	1.32	0.55	0.52	
HTZ94841	HTZ94841	07/11/06	0	0.5		Actinium-227	-0.13	0.18	0.27	0.08
						Americium-241	0.02	0.04	0.06	
						Cesium-137	0.01	0.02	0.03	
						Potassium-40	17.43	1.06	0.28	
						Protactinium-231	0.48	0.51	0.81	
						Radium-226	1.69	0.43	0.07	
						Radium-228	1.14	0.07	0.10	
						Thorium-228	1.52	0.62	0.13	
						Thorium-230	1.56	0.63	0.25	
						Thorium-232	1.42	0.59	0.13	
						Uranium-235	0.10	0.21	0.35	
						Uranium-238	1.96	0.65	0.54	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 3 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
HTZ94842	HTZ94842	07/11/06	0	0.5		Actinium-227	-0.03	0.13	0.21	0.00
						Americium-241	-0.01	0.03	0.04	
						Cesium-137	0.03	0.02	0.02	
						Potassium-40	14.70	0.80	0.17	
						Protactinium-231	0.05	0.39	0.58	
						Radium-226	1.45	0.36	0.05	
						Radium-228	0.90	0.06	0.08	
						Thorium-228	1.08	0.51	0.30	
						Thorium-230	1.95	0.73	0.14	
						Thorium-232	0.89	0.46	0.25	
						Uranium-235	0.12	0.16	0.27	
						Uranium-238	1.01	0.47	0.41	
HTZ94843	HTZ94843	07/11/06	0	0.5		Actinium-227	-0.05	0.13	0.21	0.06
						Americium-241	0.00	0.03	0.04	
						Cesium-137	0.03	0.01	0.02	
						Potassium-40	13.54	0.78	0.18	
						Protactinium-231	0.19	0.35	0.55	
						Radium-226	1.61	0.39	0.05	
						Radium-228	0.77	0.05	0.07	
						Thorium-228	1.23	0.56	0.30	
						Thorium-230	2.22	0.79	0.14	
						Thorium-232	1.06	0.50	0.14	
						Uranium-235	0.05	0.16	0.27	
						Uranium-238	1.30	0.46	0.42	
HTZ94844	HTZ94844	07/11/06	0	0.5		Actinium-227	0.05	0.12	0.19	0.01
						Americium-241	0.01	0.02	0.04	
						Cesium-137	-0.01	0.01	0.02	
						Potassium-40	19.49	0.93	0.17	
						Protactinium-231	0.20	0.33	0.50	
						Radium-226	1.42	0.34	0.05	
						Radium-228	0.90	0.05	0.07	
						Thorium-228	1.09	0.50	0.13	
						Thorium-230	1.57	0.63	0.32	
						Thorium-232	1.13	0.51	0.13	
						Uranium-235	0.01	0.15	0.24	
						Uranium-238	1.20	0.37	0.34	
HTZ94845	HTZ94845	07/11/06	0	0.5		Actinium-227	-0.01	0.18	0.29	0.41
						Americium-241	0.03	0.04	0.06	
						Cesium-137	0.02	0.02	0.03	
						Potassium-40	7.81	0.58	0.24	
						Protactinium-231	-0.06	0.48	0.72	
						Radium-226	4.00	0.93	0.07	
						Radium-228	0.76	0.06	0.09	
						Thorium-228	0.93	0.45	0.13	
						Thorium-230	3.80	1.11	0.23	
						Thorium-232	1.10	0.50	0.23	
						Uranium-235	0.21	0.22	0.37	
						Uranium-238	3.03	0.71	0.54	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 4 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
HTZ94846	HTZ94846	07/11/06	0	0.5		Actinium-227	0.07	0.14	0.22	0.29
						Americium-241	0.01	0.03	0.05	
						Cesium-137	0.06	0.02	0.02	
						Potassium-40	5.41	0.46	0.20	
						Protactinium-231	0.16	0.42	0.63	
						Radium-226	3.50	0.81	0.06	
						Radium-228	0.57	0.05	0.07	
						Thorium-228	0.76	0.40	0.23	
						Thorium-230	3.29	0.99	0.23	
						Thorium-232	0.68	0.37	0.12	
						Uranium-235	0.17	0.20	0.30	
						Uranium-238	2.26	0.46	0.42	
HTZ94847	HTZ94847	07/11/06	0	0.5		Actinium-227	0.08	0.19	0.28	0.35
						Americium-241	-0.01	0.04	0.06	
						Cesium 137	0.00	0.02	0.03	
						Potassium-40	3.09	0.39	0.23	
						Protactinium-231	-0.19	0.48	0.70	
						Radium-226	3.01	0.71	0.07	
						Radium-228	1.68	0.08	0.09	
						Thorium-228	1.63	0.67	0.14	
						Thorium-230	2.90	0.97	0.14	
						Thorium-232	1.72	0.69	0.26	
						Uranium-235	0.19	0.22	0.37	
						Uranium-238	1.85	0.54	0.54	
HTZ94848	HTZ94848	07/11/06	0	0.5		Actinium-227	0.25	0.39	0.68	0.31
						Americium-241	-0.04	0.10	0.14	
						Cesium-137	0.36	0.07	0.07	
						Potassium-40	12.53	1.43	0.62	
						Protactinium-231	0.62	1.20	1.85	
						Radium-226	3.74	0.96	0.17	
						Radium-228	0.84	0.14	0.23	
						Thorium-228	0.36	0.28	0.24	
						Thorium-230	3.30	1.01	0.13	
						Thorium-232	0.52	0.33	0.13	
						Uranium-235	0.58	0.39	0.78	
						Uranium-238	3.55	1.30	1.34	
HTZ94849	HTZ94849	07/11/06	0	0.5		Actinium-227	-0.05	0.20	0.32	0.35
						Americium-241	-0.02	0.05	0.07	
						Cesium-137	0.18	0.03	0.03	
						Potassium-40	10.69	0.83	0.22	
						Protactinium-231	-0.14	0.61	0.90	
						Radium-226	3.58	0.85	0.08	
						Radium-228	1.07	0.08	0.11	
						Thorium-228	1.06	0.51	0.26	
						Thorium-230	3.17	1.01	0.14	
						Thorium-232	1.38	0.59	0.14	
						Uranium-235	0.06	0.26	0.43	
						Uranium-238	3.82	0.73	0.64	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 5 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
HTZ94850	HTZ94850	07/11/06	0	0.5		Actinium-227	0.17	0.24	0.37	0.87
						Americium-241	-0.01	0.05	0.07	
						Cesium-137	0.11	0.03	0.04	
						Potassium-40	11.75	0.85	0.35	
						Protactinium-231	0.56	0.69	1.05	
						Radium-226	6.26	1.44	0.10	
						Radium-228	1.28	0.08	0.13	
						Thorium-228	1.45	0.65	0.34	
						Thorium-230	5.68	1.62	0.29	
						Thorium-232	1.12	0.56	0.29	
						Uranium-235	0.14	0.29	0.49	
						Uranium-238	4.11	0.58	0.69	
HTZ94881	HTZ94881	07/27/06	0	0.5		Actinium-227	9.32	0.80	2.00	55.58
						Americium-241	0.49	0.40	0.60	
						Cesium-137	0.32	0.18	0.18	
						Potassium-40	6.62	1.83	1.38	
						Protactinium-231	12.33	3.41	4.41	
						Radium-226	4.55	1.30	0.46	
						Radium-228	2.60	0.35	0.53	
						Thorium-228	2.60	0.35	0.53	
						Thorium-230	260.40	49.44	51.88	
						Thorium-232	2.60	0.35	0.53	
						Uranium-235	8.60	1.70	2.48	
						Uranium-238	179.30	11.08	5.15	
HTZ94882	HTZ94882	07/27/06	0	0.5		Actinium-227	-0.02	0.08	0.13	0.49
						Americium-241	0.02	0.02	0.03	
						Cesium-137	0.01	0.01	0.01	
						Potassium-40	4.43	0.38	0.13	
						Protactinium-231	-0.11	0.21	0.35	
						Radium-226	0.52	0.14	0.03	
						Radium-228	0.17	0.03	0.04	
						Thorium-228	1.40	0.64	0.16	
						Thorium-230	4.38	1.35	0.16	
						Thorium-232	0.63	0.41	0.29	
						Uranium-235	0.03	0.10	0.16	
						Uranium-238	0.60	0.25	0.23	
HTZ94883	HTZ94883	07/27/06	0	0.5		Actinium-227	0.07	0.25	0.37	1.30
						Americium-241	0.00	0.05	0.07	
						Cesium-137	0.58	0.05	0.03	
						Potassium-40	12.56	0.90	0.33	
						Protactinium-231	0.50	0.66	1.03	
						Radium-226	4.49	1.05	0.09	
						Radium-228	1.08	0.10	0.12	
						Thorium-228	0.23	0.23	0.15	
						Thorium-230	7.84	2.08	0.16	
						Thorium-232	0.34	0.29	0.15	
						Uranium-235	0.43	0.27	0.44	
						Uranium-238	6.01	0.86	0.70	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 6 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft 'bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
HTZ94911	HTZ94911	08/08/06	0	0.5		Actinium-227	-0.21	0.16	0.24	0.35
						Americium-241	-0.02	0.04	0.06	
						Cesium-137	0.01	0.02	0.02	
						Potassium-40	25.30	1.20	0.21	
						Protactinium-231	0.78	0.46	0.73	
						Radium-226	2.24	0.53	0.06	
						Radium-228	1.69	0.08	0.08	
						Thorium-228	2.94	1.00	0.15	
						Thorium-230	2.89	0.99	0.15	
						Thorium-232	1.88	0.75	0.15	
						Uranium-235	0.06	0.20	0.33	
						Uranium-238	1.72	0.54	0.55	
HTZ94912	HTZ94912	08/10/06	0	0.5		Actinium-227	0.14	0.14	0.22	0.05
						Americium-241	0.02	0.03	0.04	
						Cesium-137	-0.02	0.01	0.02	
						Potassium-40	23.19	1.08	0.20	
						Protactinium-231	0.28	0.39	0.59	
						Radium-226	1.74	0.42	0.05	
						Radium-228	1.19	0.06	0.07	
						Thorium-228	1.43	0.60	0.29	
						Thorium-230	1.28	0.56	0.33	
						Thorium-232	0.91	0.46	0.24	
						Uranium-235	0.02	0.16	0.27	
						Uranium-238	1.20	0.44	0.43	
HTZ94913	HTZ94913	08/10/06	0	0.5		Actinium-227	0.27	0.26	0.38	0.81
						Americium-241	0.01	0.05	0.07	
						Cesium-137	0.01	0.02	0.04	
						Potassium-40	10.52	0.81	0.31	
						Protactinium-231	0.20	0.64	0.97	
						Radium-226	6.28	1.45	0.09	
						Radium-228	1.20	0.09	0.12	
						Thorium-228	1.41	0.56	0.12	
						Thorium-230	4.84	1.28	0.12	
						Thorium-232	1.05	0.47	0.12	
						Uranium-235	0.33	0.29	0.48	
						Uranium-238	4.37	0.73	0.71	
HTZ94914	HTZ94914	08/10/06	0	0.5		Actinium-227	0.05	0.22	0.33	0.71
						Americium-241	0.00	0.04	0.06	
						Cesium-137	0.04	0.02	0.03	
						Potassium-40	11.02	0.77	0.31	
						Protactinium-231	0.77	0.61	0.94	
						Radium-226	5.63	1.29	0.08	
						Radium-228	1.17	0.08	0.11	
						Thorium-228	1.10	0.50	0.28	
						Thorium-230	4.30	1.21	0.13	
						Thorium-232	1.45	0.59	0.13	
						Uranium-235	0.23	0.25	0.42	
						Uranium-238	4.68	0.75	0.58	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 6 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft 'bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
HTZ94911	HTZ94911	08/08/06	0	0.5		Actinium-227	-0.21	0.16	0.24	0.35
						Americium-241	-0.02	0.04	0.06	
						Cesium-137	0.01	0.02	0.02	
						Potassium-40	25.30	1.20	0.21	
						Protactinium-231	0.78	0.46	0.73	
						Radium-226	2.24	0.53	0.06	
						Radium-228	1.69	0.08	0.08	
						Thorium-228	2.94	1.00	0.15	
						Thorium-230	2.89	0.99	0.15	
						Thorium-232	1.88	0.75	0.15	
						Uranium-235	0.06	0.20	0.33	
						Uranium-238	1.72	0.54	0.55	
HTZ94912	HTZ94912	08/10/06	0	0.5		Actinium-227	0.14	0.14	0.22	0.05
						Americium-241	0.02	0.03	0.04	
						Cesium-137	-0.02	0.01	0.02	
						Potassium-40	23.19	1.08	0.20	
						Protactinium-231	0.28	0.39	0.59	
						Radium-226	1.74	0.42	0.05	
						Radium-228	1.19	0.06	0.07	
						Thorium-228	1.43	0.60	0.29	
						Thorium-230	1.28	0.56	0.33	
						Thorium-232	0.91	0.46	0.24	
						Uranium-235	0.02	0.16	0.27	
						Uranium-238	1.20	0.44	0.43	
HTZ94913	HTZ94913	08/10/06	0	0.5		Actinium-227	0.27	0.26	0.38	0.81
						Americium-241	0.01	0.05	0.07	
						Cesium-137	0.01	0.02	0.04	
						Potassium-40	10.52	0.81	0.31	
						Protactinium-231	0.20	0.64	0.97	
						Radium-226	6.28	1.45	0.09	
						Radium-228	1.20	0.09	0.12	
						Thorium-228	1.41	0.56	0.12	
						Thorium-230	4.84	1.28	0.12	
						Thorium-232	1.05	0.47	0.12	
						Uranium-235	0.33	0.29	0.48	
						Uranium-238	4.37	0.73	0.71	
HTZ94914	HTZ94914	08/10/06	0	0.5		Actinium-227	0.05	0.22	0.33	0.71
						Americium-241	0.00	0.04	0.06	
						Cesium-137	0.04	0.02	0.03	
						Potassium-40	11.02	0.77	0.31	
						Protactinium-231	0.77	0.61	0.94	
						Radium-226	5.63	1.29	0.08	
						Radium-228	1.17	0.08	0.11	
						Thorium-228	1.10	0.50	0.28	
						Thorium-230	4.30	1.21	0.13	
						Thorium-232	1.45	0.59	0.13	
						Uranium-235	0.23	0.25	0.42	
						Uranium-238	4.68	0.75	0.58	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 8 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101198	SLD101199	04/03/07	0.5	1.0		Actinium-227	0.32	0.24	0.39	0.36
						Americium-241	0.01	0.05	0.07	
						Cesium-137	0.02	0.02	0.03	
						Potassium-40	12.01	0.84	0.36	
						Protactinium-231	0.26	0.69	1.04	
						Radium-226	6.79	1.57	0.10	
						Radium-228	1.36	0.09	0.13	
						Thorium-228	1.68	0.66	0.32	
						Thorium-230	5.68	1.50	0.13	
						Thorium-232	1.72	0.66	0.13	
						Uranium-235	0.39	0.42	0.51	
						Uranium-238	4.12	0.78	0.66	
	SLD101200	04/03/07	3	3.5		Actinium-227	0.33	0.29	0.29	0.06
						Americium-241	0.02	0.04	0.06	
						Cesium-137	0.00	0.02	0.03	
						Potassium-40	10.94	0.80	0.26	
						Protactinium-231	0.41	0.56	0.86	
						Radium-226	3.22	0.77	0.08	
						Radium-228	0.91	0.08	0.10	
						Thorium-228	1.37	0.59	0.14	
						Thorium-230	2.54	0.87	0.14	
						Thorium-232	0.85	0.45	0.26	
						Uranium-235	0.33	0.21	0.37	
						Uranium-238	2.37	0.59	0.54	
	SLD101201	04/03/07	4.7	5.2		Actinium-227	0.27	0.63	0.92	0.24
						Americium-241	-0.09	0.13	0.18	
						Cesium-137	-0.03	0.05	0.08	
						Potassium-40	11.17	1.69	0.87	
						Protactinium-231	-0.05	1.57	2.30	
						Radium-226	4.98	1.28	0.24	
						Radium-228	1.24	0.23	0.28	
						Thorium-228	1.16	0.54	0.14	
						Thorium-230	4.05	1.22	0.27	
						Thorium-232	0.95	0.48	0.14	
						Uranium-235	0.63	0.64	1.11	
						Uranium-238	5.29	2.03	1.61	
SLD101202	SLD101202	04/03/07	0	0.5		Actinium-227	0.15	0.58	0.82	1.41
						Americium-241	0.08	0.12	0.19	
						Cesium-137	0.40	0.08	0.10	
						Potassium-40	6.29	1.26	0.83	
						Protactinium-231	3.07	1.64	2.66	
						Radium-226	6.24	1.54	0.23	
						Radium-228	4.06	0.25	0.28	
						Thorium-228	3.97	1.23	0.28	
						Thorium-230	5.31	1.51	0.28	
						Thorium-232	4.30	1.30	0.28	
						Uranium-235	-0.11	0.66	1.08	
						Uranium-238	5.39	2.07	1.77	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 9 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101202	SLD101203	04/03/07	0.5	1.0		Actinium-227	0.08	0.51	0.82	0.20
						Americium-241	-0.05	0.12	0.17	
						Cesium-137	0.09	0.08	0.08	
						Potassium-40	10.85	1.69	0.74	
						Protactinium-231	-1.25	1.45	2.30	
						Radium-226	4.66	1.20	0.23	
						Radium-228	1.29	0.19	0.31	
						Thorium-228	1.84	0.76	0.35	
						Thorium-230	3.80	1.22	0.16	
						Thorium-232	1.58	0.69	0.16	
						Uranium-235	-0.02	0.62	1.03	
						Uranium-238	3.51	1.60	1.67	
	SLD101204	04/03/07	3	3.5		Actinium-227	0.13	0.21	0.30	0.14
						Americium-241	0.05	0.04	0.06	
						Cesium-137	-0.02	0.02	0.03	
						Potassium-40	13.74	0.86	0.27	
						Protactinium-231	0.48	0.54	0.83	
						Radium-226	3.20	0.76	0.08	
						Radium-228	1.20	0.08	0.10	
						Thorium-228	1.22	0.53	0.13	
						Thorium-230	3.56	1.06	0.13	
						Thorium-232	1.31	0.55	0.13	
						Uranium-235	0.31	0.28	0.38	
						Uranium-238	2.14	0.53	0.54	
	SLD101205	04/03/07	4.5	5.0		Actinium-227	-0.02	0.62	0.98	0.03
						Americium-241	0.13	0.14	0.23	
						Cesium-137	-0.01	0.07	0.12	
						Potassium-40	6.66	1.79	1.15	
						Protactinium-231	-0.70	1.89	3.07	
						Radium-226	1.38	0.48	0.30	
						Radium-228	0.65	0.47	0.67	
						Thorium-228	0.40	0.39	0.42	
						Thorium-230	1.18	0.69	0.23	
						Thorium-232	0.75	0.53	0.23	
						Uranium-235	0.11	0.75	1.25	
						Uranium-238	2.91	1.81	1.81	
SLD101206	SLD101206	04/04/07	0	0.5		Actinium-227	-0.11	0.35	0.47	0.09
						Americium-241	0.05	0.07	0.10	
						Cesium-137	0.05	0.04	0.05	
						Potassium-40	9.42	1.03	0.48	
						Protactinium-231	-0.05	0.95	1.40	
						Radium-226	2.64	0.68	0.13	
						Radium-228	0.47	0.11	0.15	
						Thorium-228	0.69	0.39	0.24	
						Thorium-230	2.31	0.79	0.13	
						Thorium-232	0.47	0.31	0.13	
						Uranium-235	0.28	0.35	0.64	
						Uranium-238	2.37	0.97	1.01	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 10 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101206	SLD101207	04/04/07	1	1.5		Actinium-227	-0.11	0.12	0.17	0.00
						Americium-241	-0.01	0.02	0.03	
						Cesium-137	0.01	0.01	0.02	
						Potassium-40	5.99	0.46	0.14	
						Protactinium-231	0.25	0.33	0.51	
						Radium-226	1.38	0.34	0.05	
						Radium-228	0.32	0.04	0.06	
						Thorium-228	0.89	0.46	0.14	
						Thorium-230	1.20	0.55	0.14	
						Thorium-232	0.42	0.31	0.14	
						Uranium-235	0.11	0.15	0.23	
						Uranium-238	1.11	0.26	0.32	
	SLD101208	04/04/07	3	3.5		Actinium-227	-0.15	0.14	0.21	0.00
						Americium-241	0.02	0.03	0.04	
						Cesium-137	0.08	0.05	0.02	
						Potassium-40	15.87	0.88	0.22	
						Protactinium-231	0.32	0.44	0.67	
						Radium-226	1.56	0.39	0.05	
						Radium-228	0.80	0.06	0.08	
						Thorium-228	0.98	0.48	0.13	
						Thorium-230	1.66	0.65	0.13	
						Thorium-232	1.01	0.49	0.25	
						Uranium-235	0.08	0.17	0.29	
						Uranium-238	1.02	0.44	0.42	
	SLD101209	04/04/07	5	5.5		Actinium-227	0.06	0.52	0.73	0.02
						Americium-241	0.05	0.10	0.15	
						Cesium-137	-0.04	0.04	0.07	
						Potassium-40	17.81	1.80	0.68	
						Protactinium-231	0.05	1.32	2.21	
						Radium-226	2.27	0.65	0.21	
						Radium-228	0.99	0.17	0.26	
						Thorium-228	1.22	0.54	0.13	
						Thorium-230	1.90	0.71	0.13	
						Thorium-232	1.01	0.49	0.24	
						Uranium-235	0.41	0.52	0.90	
						Uranium-238	2.39	1.51	1.35	
SLD101210	SLD101210	04/04/07	0	0.5		Actinium-227	0.07	0.41	0.65	0.02
						Americium-241	0.13	0.17	0.28	
						Cesium-137	0.14	0.05	0.07	
						Potassium-40	9.96	1.44	0.49	
						Protactinium-231	-0.58	1.07	1.72	
						Radium-226	2.46	0.69	0.15	
						Radium-228	0.64	0.14	0.20	
						Thorium-228	0.79	0.45	0.33	
						Thorium-230	1.47	0.63	0.15	
						Thorium-232	0.76	0.43	0.15	
						Uranium-235	0.53	0.48	0.84	
						Uranium-238	2.48	2.32	2.37	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 11 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101210	SLD101211	04/04/07	1.5	2.0		Actinium-227	-0.18	0.20	0.30	0.01
						Americium-241	0.01	0.08	0.12	
						Cesium-137	-0.01	0.02	0.03	
						Potassium-40	11.10	0.93	0.29	
						Protactinium-231	0.01	0.56	0.83	
						Radium-226	1.67	0.44	0.07	
						Radium-228	0.52	0.07	0.11	
						Thorium-228	0.76	0.44	0.28	
						Thorium-230	1.66	0.69	0.15	
						Thorium-232	0.75	0.44	0.33	
						Uranium-235	0.00	0.24	0.40	
						Uranium-238	1.86	1.13	0.97	
	SLD101212	04/04/07	3	3.5		Actinium-227	-0.20	0.23	0.34	0.08
						Americium-241	0.11	0.09	0.15	
						Cesium-137	0.00	0.02	0.03	
						Potassium-40	13.99	1.13	0.29	
						Protactinium-231	0.09	0.68	1.02	
						Radium-226	2.09	0.54	0.09	
						Radium-228	0.92	0.09	0.13	
						Thorium-228	1.26	0.61	0.40	
						Thorium-230	2.81	1.00	0.35	
						Thorium-232	1.42	0.65	0.16	
						Uranium-235	0.32	0.29	0.49	
						Uranium-238	1.33	1.13	1.25	
	SLD101213	04/04/07	5.5	6.0		Actinium-227	-0.06	0.24	0.37	0.01
						Americium-241	0.01	0.10	0.16	
						Cesium-137	-0.01	0.02	0.04	
						Potassium-40	14.60	1.29	0.37	
						Protactinium-231	0.27	0.66	1.02	
						Radium-226	1.64	0.44	0.10	
						Radium-228	1.08	0.10	0.12	
						Thorium-228	1.45	0.60	0.25	
						Thorium-230	1.27	0.55	0.13	
						Thorium-232	1.27	0.55	0.13	
						Uranium-235	-0.22	0.30	0.47	
						Uranium-238	0.89	0.86	1.52	
SLD101214	SLD101214	04/04/07	0	0.5		Actinium-227	-0.05	0.15	0.23	0.00
						Americium-241	0.01	0.06	0.09	
						Cesium-137	0.09	0.02	0.02	
						Potassium-40	5.82	0.58	0.14	
						Protactinium-231	-0.04	0.45	0.66	
						Radium-226	1.52	0.39	0.06	
						Radium-228	0.42	0.06	0.08	
						Thorium-228	0.63	0.37	0.13	
						Thorium-230	1.70	0.66	0.33	
						Thorium-232	0.43	0.30	0.13	
						Uranium-235	-0.02	0.21	0.34	
						Uranium-238	1.19	0.72	0.83	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 12 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101214	SLD101215	04/04/07	0.5	1.0		Actinium-227	0.03	0.16	0.23	0.00
						Americium-241	-0.04	0.05	0.08	
						Cesium-137	0.05	0.02	0.03	
						Potassium-40	4.65	0.57	0.18	
						Protactinium-231	0.18	0.39	0.68	
						Radium-226	1.19	0.32	0.06	
						Radium-228	0.23	0.05	0.07	
						Thorium-228	0.19	0.19	0.13	
						Thorium-230	0.89	0.44	0.13	
						Thorium-232	0.42	0.29	0.13	
						Uranium-235	0.01	0.19	0.32	
						Uranium-238	0.57	0.50	0.89	
	SLD101216	04/04/07	3.4	3.9		Actinium-227	-0.10	0.12	0.17	0.00
						Americium-241	0.04	0.04	0.06	
						Cesium-137	-0.01	0.01	0.01	
						Potassium-40	1.83	0.35	0.17	
						Protactinium-231	0.08	0.28	0.49	
						Radium-226	0.67	0.19	0.05	
						Radium-228	0.11	0.03	0.05	
						Thorium-228	0.11	0.16	0.27	
						Thorium-230	0.58	0.35	0.23	
						Thorium-232	0.14	0.16	0.12	
						Uranium-235	-0.02	0.15	0.25	
						Uranium-238	0.96	0.41	0.57	
	SLD101217	04/04/07	5.5	6.0		Actinium-227	-0.10	0.22	0.34	0.00
						Americium-241	0.07	0.08	0.13	
						Cesium-137	-0.02	0.02	0.03	
						Potassium-40	13.19	1.08	0.36	
						Protactinium-231	0.60	0.52	0.91	
						Radium-226	1.68	0.44	0.09	
						Radium-228	0.85	0.09	0.11	
						Thorium-228	1.09	0.55	0.29	
						Thorium-230	1.50	0.67	0.29	
						Thorium-232	1.05	0.54	0.16	
						Uranium-235	0.39	0.43	0.46	
						Uranium-238	1.11	1.15	1.13	
SLD101218	SLD101218	04/04/07	0	0.5		Actinium-227	0.06	0.21	0.34	0.01
						Americium-241	0.02	0.07	0.11	
						Cesium-137	0.46	0.06	0.03	
						Potassium-40	4.81	0.68	0.27	
						Protactinium-231	0.09	0.56	0.85	
						Radium-226	1.64	0.44	0.08	
						Radium-228	0.32	0.07	0.09	
						Thorium-228	0.37	0.30	0.35	
						Thorium-230	1.68	0.68	0.31	
						Thorium-232	0.10	0.15	0.14	
						Uranium-235	0.14	0.25	0.42	
						Uranium-238	1.85	0.89	0.98	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 7 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
HTZ94915	HTZ94915	08/10/06	0	0.5		Actinium-227	-0.02	0.15	0.20	0.00
						Americium-241	0.01	0.03	0.04	
						Cesium-137	0.02	0.01	0.02	
						Potassium-40	10.97	0.69	0.19	
						Protactinium-231	0.17	0.37	0.57	
						Radium-226	1.60	0.39	0.06	
						Radium-228	0.72	0.06	0.07	
						Thorium-228	1.40	0.64	0.30	
						Thorium-230	1.59	0.69	0.16	
						Thorium-232	1.04	0.54	0.30	
						Uranium-235	-0.02	0.19	0.28	
						Uranium-238	1.30	0.47	0.41	
HTZ94916	HTZ94916	08/10/06	0	0.5		Actinium-227	-0.03	0.25	0.27	0.36
						Americium-241	0.00	0.03	0.05	
						Cesium-137	0.34	0.03	0.02	
						Potassium-40	10.37	0.70	0.23	
						Protactinium-231	0.35	0.53	0.80	
						Radium-226	3.37	0.79	0.07	
						Radium-228	0.82	0.07	0.09	
						Thorium-228	0.83	0.41	0.26	
						Thorium-230	3.55	1.02	0.12	
						Thorium-232	0.85	0.41	0.12	
						Uranium-235	0.38	0.19	0.34	
						Uranium-238	3.52	0.65	0.49	
HTZ94917	HTZ94917	08/10/06	0	0.5		Actinium-227	-0.02	0.17	0.20	0.00
						Americium-241	0.01	0.03	0.05	
						Cesium-137	0.02	0.02	0.03	
						Potassium-40	13.81	0.92	0.21	
						Protactinium-231	0.23	0.40	0.69	
						Radium-226	1.46	0.37	0.06	
						Radium-228	0.78	0.07	0.10	
						Thorium-228	0.89	0.47	0.14	
						Thorium-230	1.78	0.70	0.14	
						Thorium-232	0.99	0.50	0.14	
						Uranium-235	0.03	0.19	0.32	
						Uranium-238	1.32	0.56	0.49	
SLD101198	SLD101198	04/03/07	0	0.5		Actinium-227	-0.26	0.58	0.78	0.70
						Americium-241	0.08	0.11	0.18	
						Cesium-137	0.20	0.09	0.08	
						Potassium-40	12.30	1.70	0.85	
						Protactinium-231	-0.77	1.46	2.37	
						Radium-226	5.50	1.39	0.20	
						Radium-228	1.27	0.21	0.29	
						Thorium-228	1.15	0.54	0.37	
						Thorium-230	3.53	1.08	0.25	
						Thorium-232	1.05	0.50	0.14	
						Uranium-235	0.17	0.61	1.01	
						Uranium-238	5.99	2.00	1.64	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 13 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101218	SLD101219	04/04/07	1.5	2.0		Actinium-227	0.15	0.17	0.29	0.00
						Americium-241	0.00	0.07	0.11	
						Cesium-137	0.00	0.02	0.02	
						Potassium-40	3.23	0.53	0.21	
						Protactinium-231	-0.05	0.53	0.78	
						Radium-226	1.27	0.35	0.08	
						Radium-228	0.41	0.06	0.08	
						Thorium-228	0.20	0.20	0.22	
						Thorium-230	0.77	0.39	0.22	
						Thorium-232	0.43	0.28	0.12	
						Uranium-235	0.11	0.23	0.39	
						Uranium-238	0.93	0.78	0.94	
SLD101220	SLD101220	04/04/07	0	0.5		Actinium-227	-0.07	0.20	0.31	0.00
						Americium-241	0.03	0.07	0.12	
						Cesium-137	0.09	0.03	0.03	
						Potassium-40	5.90	0.71	0.30	
						Protactinium-231	0.58	0.57	0.93	
						Radium-226	1.62	0.43	0.08	
						Radium-228	0.56	0.07	0.09	
						Thorium-228	0.66	0.38	0.24	
						Thorium-230	1.25	0.54	0.13	
						Thorium-232	0.77	0.41	0.13	
						Uranium-235	0.09	0.26	0.43	
						Uranium-238	1.55	1.05	1.03	
	SLD101221	04/04/07	1.4	1.9		Actinium-227	0.00	0.12	0.19	0.12
						Americium-241	0.01	0.03	0.05	
						Cesium-137	0.00	0.01	0.02	
						Potassium-40	8.72	0.71	0.15	
						Protactinium-231	0.08	0.37	0.54	
						Radium-226	1.07	0.29	0.05	
						Radium-228	0.46	0.04	0.06	
						Thorium-228	1.66	0.71	0.35	
						Thorium-230	3.78	1.21	0.29	
						Thorium-232	1.05	0.54	0.16	
						Uranium-235	0.01	0.16	0.26	
						Uranium-238	1.21	0.39	0.42	
	SLD101222	04/04/07	3	3.5		Actinium-227	-0.10	0.38	0.60	0.22
						Americium-241	0.05	0.09	0.13	
						Cesium-137	-0.01	0.04	0.05	
						Potassium-40	12.03	1.25	0.64	
						Protactinium-231	-0.12	1.21	1.70	
						Radium-226	4.05	1.03	0.15	
						Radium-228	1.13	0.13	0.21	
						Thorium-228	1.47	0.69	0.32	
						Thorium-230	3.59	1.22	0.32	
						Thorium-232	1.74	0.76	0.17	
						Uranium-235	0.40	0.51	0.80	
						Uranium-238	4.58	1.57	1.26	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 23 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101258	SLD101259	04/09/07	1.4	1.9		Actinium-227	0.07	0.09	0.13	0.00
						Americium-241	0.03	0.02	0.03	
						Cesium-137	0.00	0.01	0.01	
						Potassium-40	2.10	0.27	0.11	
						Protactinium-231	0.08	0.23	0.38	
						Radium-226	0.84	0.22	0.03	
						Radium-228	0.11	0.02	0.04	
						Thorium-228	0.00	0.00	0.14	
						Thorium-230	0.48	0.33	0.14	
						Thorium-232	0.16	0.19	0.14	
						Uranium-235	0.05	0.11	0.18	
						Uranium-238	0.72	0.28	0.27	
SLD101260	SLD101260	04/09/07	0	0.5		Actinium-227	0.19	0.33	0.56	0.00
						Americium-241	-0.04	0.08	0.11	
						Cesium-137	0.27	0.08	0.05	
						Potassium-40	8.81	1.08	0.25	
						Protactinium-231	-0.81	1.03	1.30	
						Radium-226	2.42	0.65	0.14	
						Radium-228	0.69	0.12	0.17	
						Thorium-228	0.72	0.39	0.13	
						Thorium-230	1.92	0.70	0.13	
						Thorium-232	0.62	0.36	0.13	
						Uranium-235	0.20	0.40	0.68	
						Uranium-238	1.66	1.16	1.10	
	SLD101261	04/09/07	1.5	2.0		Actinium-227	0.28	0.53	0.65	0.22
						Americium-241	-0.01	0.10	0.14	
						Cesium-137	-0.05	0.04	0.06	
						Potassium-40	11.62	1.40	0.64	
						Protactinium-231	0.81	1.26	1.91	
						Radium-226	4.92	1.22	0.17	
						Radium-228	1.19	0.16	0.23	
						Thorium-228	1.17	0.52	0.13	
						Thorium-230	2.94	0.93	0.24	
						Thorium-232	1.22	0.53	0.13	
						Uranium-235	-0.02	0.53	0.87	
						Uranium-238	4.29	1.61	1.38	
	SLD101262	04/09/07	3	3.5		Actinium-227	-0.11	0.20	0.32	0.11
						Americium-241	0.06	0.05	0.07	
						Cesium-137	0.00	0.02	0.02	
						Potassium-40	10.24	0.83	0.28	
						Protactinium-231	0.56	0.58	0.87	
						Radium-226	3.90	0.96	0.08	
						Radium-228	0.98	0.08	0.09	
						Thorium-228	1.07	0.50	0.29	
						Thorium-230	3.14	0.98	0.24	
						Thorium-232	0.93	0.46	0.29	
						Uranium-235	0.15	0.25	0.43	
						Uranium-238	2.62	0.68	0.68	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 23 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101258	SLD101259	04/09/07	1.4	1.9		Actinium-227	0.07	0.09	0.13	0.00
						Americium-241	0.03	0.02	0.03	
						Cesium-137	0.00	0.01	0.01	
						Potassium-40	2.10	0.27	0.11	
						Protactinium-231	0.08	0.23	0.38	
						Radium-226	0.84	0.22	0.03	
						Radium-228	0.11	0.02	0.04	
						Thorium-228	0.00	0.00	0.14	
						Thorium-230	0.48	0.33	0.14	
						Thorium-232	0.16	0.19	0.14	
						Uranium-235	0.05	0.11	0.18	
						Uranium-238	0.72	0.28	0.27	
SLD101260	SLD101260	04/09/07	0	0.5		Actinium-227	0.19	0.33	0.56	0.00
						Americium-241	-0.04	0.08	0.11	
						Cesium-137	0.27	0.08	0.05	
						Potassium-40	8.81	1.08	0.25	
						Protactinium-231	-0.81	1.03	1.30	
						Radium-226	2.42	0.65	0.14	
						Radium-228	0.69	0.12	0.17	
						Thorium-228	0.72	0.39	0.13	
						Thorium-230	1.92	0.70	0.13	
						Thorium-232	0.62	0.36	0.13	
						Uranium-235	0.20	0.40	0.68	
						Uranium-238	1.66	1.16	1.10	
	SLD101261	04/09/07	1.5	2.0		Actinium-227	0.28	0.53	0.65	0.22
						Americium-241	-0.01	0.10	0.14	
						Cesium-137	-0.05	0.04	0.06	
						Potassium-40	11.62	1.40	0.64	
						Protactinium-231	0.81	1.26	1.91	
						Radium-226	4.92	1.22	0.17	
						Radium-228	1.19	0.16	0.23	
						Thorium-228	1.17	0.52	0.13	
						Thorium-230	2.94	0.93	0.24	
						Thorium-232	1.22	0.53	0.13	
						Uranium-235	-0.02	0.53	0.87	
						Uranium-238	4.29	1.61	1.38	
	SLD101262	04/09/07	3	3.5		Actinium-227	-0.11	0.20	0.32	0.11
						Americium-241	0.06	0.05	0.07	
						Cesium-137	0.00	0.02	0.02	
						Potassium-40	10.24	0.83	0.28	
						Protactinium-231	0.56	0.58	0.87	
						Radium-226	3.90	0.96	0.08	
						Radium-228	0.98	0.08	0.09	
						Thorium-228	1.07	0.50	0.29	
						Thorium-230	3.14	0.98	0.24	
						Thorium-232	0.93	0.46	0.29	
						Uranium-235	0.15	0.25	0.43	
						Uranium-238	2.62	0.68	0.68	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 24 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101260	SLD101263	04/09/07	5.5	6.0		Actinium-227	-0.33	0.31	0.44	0.03
						Americium-241	-0.02	0.08	0.11	
						Cesium-137	-0.02	0.03	0.05	
						Potassium-40	9.01	1.13	0.18	
						Protactinium-231	0.28	0.94	1.55	
						Radium-226	1.82	0.52	0.13	
						Radium-228	0.67	0.13	0.19	
						Thorium-228	0.68	0.36	0.12	
						Thorium-230	1.33	0.53	0.12	
						Thorium-232	0.51	0.31	0.12	
						Uranium-235	-0.03	0.39	0.64	
						Uranium-238	2.97	1.34	1.02	
SLD101264	SLD101264	04/09/07	0	0.5		Actinium-227	0.13	0.12	0.20	0.00
						Americium-241	0.02	0.03	0.04	
						Cesium-137	0.04	0.02	0.02	
						Potassium-40	6.25	0.51	0.15	
						Protactinium-231	0.10	0.34	0.55	
						Radium-226	2.10	0.52	0.05	
						Radium-228	0.54	0.04	0.06	
						Thorium-228	0.37	0.31	0.34	
						Thorium-230	1.83	0.75	0.16	
						Thorium-232	0.91	0.49	0.16	
						Uranium-235	0.05	0.16	0.27	
						Uranium-238	1.64	0.39	0.43	
	SLD101265	04/09/07	1	1.5		Actinium-227	-0.18	0.19	0.26	0.02
						Americium-241	0.02	0.04	0.06	
						Cesium-137	0.07	0.02	0.02	
						Potassium-40	9.62	0.79	0.20	
						Protactinium-231	-0.01	0.50	0.71	
						Radium-226	2.87	0.72	0.07	
						Radium-228	0.80	0.07	0.08	
						Thorium-228	0.68	0.37	0.12	
SLD101266	SLD101266	04/10/07	0	0.5		Thorium-230	1.93	0.69	0.23	
						Thorium-232	0.27	0.23	0.12	
						Uranium-235	0.24	0.22	0.37	
						Uranium-238	2.17	0.67	0.59	
						Actinium-227	0.10	0.10	0.15	0.01
						Americium-241	-0.01	0.02	0.03	
						Cesium-137	0.04	0.01	0.01	
						Potassium-40	4.19	0.37	0.13	
						Protactinium-231	0.21	0.28	0.42	
						Radium-226	1.72	0.42	0.04	
						Radium-228	0.28	0.03	0.04	
						Thorium-228	0.49	0.33	0.13	
						Thorium-230	1.77	0.68	0.25	
						Thorium-232	0.44	0.31	0.13	
						Uranium-235	0.15	0.13	0.20	
						Uranium-238	1.73	0.44	0.30	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 25 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101266	SLD101267	04/10/07	0	0.5		Actinium-227	0.00	0.15	0.24	0.01
						Americium-241	-0.03	0.04	0.05	
						Cesium-137	0.01	0.01	0.02	
						Potassium-40	9.11	0.74	0.17	
						Protactinium-231	0.33	0.46	0.68	
						Radium-226	2.49	0.62	0.06	
						Radium-228	0.71	0.06	0.08	
						Thorium-228	1.27	0.52	0.12	
						Thorium-230	2.00	0.70	0.22	
						Thorium-232	0.65	0.36	0.12	
						Uranium-235	0.02	0.20	0.33	
						Uranium-238	1.49	0.55	0.56	
SLD101268	SLD101268	04/11/07	0	0.5		Actinium-227	0.01	0.47	0.75	0.27
						Americium-241	0.10	0.20	0.31	
						Cesium-137	0.25	0.08	0.08	
						Potassium-40	10.78	1.65	0.81	
						Protactinium-231	0.20	1.35	2.03	
						Radium-226	3.80	1.01	0.20	
						Radium-228	0.91	0.16	0.34	
						Thorium-228	1.05	0.49	0.13	
						Thorium-230	3.06	0.97	0.13	
						Thorium-232	1.04	0.40	0.21	
						Uranium-235	0.72	0.60	1.04	
						Uranium-238	3.91	2.36	2.64	
	SLD101269	04/11/07	1	1.5		Actinium-227	-0.30	0.52	0.79	0.24
						Americium-241	-0.06	0.24	0.36	
						Cesium-137	-0.01	0.06	0.09	
						Potassium-40	11.29	1.66	0.89	
						Protactinium-231	-0.92	1.45	2.33	
						Radium-226	4.60	1.22	0.21	
						Radium-228	1.23	0.22	0.24	
						Thorium-228	1.55	0.68	0.29	
						Thorium-230	3.24	1.09	0.16	
						Thorium-232	0.56	0.38	0.29	
						Uranium-235	-0.02	0.64	1.04	
						Uranium-238	6.21	2.64	2.92	
	SLD101270	04/11/07	2	2.5		Actinium-227	0.17	0.28	0.46	0.11
						Americium-241	0.11	0.10	0.17	
						Cesium-137	0.08	0.03	0.04	
						Potassium-40	9.02	0.91	0.32	
						Protactinium-231	0.61	0.77	1.22	
						Radium-226	3.05	0.78	0.11	
						Radium-228	0.91	0.10	0.15	
						Thorium-228	1.16	0.52	0.24	
						Thorium-230	3.09	0.96	0.13	
						Thorium-232	1.54	0.61	0.13	
						Uranium-235	0.14	0.40	0.60	
						Uranium-238	1.32	1.12	1.46	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 26 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101268	SLD101271	04/11/07	5.5	6.0		Actinium-227	-0.21	0.49	0.75	0.24
						Americium-241	0.10	0.22	0.34	
						Cesium-137	-0.01	0.06	0.09	
						Potassium-40	11.02	1.78	0.66	
						Protactinium-231	1.20	1.53	2.47	
						Radium-226	4.20	1.11	0.23	
						Radium-228	1.36	0.21	0.32	
						Thorium-228	1.10	0.49	0.12	
						Thorium-230	3.39	1.00	0.22	
						Thorium-232	1.81	0.66	0.12	
						Uranium-235	-0.12	0.65	1.05	
						Uranium-238	6.33	3.55	2.89	
SLD101272	SLD101272	04/11/07	0	0.5		Actinium-227	-0.09	0.11	0.17	0.00
						Americium-241	0.01	0.02	0.04	
						Cesium-137	0.13	0.02	0.02	
						Potassium-40	4.61	0.42	0.17	
						Protactinium-231	0.02	0.32	0.47	
						Radium-226	1.23	0.31	0.05	
						Radium-228	0.34	0.04	0.06	
						Thorium-228	0.52	0.32	0.12	
						Thorium-230	0.94	0.44	0.22	
						Thorium-232	0.35	0.25	0.12	
						Uranium-235	0.11	0.14	0.23	
						Uranium-238	1.05	0.34	0.34	
	SLD101273	04/11/07	1	1.5		Actinium-227	0.12	0.67	1.08	0.32
						Americium-241	-0.04	0.13	0.19	
						Cesium-137	-0.03	0.07	0.10	
						Potassium-40	10.62	1.72	0.80	
						Protactinium-231	-2.00	2.07	2.78	
						Radium-226	6.07	1.57	0.30	
						Radium-228	1.27	0.23	0.35	
						Thorium-228	1.58	0.67	0.32	
						Thorium-230	4.18	1.26	0.15	
						Thorium-232	1.29	0.58	0.15	
						Uranium-235	-0.35	0.86	1.21	
						Uranium-238	5.60	2.20	1.92	
	SLD101292	04/11/07	2	2.5		Actinium-227	0.22	0.33	0.48	0.52
						Americium-241	0.05	0.06	0.10	
						Cesium-137	-0.03	0.03	0.04	
						Potassium-40	11.44	0.96	0.45	
						Protactinium-231	0.22	0.89	1.33	
						Radium-226	8.88	2.07	0.12	
						Radium-228	1.01	0.10	0.16	
						Thorium-228	1.30	0.59	0.26	
						Thorium-230	5.88	1.61	0.14	
						Thorium-232	1.36	0.60	0.14	
						Uranium-235	0.41	0.39	0.64	
						Uranium-238	6.40	1.12	0.93	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 27 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101272	SLD101293	04/11/07	4	4.5		Actinium-227	-0.01	0.21	0.33	0.04
						Americium-241	0.02	0.04	0.07	
						Cesium-137	-0.01	0.02	0.03	
						Potassium-40	14.58	1.01	0.27	
						Protactinium-231	-0.04	0.56	0.83	
						Radium-226	3.01	0.73	0.08	
						Radium-228	0.97	0.08	0.10	
						Thorium-228	1.31	0.56	0.13	
						Thorium-230	2.04	0.74	0.13	
						Thorium-232	0.92	0.46	0.13	
						Uranium-235	0.42	0.32	0.41	
						Uranium-238	2.64	0.80	0.61	
SLD101274	SLD101274	04/10/07	0	0.5		Actinium-227	0.13	0.19	0.32	0.02
						Americium-241	0.03	0.07	0.11	
						Cesium-137	0.00	0.02	0.03	
						Potassium-40	3.78	0.50	0.28	
						Protactinium-231	0.49	0.49	0.79	
						Radium-226	2.02	0.52	0.07	
						Radium-228	0.63	0.06	0.09	
						Thorium-228	0.78	0.43	0.14	
						Thorium-230	1.34	0.59	0.26	
						Thorium-232	0.78	0.43	0.14	
						Uranium-235	-0.11	0.25	0.40	
						Uranium-238	2.40	0.90	0.95	
	SLD101275	04/10/07	0.5	1.0		Actinium-227	-0.03	0.29	0.46	0.00
						Americium-241	0.04	0.10	0.17	
						Cesium-137	-0.01	0.03	0.05	
						Potassium-40	2.89	0.70	0.52	
						Protactinium-231	0.00	0.79	1.33	
						Radium-226	2.42	0.64	0.12	
						Radium-228	0.48	0.10	0.16	
						Thorium-228	0.54	0.34	0.28	
						Thorium-230	1.94	0.71	0.13	
						Thorium-232	0.52	0.33	0.13	
						Uranium-235	-0.09	0.39	0.63	
						Uranium-238	0.70	0.94	1.66	
	SLD101276	04/10/07	2	2.5		Actinium-227	-0.05	0.16	0.25	0.00
						Americium-241	-0.01	0.06	0.10	
						Cesium-137	0.01	0.02	0.03	
						Potassium-40	9.25	0.81	0.16	
						Protactinium-231	0.23	0.49	0.76	
						Radium-226	1.24	0.33	0.06	
						Radium-228	0.39	0.06	0.09	
						Thorium-228	0.45	0.33	0.15	
						Thorium-230	1.34	0.61	0.15	
						Thorium-232	0.33	0.28	0.15	
						Uranium-235	0.06	0.21	0.35	
						Uranium-238	1.37	0.88	0.83	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 28 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101274	SLD101277	04/10/07	5	5.5		Actinium-227	0.17	0.22	0.36	0.02
						Americium-241	0.07	0.09	0.14	
						Cesium-137	-0.02	0.02	0.04	
						Potassium-40	16.32	1.21	0.28	
						Protactinium-231	0.72	0.62	1.01	
						Radium-226	1.64	0.44	0.09	
						Radium-228	0.99	0.09	0.11	
						Thorium-228	1.67	0.67	0.30	
						Thorium-230	1.64	0.65	0.25	
						Thorium-232	1.42	0.60	0.30	
						Uranium-235	0.21	0.28	0.46	
						Uranium-238	0.86	0.93	1.27	
SLD101278	SLD101278	04/10/07	0	0.5		Actinium-227	-0.16	0.56	0.87	1.08
						Americium-241	0.02	0.25	0.39	
						Cesium-137	0.02	0.07	0.10	
						Potassium-40	12.31	1.62	0.69	
						Protactinium-231	-0.22	1.70	2.49	
						Radium-226	7.00	1.77	0.23	
						Radium-228	1.62	0.22	0.30	
						Thorium-228	0.97	0.51	0.15	
						Thorium-230	6.37	1.77	0.29	
						Thorium-232	1.31	0.61	0.15	
						Uranium-235	-0.04	0.73	1.19	
						Uranium-238	4.64	3.67	3.42	
	SLD101279	04/10/07	1	1.5		Actinium-227	-0.07	0.29	0.45	0.17
						Americium-241	0.03	0.11	0.17	
						Cesium-137	0.01	0.02	0.04	
						Potassium-40	8.87	1.00	0.40	
						Protactinium-231	0.08	0.84	1.26	
						Radium-226	3.79	0.95	0.11	
						Radium-228	1.06	0.10	0.13	
						Thorium-228	1.48	0.60	0.13	
						Thorium-230	3.24	1.00	0.24	
						Thorium-232	1.96	0.72	0.13	
						Uranium-235	0.22	0.38	0.63	
						Uranium-238	2.66	1.34	1.46	
	SLD101280	04/10/07	3.5	4.0		Actinium-227	0.05	0.50	0.79	0.09
						Americium-241	0.10	0.20	0.34	
						Cesium-137	-0.03	0.05	0.08	
						Potassium-40	14.31	1.97	0.83	
						Protactinium-231	0.36	1.40	2.40	
						Radium-226	3.89	1.05	0.21	
						Radium-228	1.22	0.21	0.26	
						Thorium-228	1.10	0.50	0.13	
						Thorium-230	2.86	0.92	0.24	
						Thorium-232	1.20	0.53	0.13	
						Uranium-235	-0.09	0.61	0.98	
						Uranium-238	1.53	1.84	3.25	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 29 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101278	SLD101281	04/10/07	5.4	5.9		Actinium-227	0.47	0.31	0.41	0.01
						Americium-241	0.06	0.09	0.15	
						Cesium-137	-0.02	0.03	0.03	
						Potassium-40	13.61	1.15	0.29	
						Protactinium-231	0.23	0.67	1.03	
						Radium-226	1.85	0.49	0.10	
						Radium-228	0.84	0.09	0.12	
						Thorium-228	1.20	0.56	0.32	
						Thorium-230	1.87	0.73	0.14	
						Thorium-232	1.01	0.51	0.14	
						Uranium-235	0.19	0.30	0.51	
						Uranium-238	2.03	1.35	1.24	
SLD101282	SLD101282	04/10/07	0	0.5		Actinium-227	-0.06	0.38	0.59	0.01
						Americium-241	-0.06	0.16	0.24	
						Cesium-137	0.28	0.07	0.07	
						Potassium-40	7.39	1.37	0.59	
						Protactinium-231	0.35	0.92	1.61	
						Radium-226	1.94	0.57	0.15	
						Radium-228	0.67	0.24	0.46	
						Thorium-228	0.80	0.45	0.15	
						Thorium-230	1.83	0.72	0.15	
						Thorium-232	0.54	0.36	0.15	
						Uranium-235	-0.11	0.44	0.70	
						Uranium-238	1.99	1.91	2.08	
	SLD101283	04/10/07	1	1.5		Actinium-227	-0.05	0.51	0.80	0.09
						Americium-241	0.01	0.11	0.17	
						Cesium-137	-0.05	0.05	0.07	
						Potassium-40	8.26	1.49	0.76	
						Protactinium-231	5.99	3.60	2.52	
						Radium-226	2.76	0.79	0.21	
						Radium-228	0.95	0.19	0.29	
						Thorium-228	1.57	0.68	0.34	
						Thorium-230	2.73	0.97	0.29	
						Thorium-232	1.26	0.59	0.15	
SLD101284	SLD101284	04/11/07	0	0.5		Uranium-235	0.10	0.60	0.99	
						Uranium-238	2.79	1.80	1.56	
						Actinium-227	-0.29	0.34	0.49	2.46
						Americium-241	0.05	0.06	0.12	
						Cesium-137	0.20	0.07	0.06	
						Potassium-40	7.10	1.05	0.57	
						Protactinium-231	-0.34	0.91	1.49	
						Radium-226	1.82	0.51	0.15	
						Radium-228	0.51	0.14	0.19	
						Thorium-228	0.75	0.40	0.13	
						Thorium-230	14.24	3.14	0.13	
						Thorium-232	0.51	0.32	0.13	
						Uranium-235	-0.02	0.41	0.66	
						Uranium-238	0.94	0.75	1.42	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 30 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101284	SLD101285	04/11/07	0.5	1.0		Actinium-227	-0.17	0.15	0.22	0.00
						Americium-241	-0.01	0.03	0.04	
						Cesium-137	0.12	0.03	0.02	
						Potassium-40	5.70	0.61	0.24	
						Protactinium-231	0.13	0.38	0.58	
						Radium-226	1.26	0.32	0.06	
						Radium-228	0.35	0.05	0.09	
						Thorium-228	0.72	0.42	0.26	
						Thorium-230	1.31	0.58	0.14	
						Thorium-232	0.16	0.18	0.14	
						Uranium-235	0.11	0.18	0.30	
						Uranium-238	0.94	0.52	0.41	
SLD101286	SLD101286	04/11/07	0	0.5		Actinium-227	0.09	0.34	0.49	0.00
						Americium-241	0.01	0.06	0.10	
						Cesium-137	0.16	0.07	0.05	
						Potassium-40	3.54	0.87	0.52	
						Protactinium-231	0.89	0.88	1.61	
						Radium-226	0.88	0.29	0.15	
						Radium-228	0.21	0.18	0.27	
						Thorium-228	0.55	0.34	0.12	
						Thorium-230	0.46	0.30	0.13	
						Thorium-232	0.14	0.16	0.12	
						Uranium-235	0.69	0.75	0.61	
						Uranium-238	-0.36	0.66	1.22	
	SLD101287	04/11/07	1.3	1.8		Actinium-227	-0.03	0.16	0.25	0.00
						Americium-241	0.00	0.03	0.05	
						Cesium-137	0.00	0.02	0.02	
						Potassium-40	5.58	0.56	0.23	
						Protactinium-231	0.05	0.44	0.67	
						Radium-226	1.84	0.46	0.06	
						Radium-228	0.49	0.06	0.09	
						Thorium-228	0.49	0.36	0.17	
						Thorium-230	1.40	0.66	0.31	
						Thorium-232	0.43	0.34	0.17	
						Uranium-235	0.14	0.19	0.33	
						Uranium-238	1.05	0.43	0.46	
SLD101288	SLD101288	04/11/07	0	0.5		Actinium-227	-0.02	0.12	0.18	0.00
						Americium-241	-0.01	0.02	0.03	
						Cesium-137	0.00	0.01	0.02	
						Potassium-40	7.62	0.58	0.16	
						Protactinium-231	-0.04	0.34	0.50	
						Radium-226	1.02	0.26	0.05	
						Radium-228	0.30	0.04	0.06	
						Thorium-228	0.27	0.24	0.24	
						Thorium-230	0.83	0.43	0.24	
						Thorium-232	0.27	0.24	0.24	
						Uranium-235	0.10	0.14	0.24	
						Uranium-238	0.66	0.37	0.35	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 31 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101288	SLD101289	04/11/07	1.7	2.2		Actinium-227	0.08	0.21	0.34	0.13
						Americium-241	0.02	0.04	0.07	
						Cesium-137	0.01	0.02	0.03	
						Potassium-40	7.58	0.79	0.29	
						Protactinium-231	0.41	0.59	0.91	
						Radium-226	3.07	0.75	0.08	
						Radium-228	0.83	0.07	0.12	
						Thorium-228	1.25	0.65	0.40	
						Thorium-230	3.58	1.24	0.18	
						Thorium-232	1.15	0.61	0.18	
						Uranium-235	0.28	0.26	0.44	
						Uranium-238	2.37	0.69	0.62	
	SLD101290	04/11/07	4.2	4.7		Actinium-227	-0.01	0.20	0.31	0.00
						Americium-241	0.02	0.04	0.07	
						Cesium-137	0.00	0.02	0.03	
						Potassium-40	17.10	1.17	0.34	
						Protactinium-231	0.05	0.56	0.84	
						Radium-226	1.84	0.47	0.08	
						Radium-228	1.01	0.08	0.12	
						Thorium-228	1.25	0.53	0.13	
						Thorium-230	1.62	0.63	0.13	
						Thorium-232	0.77	0.41	0.23	
						Uranium-235	-0.04	0.25	0.40	
						Uranium-238	1.10	0.72	0.62	
	SLD101291	04/11/07	6.2	6.7		Actinium-227	-0.65	0.66	0.97	0.26
						Americium-241	0.07	0.14	0.22	
						Cesium-137	-0.11	0.08	0.09	
						Potassium-40	11.59	1.87	0.85	
						Protactinium-231	-0.49	1.78	2.94	
						Radium-226	5.06	1.34	0.31	
						Radium-228	1.50	0.25	0.40	
						Thorium-228	1.70	0.73	0.30	
						Thorium-230	4.98	1.49	0.16	
						Thorium-232	1.54	0.68	0.16	
						Uranium-235	0.18	0.77	1.28	
						Uranium-238	2.37	2.11	2.09	
SLD101294	SLD101294	05/14/07	0	0.5		Actinium-227	-0.19	0.27	0.40	0.07
						Americium-241	-0.01	0.10	0.15	
						Cesium-137	0.10	0.04	0.05	
						Potassium-40	4.49	0.74	0.31	
						Protactinium-231	-0.03	0.61	1.02	
						Radium-226	1.93	0.52	0.11	
						Radium-228	0.41	0.08	0.14	
						Thorium-228	0.68	0.39	0.13	
						Thorium-230	2.28	0.80	0.29	
						Thorium-232	0.54	0.34	0.13	
						Uranium-235	0.00	0.33	0.53	
						Uranium-238	1.60	1.24	1.25	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 32 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101294	SLD101295	05/14/07	0.5	1.0		Actinium-227	0.23	0.26	0.46	0.00
						Americium-241	0.02	0.09	0.16	
						Cesium-137	0.11	0.04	0.04	
						Potassium-40	10.48	1.32	0.17	
						Protactinium-231	0.18	0.71	1.22	
						Radium-226	0.77	0.26	0.12	
						Radium-228	0.35	0.09	0.15	
						Thorium-228	0.54	0.37	0.28	
						Thorium-230	0.83	0.46	0.15	
						Thorium-232	0.54	0.37	0.28	
						Uranium-235	-0.16	0.34	0.53	
						Uranium-238	0.52	0.90	1.61	
	SLD101296	05/14/07	3	3.5		Actinium-227	0.02	0.27	0.44	0.02
						Americium-241	0.04	0.10	0.16	
						Cesium-137	-0.04	0.02	0.03	
						Potassium-40	8.89	1.14	0.26	
						Protactinium-231	-0.08	0.75	1.10	
						Radium-226	1.57	0.45	0.10	
						Radium-228	0.41	0.09	0.15	
						Thorium-228	0.95	0.48	0.30	
						Thorium-230	1.13	0.52	0.13	
						Thorium-232	0.34	0.27	0.13	
						Uranium-235	0.09	0.34	0.57	
						Uranium-238	2.52	1.68	1.41	
	SLD101297	05/14/07	5	5.5		Actinium-227	-0.11	0.58	0.90	0.06
						Americium-241	-0.11	0.23	0.38	
						Cesium-137	-0.01	0.06	0.10	
						Potassium-40	11.41	2.09	0.94	
						Protactinium-231	0.73	1.88	3.27	
						Radium-226	2.98	0.92	0.28	
						Radium-228	1.01	0.23	0.33	
						Thorium-228	0.71	0.42	0.32	
						Thorium-230	2.81	0.95	0.14	
						Thorium-232	0.83	0.45	0.27	
						Uranium-235	0.30	0.72	1.20	
						Uranium-238	1.57	2.27	4.06	
SLD101298	SLD101298	05/14/07	0	0.5		Actinium-227	-0.10	0.52	0.80	0.18
						Americium-241	-0.10	0.23	0.34	
						Cesium-137	0.14	0.13	0.09	
						Potassium-40	7.46	1.49	0.68	
						Protactinium-231	0.25	1.46	2.22	
						Radium-226	2.96	0.87	0.26	
						Radium-228	0.67	0.20	0.35	
						Thorium-228	1.15	0.55	0.27	
						Thorium-230	2.75	0.93	0.14	
						Thorium-232	0.48	0.33	0.14	
						Uranium-235	0.19	0.64	1.06	
						Uranium-238	2.10	2.28	3.03	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 33 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101298	SLD101299	05/14/07	1.5	2.0		Actinium-227	-0.33	0.37	0.54	0.16
						Americium-241	0.14	0.14	0.23	
						Cesium-137	-0.03	0.03	0.05	
						Potassium-40	10.82	1.29	0.52	
						Protactinium-231	0.66	0.98	1.56	
						Radium-226	3.19	0.84	0.13	
						Radium-228	0.98	0.13	0.18	
						Thorium-228	1.56	0.70	0.31	
						Thorium-230	4.07	1.30	0.16	
						Thorium-232	1.15	0.58	0.16	
						Uranium-235	0.02	0.45	0.74	
						Uranium-238	2.06	1.55	1.85	
SLD101300	SLD101300	05/14/07	0	0.5		Actinium-227	0.12	0.32	0.53	0.00
						Americium-241	0.16	0.08	0.19	
						Cesium-137	0.30	0.08	0.05	
						Potassium-40	11.81	1.54	0.52	
						Protactinium-231	-0.11	0.91	1.51	
						Radium-226	0.98	0.33	0.14	
						Radium-228	0.41	0.12	0.22	
						Thorium-228	0.26	0.23	0.23	
						Thorium-230	0.99	0.46	0.12	
						Thorium-232	0.57	0.34	0.23	
						Uranium-235	0.56	0.40	0.72	
						Uranium-238	1.31	1.11	2.05	
	SLD101301	05/14/07	1.5	2.0		Actinium-227	-0.20	0.22	0.31	0.01
						Americium-241	0.03	0.10	0.15	
						Cesium-137	-0.01	0.02	0.03	
						Potassium-40	7.19	0.99	0.37	
						Protactinium-231	0.17	0.59	0.92	
						Radium-226	1.07	0.32	0.09	
						Radium-228	0.38	0.08	0.14	
						Thorium-228	0.73	0.42	0.30	
						Thorium-230	1.46	0.61	0.25	
						Thorium-232	0.45	0.32	0.14	
						Uranium-235	-0.03	0.30	0.48	
						Uranium-238	2.10	0.98	1.23	
SLD101302	SLD101302	05/14/07	0	0.5		Actinium-227	0.11	0.28	0.46	0.19
						Americium-241	0.05	0.11	0.17	
						Cesium-137	0.27	0.05	0.04	
						Potassium-40	15.43	1.42	0.37	
						Protactinium-231	0.02	0.74	1.25	
						Radium-226	1.97	0.53	0.11	
						Radium-228	0.53	0.09	0.12	
						Thorium-228	1.44	0.64	0.34	
						Thorium-230	2.88	0.99	0.15	
						Thorium-232	0.27	0.26	0.28	
						Uranium-235	0.32	0.33	0.56	
						Uranium-238	1.46	1.34	1.48	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 34 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101302	SLD101303	05/14/07	1	1.5		Actinium-227	0.07	0.36	0.58	0.10
						Americium-241	0.05	0.15	0.23	
						Cesium-137	0.02	0.03	0.05	
						Potassium-40	10.52	1.30	0.54	
						Protactinium-231	-0.20	0.97	1.41	
						Radium-226	3.59	0.93	0.16	
						Radium-228	1.01	0.13	0.18	
						Thorium-228	0.97	0.47	0.24	
						Thorium-230	3.14	0.97	0.13	
						Thorium-232	1.08	0.49	0.13	
						Uranium-235	0.22	0.50	0.83	
						Uranium-238	2.48	1.48	2.02	
SLD101304	SLD101304	05/14/07	0	0.5		Actinium-227	0.14	0.29	0.49	0.00
						Americium-241	-0.04	0.10	0.17	
						Cesium-137	0.25	0.05	0.04	
						Potassium-40	8.74	1.27	0.47	
						Protactinium-231	-0.98	0.86	1.29	
						Radium-226	2.01	0.56	0.12	
						Radium-228	0.46	0.10	0.14	
						Thorium-228	0.81	0.44	0.26	
						Thorium-230	1.69	0.68	0.26	
						Thorium-232	0.77	0.43	0.14	
						Uranium-235	0.13	0.39	0.65	
						Uranium-238	1.08	1.05	1.89	
	SLD101305	05/14/07	1.5	2.0		Actinium-227	-0.26	0.38	0.57	0.09
						Americium-241	0.05	0.14	0.21	
						Cesium-137	0.00	0.03	0.05	
						Potassium-40	7.35	1.17	0.34	
						Protactinium-231	0.55	1.01	1.69	
						Radium-226	3.02	0.79	0.15	
						Radium-228	0.83	0.13	0.20	
						Thorium-228	1.45	0.70	0.34	
						Thorium-230	2.66	1.02	0.34	
						Thorium-232	1.05	0.58	0.34	
						Uranium-235	0.22	0.47	0.71	
						Uranium-238	3.33	1.54	1.83	
	SLD101306	05/14/07	2.5	3.0		Actinium-227	-0.43	0.46	0.69	0.28
						Americium-241	0.00	0.18	0.27	
						Cesium-137	-0.02	0.04	0.06	
						Potassium-40	10.04	1.27	0.55	
						Protactinium-231	1.49	1.54	2.06	
						Radium-226	5.20	1.32	0.19	
						Radium-228	1.25	0.17	0.22	
						Thorium-228	1.76	0.76	0.37	
						Thorium-230	5.00	1.52	0.31	
						Thorium-232	1.21	0.61	0.37	
						Uranium-235	0.16	0.60	0.99	
						Uranium-238	4.45	1.69	2.34	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 35 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101304	SLD101307	05/14/07	5	5.5		Actinium-227	0.00	0.21	0.33	0.01
						Americium-241	-0.03	0.05	0.08	
						Cesium-137	0.01	0.02	0.03	
						Potassium-40	16.29	1.27	0.24	
						Protactinium-231	0.52	0.62	0.94	
						Radium-226	2.17	0.56	0.08	
						Radium-228	1.10	0.09	0.09	
						Thorium-228	1.13	0.49	0.12	
						Thorium-230	1.28	0.53	0.26	
						Thorium-232	0.65	0.36	0.12	
						Uranium-235	0.01	0.27	0.44	
						Uranium-238	1.61	0.63	0.77	
SLD101308	SLD101308	05/14/07	0	0.5		Actinium-227	0.05	0.38	0.62	0.05
						Americium-241	0.03	0.08	0.14	
						Cesium-137	0.02	0.04	0.07	
						Potassium-40	7.88	1.09	0.46	
						Protactinium-231	-0.18	1.28	1.78	
						Radium-226	2.86	0.76	0.17	
						Radium-228	0.81	0.13	0.22	
						Thorium-228	0.65	0.37	0.24	
						Thorium-230	2.12	0.75	0.13	
						Thorium-232	0.36	0.28	0.24	
						Uranium-235	-0.06	0.45	0.73	
						Uranium-238	2.05	1.25	1.28	
	SLD101309	05/14/07	1.5	2.0		Actinium-227	0.01	0.28	0.40	0.09
						Americium-241	0.01	0.06	0.09	
						Cesium-137	0.01	0.02	0.03	
						Potassium-40	9.96	0.92	0.33	
						Protactinium-231	-0.06	0.73	1.03	
						Radium-226	3.62	0.91	0.10	
						Radium-228	1.30	0.11	0.11	
						Thorium-228	1.92	0.76	0.29	
						Thorium-230	2.72	0.95	0.15	
						Thorium-232	1.38	0.62	0.15	
						Uranium-235	0.15	0.33	0.55	
						Uranium-238	2.23	0.66	0.88	
SLD101310	SLD101310	05/14/07	0	0.5		Actinium-227	-0.03	0.29	0.46	0.01
						Americium-241	-0.05	0.07	0.09	
						Cesium-137	0.59	0.07	0.05	
						Potassium-40	7.98	0.99	0.38	
						Protactinium-231	-0.61	0.78	1.14	
						Radium-226	0.97	0.31	0.12	
						Radium-228	0.35	0.09	0.15	
						Thorium-228	0.45	0.30	0.23	
						Thorium-230	0.96	0.46	0.12	
						Thorium-232	0.46	0.30	0.12	
						Uranium-235	0.03	0.34	0.56	
						Uranium-238	2.01	1.07	0.86	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 36 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101310	SLD101311	05/14/07	1.5	2.0		Actinium-227	0.06	0.44	0.71	0.14
						Americium-241	-0.03	0.10	0.14	
						Cesium-137	-0.05	0.05	0.06	
						Potassium-40	12.04	1.56	0.59	
						Protactinium-231	0.90	1.21	1.86	
						Radium-226	4.26	1.08	0.18	
						Radium-228	1.13	0.15	0.22	
						Thorium-228	1.35	0.60	0.26	
						Thorium-230	3.30	1.06	0.14	
						Thorium-232	1.08	0.52	0.26	
						Uranium-235	-0.34	0.51	0.81	
						Uranium-238	2.95	1.60	1.39	
SLD101312	SLD101312	05/15/07	0	0.5		Actinium-227	2.96	0.47	1.17	12.49
						Americium-241	0.06	0.24	0.35	
						Cesium-137	0.29	0.11	0.11	
						Potassium-40	10.05	1.67	0.83	
						Protactinium-231	1.97	2.47	4.07	
						Radium-226	9.25	2.29	0.31	
						Radium-228	1.53	0.24	0.43	
						Thorium-228	1.58	0.65	0.31	
						Thorium-230	58.45	11.86	0.26	
						Thorium-232	1.08	0.52	0.14	
						Uranium-235	3.26	1.02	1.51	
						Uranium-238	55.19	4.94	3.08	
	SLD101313	05/15/07	1.3	1.8		Actinium-227	-0.15	0.60	0.85	0.51
						Americium-241	0.08	0.14	0.21	
						Cesium-137	0.03	0.04	0.07	
						Potassium-40	12.55	1.72	0.80	
						Protactinium-231	-0.40	1.62	2.53	
						Radium-226	7.57	1.87	0.25	
						Radium-228	1.15	0.19	0.34	
						Thorium-228	1.58	0.67	0.28	
						Thorium-230	5.88	1.63	0.15	
						Thorium-232	1.37	0.61	0.15	
						Uranium-235	0.47	0.72	1.23	
						Uranium-238	10.04	2.40	1.92	
	SLD101314	05/15/07	2	2.5		Actinium-227	1.55	0.33	0.91	2.58
						Americium-241	0.07	0.18	0.27	
						Cesium-137	0.15	0.07	0.07	
						Potassium-40	10.24	1.78	0.77	
						Protactinium-231	0.88	2.00	2.96	
						Radium-226	6.49	1.63	0.23	
						Radium-228	1.37	0.20	0.32	
						Thorium-228	1.36	0.60	0.27	
						Thorium-230	31.97	6.79	0.14	
						Thorium-232	1.00	0.50	0.14	
						Uranium-235	0.52	0.82	1.40	
						Uranium-238	28.97	3.56	2.38	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 37 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101312	SLD101315	05/15/07	5	5.5		Actinium-227	0.15	0.18	0.34	0.09
						Americium-241	0.00	0.05	0.08	
						Cesium-137	0.00	0.02	0.03	
						Potassium-40	11.28	0.96	0.26	
						Protactinium-231	0.42	0.60	0.90	
						Radium-226	3.17	0.80	0.08	
						Radium-228	0.88	0.08	0.10	
						Thorium-228	1.38	0.60	0.14	
						Thorium-230	3.07	1.00	0.26	
						Thorium-232	0.61	0.38	0.14	
						Uranium-235	0.06	0.27	0.45	
						Uranium-238	2.09	0.77	0.73	
SLD101316	SLD101316	05/16/07	0	0.5		Actinium-227	-0.10	0.56	0.88	0.25
						Americium-241	-0.04	0.12	0.18	
						Cesium-137	0.15	0.07	0.08	
						Potassium-40	8.11	1.59	0.76	
						Protactinium-231	2.03	1.74	2.86	
						Radium-226	2.71	0.78	0.25	
						Radium-228	1.25	0.20	0.32	
						Thorium-228	1.23	0.56	0.14	
						Thorium-230	2.80	0.94	0.31	
						Thorium-232	1.34	0.58	0.14	
						Uranium-235	0.81	0.66	1.16	
						Uranium-238	2.41	2.00	1.74	
	SLD101317	05/16/07	1.5	2.0		Actinium-227	-0.14	0.23	0.35	0.00
						Americium-241	-0.02	0.04	0.06	
						Cesium-137	-0.02	0.02	0.03	
						Potassium-40	5.18	0.70	0.37	
						Protactinium-231	0.04	0.69	1.03	
						Radium-226	2.09	0.53	0.08	
						Radium-228	0.45	0.08	0.11	
						Thorium-228	0.61	0.44	0.35	
						Thorium-230	1.90	0.84	0.19	
						Thorium-232	0.26	0.29	0.35	
						Uranium-235	0.06	0.26	0.43	
						Uranium-238	1.54	0.72	0.61	
	SLD101318	05/16/07	2	2.5		Actinium-227	0.02	0.25	0.35	0.12
						Americium-241	0.00	0.04	0.06	
						Cesium-137	-0.01	0.02	0.03	
						Potassium-40	6.57	0.75	0.32	
						Protactinium-231	0.01	0.65	0.96	
						Radium-226	2.94	0.72	0.09	
						Radium-228	0.64	0.08	0.12	
						Thorium-228	1.11	0.54	0.32	
						Thorium-230	3.48	1.10	0.14	
						Thorium-232	0.98	0.49	0.14	
						Uranium-235	0.15	0.28	0.47	
						Uranium-238	2.17	0.63	0.66	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 38 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101316	SLD101319	05/16/07	4.5	5.0		Actinium-227	-0.10	0.40	0.62	0.37
						Americium-241	0.05	0.08	0.12	
						Cesium-137	0.01	0.04	0.06	
						Potassium-40	12.69	1.23	0.49	
						Protactinium-231	-0.32	1.14	1.64	
						Radium-226	7.21	1.72	0.15	
						Radium-228	1.27	0.15	0.21	
						Thorium-228	1.68	0.67	0.30	
						Thorium-230	4.93	1.38	0.14	
						Thorium-232	1.04	0.50	0.25	
						Uranium-235	-0.09	0.47	0.76	
						Uranium-238	4.15	1.18	1.17	
SLD101320	SLD101320	05/15/07	0	0.5		Actinium-227	0.06	0.44	0.72	0.46
						Americium-241	0.02	0.10	0.15	
						Cesium-137	0.10	0.06	0.06	
						Potassium-40	10.17	1.58	0.62	
						Protactinium-231	-0.05	1.45	2.05	
						Radium-226	4.21	1.08	0.16	
						Radium-228	1.23	0.19	0.23	
						Thorium-228	1.16	0.55	0.27	
						Thorium-230	3.85	1.18	0.14	
						Thorium-232	1.01	0.51	0.14	
						Uranium-235	0.51	0.53	0.93	
						Uranium-238	2.78	1.57	1.48	
	SLD101321	05/15/07	0.5	1.0		Actinium-227	0.11	0.25	0.42	0.11
						Americium-241	-0.04	0.06	0.09	
						Cesium-137	0.03	0.03	0.03	
						Potassium-40	11.85	1.07	0.34	
						Protactinium-231	0.82	0.74	1.13	
						Radium-226	3.81	0.96	0.10	
						Radium-228	1.01	0.09	0.11	
						Thorium-228	0.93	0.49	0.28	
						Thorium-230	3.19	1.06	0.33	
						Thorium-232	0.87	0.48	0.28	
						Uranium-235	-0.13	0.33	0.53	
						Uranium-238	2.35	0.72	0.88	
	SLD101322	05/15/07	3	3.5		Actinium-227	0.03	0.47	0.76	0.17
						Americium-241	0.08	0.11	0.17	
						Cesium-137	0.00	0.05	0.07	
						Potassium-40	12.71	1.57	0.54	
						Protactinium-231	1.35	1.48	2.31	
						Radium-226	4.56	1.18	0.21	
						Radium-228	1.03	0.16	0.25	
						Thorium-228	0.82	0.46	0.32	
						Thorium-230	3.91	1.20	0.27	
						Thorium-232	0.98	0.50	0.32	
						Uranium-235	-0.29	0.56	0.90	
						Uranium-238	2.88	1.80	1.60	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 39 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101320	SLD101323	05/15/07	5.3	5.8		Actinium-227	-0.04	0.35	0.58	0.19
						Americium-241	0.02	0.35	0.51	
						Cesium-137	0.02	0.03	0.05	
						Potassium-40	10.31	1.24	0.48	
						Protactinium-231	-0.79	1.01	1.56	
						Radium-226	2.79	0.75	0.14	
						Radium-228	0.93	0.13	0.23	
						Thorium-228	1.71	0.71	0.15	
						Thorium-230	3.74	1.19	0.29	
						Thorium-232	0.97	0.51	0.15	
						Uranium-235	0.42	0.48	0.80	
						Uranium-238	4.78	3.70	3.67	
SLD101324	SLD101324	05/15/07	0	0.5		Actinium-227	0.07	0.23	0.38	0.11
						Americium-241	0.04	0.22	0.35	
						Cesium-137	0.08	0.04	0.05	
						Potassium-40	4.06	0.69	0.27	
						Protactinium-231	-0.38	0.68	1.07	
						Radium-226	1.57	0.44	0.09	
						Radium-228	0.47	0.09	0.12	
						Thorium-228	0.72	0.43	0.37	
						Thorium-230	2.47	0.89	0.37	
						Thorium-232	0.31	0.28	0.27	
						Uranium-235	0.29	0.33	0.56	
						Uranium-238	1.11	1.79	2.93	
	SLD101325	05/15/07	1.5	2.0		Actinium-227	-0.18	0.38	0.61	0.16
						Americium-241	0.04	0.41	0.60	
						Cesium-137	0.02	0.04	0.06	
						Potassium-40	9.61	1.11	0.44	
						Protactinium-231	0.13	0.99	1.64	
						Radium-226	3.76	0.99	0.15	
						Radium-228	1.32	0.14	0.18	
						Thorium-228	1.61	0.69	0.16	
						Thorium-230	3.59	1.17	0.34	
						Thorium-232	1.43	0.64	0.16	
						Uranium-235	-0.08	0.51	0.81	
						Uranium-238	2.82	3.19	4.28	
	SLD101326	05/15/07	3.2	3.7		Actinium-227	-0.07	0.37	0.61	0.23
						Americium-241	0.31	0.35	0.54	
						Cesium-137	-0.04	0.04	0.05	
						Potassium-40	8.12	1.06	0.55	
						Protactinium-231	0.86	1.09	1.67	
						Radium-226	4.37	1.14	0.15	
						Radium-228	0.99	0.13	0.17	
						Thorium-228	1.55	0.67	0.28	
						Thorium-230	4.23	1.29	0.34	
						Thorium-232	1.06	0.53	0.15	
						Uranium-235	0.12	0.53	0.87	
						Uranium-238	5.22	5.07	4.16	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 40 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101324	SLD101327	05/15/07	4.5	5.0		Actinium-227	-0.14	0.36	0.58	0.28
						Americium-241	0.01	0.38	0.55	
						Cesium-137	0.01	0.03	0.05	
						Potassium-40	8.34	1.00	0.49	
						Protactinium-231	0.08	1.12	1.62	
						Radium-226	5.03	1.29	0.15	
						Radium-228	0.91	0.12	0.21	
						Thorium-228	1.60	0.66	0.31	
						Thorium-230	5.26	1.47	0.31	
						Thorium-232	1.24	0.57	0.26	
						Uranium-235	1.23	0.94	0.83	
						Uranium-238	3.76	3.85	3.88	
SLD101328	SLD101328	05/15/07	0	0.5		Actinium-227	0.02	0.23	0.37	0.00
						Americium-241	-0.03	0.21	0.32	
						Cesium-137	0.36	0.06	0.03	
						Potassium-40	4.58	0.72	0.26	
						Protactinium-231	-0.19	0.63	1.01	
						Radium-226	0.96	0.29	0.10	
						Radium-228	0.30	0.08	0.14	
						Thorium-228	0.57	0.38	0.15	
						Thorium-230	1.25	0.59	0.15	
						Thorium-232	0.31	0.29	0.34	
						Uranium-235	0.04	0.31	0.51	
						Uranium-238	1.16	1.58	2.67	
	SLD101329	05/15/07	1	1.5		Actinium-227	-0.13	0.26	0.42	0.04
						Americium-241	0.07	0.25	0.40	
						Cesium-137	0.01	0.03	0.04	
						Potassium-40	6.79	0.88	0.30	
						Protactinium-231	0.92	0.77	1.23	
						Radium-226	2.23	0.60	0.11	
						Radium-228	0.56	0.09	0.15	
						Thorium-228	1.23	0.58	0.15	
						Thorium-230	2.53	0.91	0.15	
						Thorium-232	0.95	0.50	0.15	
						Uranium-235	0.12	0.38	0.62	
						Uranium-238	0.89	1.93	3.12	
	SLD101330	05/15/07	2	2.5		Actinium-227	0.19	0.21	0.34	0.00
						Americium-241	0.02	0.21	0.33	
						Cesium-137	0.16	0.03	0.04	
						Potassium-40	4.53	0.82	0.33	
						Protactinium-231	-0.19	0.80	1.11	
						Radium-226	1.15	0.34	0.11	
						Radium-228	0.34	0.08	0.12	
						Thorium-228	0.37	0.28	0.24	
						Thorium-230	1.44	0.59	0.13	
						Thorium-232	0.57	0.35	0.13	
						Uranium-235	-0.13	0.34	0.53	
						Uranium-238	-0.10	1.74	2.72	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 41 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101328	SLD101331	05/16/07	5.5	6.0		Actinium-227	-0.23	0.21	0.31	0.01
						Americium-241	0.04	0.04	0.06	
						Cesium-137	-0.02	0.02	0.03	
						Potassium-40	9.96	0.94	0.33	
						Protactinium-231	0.44	0.57	0.89	
						Radium-226	1.98	0.50	0.09	
						Radium-228	0.59	0.07	0.12	
						Thorium-228	0.75	0.42	0.25	
						Thorium-230	2.13	0.77	0.14	
						Thorium-232	0.69	0.40	0.25	
						Uranium-235	0.28	0.33	0.42	
						Uranium-238	1.33	0.61	0.56	
SLD101332	SLD101332	05/16/07	0	0.5		Actinium-227	0.01	0.30	0.47	0.00
						Americium-241	-0.01	0.06	0.09	
						Cesium-137	0.13	0.05	0.04	
						Potassium-40	3.80	0.90	0.42	
						Protactinium-231	-0.30	0.78	1.26	
						Radium-226	0.97	0.31	0.13	
						Radium-228	0.20	0.15	0.26	
						Thorium-228	0.13	0.19	0.32	
						Thorium-230	1.00	0.51	0.27	
						Thorium-232	0.21	0.22	0.14	
						Uranium-235	-0.17	0.32	0.50	
						Uranium-238	0.63	0.64	1.14	
	SLD101333	05/16/07	1	1.5		Actinium-227	-0.18	0.30	0.43	0.00
						Americium-241	-0.04	0.06	0.09	
						Cesium-137	0.17	0.05	0.04	
						Potassium-40	1.84	0.62	0.25	
						Protactinium-231	0.60	0.86	1.54	
						Radium-226	0.50	0.21	0.14	
						Radium-228	0.08	0.12	0.23	
						Thorium-228	0.15	0.22	0.37	
						Thorium-230	0.86	0.49	0.17	
						Thorium-232	0.00	0.00	0.17	
						Uranium-235	0.12	0.35	0.59	
						Uranium-238	0.98	0.76	1.02	
SLD101334	SLD101334	05/16/07	0	0.5		Actinium-227	-0.10	0.29	0.44	0.00
						Americium-241	0.02	0.05	0.09	
						Cesium-137	0.00	0.03	0.05	
						Potassium-40	1.28	0.59	0.49	
						Protactinium-231	-0.11	0.73	1.21	
						Radium-226	0.88	0.28	0.12	
						Radium-228	0.09	0.12	0.22	
						Thorium-228	0.05	0.13	0.31	
						Thorium-230	0.74	0.45	0.17	
						Thorium-232	0.12	0.18	0.17	
						Uranium-235	0.06	0.33	0.54	
						Uranium-238	0.21	0.55	0.97	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 42 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101334	SLD101335	05/16/07	1.3	1.8		Actinium-227	0.13	0.27	0.45	0.03
						Americium-241	-0.01	0.07	0.10	
						Cesium-137	0.04	0.04	0.05	
						Potassium-40	4.07	0.75	0.46	
						Protactinium-231	-0.17	0.88	1.28	
						Radium-226	2.33	0.62	0.12	
						Radium-228	0.40	0.09	0.15	
						Thorium-228	0.47	0.33	0.27	
						Thorium-230	2.40	0.86	0.14	
						Thorium-232	0.41	0.31	0.27	
						Uranium-235	-0.26	0.35	0.55	
						Uranium-238	1.49	0.90	0.94	
SLD101336	SLD101336	05/16/07	0	0.5		Actinium-227	-0.04	0.25	0.39	0.00
						Americium-241	0.01	0.05	0.08	
						Cesium-137	0.08	0.04	0.04	
						Potassium-40	5.41	0.77	0.29	
						Protactinium-231	-0.42	0.68	1.08	
						Radium-226	0.62	0.21	0.11	
						Radium-228	0.37	0.08	0.14	
						Thorium-228	0.77	0.41	0.23	
						Thorium-230	0.54	0.34	0.23	
						Thorium-232	0.51	0.32	0.12	
						Uranium-235	-0.21	0.28	0.44	
						Uranium-238	0.39	0.51	0.90	
	SLD101337	05/16/07	1.5	2.0		Actinium-227	-0.06	0.28	0.44	0.00
						Americium-241	-0.06	0.05	0.08	
						Cesium-137	0.01	0.03	0.05	
						Potassium-40	8.38	1.13	0.36	
						Protactinium-231	0.07	0.94	1.40	
						Radium-226	1.13	0.34	0.12	
						Radium-228	0.59	0.11	0.17	
						Thorium-228	0.77	0.45	0.28	
SLD101338	SLD101338	05/16/07	0	0.5		Thorium-230	0.73	0.43	0.15	
						Thorium-232	0.67	0.41	0.15	
						Uranium-235	-0.13	0.32	0.52	
						Uranium-238	0.67	0.63	1.11	
						Actinium-227	-0.13	0.27	0.41	0.00
						Americium-241	-0.03	0.05	0.09	
						Cesium-137	0.08	0.04	0.05	
						Potassium-40	10.83	1.16	0.44	
						Protactinium-231	-0.54	0.79	1.25	
						Radium-226	0.94	0.29	0.12	
						Radium-228	0.45	0.10	0.17	
						Thorium-228	0.55	0.37	0.28	
						Thorium-230	0.55	0.37	0.28	
						Thorium-232	0.49	0.35	0.28	
						Uranium-235	0.08	0.32	0.54	
						Uranium-238	0.08	0.56	0.95	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 43 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101338	SLD101339	05/16/07	0.5	1.0		Actinium-227	0.01	0.17	0.28	0.00
						Americium-241	0.02	0.03	0.05	
						Cesium-137	0.18	0.04	0.02	
						Potassium-40	9.32	0.80	0.21	
						Protactinium-231	-0.33	0.47	0.74	
						Radium-226	1.02	0.28	0.07	
						Radium-228	0.41	0.06	0.09	
						Thorium-228	0.51	0.34	0.29	
						Thorium-230	0.91	0.46	0.24	
						Thorium-232	0.22	0.22	0.29	
						Uranium-235	0.00	0.21	0.35	
						Uranium-238	1.25	0.54	0.44	
	SLD101340	05/16/07	3	3.5		Actinium-227	-0.05	0.46	0.72	0.22
						Americium-241	0.05	0.17	0.27	
						Cesium-137	-0.02	0.04	0.06	
						Potassium-40	7.49	1.21	0.50	
						Protactinium-231	-0.27	1.25	1.81	
						Radium-226	4.84	1.24	0.16	
						Radium-228	0.96	0.16	0.23	
						Thorium-228	1.63	0.72	0.31	
						Thorium-230	4.40	1.39	0.41	
						Thorium-232	0.90	0.51	0.31	
						Uranium-235	0.59	0.60	1.03	
						Uranium-238	4.03	2.31	2.39	
	SLD101341	05/16/07	4	4.5		Actinium-227	-0.08	0.28	0.44	0.03
						Americium-241	0.12	0.12	0.19	
						Cesium-137	-0.03	0.03	0.04	
						Potassium-40	10.23	1.18	0.36	
						Protactinium-231	0.12	0.85	1.28	
						Radium-226	2.47	0.65	0.13	
						Radium-228	0.91	0.10	0.14	
						Thorium-228	1.24	0.54	0.13	
						Thorium-230	2.14	0.76	0.13	
						Thorium-232	0.71	0.39	0.13	
						Uranium-235	0.11	0.40	0.65	
						Uranium-238	2.13	1.58	1.56	
SLD101342	SLD101342	05/16/07	0	0.5		Actinium-227	-0.33	0.36	0.52	0.02
						Americium-241	-0.06	0.15	0.22	
						Cesium-137	0.03	0.04	0.07	
						Potassium-40	5.53	1.13	0.71	
						Protactinium-231	0.02	1.04	1.55	
						Radium-226	2.14	0.60	0.14	
						Radium-228	0.73	0.13	0.20	
						Thorium-228	0.51	0.35	0.26	
						Thorium-230	1.68	0.68	0.14	
						Thorium-232	0.47	0.33	0.14	
						Uranium-235	0.18	0.41	0.69	
						Uranium-238	2.39	1.67	1.92	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 44 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft 'bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101342	SLD101343	05/16/07	1	1.5		Actinium-227	-0.16	0.30	0.45	0.01
						Americium-241	0.05	0.11	0.18	
						Cesium-137	0.08	0.04	0.05	
						Potassium-40	4.24	0.85	0.36	
						Protactinium-231	0.24	0.86	1.32	
						Radium-226	1.54	0.44	0.12	
						Radium-228	0.44	0.09	0.11	
						Thorium-228	0.79	0.44	0.14	
						Thorium-230	1.37	0.60	0.14	
						Thorium-232	0.41	0.31	0.26	
						Uranium-235	0.23	0.38	0.64	
						Uranium-238	1.97	1.46	1.45	
SLD101344	SLD101344	05/17/07	0	0.5		Actinium-227	-0.09	0.14	0.22	0.01
						Americium-241	0.01	0.03	0.05	
						Cesium-137	0.09	0.02	0.02	
						Potassium-40	4.09	0.48	0.23	
						Protactinium-231	0.29	0.41	0.63	
						Radium-226	1.71	0.43	0.06	
						Radium-228	0.59	0.06	0.08	
						Thorium-228	0.62	0.38	0.35	
						Thorium-230	2.00	0.73	0.24	
						Thorium-232	0.76	0.41	0.13	
						Uranium-235	0.09	0.18	0.30	
						Uranium-238	1.33	0.52	0.44	
	SLD101345	05/17/07	1.5	2.0		Actinium-227	0.40	0.55	0.91	0.24
						Americium-241	0.12	0.12	0.19	
						Cesium-137	-0.03	0.06	0.09	
						Potassium-40	12.20	1.64	0.75	
						Protactinium-231	-0.87	1.17	2.38	
						Radium-226	5.29	1.36	0.23	
						Radium-228	1.15	0.19	0.32	
						Thorium-228	1.63	0.68	0.15	
SLD101346	SLD101346	05/22/07	0.5	1.0		Thorium-230	4.39	1.31	0.27	
						Thorium-232	1.02	0.52	0.27	
						Uranium-235	-0.07	0.65	1.05	
						Uranium-238	4.22	2.05	1.66	
						Actinium-227	-0.19	0.22	0.33	0.05
						Americium-241	0.00	0.04	0.07	
						Cesium-137	0.00	0.02	0.03	
						Potassium-40	10.86	0.88	0.33	
						Protactinium-231	0.25	0.64	0.96	
						Radium-226	2.48	0.61	0.09	
						Radium-228	0.81	0.07	0.11	
						Thorium-228	0.80	0.43	0.29	
						Thorium-230	2.64	0.88	0.13	
						Thorium-232	1.06	0.50	0.25	
						Uranium-235	0.27	0.31	0.43	
						Uranium-238	1.80	0.68	0.58	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 45 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101346	SLD101347	05/22/07	1.5	2.0		Actinium-227	-0.08	0.29	0.39	0.02
						Americium-241	0.00	0.05	0.08	
						Cesium-137	-0.02	0.02	0.04	
						Potassium-40	11.61	1.07	0.33	
						Protactinium-231	0.21	0.75	1.13	
						Radium-226	2.50	0.63	0.11	
						Radium-228	0.85	0.10	0.14	
						Thorium-228	1.22	0.56	0.26	
						Thorium-230	2.12	0.78	0.14	
						Thorium-232	1.13	0.53	0.14	
						Uranium-235	0.23	0.31	0.53	
						Uranium-238	1.55	0.85	0.78	
SLD101366	SLD101366	05/17/07	0	0.5		Actinium-227	0.37	0.23	0.21	0.12
						Americium-241	0.05	0.04	0.04	
						Cesium-137	0.03	0.02	0.02	
						Potassium-40	3.27	0.35	0.17	
						Protactinium-231	0.22	0.35	0.54	
						Radium-226	2.13	0.51	0.05	
						Radium-228	0.50	0.04	0.06	
						Thorium-228	0.45	0.40	0.39	
						Thorium-230	2.46	1.05	0.47	
						Thorium-232	0.62	0.46	0.21	
						Uranium-235	-0.07	0.16	0.26	
						Uranium-238	1.96	0.36	0.35	
	SLD101367	05/17/07	1	1.5		Actinium-227	0.15	0.15	0.22	0.04
						Americium-241	0.02	0.03	0.04	
						Cesium-137	0.05	0.02	0.02	
						Potassium-40	4.81	0.45	0.19	
						Protactinium-231	0.31	0.36	0.56	
						Radium-226	2.59	0.62	0.06	
						Radium-228	0.56	0.04	0.05	
						Thorium-228	1.14	0.53	0.30	
						Thorium-230	2.32	0.82	0.26	
						Thorium-232	0.78	0.43	0.30	
						Uranium-235	0.15	0.17	0.29	
						Uranium-238	2.12	0.51	0.42	
SLD101368	SLD101368	05/17/07	0	0.5		Actinium-227	0.02	0.13	0.19	0.00
						Americium-241	0.02	0.03	0.04	
						Cesium-137	0.07	0.02	0.02	
						Potassium-40	6.40	0.52	0.18	
						Protactinium-231	-0.03	0.36	0.54	
						Radium-226	1.43	0.35	0.05	
						Radium-228	0.47	0.04	0.06	
						Thorium-228	0.62	0.37	0.25	
						Thorium-230	1.11	0.52	0.25	
						Thorium-232	0.49	0.32	0.13	
						Uranium-235	-0.07	0.15	0.25	
						Uranium-238	0.92	0.41	0.38	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 46 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101368	SLD101369	05/17/07	1.5	2.0		Actinium-227	0.29	0.44	0.74	0.02
						Americium-241	-0.01	0.09	0.14	
						Cesium-137	0.03	0.06	0.10	
						Potassium-40	8.82	1.50	0.77	
						Protactinium-231	0.11	1.45	2.17	
						Radium-226	2.53	0.72	0.20	
						Radium-228	1.00	0.18	0.28	
						Thorium-228	1.03	0.56	0.38	
						Thorium-230	2.07	0.84	0.17	
						Thorium-232	0.88	0.50	0.17	
						Uranium-235	-0.08	0.55	0.89	
						Uranium-238	1.97	1.94	1.35	
SLD101370	SLD101370	05/17/07	0	0.5		Actinium-227	0.00	0.14	0.20	0.00
						Americium-241	0.01	0.03	0.04	
						Cesium-137	0.01	0.01	0.02	
						Potassium-40	4.42	0.46	0.18	
						Protactinium-231	0.07	0.32	0.55	
						Radium-226	1.59	0.39	0.05	
						Radium-228	0.32	0.05	0.06	
						Thorium-228	0.50	0.37	0.17	
						Thorium-230	1.14	0.58	0.17	
						Thorium-232	0.38	0.32	0.17	
						Uranium-235	-0.10	0.16	0.25	
						Uranium-238	0.97	0.42	0.37	
	SLD101371	05/17/07	1	1.5		Actinium-227	0.19	0.15	0.23	0.02
						Americium-241	0.02	0.03	0.05	
						Cesium-137	-0.01	0.01	0.02	
						Potassium-40	13.78	0.86	0.21	
						Protactinium-231	0.16	0.39	0.59	
						Radium-226	1.43	0.36	0.06	
						Radium-228	0.76	0.06	0.08	
						Thorium-228	1.47	0.66	0.16	
						Thorium-230	2.06	0.81	0.16	
						Thorium-232	1.35	0.63	0.16	
						Uranium-235	0.07	0.18	0.29	
						Uranium-238	0.95	0.43	0.46	
	SLD101372	05/17/07	2	2.5		Actinium-227	0.00	0.36	0.56	0.00
						Americium-241	-0.01	0.06	0.11	
						Cesium-137	-0.04	0.04	0.05	
						Potassium-40	7.17	1.18	0.59	
						Protactinium-231	0.05	1.12	1.66	
						Radium-226	2.01	0.56	0.16	
						Radium-228	0.40	0.19	0.37	
						Thorium-228	0.74	0.42	0.31	
						Thorium-230	1.44	0.61	0.14	
						Thorium-232	0.61	0.37	0.14	
						Uranium-235	-0.16	0.44	0.70	
						Uranium-238	0.90	0.81	1.54	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 47 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101370	SLD101373	05/17/07	5.5	6.0		Actinium-227	-0.10	0.17	0.26	0.02
						Americium-241	-0.02	0.04	0.07	
						Cesium-137	-0.01	0.02	0.03	
						Potassium-40	14.98	1.15	0.24	
						Protactinium-231	0.21	0.57	0.84	
						Radium-226	1.36	0.37	0.08	
						Radium-228	0.81	0.07	0.08	
						Thorium-228	1.02	0.51	0.15	
						Thorium-230	2.12	0.80	0.32	
						Thorium-232	1.29	0.58	0.15	
						Uranium-235	-0.01	0.23	0.38	
						Uranium-238	1.32	0.52	0.66	
SLD101374	SLD101374	05/17/07	0	0.5		Actinium-227	-0.14	0.17	0.25	0.00
						Americium-241	0.01	0.04	0.06	
						Cesium-137	0.25	0.05	0.03	
						Potassium-40	1.83	0.47	0.26	
						Protactinium-231	0.27	0.57	0.87	
						Radium-226	0.54	0.18	0.07	
						Radium-228	0.24	0.06	0.10	
						Thorium-228	0.36	0.29	0.27	
						Thorium-230	0.59	0.37	0.14	
						Thorium-232	0.20	0.22	0.27	
						Uranium-235	0.28	0.24	0.40	
						Uranium-238	1.00	0.50	0.54	
	SLD101375	05/17/07	1.5	2.0		Actinium-227	-0.11	0.17	0.26	0.00
						Americium-241	0.01	0.04	0.06	
						Cesium-137	0.01	0.02	0.02	
						Potassium-40	9.00	0.80	0.22	
						Protactinium-231	0.09	0.49	0.71	
						Radium-226	1.59	0.42	0.06	
						Radium-228	0.60	0.06	0.08	
						Thorium-228	0.62	0.37	0.29	
						Thorium-230	1.58	0.62	0.13	
						Thorium-232	0.70	0.38	0.13	
						Uranium-235	0.34	0.22	0.39	
						Uranium-238	1.42	0.54	0.54	
	SLD101376	05/17/07	2.5	3.0		Actinium-227	-0.25	0.24	0.36	0.00
						Americium-241	0.01	0.05	0.08	
						Cesium-137	-0.01	0.02	0.03	
						Potassium-40	12.16	1.13	0.27	
						Protactinium-231	0.00	0.66	0.93	
						Radium-226	2.16	0.57	0.09	
						Radium-228	0.84	0.09	0.10	
						Thorium-228	0.81	0.43	0.29	
						Thorium-230	1.91	0.71	0.13	
						Thorium-232	0.67	0.39	0.25	
						Uranium-235	0.05	0.29	0.48	
						Uranium-238	1.46	0.69	0.81	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 48 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101374	SLD101377	05/17/07	5	5.5		Actinium-227	0.06	0.23	0.37	0.04
						Americium-241	0.00	0.06	0.09	
						Cesium-137	-0.02	0.02	0.03	
						Potassium-40	14.36	1.23	0.27	
						Protactinium-231	0.06	0.69	0.98	
						Radium-226	2.76	0.71	0.09	
						Radium-228	1.07	0.09	0.11	
						Thorium-228	1.43	0.62	0.27	
						Thorium-230	2.30	0.84	0.15	
						Thorium-232	0.95	0.49	0.27	
						Uranium-235	0.16	0.30	0.51	
						Uranium-238	1.96	0.86	0.88	
SLD101378	SLD101378	05/17/07	0	0.5		Actinium-227	-0.13	0.28	0.43	0.00
						Americium-241	-0.02	0.06	0.09	
						Cesium-137	0.21	0.06	0.05	
						Potassium-40	7.23	0.98	0.31	
						Protactinium-231	0.01	0.88	1.40	
						Radium-226	1.04	0.33	0.12	
						Radium-228	0.34	0.09	0.14	
						Thorium-228	0.49	0.35	0.28	
						Thorium-230	1.12	0.55	0.15	
						Thorium-232	0.11	0.16	0.15	
						Uranium-235	-0.12	0.34	0.53	
						Uranium-238	1.05	0.69	1.28	
	SLD101379	05/17/07	1.5	2.0		Actinium-227	0.10	0.41	0.67	0.17
						Americium-241	0.02	0.10	0.15	
						Cesium-137	0.00	0.04	0.07	
						Potassium-40	10.92	1.35	0.68	
						Protactinium-231	0.92	1.21	1.88	
						Radium-226	3.56	0.93	0.17	
						Radium-228	0.88	0.16	0.20	
						Thorium-228	1.40	0.62	0.27	
						Thorium-230	3.98	1.22	0.15	
						Thorium-232	0.80	0.45	0.27	
						Uranium-235	-0.45	0.51	0.79	
						Uranium-238	3.06	1.50	1.34	
	SLD101380	05/17/07	3	3.5		Actinium-227	-0.08	0.22	0.34	0.01
						Americium-241	0.01	0.06	0.08	
						Cesium-137	0.01	0.02	0.03	
						Potassium-40	20.17	1.50	0.19	
						Protactinium-231	0.46	0.60	0.92	
						Radium-226	1.50	0.41	0.09	
						Radium-228	1.05	0.09	0.11	
						Thorium-228	1.09	0.49	0.27	
						Thorium-230	1.59	0.61	0.22	
						Thorium-232	1.06	0.48	0.12	
						Uranium-235	0.23	0.27	0.47	
						Uranium-238	1.14	0.76	0.79	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 49 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101378	SLD101381	05/17/07	4.5	5.0		Actinium-227	-0.05	0.14	0.22	0.00
						Americium-241	0.01	0.04	0.06	
						Cesium-137	0.00	0.01	0.02	
						Potassium-40	13.91	1.08	0.16	
						Protactinium-231	-0.33	0.43	0.55	
						Radium-226	0.86	0.24	0.05	
						Radium-228	0.37	0.05	0.06	
						Thorium-228	0.74	0.46	0.36	
						Thorium-230	0.78	0.46	0.16	
						Thorium-232	0.46	0.35	0.30	
						Uranium-235	-0.17	0.17	0.26	
						Uranium-238	0.76	0.54	0.52	
SLD101382	SLD101382	05/17/07	0	0.5		Actinium-227	-0.03	0.12	0.19	0.00
						Americium-241	0.02	0.03	0.05	
						Cesium-137	0.04	0.02	0.01	
						Potassium-40	3.02	0.41	0.19	
						Protactinium-231	0.30	0.35	0.59	
						Radium-226	1.17	0.31	0.05	
						Radium-228	0.18	0.04	0.06	
						Thorium-228	0.20	0.20	0.22	
						Thorium-230	1.23	0.51	0.22	
						Thorium-232	0.21	0.20	0.12	
						Uranium-235	0.02	0.16	0.26	
						Uranium-238	0.71	0.48	0.44	
	SLD101383	05/17/07	1.5	2.0		Actinium-227	0.75	0.48	0.42	0.15
						Americium-241	0.07	0.07	0.09	
						Cesium-137	0.01	0.02	0.03	
						Potassium-40	10.42	1.01	0.35	
						Protactinium-231	-0.22	0.84	1.17	
						Radium-226	4.40	1.11	0.11	
						Radium-228	1.00	0.09	0.13	
						Thorium-228	1.48	0.65	0.28	
						Thorium-230	3.55	1.13	0.15	
						Thorium-232	0.66	0.41	0.15	
						Uranium-235	0.21	0.35	0.60	
						Uranium-238	3.38	1.01	0.94	
	SLD101384	05/17/07	3.5	4.0		Actinium-227	-0.07	0.20	0.32	0.03
						Americium-241	0.00	0.05	0.08	
						Cesium-137	0.00	0.02	0.03	
						Potassium-40	12.03	1.07	0.20	
						Protactinium-231	0.02	0.67	0.95	
						Radium-226	2.05	0.54	0.09	
						Radium-228	0.72	0.08	0.10	
						Thorium-228	0.70	0.44	0.30	
						Thorium-230	2.36	0.89	0.30	
						Thorium-232	0.58	0.39	0.30	
						Uranium-235	0.03	0.26	0.43	
						Uranium-238	0.88	0.85	0.77	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 50 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101382	SLD101385	05/17/07	4.5	5.0		Actinium-227	0.06	0.18	0.29	0.00
						Americium-241	0.00	0.04	0.07	
						Cesium-137	-0.01	0.02	0.03	
						Potassium-40	10.24	0.95	0.20	
						Protactinium-231	0.06	0.56	0.80	
						Radium-226	1.61	0.43	0.07	
						Radium-228	0.48	0.06	0.09	
						Thorium-228	0.87	0.54	0.42	
						Thorium-230	1.94	0.85	0.35	
						Thorium-232	1.01	0.59	0.42	
						Uranium-235	0.01	0.23	0.39	
						Uranium-238	1.21	0.59	0.65	
SLD101386	SLD101386	05/21/07	0	0.5		Actinium-227	-0.07	0.24	0.38	0.00
						Americium-241	0.01	0.05	0.08	
						Cesium-137	0.14	0.05	0.04	
						Potassium-40	15.20	1.24	0.29	
						Protactinium-231	0.11	0.71	1.02	
						Radium-226	1.02	0.30	0.10	
						Radium-228	0.40	0.09	0.14	
						Thorium-228	0.45	0.31	0.13	
						Thorium-230	0.92	0.47	0.30	
						Thorium-232	0.40	0.29	0.13	
						Uranium-235	0.18	0.29	0.48	
						Uranium-238	0.38	0.55	0.96	
	SLD101387	05/21/07	1.5	2.0		Actinium-227	0.03	0.21	0.35	0.00
						Americium-241	0.00	0.05	0.08	
						Cesium-137	0.00	0.02	0.04	
						Potassium-40	5.37	0.76	0.34	
						Protactinium-231	-0.17	0.59	0.91	
						Radium-226	1.06	0.30	0.09	
						Radium-228	0.30	0.08	0.12	
						Thorium-228	0.43	0.29	0.22	
						Thorium-230	0.44	0.29	0.12	
						Thorium-232	0.43	0.29	0.22	
						Uranium-235	0.10	0.26	0.44	
						Uranium-238	0.70	0.52	0.96	
	SLD101388	05/21/07	3.5	4.0		Actinium-227	-0.19	0.21	0.31	0.01
						Americium-241	0.02	0.05	0.08	
						Cesium-137	-0.01	0.02	0.03	
						Potassium-40	18.30	1.38	0.22	
						Protactinium-231	0.22	0.68	0.99	
						Radium-226	1.53	0.41	0.08	
						Radium-228	1.03	0.09	0.10	
						Thorium-228	1.38	0.59	0.30	
						Thorium-230	1.41	0.59	0.13	
						Thorium-232	0.92	0.46	0.13	
						Uranium-235	0.23	0.26	0.46	
						Uranium-238	1.24	0.84	0.79	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 51 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101386	SLD101389	05/21/07	5.3	5.8		Actinium-227	0.03	0.24	0.36	0.03
						Americium-241	-0.02	0.06	0.08	
						Cesium-137	0.01	0.02	0.03	
						Potassium-40	18.42	1.44	0.25	
						Protactinium-231	0.39	0.71	0.87	
						Radium-226	1.69	0.45	0.09	
						Radium-228	1.03	0.09	0.12	
						Thorium-228	0.83	0.40	0.23	
						Thorium-230	1.13	0.47	0.11	
						Thorium-232	1.08	0.45	0.20	
						Uranium-235	-0.14	0.28	0.45	
						Uranium-238	2.60	0.88	0.76	
SLD101390	SLD101390	05/21/07	0	0.5		Actinium-227	-0.14	0.22	0.33	0.00
						Americium-241	-0.01	0.06	0.09	
						Cesium-137	0.02	0.03	0.05	
						Potassium-40	6.55	0.85	0.31	
						Protactinium-231	0.54	0.70	1.19	
						Radium-226	1.38	0.39	0.11	
						Radium-228	0.34	0.09	0.13	
						Thorium-228	0.39	0.28	0.22	
						Thorium-230	1.43	0.57	0.12	
						Thorium-232	0.30	0.24	0.22	
						Uranium-235	-0.08	0.29	0.46	
						Uranium-238	0.42	0.61	1.06	
	SLD101391	05/21/07	1	1.5		Actinium-227	-0.09	0.25	0.39	0.04
						Americium-241	0.00	0.06	0.09	
						Cesium-137	0.07	0.03	0.03	
						Potassium-40	14.52	1.16	0.23	
						Protactinium-231	-0.02	0.69	0.98	
						Radium-226	2.76	0.71	0.09	
						Radium-228	1.22	0.10	0.10	
						Thorium-228	1.34	0.58	0.29	
						Thorium-230	2.08	0.75	0.25	
						Thorium-232	0.87	0.45	0.13	
						Uranium-235	-0.10	0.31	0.50	
						Uranium-238	2.18	0.92	0.86	
	SLD101392	05/21/07	3.5	4.0		Actinium-227	-0.14	0.31	0.44	0.20
						Americium-241	-0.06	0.06	0.09	
						Cesium-137	0.01	0.03	0.03	
						Potassium-40	11.25	1.09	0.31	
						Protactinium-231	0.69	0.81	1.23	
						Radium-226	3.72	0.95	0.11	
						Radium-228	1.43	0.12	0.13	
						Thorium-228	1.15	0.55	0.32	
						Thorium-230	3.90	1.19	0.14	
						Thorium-232	1.91	0.74	0.27	
						Uranium-235	0.08	0.36	0.60	
						Uranium-238	2.41	0.86	0.98	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 52 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101390	SLD101393	05/21/07	5.5	6.0		Actinium-227	-0.10	0.22	0.34	0.01
						Americium-241	0.06	0.06	0.09	
						Cesium-137	0.00	0.02	0.03	
						Potassium-40	19.83	1.51	0.25	
						Protactinium-231	-0.34	0.69	0.92	
						Radium-226	1.57	0.43	0.09	
						Radium-228	1.05	0.09	0.12	
						Thorium-228	1.30	0.54	0.22	
						Thorium-230	1.54	0.59	0.12	
						Thorium-232	0.44	0.29	0.12	
						Uranium-235	0.17	0.29	0.49	
						Uranium-238	1.11	0.75	0.76	
SLD101394	SLD101394	05/21/07	0	0.5		Actinium-227	0.01	0.16	0.26	0.00
						Americium-241	-0.02	0.04	0.06	
						Cesium-137	0.09	0.03	0.03	
						Potassium-40	7.93	0.82	0.22	
						Protactinium-231	0.08	0.59	0.85	
						Radium-226	0.62	0.19	0.08	
						Radium-228	0.19	0.05	0.10	
						Thorium-228	0.40	0.28	0.23	
						Thorium-230	1.00	0.46	0.12	
						Thorium-232	0.36	0.26	0.12	
						Uranium-235	-0.13	0.22	0.35	
						Uranium-238	0.23	0.43	0.76	
	SLD101395	05/21/07	1.5	2.0		Actinium-227	-0.20	0.40	0.62	0.14
						Americium-241	-0.05	0.09	0.13	
						Cesium-137	0.04	0.03	0.06	
						Potassium-40	10.05	1.24	0.45	
						Protactinium-231	0.25	1.15	1.67	
						Radium-226	4.35	1.09	0.16	
						Radium-228	1.22	0.14	0.20	
						Thorium-228	1.54	0.63	0.13	
						Thorium-230	2.92	0.95	0.25	
						Thorium-232	0.79	0.43	0.13	
						Uranium-235	-0.37	0.47	0.74	
						Uranium-238	2.17	1.36	1.27	
	SLD101396	05/21/07	3.2	3.7		Actinium-227	0.01	0.21	0.33	0.01
						Americium-241	0.00	0.05	0.08	
						Cesium-137	-0.02	0.02	0.03	
						Potassium-40	18.50	1.43	0.29	
						Protactinium-231	0.36	0.68	1.01	
						Radium-226	1.56	0.42	0.09	
						Radium-228	0.87	0.09	0.11	
						Thorium-228	0.77	0.40	0.22	
						Thorium-230	1.22	0.52	0.12	
						Thorium-232	1.26	0.53	0.12	
						Uranium-235	-0.01	0.27	0.45	
						Uranium-238	1.06	0.73	0.78	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 53 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101394	SLD101397	05/21/07	5.5	6.0		Actinium-227	-0.24	0.30	0.45	0.02
						Americium-241	-0.02	0.08	0.12	
						Cesium-137	-0.01	0.03	0.05	
						Potassium-40	17.46	1.54	0.48	
						Protactinium-231	0.17	0.97	1.40	
						Radium-226	1.68	0.47	0.14	
						Radium-228	0.89	0.12	0.17	
						Thorium-228	1.01	0.54	0.30	
						Thorium-230	1.85	0.77	0.30	
						Thorium-232	1.19	0.59	0.30	
						Uranium-235	-0.13	0.36	0.58	
						Uranium-238	1.93	1.17	1.02	
SLD101398	SLD101398	05/21/07	0	0.5		Actinium-227	0.08	0.14	0.24	0.00
						Americium-241	0.02	0.03	0.05	
						Cesium-137	0.14	0.03	0.02	
						Potassium-40	11.16	0.91	0.15	
						Protactinium-231	0.19	0.45	0.66	
						Radium-226	0.98	0.27	0.06	
						Radium-228	0.36	0.05	0.07	
						Thorium-228	1.03	0.53	0.33	
						Thorium-230	1.22	0.58	0.28	
						Thorium-232	0.31	0.28	0.33	
						Uranium-235	0.06	0.19	0.32	
						Uranium-238	0.82	0.61	0.47	
	SLD101399	05/21/07	1.5	2.0		Actinium-227	-0.02	0.45	0.72	0.35
						Americium-241	0.10	0.11	0.17	
						Cesium-137	0.03	0.04	0.07	
						Potassium-40	9.99	1.43	0.65	
						Protactinium-231	1.12	1.39	2.12	
						Radium-226	6.53	1.60	0.20	
						Radium-228	1.41	0.17	0.27	
						Thorium-228	1.19	0.57	0.28	
						Thorium-230	5.70	1.59	0.15	
						Thorium-232	1.68	0.70	0.28	
						Uranium-235	0.06	0.56	0.92	
						Uranium-238	4.51	1.82	1.61	
	SLD101400	05/21/07	3.4	3.9		Actinium-227	-0.06	0.15	0.23	0.00
						Americium-241	-0.01	0.04	0.05	
						Cesium-137	-0.01	0.01	0.02	
						Potassium-40	14.61	0.98	0.15	
						Protactinium-231	0.27	0.41	0.61	
						Radium-226	1.57	0.41	0.06	
						Radium-228	0.90	0.06	0.07	
						Thorium-228	0.99	0.47	0.29	
						Thorium-230	1.34	0.56	0.13	
						Thorium-232	0.74	0.39	0.13	
						Uranium-235	0.23	0.25	0.31	
						Uranium-238	0.78	0.51	0.51	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 54 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101398	SLD101401	05/21/07	5.5	6.0		Actinium-227	0.10	0.36	0.59	0.01
						Americium-241	-0.01	0.08	0.13	
						Cesium-137	-0.02	0.03	0.05	
						Potassium-40	20.47	1.75	0.48	
						Protactinium-231	-0.22	1.08	1.48	
						Radium-226	1.72	0.48	0.13	
						Radium-228	1.13	0.14	0.20	
						Thorium-228	1.28	0.60	0.28	
						Thorium-230	1.74	0.72	0.15	
						Thorium-232	1.24	0.58	0.15	
						Uranium-235	0.41	0.43	0.74	
						Uranium-238	0.58	0.85	1.48	
SLD101402	SLD101402	05/21/07	0	0.5		Actinium-227	-0.08	0.22	0.34	0.00
						Americium-241	-0.03	0.05	0.07	
						Cesium-137	0.00	0.02	0.04	
						Potassium-40	4.65	0.75	0.28	
						Protactinium-231	0.15	0.59	0.95	
						Radium-226	1.67	0.45	0.09	
						Radium-228	0.43	0.08	0.10	
						Thorium-228	0.63	0.36	0.23	
						Thorium-230	1.56	0.61	0.12	
						Thorium-232	0.46	0.30	0.12	
						Uranium-235	0.30	0.28	0.49	
						Uranium-238	0.70	0.57	1.01	
	SLD101403	05/21/07	1.5	2.0		Actinium-227	0.29	0.29	0.46	0.00
						Americium-241	-0.01	0.06	0.09	
						Cesium-137	-0.01	0.03	0.04	
						Potassium-40	8.95	1.09	0.46	
						Protactinium-231	-0.35	0.79	1.19	
						Radium-226	1.60	0.45	0.11	
						Radium-228	0.50	0.10	0.15	
						Thorium-228	0.55	0.35	0.26	
						Thorium-230	1.73	0.68	0.14	
						Thorium-232	0.44	0.32	0.26	
						Uranium-235	0.06	0.31	0.51	
						Uranium-238	0.52	0.65	1.16	
	SLD101404	05/21/07	3	3.5		Actinium-227	0.00	0.25	0.40	0.05
						Americium-241	0.03	0.06	0.10	
						Cesium-137	0.00	0.03	0.04	
						Potassium-40	9.89	1.14	0.42	
						Protactinium-231	0.11	0.82	1.18	
						Radium-226	1.94	0.52	0.12	
						Radium-228	0.58	0.09	0.15	
						Thorium-228	1.64	0.71	0.36	
						Thorium-230	2.43	0.91	0.30	
						Thorium-232	1.25	0.60	0.16	
						Uranium-235	0.14	0.35	0.59	
						Uranium-238	1.71	1.01	0.91	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 55 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD101402	SLD101405	05/21/07	4	4.5		Actinium-227	-0.16	0.25	0.37	0.00
						Americium-241	0.03	0.06	0.09	
						Cesium-137	0.01	0.02	0.04	
						Potassium-40	9.62	1.00	0.36	
						Protactinium-231	-0.17	0.85	1.16	
						Radium-226	1.93	0.52	0.11	
						Radium-228	0.64	0.10	0.12	
						Thorium-228	0.90	0.46	0.29	
						Thorium-230	1.81	0.69	0.13	
						Thorium-232	0.87	0.45	0.25	
						Uranium-235	-0.16	0.33	0.53	
						Uranium-238	1.39	1.02	0.82	
SLD103455	SLD103455	05/22/07	0	0.5		Actinium-227	-0.08	0.26	0.40	0.00
						Americium-241	0.01	0.05	0.08	
						Cesium-137	0.07	0.03	0.04	
						Potassium-40	3.81	0.62	0.36	
						Protactinium-231	-0.27	0.64	1.03	
						Radium-226	0.74	0.25	0.11	
						Radium-228	0.15	0.16	0.22	
						Thorium-228	0.40	0.29	0.23	
						Thorium-230	0.79	0.41	0.13	
						Thorium-232	0.32	0.25	0.13	
						Uranium-235	0.24	0.26	0.46	
						Uranium-238	0.92	0.75	0.70	
	SLD103456	05/22/07	1	1.5		Actinium-227	-0.11	0.19	0.29	0.00
						Americium-241	0.02	0.04	0.06	
						Cesium-137	0.00	0.02	0.03	
						Potassium-40	8.32	0.72	0.27	
						Protactinium-231	0.24	0.53	0.82	
						Radium-226	1.78	0.45	0.08	
						Radium-228	0.70	0.07	0.09	
						Thorium-228	1.03	0.53	0.29	
						Thorium-230	1.91	0.77	0.16	
						Thorium-232	0.81	0.46	0.16	
SLD103457	SLD103457	05/22/07	0	0.5		Uranium-235	0.23	0.23	0.40	
						Uranium-238	1.34	0.56	0.54	
						Actinium-227	-0.02	0.30	0.47	0.00
						Americium-241	0.04	0.06	0.10	
						Cesium-137	0.21	0.05	0.05	
						Potassium-40	5.86	0.82	0.38	
						Protactinium-231	-0.38	0.83	1.35	
						Radium-226	1.42	0.41	0.12	
						Radium-228	0.37	0.10	0.16	
						Thorium-228	0.57	0.35	0.24	
						Thorium-230	0.97	0.47	0.13	
						Thorium-232	0.37	0.28	0.24	
						Uranium-235	-0.02	0.32	0.52	
						Uranium-238	1.18	0.94	0.91	

Table 3-2
Terminal Railroad Association Soil Spoils Area
Pre-Design Investigation Radiological Data Results

Page 56 of 56

Sample Location	Sample Identification Number	Collection Date	Start Depth (ft ¹ bgs) ²	End Depth (ft bgs)	Thickness of Cover Material (ft)	Parameter	Result ³ (pCi/g) ⁴	Error	Detection Limit (pCi/g)	Sum of ⁵ Ratios Value
SLD103457	SLD103458	05/22/07	1.3	1.8		Actinium-227	-0.03	0.27	0.38	0.08
						Americium-241	0.06	0.05	0.08	
						Cesium-137	0.00	0.03	0.04	
						Potassium-40	8.72	0.83	0.34	
						Protactinium-231	0.32	0.74	1.13	
						Radium-226	3.40	0.83	0.10	
						Radium-228	0.83	0.10	0.13	
						Thorium-228	0.79	0.45	0.33	
						Thorium-230	2.22	0.83	0.27	
						Thorium-232	0.76	0.43	0.15	
						Uranium-235	-0.09	0.31	0.51	
						Uranium-238	3.35	0.83	0.70	

¹ ft - feet

² bgs - below ground surface

³ Analytical data includes background values (i.e., concentrations reflect gross radionuclide values)

⁴ pCi/g - Picocuries per gram

⁵ Prior to calculating the SOR, background values for each radionuclide were subtracted from their respective gross radionuclide values

Background Values:

Radium-226 =	2.78 pCi/g
Radium-228 =	.95 pCi/g
Thorium-230 =	1.94 pCi/g
Thorium-232 =	1.09 pCi/g
Uranium-238 =	1.44 pCi/g

Table 4-1
Summary of Data Quality Assessment for the
Terminal Railroad Association Soil Spoils Area Pre-Design Investigation

Precision^a	
Did field screening samples meet SAG Table 3-1 DQOs for precision?	Field screening samples met the precision objectives.
Did field and laboratory duplicate samples analyzed in the laboratory meet SAG Table 3-1 DQOs for precision?	The data have been evaluated and/or validated by the SAIC Data Management Group. The Relative Percent Difference (RPD) and/or Normalized Absolute Difference (NAD) were generally within the control limits for both the field split and field duplicate samples. Tables 4-1A through 4-1D demonstrate the exceptions. Laboratory duplicates are analyzed at the time of data package review. The sample data was within the control limits for all data. The data can be used for their intended purpose.
Accuracy^a	
Did laboratory control samples and/or tracer samples analyzed in the laboratory meet SAG Table 3-1 DQOs for accuracy?	The data have been evaluated and/or validated by the SAIC Data Management Group. 0.2 percent of the sample data was qualified as estimated when the laboratory control sample and/or the tracer was outside of the control limits. The data can be used for their intended purpose.
Representativeness^a	
Was the pre-design investigation sampling plan designed according to the SAG requirements?	The pre-design investigation sampling was designed according to the SAG.
Were the sampling techniques defined in the SAG implemented?	Sampling techniques defined in the SAG were implemented.
Were the analytical procedures specified in the SAG and work description followed?	The data have been evaluated and/or validated by the SAIC Data Management Group. The proper analytical methods were utilized in the analyses of these samples. The data can be used for their intended purpose.
Were holding times exceeded?	Holding times were met for 100.0 percent of the analyses. The data can be used for their intended purpose.

Table 4-1
Summary of Data Quality Assessment for the
Terminal Railroad Association Soil Spoils Area Pre-Design Investigation

Completeness^a	
Are results available for at least 95 percent of field screening measurements for VOCs and Radiological Activity?	Results are available for 100 percent of the field screening measurements.
Are results available for at least 90 percent of laboratory samples?	The percent completeness for this sampling effort is 99.9 percent.
Comparability^a	
Are data sets sufficiently comparable to allow reasonable conclusions to be drawn?	Standardized and consistent procedures used to obtain analytical data are expected to provide comparable results. Current and historical information are sufficiently comparable to allow a reasonable determination of the nature and extent of the radiological contamination.
Pre-Design Investigation Samples	
Were all proposed sample locations sampled? Were the surface and subsurface soil concentrations of radiological COCs, and their associated SOR values, determined for the TRRA Soil Spoils Area? Were areas within the TRRA Soil Spoils Area identified as requiring remediation? Was the vertical extent of contamination delineated? Was the horizontal extent of contamination delineated? What were the soil concentrations of arsenic and cadmium at the TRRA Soil Spoils Area, and do they meet the remediation criteria established in the ROD (USACE, 1998)? Does the total dose from residual activity in soils containing material licensed by the NRC, commingled with MED/AEC-related wastes, exceed 25 millirems per year?	All sample locations were sampled. The surface and subsurface concentration of radiological COCs and their associated SOR values were determined for the TRRA Soil Spoils Area. Four areas requiring remediation were identified within the TRRA Soil Spoils Area. Two of the Areas (Area 3 and Area 4) may be candidates for areal averaging. The vertical extent of contamination was delineated utilizing the analytical data, the geological data, and historical information. The horizontal extent of contamination was delineated utilizing the analytical data, gamma walkover survey results, the geological data, and historical information. In accordance with e-mail direction from the U.S. Army Corps of Engineers, St. Louis District (USACE, 2006), soil samples for arsenic and cadmium are not required for the TRRA Soil Spoils Area. This assessment will be performed by the Verification Contractor after the remedial actions have been completed.

Table 4-1
Summary of Data Quality Assessment for the
Terminal Railroad Association Soil Spoils Area Pre-Design Investigation

Pre-Design Investigation Samples (continued)	
Do the minimum detectable activities of the individual radionuclides exceed 50 percent of their respective ROD remediation criteria?	The minimum detectable activities of the individual radionuclides do not exceed 50 percent of their respective ROD remediation criteria.
Are there property characteristics that may affect the remedial design of the TRRA Soil Spoils Area?	There are no known property characteristics that may affect the remedial design of the TRRA Soil Spoils Area.
Potential Class 2 and Class 3 Areas	
Were all Potential Class 2 and Class 3 borings completed and sampled?	All planned borings were completed and sampled.
Has USACE concurrence been documented for samples that were not obtained?	All sample locations were sampled.
For borings with sample results with SOR_{net} values greater than 1.0, were additional borings completed?	Three HTR samples (HTR105391, HTR105392, and HTR105393) were used to help delineate SLD101278 (Area 3) and three HTR samples (HTR105394, SLD105395, and HTR105396) were used to help delineate SLD101284 (Area 4).

Note:

^a Data quality assessment information for precision, accuracy, representativeness, completeness, and comparability provided by Science Applications International Corporation.

Table 4-1A

**Split Precision for Alpha Spec. Analyses for the
Terminal Railroad Association Soil Spoils Area Pre-Design Investigation**

Sample Name	Thorium-228		Thorium-230		Thorium-232	
	RPD	NAD	RPD	NAD	RPD	NAD
SLD101198 / SLD101198-1	50.16	0.82	25.89	NC	16.59	NC
SLD101214 / SLD101214-1	37.88	0.48	16.22	NC	21.95	NC
SLD101220 / SLD101220-1	6.90	NC	25.73	NC	38.69	0.47
SLD101230 / SLD101230-1	6.23	NC	47.25	0.79	51.77	0.45
SLD101266 / SLD101266-1	23.06	NC	35.73	0.67	44.17	0.40
SLD101272 / SLD101272-1	*	*	*	*	*	*
SLD101312 / SLD101312-1	*	*	*	*	*	*
SLD101324 / SLD101324-1	17.91	NC	2.87	NC	18.29	NC
SLD101328 / SLD101328-1	14.54	NC	14.13	NC	NC	NC
SLD101398 / SLD101398-1	*	*	*	*	*	*

* Sample not analyzed.

NAD - Normalized Absolute Difference

NC - Not Calculable when one or both samples non-detect.

RPD - Relative Percent Difference

Source: Data table provided by Science Applications International Corporation

Table 4-1B

**Duplicate Precision for Alpha Spec. Analyses for the
Terminal Railroad Association Soil Spoils Area Pre-Design Investigation**

Sample Name	Thorium-228		Thorium-230		Thorium-232	
	RPD	NAD	RPD	NAD	RPD	NAD
SLD101198 / SLD101198-2	*	*	*	*	*	*
SLD101214 / SLD101214-2	*	*	*	*	*	*
SLD101220 / SLD101220-2	*	*	*	*	*	*
SLD101230 / SLD101230-2	*	*	*	*	*	*
SLD101266 / SLD101266-2	*	*	*	*	*	*
SLD101272 / SLD101272-2	*	*	*	*	*	*
SLD101312 / SLD101312-2	*	*	*	*	*	*
SLD101324 / SLD101324-2	*	*	*	*	*	*
SLD101328 / SLD101328-2	*	*	*	*	*	*
SLD101398 / SLD101398-2	*	*	*	*	*	*

* Sample not analyzed.

NAD - Normalized Absolute Difference

NC - Not Calculable when one or both samples non-detect.

RPD - Relative Percent Difference

Shaded and Boldface - RPD / NAD pair exceeds the control limit.

Source: Data table provided by Science Applications International Corporation

Table 4-1C
Split Precision for Gamma Spec. Analyses for the
Terminal Railroad Association Soil Spoils Area Pre-Design Investigation

Sample Name	Actinium-227		Americium-241		Cesium-137		Potassium-40		Protactinium-231		Radium-226		Radium-228		Thorium-228		Thorium-230		Thorium-232		Uranium-235		Uranium-238	
	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD
SLD101198 / SLD101198-1	NC	NC	NC	NC	36.59	0.75	15.04	NC	NC	NC	5.31	NC	4.62	NC	4.62	NC	NC	NC	4.62	NC	NC	NC	12.96	NC
SLD101214 / SLD101214-1	NC	NC	NC	NC	12.81	NC	1.56	NC	NC	NC	5.75	NC	7.95	NC	7.95	NC	NC	NC	7.95	NC	NC	NC	4.12	NC
SLD101220 / SLD101220-1	NC	NC	NC	NC	NC	NC	9.03	NC	NC	NC	6.37	NC	6.70	NC	6.70	NC	NC	NC	6.70	NC	NC	NC	4.42	NC
SLD101230 / SLD101230-1	NC	NC	NC	NC	1.25	NC	0.78	NC	NC	NC	33.64	0.95	50.05	3.14	50.05	3.14	NC	NC	50.05	3.14	NC	NC	17.86	NC
SLD101266 / SLD101266-1	NC	NC	NC	NC	26.20	NC	1.44	NC	NC	NC	3.55	NC	1.08	NC	1.08	NC	NC	NC	1.08	NC	NC	NC	35.37	0.95
SLD101272 / SLD101272-1	NC	NC	NC	NC	28.33	NC	15.67	NC	NC	NC	8.47	NC	20.71	NC	20.71	NC	NC	NC	20.71	NC	NC	NC	34.77	0.70
SLD101312 / SLD101312-1	24.59	NC	NC	NC	12.80	NC	0.00	NC	NC	NC	4.85	NC	18.40	NC	18.40	NC	3.09	NC	18.40	NC	7.67	NC	26.28	NC
SLD101324 / SLD101324-1	NC	NC	NC	NC	26.85	NC	8.04	NC	NC	NC	3.90	NC	14.25	NC	14.25	NC	NC	NC	14.25	NC	NC	NC	NC	NC
SLD101328 / SLD101328-1	NC	NC	NC	NC	19.94	NC	6.14	NC	NC	NC	1.36	NC	13.90	NC	13.90	NC	NC	NC	13.90	NC	NC	NC	NC	NC
SLD101398 / SLD101398-1	NC	NC	NC	NC	3.51	NC	14.11	NC	NC	NC	13.91	NC	9.67	NC	9.67	NC	NC	NC	9.67	NC	NC	NC	19.87	NC

NAD - Normalized Absolute Difference

NC - Not Calculable

RPD - Relative Percent Difference

Source: Data table provided by Science Applications International Corporation

Table 4-1D
Duplicate Precision for Gamma Spec. Analyses for the
Terminal Railroad Association Soil Spoils Area Pre-Design Investigation

Sample Name	Actinium-227		Americium-241		Cesium-137		Potassium-40		Protactinium-231		Radium-226		Radium-228		Thorium-228		Thorium-230		Thorium-232		Uranium-235		Uranium-238	
	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD
SLD101198 / SLD101198-2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
SLD101214 / SLD101214-2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
SLD101220 / SLD101220-2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
SLD101230 / SLD101230-2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
SLD101266 / SLD101266-2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
SLD101272 / SLD101272-2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
SLD101312 / SLD101312-2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
SLD101324 / SLD101324-2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
SLD101328 / SLD101328-2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
SLD101398 / SLD101398-2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

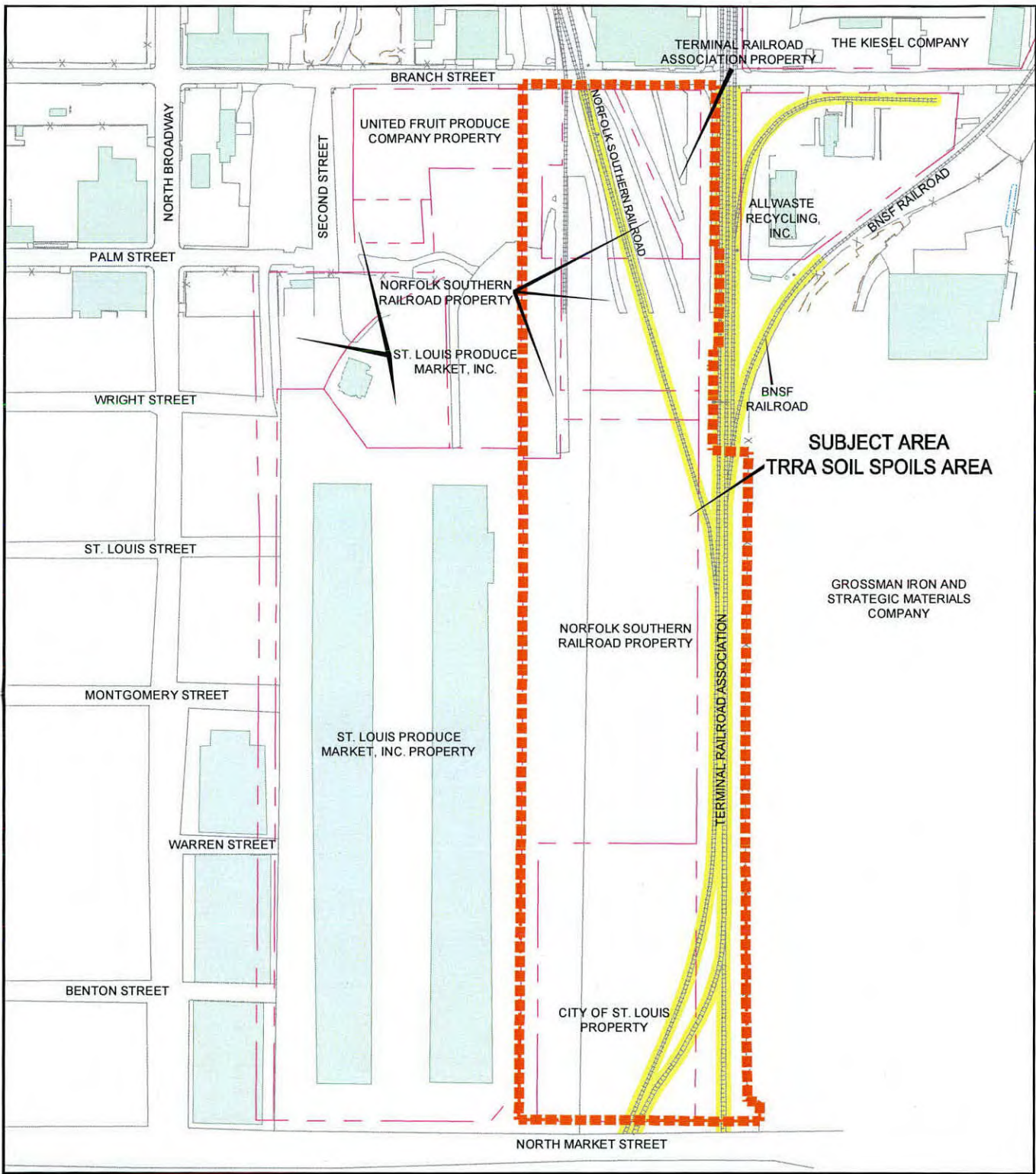
* Sample not analyzed.

NAD - Normalized Absolute Difference

RPD - Relative Percent Difference

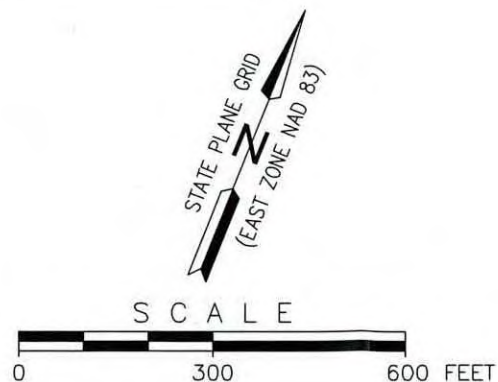
Source: Data table provided by Science Applications International Corporation

FIGURES



SITE LOCATION MAP

FUSRAP



PRE-DESIGN INVESTIGATION DATA SUMMARY REPORT TERMINAL RAILROAD ASSOCIATION SOIL SPOILS AREA ST. LOUIS DOWNTOWN SITE (SLDS) ST. LOUIS, MISSOURI

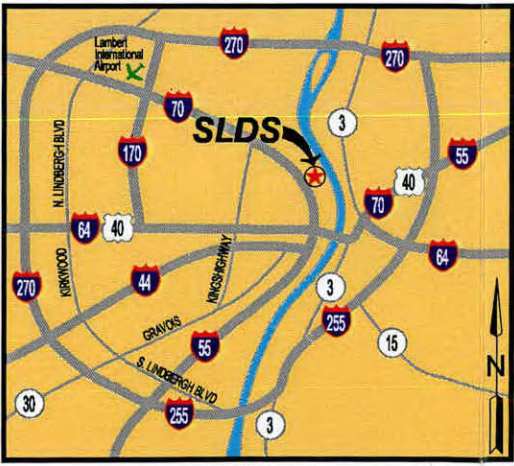
Prepared for:
**U.S. ARMY CORPS of ENGINEERS
KANSAS CITY DISTRICT/ST. LOUIS DISTRICT**

FIGURE TITLE	FIGURE NO.
COVER SHEET	FIGURE 1
SAMPLE LOCATIONS	FIGURE 2
WALKOVER SURVEY MAP	FIGURE 3
ESTIMATED EXTENT OF CONTAMINATION (SHEET 1 of 2)	FIGURE 4A
ESTIMATED EXTENT OF CONTAMINATION (SHEET 2 of 2)	FIGURE 4B

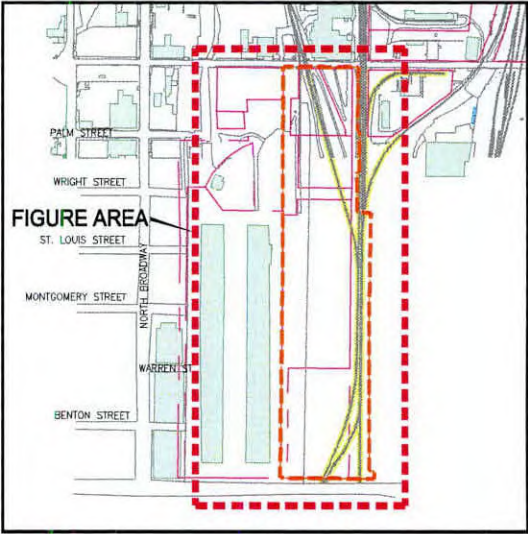
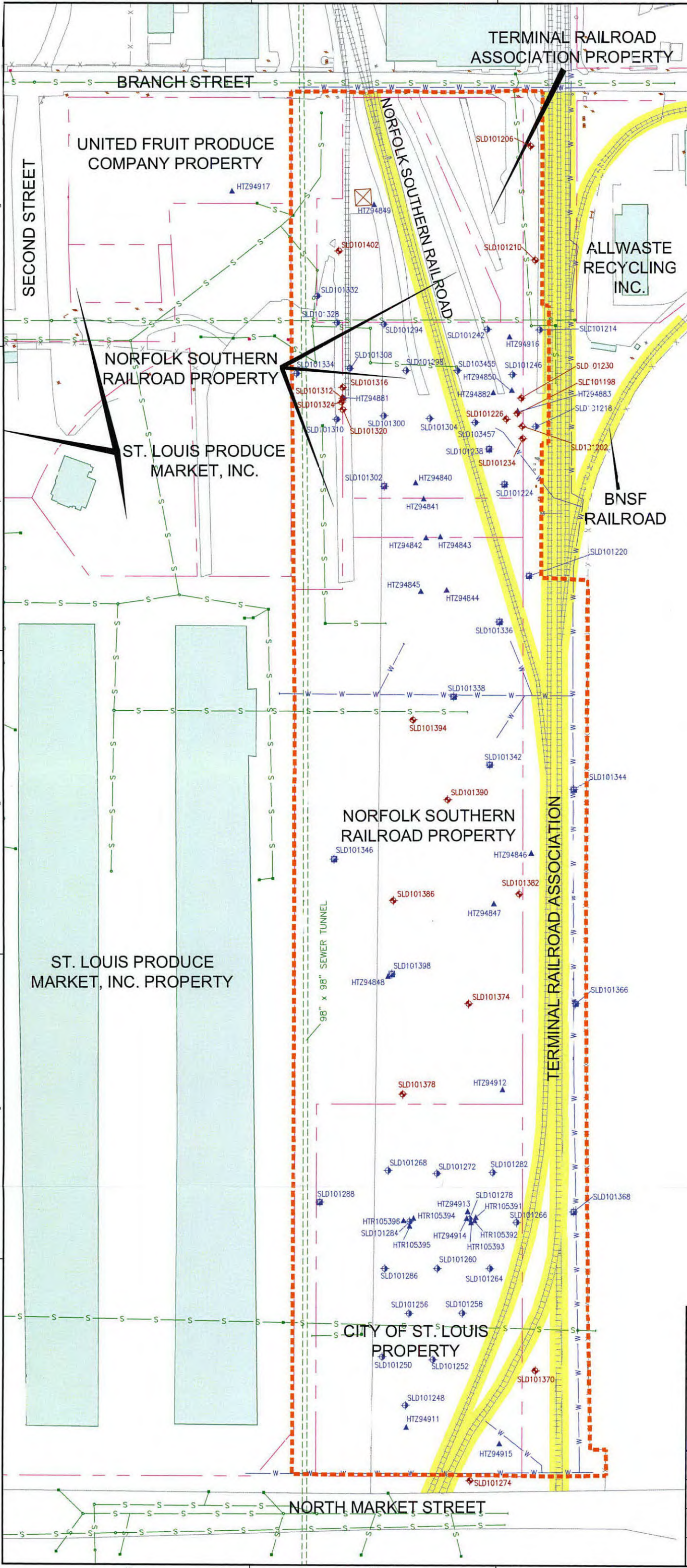
- GENERAL LEGEND:**
- APPROXIMATE PROPERTY LINE
 - SUBJECT AREA
 - WATER HYDRANT
 - UTILITY POLE
 - UTILITY POLE WITH OVERHEAD LIGHT
 - CHAIN LINK FENCE
 - RAILROAD TRACKS
 - EXISTING GROUND CONTOUR (ELEVATION, FEET)
 - EXISTING BUILDING (INCLUDING TEMPORARY BUILDING)
 - INACCESSIBLE AREA
 - ESTIMATED EXTENT OF CONTAMINATION CONTOUR (DEPTH, FEET)
 - ELECTRICAL TOWER
 - MANHOLE
 - GRATED INLET
 - SEWER LINE
 - WATER LINE

- SAMPLE LEGEND:**
- | SYMBOL | ID | DESCRIPTION |
|----------|----|---|
| SLDxxxxx | | = FSS POTENTIAL CLASS 2 SAMPLE LOCATION |
| SLDxxxxx | | = FSS POTENTIAL CLASS 3 SAMPLE LOCATION |
| HTZxxxxx | | = FSS HTZ SAMPLE LOCATION |
| SLDxxxxx | | = PDI SAMPLE LOCATION |

- ABBREVIATIONS**
- | | |
|------|--|
| BNSF | = BURLINGTON NORTHERN SANTA FE |
| CPM | = COUNTS PER MINUTE |
| FSS | = FINAL STATUS SURVEY |
| NTS | = NOT TO SCALE |
| PDI | = PRE-DESIGN INVESTIGATION |
| PDIR | = PRE-DESIGN INVESTIGATION DATA SUMMARY REPORT |
| SLDS | = ST. LOUIS DOWNTOWN SITE |
| TRRA | = TERMINAL RAILROAD ASSOCIATION |



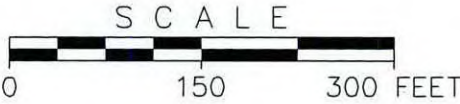
Revisions																	
Symbol	Descriptions	Date	Approved														
0	ISSUE FOR REV. 0 TRRA SOIL SPOILS AREA PDIR	8/6/08	K. BEACH														
Shaw Environmental, Inc. FUSRAP U.S. ARMY CORPS OF ENGINEERS KANSAS CITY DISTRICT (CENWK) ST. LOUIS DISTRICT (CEMVS) <table><tr><td>Designed by: Mark Cummings</td><td rowspan="4">COVER SHEET TRRA SOIL SPOILS AREA ST. LOUIS DOWNTOWN SITE ST. LOUIS, MISSOURI</td><td>Figure Number: 1</td><td>Spec No.</td></tr><tr><td>Drawn by: MvG/MJH</td><td>Contract No. DACW41-98-D-9006</td></tr><tr><td>Checked by: Ken Beach</td><td></td></tr><tr><td>Approved by: A. Neil DeYang</td><td></td></tr><tr><td>Scale: As Shown</td><td>Date: 10/11/07</td><td>Drawing File: 845843B191.dwg</td><td></td></tr></table>				Designed by: Mark Cummings	COVER SHEET TRRA SOIL SPOILS AREA ST. LOUIS DOWNTOWN SITE ST. LOUIS, MISSOURI	Figure Number: 1	Spec No.	Drawn by: MvG/MJH	Contract No. DACW41-98-D-9006	Checked by: Ken Beach		Approved by: A. Neil DeYang		Scale: As Shown	Date: 10/11/07	Drawing File: 845843B191.dwg	
Designed by: Mark Cummings	COVER SHEET TRRA SOIL SPOILS AREA ST. LOUIS DOWNTOWN SITE ST. LOUIS, MISSOURI	Figure Number: 1	Spec No.														
Drawn by: MvG/MJH		Contract No. DACW41-98-D-9006															
Checked by: Ken Beach																	
Approved by: A. Neil DeYang																	
Scale: As Shown	Date: 10/11/07	Drawing File: 845843B191.dwg															



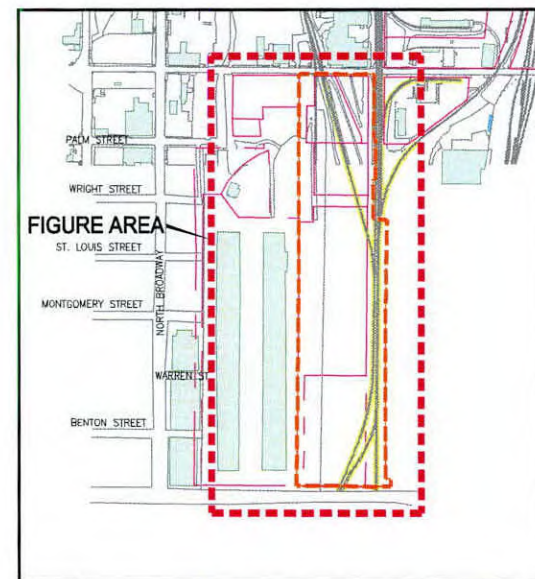
KEY PLAN
SCALE: 1" = 1000'

GENERAL NOTE:

SEE FIGURE 1 FOR GENERAL AND SAMPLE LEGENDS AND ABBREVIATIONS.



Revisions			
Symbol	Descriptions	Date	Approved
0	ISSUE FOR REV. 0 TRRA SOIL SPOILS AREA PDIR	8/6/08	K. BEACH
 Shaw Environmental, Inc.		FUSRAP U.S. ARMY CORPS OF ENGINEERS KANSAS CITY DISTRICT (CENWK) ST. LOUIS DISTRICT (CEMVS)	
Designed by: Mark Cummings		SAMPLE LOCATIONS TRRA SOIL SPOILS AREA ST. LOUIS DOWNTOWN SITE ST. LOUIS, MISSOURI	
Drawn by: MVG/MJH			
Checked by: Ken Beach	Scale: As Shown	Figure Number: 2	Spec No.
Approved by: A. Neil DeYong	Date: 10/12/07		Contract No. DACW41-98-D-9006
	Drawing File: 845843B191.dwg		



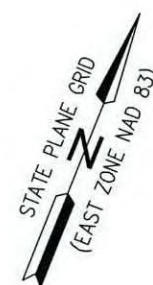
KEY PLAN
SCALE: 1" = 1000'

SOIL CPM - COMBINED

CPM

- 0 - 9000
- 9,001 - 11,000
- 11,001 - 13,000
- 13,001 - 15,000
- 15,001 - 207,725

SEE FIGURE 1 FOR GENERAL AND SAMPLE LEGENDS
AND ABBREVIATIONS.



S C A L E

0 150 300 FEET

Revisions			
Symbol	Descriptions	Date	Approved
0	ISSUE FOR REV. 0 TRRA SOIL SPOILS AREA PDIR	8/6/08	K. BEACH



Shaw Environmental, Inc.





U.S. ARMY CORPS OF ENGINEERS
KANSAS CITY DISTRICT (CENWK)
ST. LOUIS DISTRICT (CEMVS)

Designed by:
Mark Cummings

Drawn by:
MVG/MJH

Checked by:
Ken Beach

Approved by:
A. Neil DeYong

WALKOVER SURVEY MAP

TRRA SOIL SPOILS AREA
ST. LOUIS DOWNTOWN SITE
ST. LOUIS, MISSOURI

Scale:
As Shown

Date:
10/12/07

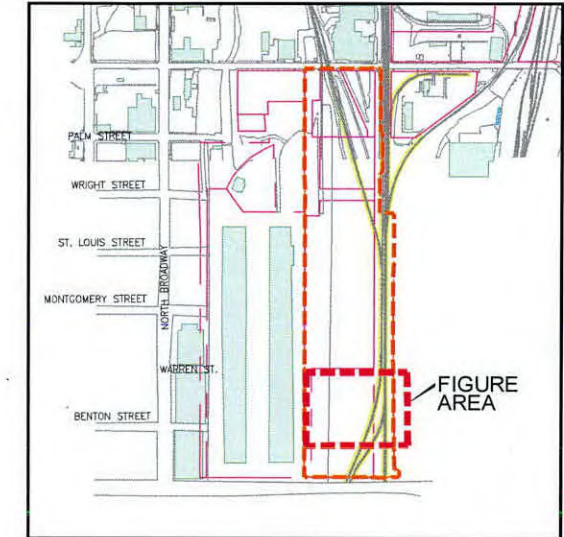
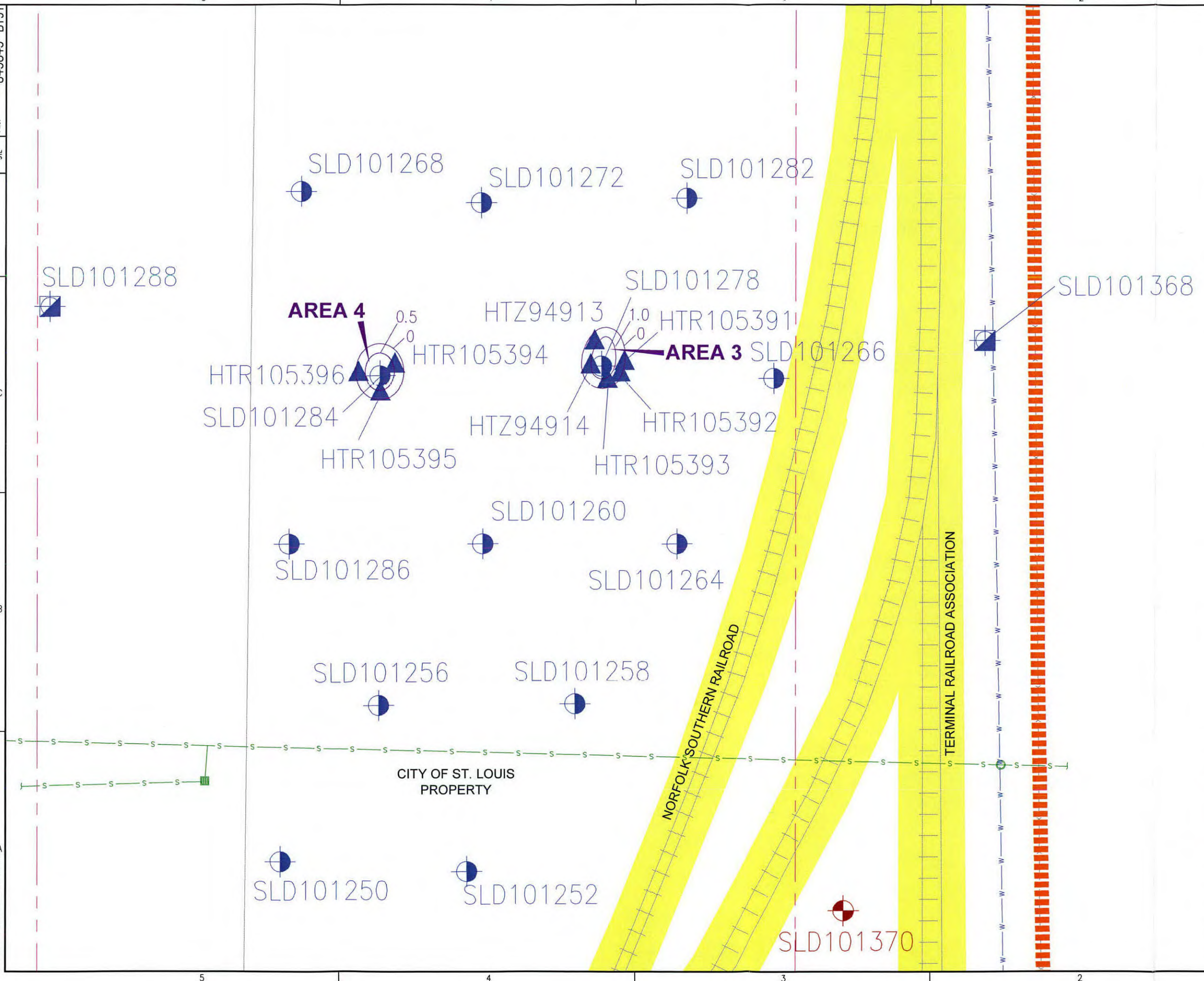
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845843B191.dwg

Figure Number:
3

Spec No.

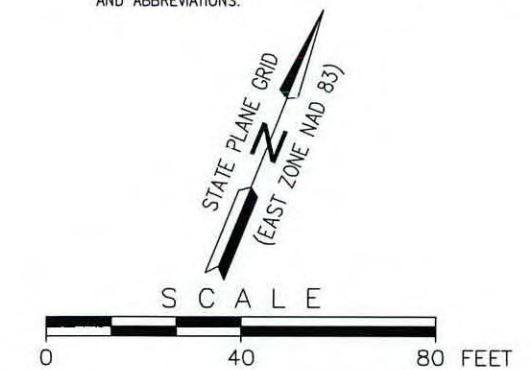
Contract No.

DACW41-98-D-9006



KEY PLAN
SCALE: 1" = 1000'

GENERAL NOTE:
SEE FIGURE 1 FOR GENERAL AND SAMPLE LEGENDS AND ABBREVIATIONS.



Revisions			
Symbol	Descriptions	Date	Approved
0	ISSUE FOR REV. 0 TRRA SOIL SPOILS AREA PDIR	8/6/08	K. BEACH

 Shaw Environmental, Inc.	 FUSRAP U.S. ARMY CORPS OF ENGINEERS KANSAS CITY DISTRICT (CENWK) ST. LOUIS DISTRICT (CENVS)
--	--

Designed by: Mark Cummings	<u>ESTIMATED EXTENT OF CONTAMINATION</u> <u>SHEET 2 OF 2</u> TRRA SOIL SPOILS AREA ST. LOUIS DOWNTOWN SITE ST. LOUIS, MISSOURI
Drawn by: MVG/MJH	

Checked by: Ken Beach	Scale: As Shown	Figure Number: 4B	Spec No.
Approved by: A. Neil DeYong	Date: 10/12/07	Drawing File: 845843B191.dwg	Contract No. DACW41-98-D-9006

APPENDIX A
Terminal Railroad Association Soil Spoils Area
Boring Logs

101198	101202	101206	101210	101214
101218	101218B	101220	101224	101226
101230	101234	101238	101242	101246
101248	101250	101252	101256	101256B
101258	101260	101264	101266	101268
101272	101274	101278	101282	101282B
101284	101286	101288	101294	101298
101300	101302	101302B	101304	101308
101310	101312	101316	101320	101320B
101324	101328	101328B	101332	101334
101336	101338	101342	101344	101346
101346B	101366	101368	101370	101374
101374B	101378	101382	101386	101390
101394	101398	101402	103455	103457

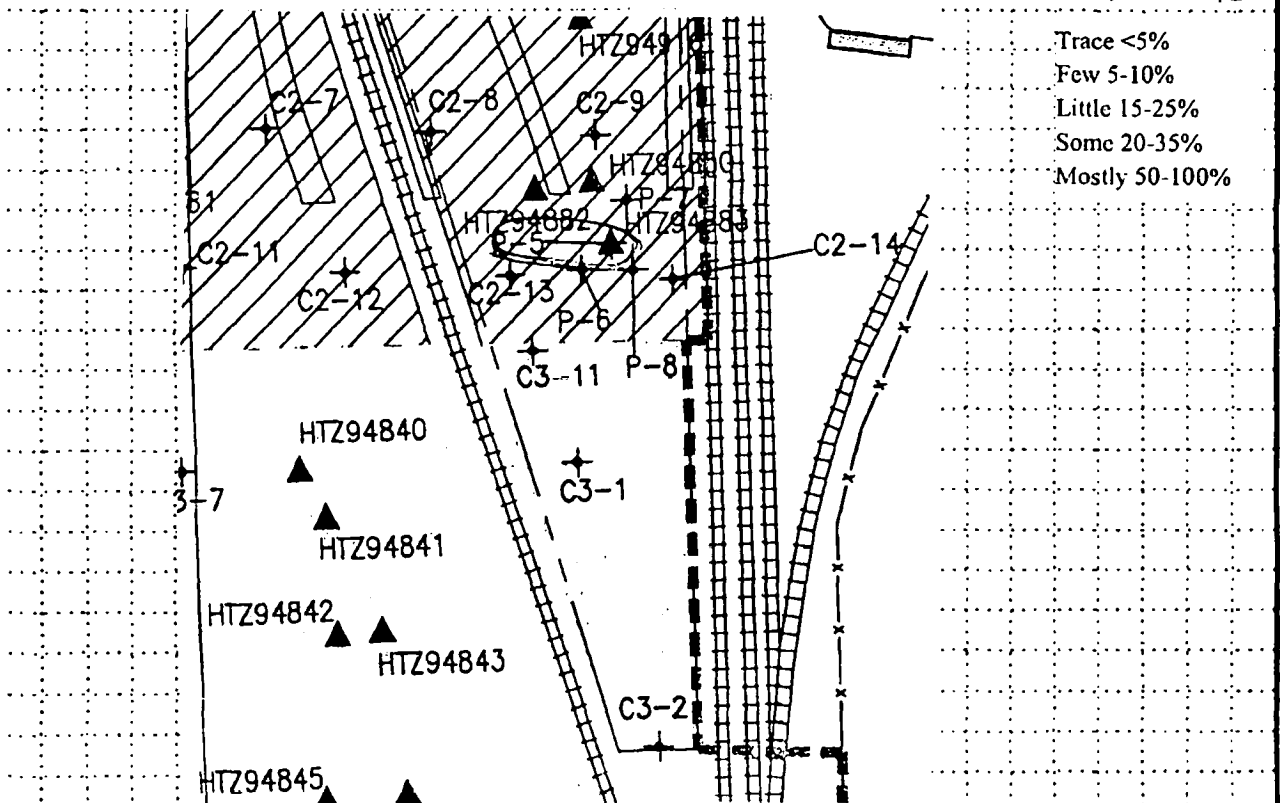
(Note: Boring Logs were not prepared for HTZ and HTR sample locations due to shallow depths)

HTRW DRILLING LOG		DISTRICT	ST. LOUIS		HOLE NUMBER	P5/SLD1198	
1. COMPANY NAME SHAW ENVIRONMENTAL		2. DRILLING SUBCONTRACTOR Shaw			SHEET	1 OF 2	
3. PROJECT FUSRAP/SLDS		4. LOCATION TRRA Soils Pile - TRRA Property					
5. NAME OF DRILLER Dan Gotto		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75					
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3.25" HSA and 3" x 2' split spoon		8. HOLE LOCATION See location sketch					
Driven with a 140# hammer over 30" drop Cal Due: 1-25-08		9. SURFACE ELEVATION					
PID: 013879 Na: 149963 LUD: 149963		10. DATE STARTED 4-3-07		11. DATE COMPLETED 4-3-07			
BVG = 2.000m Cal Due: 1-16-07 Background: 60002		12. OVERBURDEN THICKNESS N/A					
13. DEPTH DRILLED INTO ROCK N/A		15. DEPTH GROUNDWATER ENCOUNTERED N/A					
14. TOTAL DEPTH OF HOLE 6.0 ft bas		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A					
18. GEOTECHNICAL SAMPLES Ø		DISTURBED Ø		UNDISTURBED Ø		19. TOTAL NUMBER OF CORE BOXES Ø	
20. SAMPLES FOR CHEMICAL ANALYSIS Ø		VOC Ø		METALS Ø		OTHER (SPECIFY) Ø	
22. DISPOSITION OF HOLE BACKFILLED		MONITORING WELL N/A		OTHER (SPECIFY) Ø		21. TOTAL CORE RECOVERY Ø %	
						23. SIGNATURE OF INSPECTOR Blaine Cottle	

LOCATION SKETCH/COMMENTS

Witnessed by: N/A

SCALE: Not to Scale



PROJECT FUSRAP/SLDS

TRRA Soils Pile PDI

HOLE NO. P5/SLD1198

HTRW DRILLING LOG (CONTINUATION SHEET)							HOLE NUMBER
PROJECT			INSPECTOR		SHEET		SHEETS
BLVD	DEPTH	DESCRIPTION OF MATERIALS	FIELD SAMPLE NO.	SOILS SAMPLE NO.	SLD	BLOW COUNT	REMARKS
FUSRAP/SLDS							
ML	1	brown silt with roots, grass, some clay, med dense, poorly graded	+500 0.0 +800 0.0 +300 0.0	2.0/2.0	SLD 101198 1025 SLD 101199 1023	4 4 4	-1, -2
EC	2	light gray gravel with brown silt and clay, loose, poorly graded	+200 0.0 +500 0.0 +500 0.0	2.0/2.0		8 13 46	
ML	3	blocky sand with silt, some sand, some brick, some clay, few glass med dense, poorly graded	+500 0.0 +500 0.0		SLD 101200 1053	12	
CL	4	mottled green clay with blocky brown silt, some red, med plasticity	+300 0.0 +300 0.0			8 4	
ML	5	gray silt with some clay, some gravel, moist, few brick med dense, poorly graded	+300 0.0 +500 0.0 +300 0.0	1.7/2.0	SLD 101201 1040	3 3	
EC	6	gravel, block, with few brick, some silt, few clay, wet, very loose, poorly graded	+300 0.0 +500 0.0 +300 0.0	no recovery		7	
		TD - 6.04 ft bgs EUB 1055					

PROJECT: FUSRAP/SLDS

INSPECTOR: TERRA Soils Pile

PD1

ROLE NO: P5/SLD101198

(Proponent: (ECW-EG))

ENG FORM 5056A-R, AUG 94

Figure 4-2 (Concluded)

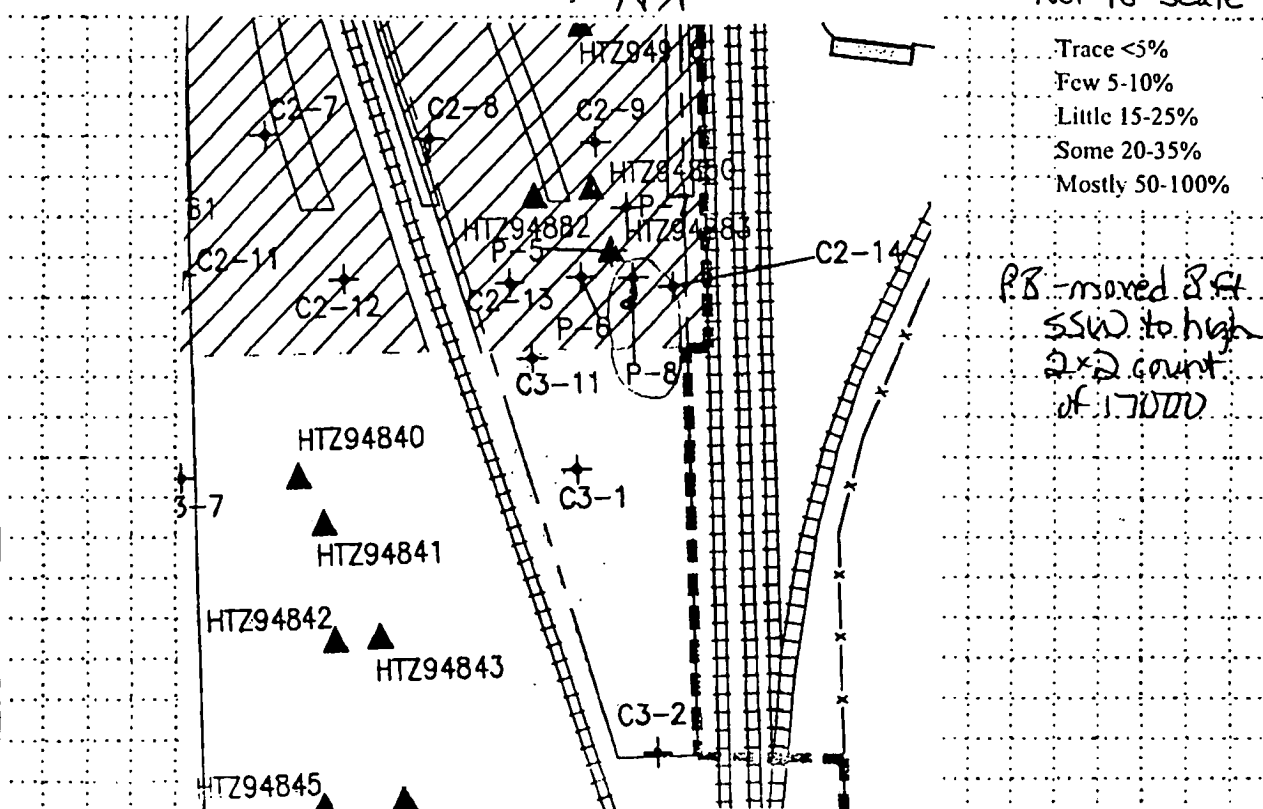
HTRW DRILLING LOG		DISTRICT	ST. LOUIS	HOLE NUMBER	P3/SLD
1. COMPANY NAME SHAW ENVIRONMENTAL		2. DRILLING SUBCONTRACTOR Shaw		SHEET	1 OF 2
3. PROJECT FUSRAP/SLDS		4. LOCATION TRRA Spills Pile - TRRA Property			
5. NAME OF DRILLER Dan Gotto		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3.25" HSA and 3" x 2' split spoon		8. HOLE LOCATION See location sketch			
Driven with a 140# hammer over 30" drop Cal Due: 1-75-183		9. SURFACE ELEVATION			
PID: 013 879 Nat: 1409163 LUD: 1499163 BK6 = 0.000m Cal Due: 11-16-07 Background: (6000)		10. DATE STARTED 4-3-07		11. DATE COMPLETED 4-3-07	
12. OVERBURDEN THICKNESS N/A		15. DEPTH GROUNDWATER ENCOUNTERED N/A			
13. DEPTH DRILLED INTO ROCK N/A		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A			
14. TOTAL DEPTH OF HOLE 6.0 ft bgs		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A			
18. GEOTECHNICAL SAMPLES Ø	DISTURBED Ø	UNDISTURBED Ø	19. TOTAL NUMBER OF CORE BOXES Ø		
20. SAMPLES FOR CHEMICAL ANALYSIS Ø	VOC Ø	METALS Ø	OTHER (SPECIFY) RAD	OTHER (SPECIFY) Ø	OTHER (SPECIFY) Ø
22. DISPOSITION OF HOLE backfilled		MONITORING WELL N/A	OTHER (SPECIFY) Ø	23. SIGNATURE OF INSPECTOR E. L. ...	
21. TOTAL CORE RECOVERY Ø %					

LOCATION SKETCH/COMMENTS

Witnessed by:

N/A

SCALE: Not to Scale



PROJECT

FUSRAP/SLDS

TRRA Spills Pile PDI

HOLE NO.

P3/SLD10/202

HTRW DRILLING LOG (CONTINUATION SHEET)							HOLE NUMBER
PROJECT		INSPECTOR		SHEET		SHEETS	
FASRAP/SLDS		B. Cook		2 OF 2		P8/SLD101202	
REV.	DEPTH	DESCRIPTION OF MATERIALS	FIELD MEASUREMENTS	TESTER/ANALYST	BLOW COUNT	REMARKS	
ML	1	brown silt with roots, grass some gravel with brown silt, black cinders some clay, poorly graded	+1500 0.0	SLD 101202 1108	4		
1		black cinders mottled with brown gravel, some sand some silt, loose poorly graded	+700 0.0	SLD 101203 1110	4		
		mottled black/brown silt with some cinders, some clay, few sand med dense, poorly graded	+600 0.0		4		
		brown silt with white gravel, few sand, few clay, loose, poorly graded	+350 0.0		13		
			+600 0.0		12	done in red trailer had trailer background - 4400	
		black cinders with silt, sand, med dense, poorly graded	+1100 0.3		21		
		black cinders with clay, sand, silt med dense, poorly graded	+1100 0.4	SLD 101204 1305	5		
		black cinders with silt, sand, clay med dense, poorly graded	+1400 0.0		4	only upper 0.2 ft was high reading	
		black cinders with sand, silt, clay med dense, poorly graded	+1400 0.0		3		
		black cinders, silt, clay, few gravel moist, some wood, med dense, poorly graded	+1100 0.0	SLD 101205 1320	1		
		black cinders, coarse sand, silt, clay, moist, med dense, poorly graded	+600 0.0		2		
		gray silt with clay, sand, moist med dense, poorly graded	+400 0.0		3		
		TD - 6.0 ft bgs EOB - 1320					

Figure 4-2 (Concluded)

HTRW DRILLING LOG			DISTRICT ST. LOUIS		HOLE NUMBER <i>P9/SLDS 01206</i>		
1. COMPANY NAME SHAW ENVIRONMENTAL			2. DRILLING SUBCONTRACTOR <i>Shaw</i>		SHEET 1 OF 2		
3. PROJECT FUSRAP/SLDS			4. LOCATION <i>TERRA soils Pile - TRRT Property</i>				
5. NAME OF DRILLER Dan Gotto			6. MANUFACTURER'S DESIGNATION OF DRILL CME 75				
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3 23" HSA and 3" A 2" split spoon			8. HOLE LOCATION See location sketch				
Driven with a 140# hammer over 30" drop Cal Due: 1-25-67			9. SURFACE ELEVATION				
PID: 1, 2, 3, 7, 9 Na: 146, 96, 3 LUD: 147, 96, 3			10. DATE STARTED 4-21-67		11. DATE COMPLETED 4-21-67		
BKG: 0.0 p.p.m. Cal Due: 11-16-67 Background: 5.5 p.p.m.			15. DEPTH GROUNDWATER ENCOUNTERED N/A				
12. OVERBURDEN THICKNESS N/A			16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A				
13. DEPTH DRILLED INTO ROCK N/A			17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A				
14. TOTAL DEPTH OF HOLE 60.0 ft bgs			19. TOTAL NUMBER OF CORE BOXES 0				
18. GEOTECHNICAL SAMPLES 0		DISTURBED 0		UNDISTURBED 0		21. TOTAL CORE RECOVERY 0 %	
20. SAMPLES FOR CHEMICAL ANALYSIS 0		VOC 0		METALS 0		OTHER (SPECIFY) RAD 0	
22. DISPOSITION OF HOLE BACKFILLED		MONITORING WELL N/A		OTHER (SPECIFY) 0		23. SIGNATURE OF INSPECTOR <i>Elaine Wise</i>	
LOCATION SKETCH/COMMENTS Witnessed by: <i>NT</i>							SCALE: Not to Scale
							Trace <5% Few 5-10% Little 15-25% Some 20-35% Mostly 50-100%
PROJECT FUSRAP/SLDS <i>TERRA soils Pile - PDI</i>						HOLE NO. <i>P9/SLDS 01206</i>	

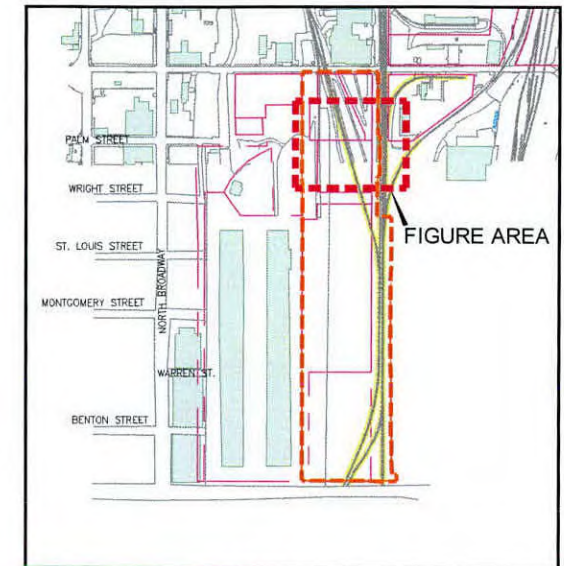
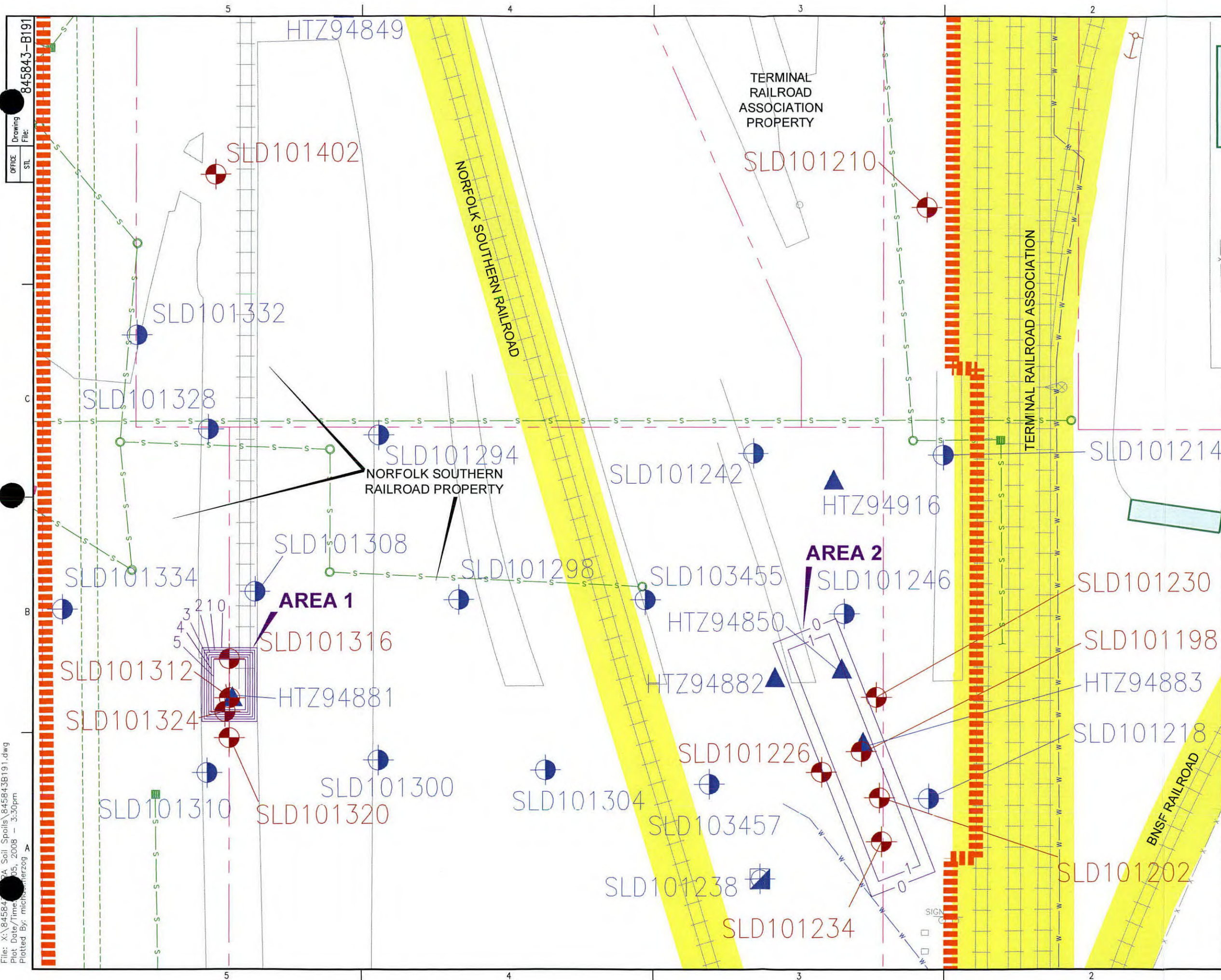
HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER
PROJECT		INSPECTOR		SHEET		SUBJECTS
FUSKIP/SLDS		E. Clark		2 OF 2		P9/SLD1012006
BLK.	DEPTH	DESCRIPTION OF MATERIALS	FIELD PENETROMETER	TESTED SAMPLE	SLURRY	BLOW COUNT
ml		brown silt with some gravel, mostly fine sand, loose, poorly graded	+300 0.0	1.5/2.0	SLD 101206 0845	4
sm		brown sand with some silt, med dense, poorly graded	+400 0.0			4
ml	1	brown silt with some sand, few gravel, med dense, poorly graded	+400 0.0		SLD 101207 0847	4
bm		white gravel with brown silt, few sand, loose, poorly graded	+200 0.0			3
	2	brown silt with sand, trace gravel, some clay, trace bricks, med dense, poorly graded	+600 0.0 +800 0.0	1.8/2.0		16
	3		+800 0.0 +200 0.0		SLD 101208 0940	10
ml	4	poorly graded light brown silt with some sand, clay with some black cinders, med dense	+600 0.0 +800 0.0	2.0/2.0		8
		light brown silt with clay, med dense, poorly graded	+600 0.0			6
	5	brown silt with some sand, few gravel, med dense, poorly graded	+500 0.0		SLD 101209 0935	2
bm		gray green fine sand with some silt, med dense, poorly graded	+400 0.0			4
sm	6					5
TD - 6 off bgs EUB - 0700						
PROJECT FUSKIP/SLDS TRIT S. S. PDI						NO. 18 NO. P9/SLD1012006

ENG FORM 5056A-R, AUG 94

(Proponent: ECHW-EG)

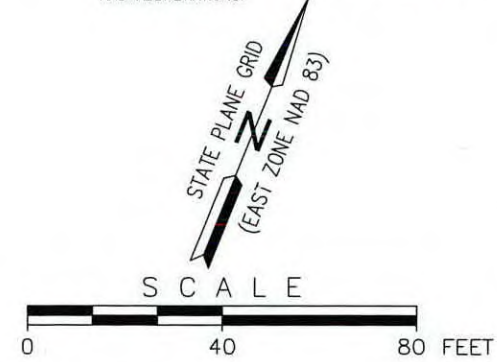
Figure 4-2 (Concluded)

File: X:\845843\TRA Soil Spoils\845843B191.dwg
Plot Date/Time: 05/05/2008 - 3:30pm
Plotted By: michal.kierzog



KEY PLAN
SCALE: 1" = 1000'

GENERAL NOTE:
SEE FIGURE 1 FOR GENERAL AND SAMPLE LEGENDS AND ABBREVIATIONS.



Revisions			
Symbol	Descriptions	Date	Approved
0	ISSUE FOR REV. 0 TRRA SOIL SPOILS AREA PDIR	8/6/08	K. BEACH

Shaw Environmental, Inc.

FUSRAP
U.S. ARMY CORPS OF ENGINEERS
KANSAS CITY DISTRICT (CENWK)
ST. LOUIS DISTRICT (CENVS)

Designed by:
Mark Cummings

Drawn by:
MVG/MJH

Checked by:
Ken Beach

Approved by:
A. Neil DeYong

ESTIMATED EXTENT OF CONTAMINATION
SHEET 1 OF 2
TRRA SOIL SPOILS AREA
ST. LOUIS DOWNTOWN SITE
ST. LOUIS, MISSOURI

Scale: As Shown
Date: 10/12/07
Figure Number: 4A
Drawing File: 845843B191.dwg

Spec No.
Contract No.
DACW41-98-D-9006

HTRW DRILLING LOG				DISTRICT ST. LOUIS		HOLE NUMBER P10/SLD1010	
1. COMPANY NAME SHAW ENVIRONMENTAL				2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2 SHEETS	
3. PROJECT FUSRAP/SLDS				4. LOCATION TRRA Spills Pile - TRRA Property			
5. NAME OF DRILLER Dan Gotto				6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3.25" HSA and 3" x 2' split spoon				8. HOLE LOCATION See location sketch			
Driven with a 140# hammer over 35" drop Cal Due: 1-75-732				9. SURFACE ELEVATION			
PID: 1-12-5-75 Nat: 1499163 LUD: 141463 BXG: 12-1-107 Cal Due: 11-14-07 Background: 5500				10. DATE STARTED 4-4-707		11. DATE COMPLETED 4-4-707	
12. OVERBURDEN THICKNESS N/A				15. DEPTH GROUNDWATER ENCOUNTERED NA			
13. DEPTH DRILLED INTO ROCK N/A				16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A			
14. TOTAL DEPTH OF HOLE 60 ft + 695				17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A			
18. GEOTECHNICAL SAMPLES		DISTURBED		UNDISTURBED		19. TOTAL NUMBER OF CORE BOXES	
0		0		0		0	
20. SAMPLES FOR CHEMICAL ANALYSIS		VOC		METALS		OTHER (SPECIFY)	
0		0		0		0	
22. DISPOSITION OF HOLE		BACKFILLED		MONITORING WELL		OTHER (SPECIFY)	
backfill		N/A		0		23. SIGNATURE OF INSPECTOR T. W. H. C. 7/8	
LOCATION SKETCH/COMMENTS Witnessed by: NA SCALE: Not to Scale							
Trace <5% Few 5-10% Little 15-25% Some 20-35% Mostly 50-100%							
PROJECT FUSRAP/SLDS TRRA Spills Pile - TRRA PDI						HOLE NO. P10/SLD1010	

HTRW DRILLING LOG (CONTINUATION SHEET)						ROLE NUMBER
PROJECT		INSPECTOR		SHEET		PI/D/S/D101210
REV.	DEPTH	DESCRIPTION OF MATERIALS	FIELD LOG (ft)	SCOTER SAMPLE	QUALITY	BLOW COUNT
(1)	(2)	(3)	(4)	(5)	(6)	(7)
ML	1	brown silt with some clay, some sand, rills, med dense, poorly graded	5.00	2.0/2.0	SLD 10:20 10:22	4
		brown silt with some sand, some clay, fine, loose, med dense, poorly graded	12.0			4
		med black/brown sand with some silt, med dense, poorly graded	+30.0			
		black silt with some sand, med dense, poorly graded	0.0			4
		black silt with some sand, med dense, poorly graded	12.0			4
2	black silt with some sand, some silt, fine gravel, med density, poorly graded	2.0		SLD 10:21 10:25	9	
		+24.0				
3	white gravel with black silt, some sand, loose, poorly graded	15.0	2.0/2.0		16	
		+50.0			7	
4	black silt with some sand, some silt, med dense, poorly graded	44.0		SLD 10:22 10:25	6	
	black silt with some sand, some silt, med dense, poorly graded	+20.0			10	
5	gray silt with some sand, some silt, loose, poorly graded	+30.0	2.0/2.0		4	
	gray silt with some sand, some silt, loose, poorly graded	0.0			4	
6	gray silt with some sand, some silt, loose, poorly graded	+3.0			4	
	gray silt with some sand, some silt, loose, poorly graded	0.0			6	
SM	gray silt with some sand, some silt, loose, poorly graded	+20.0			6	
	gray silt with some sand, some silt, loose, poorly graded	0.0		SLD 10:23 10:25	6	
6	TD 60 ft bgs					
	EDS - 1035					

Remarks: cinders are silt size

PROJECT: FUSRAP/SLDS TRRA PDI

ROLE NO: PI/D/S/D101210

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG				DISTRICT ST. LOUIS		HOLE NUMBER C2-4/SLD/101214	
1. COMPANY NAME SHAW ENVIRONMENTAL				2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2 SHEETS	
3. PROJECT FUSRAP/SLDS				4. LOCATION TPR & Spills Pile TREAT Property			
5. NAME OF DRILLER Dan Gotto				6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 1.25" HSA and 3" x 2' split spoon				8. HOLE LOCATION See location sketch			
Driven with a 140# hammer over 35" drop Cal Due: 1-75-01				9. SURFACE ELEVATION			
PID: N3579 Nat: 46612 LUD: 149902 RKG: 01020 Cal Due: 11-16-07 Background: 5500				10. DATE STARTED 1-1-07		11. DATE COMPLETED 1-1-07	
12. OVERBURDEN THICKNESS N/A				15. DEPTH GROUNDWATER ENCOUNTERED N/A			
13. DEPTH DRILLED INTO ROCK N/A				16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A			
14. TOTAL DEPTH OF HOLE 60 ft bgs				17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A			
18. GEOTECHNICAL SAMPLES		DISTURBED		UNDISTURBED		19. TOTAL NUMBER OF CORE BOXES	
Ø		Ø		Ø		Ø	
20. SAMPLES FOR CHEMICAL ANALYSIS		VOC		METALS		OTHER (SPECIFY)	
Ø		Ø		Ø		Ø	
22. DISPOSITION OF HOLE		BACKFILLED		MONITORING WELL		OTHER (SPECIFY)	
bioreactor		N/A		Ø		23. SIGNATURE OF INSPECTOR Elaine COTTE	
LOCATION SKETCH/COMMENTS Witnessed by: Juan F. Adames SCALE: Not to Scale							
Trace <5% Few 5-10% Little 15-25% Some 20-35% Mostly 50-100% <i>moved 2 ft east to avoid underground utility (electric)</i>							
PROJECT FUSRAP/SLDS TPR & Spills Pile - Class 13						HOLE NO. C2-4/SLD/101214	

HTRW DRILLING LOG (CONTINUATION SHEET)							HOLE NUMBER
PROJECT	INSPECTOR						SHEET
FW32AP/SLDS	ECORC						2 of 2
REV.	DEPTH	DESCRIPTION OF MATERIALS	FIELD LOGGING	SOILS SAMPLE	ANALYTICAL	BLOW COUNT	REMARKS
			FEET	DATE	NO.	FEET	
ML	1	dark brown silt with few gravel, roots, loose, poorly graded	-100	1.7/2.0	SLD 101214	6	1-2
		brown silt with some sand, few gravel, some clay, med dense, poorly graded	+300		SLD 101215	7	
			0.0		SLD 101215	6	
	2		0.0	no recovery	SLD 101215	8	
			+200	1.9/2.0		11	
			0.0			7	
GC	3		+200			8	
			0.0		SLD 101216	6	
	4	light gray gravel with some sand some silt, loose, poorly graded	+200	1.0/2.0		9	
			0.0			3	
	5		+400			3	
		gray sand with few silt, med dense poorly graded	120		SLD 101217	6	
SM	6	gray green sand with some silt med dense poorly graded	+400		1112		
		TD 6 041-bys EUB 1130					

PROJECT FW32AP/SLDS TRPA Soils Plc C 652-13 HOLE NO. C 2-4/SLD101214
ENG FORM 5056A-R, AUG 94 (Proprietor: CECW:EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG				DISTRICT ST. LOUIS		HOLE NUMBER C2-14/SLDS 101218	
1. COMPANY NAME SHAW ENVIRONMENTAL				2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2 SHEETS	
3. PROJECT FUSRAP/SLDS				4. LOCATION TRRA Spills Pile - TRRA Property			
5. NAME OF DRILLER Dan Gotto				6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3.25" HSA and 3" x 2' split spoon Driven with a 140# hammer over 35" drop Cal Due: 1-7-17				8. HOLE LOCATION See location sketch			
9. SURFACE ELEVATION				10. DATE STARTED 4-4-07			
11. DATE COMPLETED 4-4-07				12. OVERBURDEN THICKNESS N/A			
13. DEPTH DRILLED INTO ROCK N/A				15. DEPTH GROUNDWATER ENCOUNTERED N/A			
14. TOTAL DEPTH OF HOLE 6.0 ft hrs				16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A			
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A				18. GEOTECHNICAL SAMPLES			
19. TOTAL NUMBER OF CORE BOXES				20. SAMPLES FOR CHEMICAL ANALYSIS			
21. TOTAL CORE RECOVERY 0 %				22. DISPOSITION OF HOLE			
23. SIGNATURE OF INSPECTOR R. G. G. G.				24. LOCATION SKETCH/COMMENTS			
25. WITNESSED BY: Susan L. Adams				26. SCALE: Not to Scale			
Trace <5% Few 5-10% Little 15-25% Some 20-35% Mostly 50-100%							
PROJECT FUSRAP/SLDS				HOLE NO. TRRA Spills Pile - Class 2/3		HOLE NO. C2-14/SLDS 101218	

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER
PROJECT	INSPECTOR					SHEET
FUSRAP/SLDS	E. C. O'NEIL					2 of 2
DEPTH (ft)	DESCRIPTION OF MATERIALS (a)	FIELD PENETRATION (b)	SOIL FOR SAMPLE OR CORRECTION NO. (c)	ANALYTICAL SAMPLE NO. (d)	BLOW COUNT (e)	REMARKS (f)
6C	gravel with mostly silt, some clay units - dark brown, med dense, poorly graded	17.00	2.0/2.0	SLD 101208 1320	6	
	dark brown silt with some silt med dense, poorly graded	0.0			6	
	dark brown silt with some sand, some clay, med dense, poorly graded	0.0			6	
1	dark brown silt with some sand, some clay, med dense, poorly graded	0.0			6	
2	black silt with some gravel, some silt, med dense, poorly graded	0.0		SLD 101219 1323	9	
3						insufficient sample
4	dark gray silt with some sand, some clay, med dense, poorly graded	0.0	1.8/2.0		3	
5	dark brown silt with mostly clay, some sand, med dense, poorly graded	0.0			6	
6	gray green sand with some silt, med dense, poorly graded	0.0		SLD 101219 1310	5	
	TD 6.04 ft bgs EOB 1325					

Figure 4-2 (Concluded)

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER C2-14B/SLDS 0101218B	
PROJECT FWSRAP/SLDS		INSPECTOR E. COOK		SHEET 2 OF 2		REMARKS	
ELEV. (ft)	DEPTH (ft)	DESCRIPTION OF MATERIALS (ft)	FIELD MOISTURE (%)	SECTOR SAMPLE OR CORE FOR Q _c (ft)	QUALITY CLASSIFICATION (ft)	BLOW COUNT (ft)	REMARKS (ft)
		20' augered cut then down to 2 ft bgs					
	1						
	2	dkrt brwn silt with some sand, some clay, trace brick, med dense, poorly graded	+40 0.0			1	
	3	med dense, poorly graded	+500 0.0			7	
	4	med dense, poorly graded	+400 0.0		Archive 1345	7	
	5	TD 13.0 ft bgs Elev 1345	+400 0.0			11	
	6						

PROJECT: FWSRAP/SLDS TRRA spoils Pile class 2B
HOLE NO. C2-14B/SLDS 0101218B
ENG FORM 5056A-R, AUG 94
(Proponent: CECW-EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG (CONTINUATION SHEET)							HOLE NUMBER
PROJECT		INSPECTOR					SHEET
FUS RAPISLDS		F. LOOK					2 of 2
BLK. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SAMPLE RESULTS (D)	SCOTT SAMPLE OR OTHER TESTS (E)	ANALYTICAL DATA (F)	BLOW COUNT (G)	REMARKS (H)
bc	1	white gravel with mostly dark brown silt, some clay, roots loose, poorly graded	+700 0.0	1.9/2.0	SLD 101220 1438	6	cinders are silt sized
			+400 0.0			8	
sp		coarse sand with med sand med dense, poorly graded	+300 0.0		SLD 101221 1440	6	
			+400 0.0			7	
ml	2	dark brown silt with sand, some clay, moist med dense poorly graded	+300 0.0	2.0/2.0		7	
			+500 0.0			4	
3		black cinders with some coarse sand, sand, silt, some clay, few gravel, moist, med dense, poorly graded	+800 0.0		SLD 101222 1430	7	
			+600 0.0			6	
4		green-gray sand with some silt moist, med dense, poorly graded	+600 0.0	1.8/2.0		6	
			+700 0.0			5	
5			+200 0.0			3	
			+1000 0.0		SLD 101223 1415	7	
6		dark brown gravel with some sand, some silt, some clay, wet loose poorly graded	+1000 0.0				
		TD-6.0 ft bgs EUB 1440					

PROJECT FUS RAPISLDS TRPA Spills Pile class B3 ROILE NO. C3-2/SLD/101220
ENG FORM 5056A-R, AUG 94 (Preponent: CECW-EG)

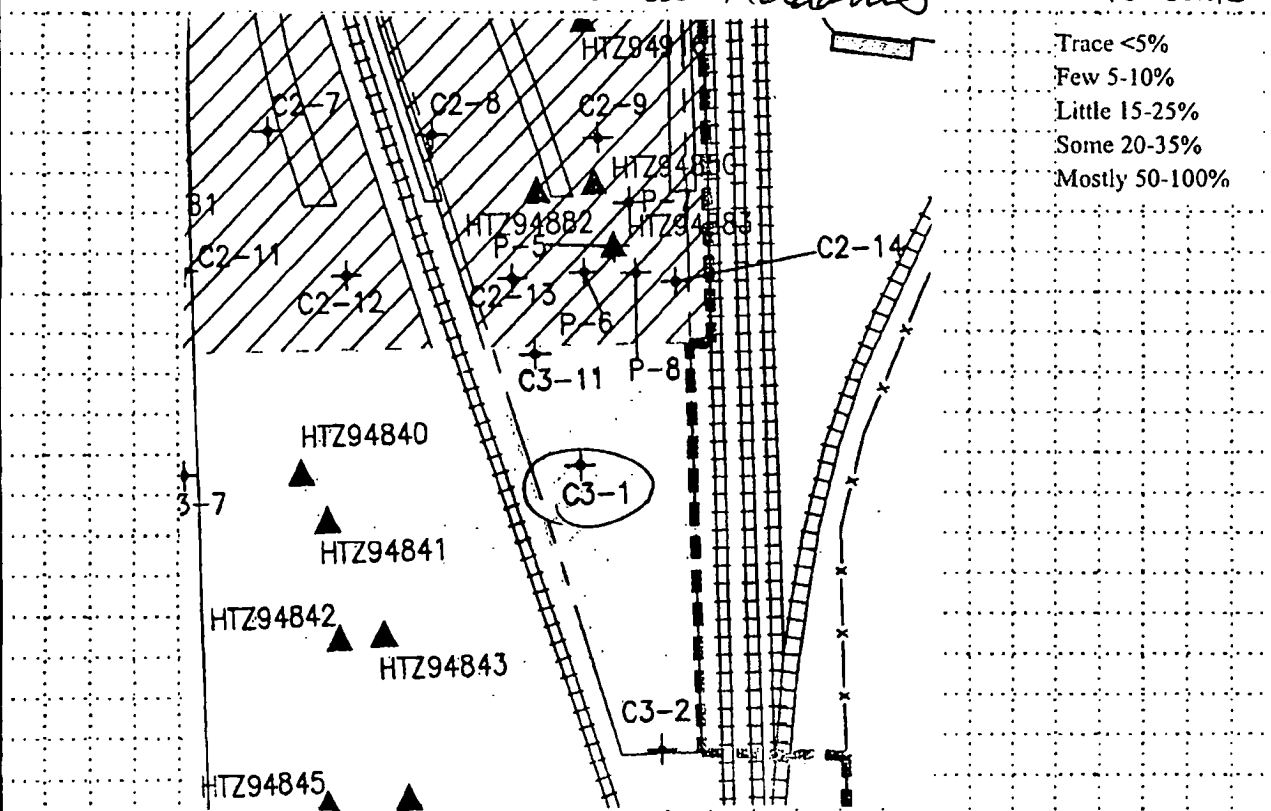
Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT	ST. LOUIS		HOLE NUMBER	C3-1/SLD101224	
1. COMPANY NAME SHAW ENVIRONMENTAL		2. DRILLING SUBCONTRACTOR Shaw			SHEET 1 OF 2 SHEETS		
3. PROJECT FUSRAP/SLDS		4. LOCATION TRRA Sports Pile - TRRA Property					
5. NAME OF DRILLER Dan Gotto		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75					
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3.25" HSA and 3" x 2' split spoon		8. HOLE LOCATION See location sketch					
Driven with a 140# hammer over 30" drop Cal Due: 1-7-28		9. SURFACE ELEVATION					
PID: 013379 Na: 149065 LUD: 149163		10. DATE STARTED 4-4-07		11. DATE COMPLETED 4-4-07			
BKG: 0.0 ppm Cal Due: 11-16-17 Background: 5801		15. DEPTH GROUNDWATER ENCOUNTERED N/A					
12. OVERBURDEN THICKNESS N/A		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A					
13. DEPTH DRILLED INTO ROCK N/A		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A					
14. TOTAL DEPTH OF HOLE 6.0 ft bgs		19. TOTAL NUMBER OF CORE BOXES 0					
18. GEOTECHNICAL SAMPLES 0		DISTURBED 0		UNDISTURBED 0		21. TOTAL CORE RECOVERY 0 %	
20. SAMPLES FOR CHEMICAL ANALYSIS 0		VOC 0		METALS 0		OTHER (SPECIFY) RAD	
22. DISPOSITION OF HOLE backfilled		BACKFILLED N/A		MONITORING WELL N/A		23. SIGNATURE OF INSPECTOR C. L. Adams	

LOCATION SKETCH/COMMENTS

Witnessed by: Susan Adams

SCALE: Not to Scale



PROJECT	FUSRAP/SLDS TRRA Sports Pile class 2/3	HOLE NO.	C3-1/SLD101224
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HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER
PROJECT		INSPECTOR		SHEET		SHEETS
EUSRAPIS LIDS		E. C. O. D.		2 OF 2		C3-1/5/D101224
ELEV (ft)	DEPTH (ft)	DESCRIPTION OF MATERIALS	FIELD PENETROMETER (psi)	SOIL TYPE	BLOW COUNT (ft)	REMARKS
ML		brown silt with some gravel, roots, sand, clay, loose, poorly graded	0	1.9/2.0	SD 101224 1455	
SM	1	light brown sand with some silt, some gravel, med dense, poorly graded	+200			
GM		medium sand with some gravel and some silt, some brown sand, loose, poorly graded	+200			
ML	2	black cinders with some sand, some clay, some brick, some silt, some gravel, loose, poorly graded	+400	SD 101225 1458	10	cinders are silt sized
SM	3	mottled brown/dark brown sand with some silt, some gravel, loose, poorly graded	+600	2.0/2.0		
		brown fine sand with gravel (some), some silt, wet, loose, poorly graded	+900		Archive 1515	
	4	mottled light brown/dark brown gravel with mostly silt some sand	+500			
		gravel brown, with some sand, some silt, trace brick, wet, some clay, loose, poorly graded	+1000	2.0/2.0		loose, poorly graded
BC	5		+600		Archive 1505	
			+600			
	6		+600			
		TD - 604 ft bgs EOB 1515				

ENG FORM 5056A-R, AUG 94

(Proprietor: CECW-EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG			DISTRICT ST. LOUIS		HOLE NUMBER 1-6/SLD101226	
1. COMPANY NAME SHAW ENVIRONMENTAL			2. DRILLING SUBCONTRACTOR <i>Shaw</i>			SHEET 1 OF 2
3. PROJECT FUSRAP/SLDS			4. LOCATION <i>TRRA Soils Pile TRRA Property</i>			
5. NAME OF DRILLER Dan Gotto			6. MANUFACTURER'S DESIGNATION OF DRILL CMZ 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CMZ 75 using 3.25" HSA and 3" x 2" split spoon			8. HOLE LOCATION See location sketch			
Driven with a 140# hammer over 30" drop Cal Due: 1-75-25			9. SURFACE ELEVATION			
PID. 0123579 Nat. 1449623 LUD: 146603			10. DATE STARTED 1-5-07		11. DATE COMPLETED 4-5-07	
BKG: 0.02m Cal Due: 11-11-07 Background: 5800			15. DEPTH GROUNDWATER ENCOUNTERED N/A			
12. OVERBURDEN THICKNESS N/A			16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A			
13. DEPTH DRILLED INTO ROCK N/A			17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A			
14. TOTAL DEPTH OF HOLE 6.0 ft bgs			19. TOTAL NUMBER OF CORE BOXES			
18. GEOTECHNICAL SAMPLES		DISTURBED	UNDISTURBED	21. TOTAL CORE RECOVERY		
20. SAMPLES FOR CHEMICAL ANALYSIS		VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)
22. DISPOSITION OF HOLE		BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR <i>B. G. L. S.</i>	
LOCATION SKETCH/COMMENTS Witnessed by: <i>NA</i> SCALE: Not to Scale						
PROJECT FUSRAP/SLDS			TRRA Soils Pile PDI		HOLE NO. 1-6/SLD101226	

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER <u>P6/SLD101226</u>	
PROJECT <u>FUSRAP/SLDS</u>		INSPECTOR <u>E. Cook</u>		SHEET <u>2</u> OF <u>3</u>			
DEPTH (ft)	DESCRIPTION OF MATERIALS (a)	FIELD SPT RESISTANCE (b)	SOIL SAMPLE FOR TESTS (c)	ANALYTICAL DATA (d)	BLOW COUNT (e)	REMARKS (f)	
0m	gray gravel with silt, sand, very loose, poorly graded	+200	1.5/2.0	SLD 101226 101226	6		
SW	coarse sand, brown, moist, med dense, poorly graded	0.0			5		
1	silt-sand black clinders with some sand med dense, poorly graded	+200		SLD 101227 101227	5		
ML	gray gravel with gray silt, some clay, very loose, poorly graded	+200			6		
2	silt-sand black clinders with some sand, some silt, few gravel loose, poorly graded	+200	2.0/2.0		10		
3		0.0			10		
4	fine gravel with gray silt with some clay, loose, poorly graded	+200		SLD 101228 101228	6		
5	coarse sand, brown, med dense, poorly graded	+800	2.0/2.0		3		
6	medium green-gray/black silt with clay, some sand, med dense, poorly graded	+200			2		
		+800			3		
		0.0			6		
		+200		SLD 101229 101229	6		
		0.0					
	TD 6 ft bags EDS 1050						

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

Figure 4-2 (Concluded)

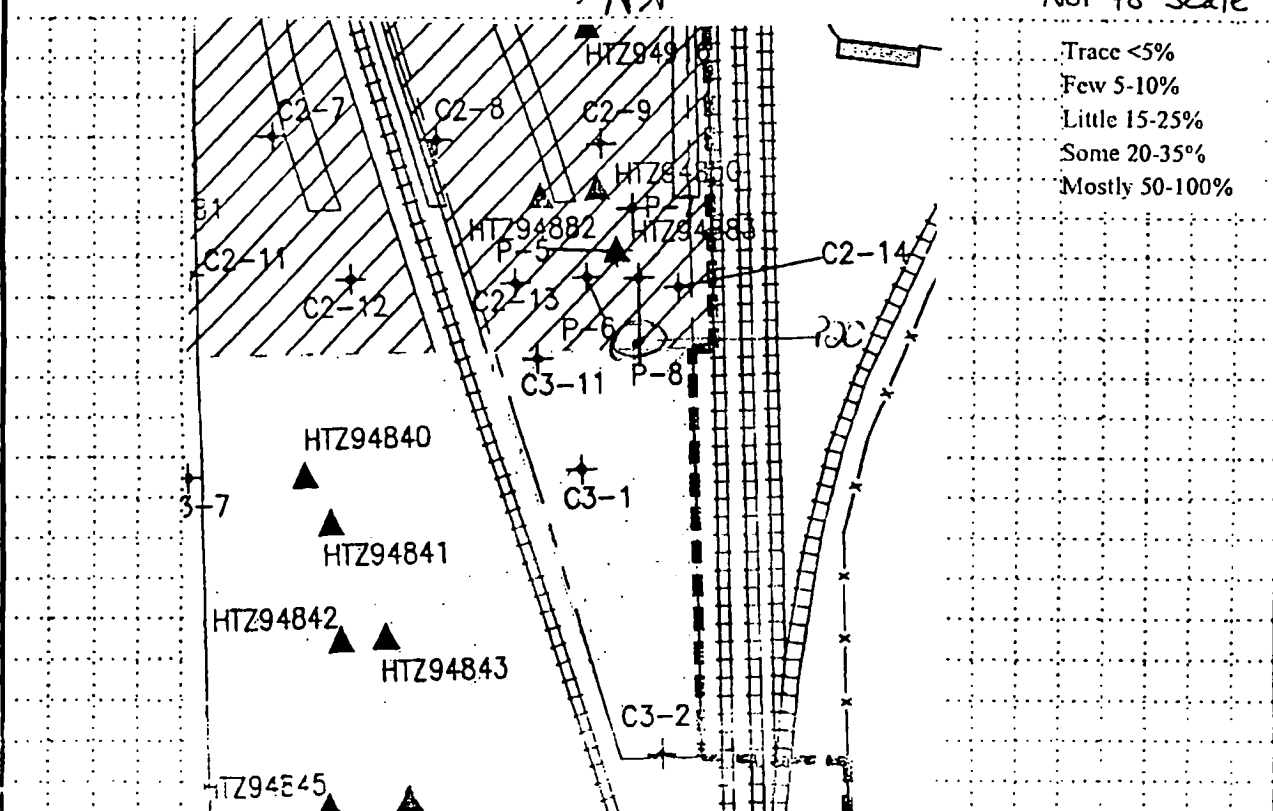
HTRW DRILLING LOG		DISTRICT ST. LOUIS		HOLE NUMBER P7/SLD101230	
1. COMPANY NAME SHAW ENVIRONMENTAL		2. DRILLING SUBCONTRACTOR <i>Shaw</i>		SHEET 1 OF 2	
3. PROJECT FUSRAP/SLDS		4. LOCATION <i>TRRA Spills Pile - TRRA Property</i>			
5. NAME OF DRILLER Dan Gotto		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3 25" HSA and 3" x 2" split spoon		8. HOLE LOCATION See location sketch			
Driven with a 140# hammer over 30" drop		9. SURFACE ELEVATION			
Cal Due: 1-7-5-7		10. DATE STARTED 4-5-07		11. DATE COMPLETED 4-5-07	
PID: D12579 Nal: 1466162 LUD: 1466163		15. DEPTH GROUNDWATER ENCOUNTERED 41			
Background: 5.5 (C)		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A			
12. OVERBURDEN THICKNESS N/A		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A			
13. DEPTH DRILLED INTO ROCK N/A					
14. TOTAL DEPTH OF HOLE 6.0 ft 1.5					
18. GEOTECHNICAL SAMPLES		19. TOTAL NUMBER OF CORE BOXES			
DISTURBED		UNDISTURBED			
20. SAMPLES FOR CHEMICAL ANALYSIS		OTHER (SPECIFY)		21. TOTAL CORE RECOVERY 0%	
VOC		METALS		OTHER (SPECIFY)	
22. DISPOSITION OF HOLE		MONITORING WELL		23. SIGNATURE OF INSPECTOR <i>Blaine Corio</i>	
BACKFILLED		N/A			
LOCATION SKETCH/COMMENTS Witnessed by: <i>NA</i> SCALE: Not to Scale Trace <5% Few 5-10% Little 15-25% Some 20-35% Mostly 50-100%					
PROJECT FUSRAP/SLDS		TRRA Spills Pile PDI		HOLE NO. P7/SLD101230	

HTRW DRILLING LOG		DISTRICT ST. LOUIS		HOLE NUMBER P-20/SLD101234	
1. COMPANY NAME SHAW ENVIRONMENTAL		2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2	
3. PROJECT FUSRAP/SLDS		4. LOCATION TR-2+ S. 21st St. TR-1 P. 21st			
5. NAME OF DRILLER Dan Gotto		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3.25" HSA and 3" x 2" split spoon		8. HOLE LOCATION See location sketch			
Driven with a 140# hammer over 30" drop		9. SURFACE ELEVATION			
Cal Due: 1-25-77		10. DATE STARTED 4-5-07		11. DATE COMPLETED 4-2-07	
PID: 3A-79 Nat: 144916-3 LUD: 144916-5		12. OVERBURDEN THICKNESS N/A		15. DEPTH GROUNDWATER ENCOUNTERED 40-11 bgs	
BKG: 2-1-2007 Cal Due: 11-11-07 Background: C-200		13. DEPTH DRILLED INTO ROCK N/A		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14. TOTAL DEPTH OF HOLE 60.54 bgs		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A			
18. GEOTECHNICAL SAMPLES		DISTURBED		UNDISTURBED	
20. SAMPLES FOR CHEMICAL ANALYSIS		VOC		METALS	
22. DISPOSITION OF HOLE		BACKFILLED		MONITORING WELL	
		bentonite		N/A	
19. TOTAL NUMBER OF CORE BOXES		OTHER (SPECIFY)		OTHER (SPECIFY)	
		RAD		OTHER (SPECIFY)	
		OTHER (SPECIFY)		21. TOTAL CORE RECOVERY %	
		OTHER (SPECIFY)		23. SIGNATURE OF INSPECTOR	
				C. Lewis C. F.	

LOCATION SKETCH/COMMENTS

Witnessed by: NA

SCALE: Not to Scale



PROJECT FUSRAP/SLDS	TR-2+ S. 21st St. TR-1 P. 21st	HOLE NO. P-20/SLD101234
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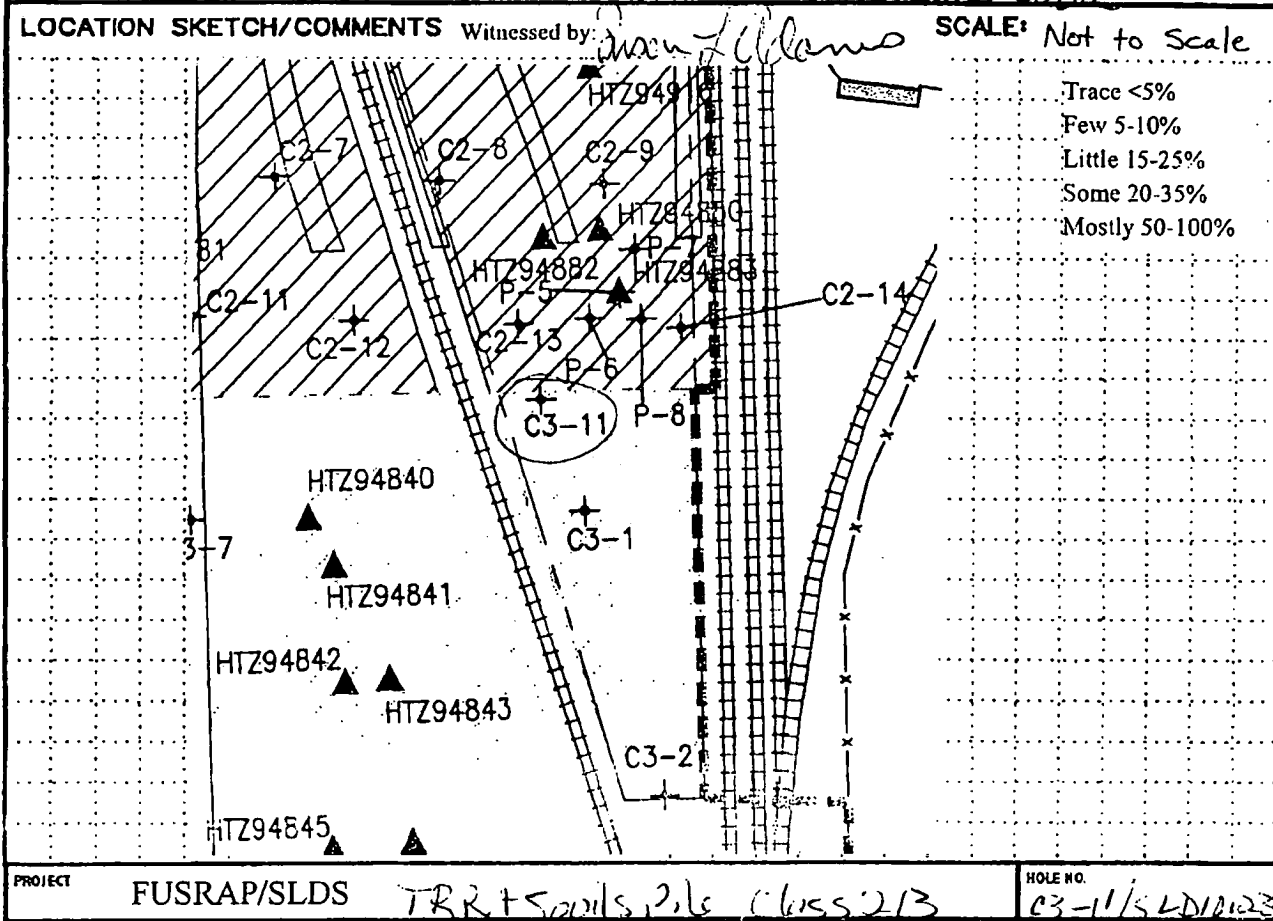
HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER	
PROJECT			INSPECTOR		SHEET		
FUSRAP/SLDS			F. Cant		P20/SLD101234		
DEPTH	DESCRIPTION OF MATERIALS	FIELD LOGGING	TESTING	ANALYTICAL	BLOW COUNT	REMARKS	
6C	black fine gravel with some silt, some silt, rps. very loose, poorly graded	1100	2400	SLD 101234	5		
		1200			8		
1	dark brown silt with some silt, few gravel, some silt, med dense, poorly graded	1200			9		
		1200					
2	black cinders with some gravel, some silt, few gravel, med dense, poorly graded	1200		SLD 101235	13		
		1200					
	black cinders with silt, some sand, some clay, med dense, poorly graded	1200	2.0/2.0	SLD 101236	55	cinders are silt sized	
		1200					
	black cinders with sand, some silt, med dense, poorly graded	1200			21	cinders are silt sized	
		1200			9		
3	light gray cinders with some silt, some clay, few sand, trace gravel, med dense, poorly graded	1200			8		
		1200					
WOOD	4	wood	1500	2.0/2.0	SLD 101237	2	
CL		1500					
	medium, greenish gray clay with some silt, very saturated, very soft, med plasticity	2000		SLD 101238	2		
		2000					
WOOD	5	wood, white, saturated	2000		SLD 101239	2	
		2000					
	black cinders with some sand, few gravel, some silt, saturated, very loose, poorly graded	2000			2		
		2000					
ML	6	medium, greenish gray clay with some silt, very saturated, very soft, med plasticity	2000			2	
CL							
TD 60 FT bgs							
EGB 0845							
PROJECT: FUSRAP/SLDS TERN Spills Pile PDI						NOTE NO. P20/SLD101234	

ENG FORM 5056A-R, AUG 94

(Proponent: ECEW-EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT ST. LOUIS		HOLE NUMBER C3-11/SLDS 101238	
1. COMPANY NAME SHAW ENVIRONMENTAL		2. DRILLING SUBCONTRACTOR <i>Shaw</i>		SHEET OF 2	
3. PROJECT FUSRAP/SLDS		4. LOCATION TRR + Spills, 216 Class 213		5. NAME OF DRILLER Dan Gotto	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3.25" HSA and 3" x 2' split spoon		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75		8. HOLE LOCATION See location sketch	
Driven with a 140# hammer over 35" drop Cal Due: 1-75-1.5		9. SURFACE ELEVATION		10. DATE STARTED 4-5-07	
PID: 113579 Na: 149463 LUD: 149463 RK6: 12.2m Cal Due: 11-16-07 Background: 5500		11. DATE COMPLETED 4-5-07		12. OVERBURDEN THICKNESS N/A	
13. DEPTH DRILLED INTO ROCK N/A		15. DEPTH GROUNDWATER ENCOUNTERED N/A		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14. TOTAL DEPTH OF HOLE 100 ft		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A		18. GEOTECHNICAL SAMPLES	
20. SAMPLES FOR CHEMICAL ANALYSIS		21. TOTAL CORE RECOVERY		23. SIGNATURE OF INSPECTOR <i>Blaine Cook</i>	
22. DISPOSITION OF HOLE		23. SIGNATURE OF INSPECTOR		24. TOTAL NUMBER OF CORE BOXES	



PROJECT FUSRAP/SLDS	TRR + Spills, 216 Class 213	HOLE NO. C3-11/SLDS 101238-P
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HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER C3-11/SLD 101238	
PROJECT FWSRAP/SLDS		INSPECTOR E. L. DICK		SHEET 2 OF 2		SHEETS	
ELAY. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD PENETROMETER TESTS (4)	WATER SAMPLE OR OTHER TESTS (5)	QUALITY CHECK NO. (6)	BLOW COUNT (7)	REMARKS (8)
ML		brown silt with some gravel, some clay, very med dense poorly graded	+200	1.7/2.0	SLD 101238	5	
GM		coarse gravel with few sand few silt, loose, poorly graded	+200		1110	5	
SW	1	medium sand, med dense, well graded	+200		SLD 101239	5	
ML		black sand with some silt, some clay, med dense, poorly graded	+200		1112	7	
SW	2	coarse sand, brown, med dense	+200	1.5/2.0		5	
ML		brown silt with some clay, some sand, few gravel, med dense, poorly graded	+200			6	
SW	3	green-gray fine sand, moist, med dense, well graded	+200		SLD 101240	6	
			+200		1130	5	
ML	4	black silt with some clay, some sand, med dense, poorly graded	+200	2.0/2.0		2	
		black silt with some clay, some gravel, wet, some sand, loose, poorly graded	+200			3	
CL	5	dark gray clay with some silt, some sand, few gravel, trace glass - wet, med plasticity, soft	+200			3	med stiff
SW	6	white sand, med dense, poorly graded	+200		SLD 101241	5	
		TD 6.04 bgs EUB 1135					

PROJECT FWSRAP/SLDS TRRT Spills, Pile class B3 C3-11/SLD 101238
ENG FORM 5056A-R, AUG 94 (Proponent: CECF-EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG			DISTRICT ST. LOUIS		HOLE NUMBER C2-3/SLD 01242	
1. COMPANY NAME SHAW ENVIRONMENTAL			2. DRILLING SUBCONTRACTOR <i>Shaw</i>		SHEET 1 OF 2	
3. PROJECT FUSRAP/SLDS			4. LOCATION TRRA Spills Pile - TRRA Property			
5. NAME OF DRILLER Dan Gotto			6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3.25" HSA and 3" x 2" split spoon			8. HOLE LOCATION See location sketch			
Driven with a 140# hammer over 30" drop Cal Due: 1-7-57			9. SURFACE ELEVATION			
PID: 113879 Nal: 119913 LUD: 149163			10. DATE STARTED 4-5-07		11. DATE COMPLETED 4-5-07	
BKG: 0.0 ppm Cal Due: 11-16-07 Background: 5300			12. OVERBURDEN THICKNESS N/A			
13. DEPTH DRILLED INTO ROCK N/A			15. DEPTH GROUNDWATER ENCOUNTERED N/A			
14. TOTAL DEPTH OF HOLE 6.0 ft bgs			16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A			
18. GEOTECHNICAL SAMPLES			DISTURBED		UNDISTURBED	
20. SAMPLES FOR CHEMICAL ANALYSIS			VOC		METALS	
22. DISPOSITION OF HOLE			BACKFILLED		MONITORING WELL	
23. SIGNATURE OF INSPECTOR			SCALE: Not to Scale		21. TOTAL CORE RECOVERY 0%	
LOCATION SKETCH/COMMENTS Witnessed by: <i>Shaw & Adams</i> BRANCH STREET TERMINAL RAILROAD ASSOCIATION PROPERTY (DT-9) P-9 P-10 C2-2 C2-3 H72949 Trace <5% Few 5-10% Little 15-25% Some 20-35% Mostly 50-100%						
PROJECT FUSRAP/SLDS			TRRA Spills Pile C2-3/SLD 01242		HOLE NO. C2-3/SLD 01242	

HTRW DRILLING LOG (CONTINUATION SHEET)							HOLE NUMBER C2-3/SLD1242
PROJECT FUSRAP/SLDS		INSPECTOR E. L. Cole		SHEET 2 OF 2		SHEETS	
ELEV. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD SOFTENING BLASTS (4)	SCOTT'S SAMPLE CORRECTION FOR NO. (5)	QUALITY SAMPLE NO. (6)	BLOW COUNT (7)	REMARKS (8)
ML		brown silt with some sand some gravel, roots, med dense poorly graded	+400 0.0	1.7/2.0	SLD 101242 1350	5	
SW	1	coarse sand, loose, poorly graded	+200 0.0			5	
CL	2	mottled green-gray/black clay with some silt, few sand high plasticity, med stiff	+200 0.0		SLD 101243 1340	5	
			+500 0.0	no recovery		9	
	3	mottled green-gray/brown silt with fine sand, some clay med dense, poorly graded	+200 0.0			5	
			+200 0.0			7	
ML	4	mottled dark gray/red weather silt with some clay, some sand med dense, poorly graded	+100 0.0			7	
			+100 0.0		SLD 101244 1350	9	
	5	mottled green-gray and black silt with some clay, some sand med dense, poorly graded	+200 0.0	2.0/2.0		4	
			+200 0.0			2	
CL	5	green-gray clay with some silt, med plasticity, med stiff	+200 0.0			2	
SC	6	green-gray sand with some silt, few clay, med dense, poorly graded	+400 0.0		SLD 101245 1350	4	
		TD-6.0 ft bps EOB-1350					

PROJECT FUSRAP/SLDS Test Spots Pile class 20 POLE NO. C2-3/SLD1242
ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT ST. LOUIS	HOLE NUMBER C2-9/SLD101246
1. COMPANY NAME SHAW ENVIRONMENTAL		2. DRILLING SUBCONTRACTOR Shaw	
3. PROJECT FUSRAP/SLDS		4. LOCATION TRRA Spoils Pile TRRA Property	
5. NAME OF DRILLER Dan Gotto		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3.25" HSA and 3" x 2" split spoon		8. HOLE LOCATION See location sketch	
Driven with a 140# hammer over 30" drop Cal Due: 1-25-05		9. SURFACE ELEVATION	
PID: 013879 Ntl: 149963 LUD: 149963		10. DATE STARTED 4-5-07	
RK6: 0-0-0-0-0-0 Cal Due: 11-16-07 Background: 5507		11. DATE COMPLETED 4-5-07	
12. OVERBURDEN THICKNESS N/A		15. DEPTH GROUNDWATER ENCOUNTERED N/A	
13. DEPTH DRILLED INTO ROCK N/A		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14. TOTAL DEPTH OF HOLE 612 ft bgs		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A	
18. GEOTECHNICAL SAMPLES ☐ DISTURBED ☐ UNDISTURBED		19. TOTAL NUMBER OF CORE BOXES ☐	
20. SAMPLES FOR CHEMICAL ANALYSIS ☐ VOC ☐ METALS ☐ OTHER (SPECIFY) ☐		21. TOTAL CORE RECOVERY ☐ %	
22. DISPOSITION OF HOLE ☐ BACKFILLED ☐ MONITORING WELL ☐ OTHER (SPECIFY) ☐		23. SIGNATURE OF INSPECTOR Elaine C. Calk	
LOCATION SKETCH/COMMENTS Witnessed by: Steven P. Adams SCALE: Not to Scale			
PROJECT FUSRAP/SLDS		HOLE NO. C2-9/SLD101246	

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER	
PROJECT		INSPECTOR		SHEET		SHEETS	
DEPT.	DEPTH	DESCRIPTION OF MATERIALS	FIELD TESTS	SOILS SAMPLE NO.	ANALYTICAL NO.	BLOW COUNT	REMARKS
ML	1	very silty with some clay, med dense, poorly graded	+700 0.0	2.0/2.0	SCD 101246 1475	4	cinders are silt sized
		black cinders with some silt, some slag, med dense, poorly graded	+800 0.0			4	
		very silty with some clay, few sand	+800 0.0			4	
		black cinders with silt, some sand trace gravel, med dense, poorly graded	+700 0.0			14	
GW	3	gray gravel, loose, poorly graded	+100 0.0	2.0/2.0	Archive 1435	10	cinders are silt sized
gray gravel with some silt, loose		+100 0.0	13				
black cinders with some silt, some sand, some clay, med dense, poorly graded		+200 0.0	10				
gray green clay with few silt, med stiff, med plasticity		+400 0.0	8				
GM	5	gray gravel with some silt, some sand, loose, poorly graded	+400 0.0	1.6/2.0	Archive 1415	7	
gray silt with mostly clay, some sand trace gravel, med dense, poorly graded		+200 0.0	2				
gray sand with some silt, some clay, trace gravel, med dense, poorly graded		+200 0.0	6				
gray sand with some silt, some clay, trace gravel, med dense, poorly graded		+200 0.0	5				
SC	6	TD-6.0 ft bgs EUB 1440		no return			

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER
PROJECT		INSPECTOR		SHEET		SHEETS
EUSRAPISLDS		P. C. M. C.		2 of 2		276 D101230
EST. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD MEASUREMENTS (4)	TESTING NUMBER (5)	QUALITY CONTROL (6)	REMARKS (7)
bc		gravel with black cinders, some silt, some sand, spots very loose, poorly graded	+2.0 C.O.	2.0/2.0	SLD 10.230 10.25	1, 2
			+7.0 C.O.			4
			+7.0 C.O.			7
ml	1	silt-sized black cinders with some silt, some sand, few clay, med dense, poorly graded	+2.0 C.O.			7
bc	2	gray gravel with some, some fine clay with few black cinders, very loose, poorly graded	+4.0 C.O.		SLD 10.233 10.25	7
sw		gray fine sand, med dense, poorly graded	+2.0 C.O.	2.0/2.0		18
			+0.0 C.O.			10
			+2.0 C.O.			6
			+7.0 C.O.			6
ml	4	gray silt with some silt, some sand, med dense, poorly graded	+2.0 C.O.	2.0/2.0	SLD 10.234 10.25	3
			+2.0 C.O.			3
			+4.0 C.O.			3
			+7.0 C.O.			3
			+2.0 C.O.			4
	6	TD-60 ft bgs EUS 1020				

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

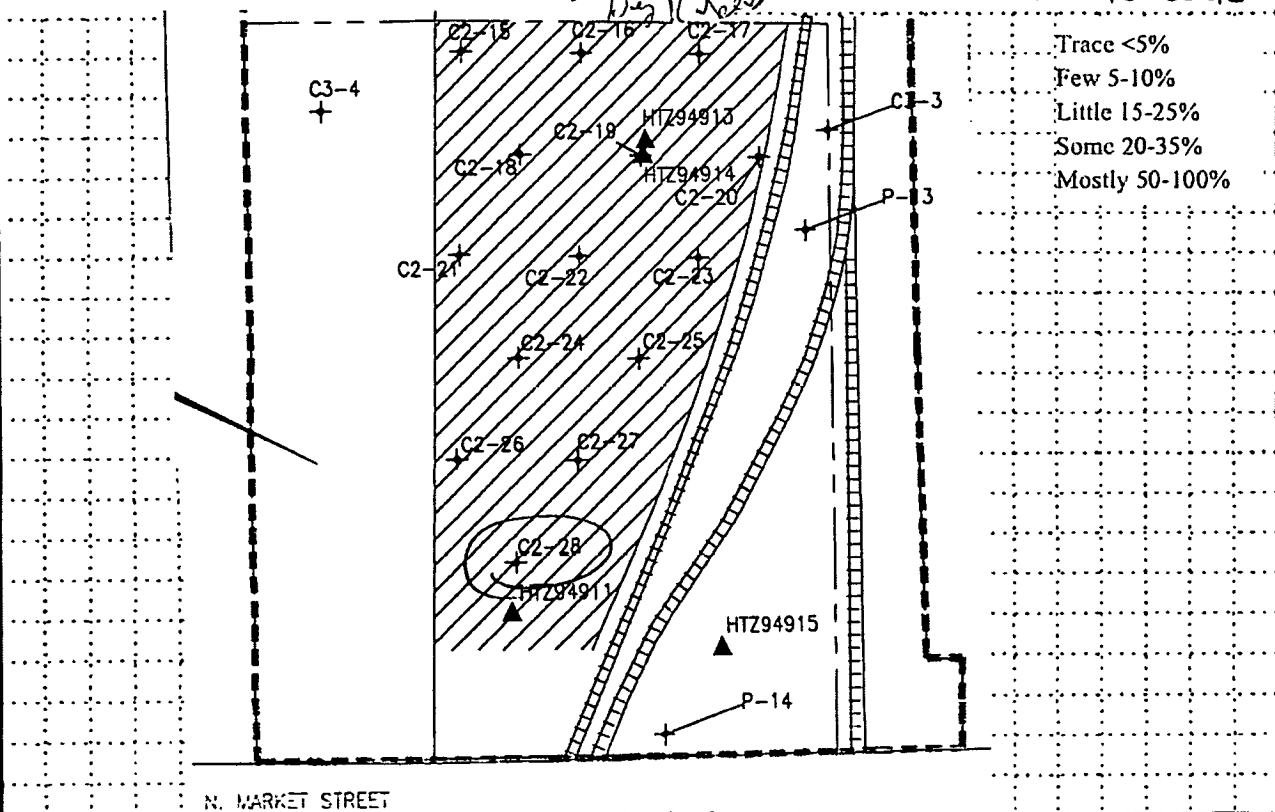
Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT	ST. LOUIS		HOLE NUMBER	12-28/SLD 101248	
1. COMPANY NAME		SHAW ENVIRONMENTAL			2. DRILLING SUBCONTRACTOR	Shaw	
3. PROJECT		FUSRAP/SLDS			4. LOCATION	TR4 Spills Pile - City Properties	
5. NAME OF DRILLER		Dan Gotto			6. MANUFACTURER'S DESIGNATION OF DRILL	CME 75	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT		CME 75 using 3.25" HSA and 3" x 2' split spoon			8. HOLE LOCATION	See location sketch	
Driven with a 140# hammer over 30" drop					9. SURFACE ELEVATION		
Cal Due: 1-7-02					10. DATE STARTED	4-9-07	
PID: D13879		Nal: 149963 LUD: 149963			11. DATE COMPLETED	4-9-07	
RKG: D.D.		Cal Due: 11-16-17 Background: 6700			15. DEPTH GROUNDWATER ENCOUNTERED	N/A	
12. OVERBURDEN THICKNESS		N/A			16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	N/A	
13. DEPTH DRILLED INTO ROCK		N/A			17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	N/A	
14. TOTAL DEPTH OF HOLE		6.0 ft bgs					
18. GEOTECHNICAL SAMPLES		DISTURBED		UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES		
		Ø		Ø	Ø		
20. SAMPLES FOR CHEMICAL ANALYSIS		VOC		METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)
		Ø		Ø	RAD	Ø	Ø
22. DISPOSITION OF HOLE		BACKFILLED		MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR	
		bentonite		N/A	Ø	Blaine Corle	

LOCATION SKETCH/COMMENTS

Witnessed by: *Daryl L. ...*

SCALE: Not to Scale



PROJECT	FUSRAP/SLDS TR4 Spills Pile Class 2/3	HOLE NO.	12-28/SLD 101248
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1 Nov 98

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER 12-22/SED/1012-48	
PROJECT FASRAP/SLDS		INSPECTOR E. C. M. K.		SHEET 2 OF 2		INSETS	
DEPTH (ft)	DESCRIPTION OF MATERIALS (ft)	FIELD SAMPLE NO.	TESTED SAMPLE NO.	QUALITY NO.	BLOW COUNT (ft)	REMARKS	
GC	gravel with some silt, roots, few sand, some clay, below dense poorly graded	0	1.2/2.0	SED 1012-48	5	cinders are silt sized	
1	black cinders with few gravel, some silt, fine clay, med dense poorly graded	6.4		1012-48	8		
		1.3		1012-48	8		
		1.8		1012-48	6		
2	silt sized med black cinders / brown silt with some clay, few sand med dense poorly graded	2.8	no recovery	1012-48			
	black cinders with some silt, few sand med dense, poorly graded	0	1.4/2.0				
		0.4					
		0					
		0.6					
3	brown fine sand with some silt med dense, poorly graded	1100		Archive 09102			
SM		0.2					
4	silt sized black cinders with few gravel some silt some sand, loose, poorly graded	0	2.0/2.0		2		
ML		0.0			2		
5	brown fine sand, med, with some silt, med dense, poorly graded	0			6		
SM		200			8		
		0.0		Archive 0355			
6	TD-6.0 ft + bag EUB 0905						

ENG FORM 5056A-R, AUG 94

Figure 4-2 (Concluded)

HTRW DRILLING LOG			DISTRICT ST. LOUIS		HOLE NUMBER C2-26/SLDID050	
1. COMPANY NAME SHAW ENVIRONMENTAL			2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2	
3. PROJECT FUSRAP/SLDS			4. LOCATION TRIA Spills Pile - City Properties			
5. NAME OF DRILLER Dan Gotto			6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3.25" HSA and 3" x 2" split spoon			8. HOLE LOCATION See location sketch			
9. SURFACE ELEVATION			10. DATE STARTED 4-9-07			
11. DATE COMPLETED 4-9-07			12. OVERBURDEN THICKNESS N/A			
13. DEPTH DRILLED INTO ROCK N/A			14. TOTAL DEPTH OF HOLE 6-0 ft bgs			
15. DEPTH GROUNDWATER ENCOUNTERED N/A			16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A			
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A			18. GEOTECHNICAL SAMPLES			
19. TOTAL NUMBER OF CORE BOXES 0			20. SAMPLES FOR CHEMICAL ANALYSIS			
21. TOTAL CORE RECOVERY 0 %			22. DISPOSITION OF HOLE			
23. SIGNATURE OF INSPECTOR Blaine Curila			24. LOCATION SKETCH/COMMENTS			
25. WITNESSED BY Dan Rubens			26. SCALE: Not to Scale			
Trace <5% Few 5-10% Little 15-25% Some 20-35% Mostly 50-100%						
PROJECT FUSRAP/SLDS			HOLE NO. C2-26/SLDID050		CLASS Class #13	

HTRW DRILLING LOG (CONTINUATION SHEET)							HOLE NUMBER CA-26/SLD/1250
PROJECT FUSRAP/SLDS		INSPECTOR E. LODK		SHEET 2 of 2		SHEETS	
FLY	DEPTH BT	DESCRIPTION OF MATERIALS (1)	FIELD PENETROMETER READING (2)	TESTER SAMPLE OR CORE FOR NO. (3)	ANALYTICAL LABORATORY NO. (4)	BLOW COUNT (5)	REMARKS (6)
ML		gray silt with roots, some gravel some sand, loose, poorly graded	0	1.3/0.0	SLD 101250 1035	150	1st span - 0.0-0.5ft 2nd span 0.5-2.0ft bgs
ML	1	coarse, gravel, clay, some silt medium silt with few gravel some sand med dense, poorly graded	0.0 -100 0.0 -200 0.0			4	
SW	2	black cinders with some silt, some sand med dense, poorly graded	0 0.0 -100 0.0 +100 0.0	no running 2.0/2.0	SLD 101251 1040	4	cinders are silt sized
ML	3	silt sized black cinders, some silt, few gravel, some sand med dense	+100 0.0 -300 0.0		Archive 1045	11	poorly graded cinders are silt sized
	4	black cinders, some silt, few sand med dense, poorly graded	0.0 1100 0.0 +200 0.0 +100	2.0/2.0		9 76 76 76	
	5	silt sized mottled black cinders/brown sand with some silt, some clay, moist med dense, poorly graded	0.0 +400 0.0		Archive 1052	96	
SW	6	green-gray fine sand, moist, med dense, well sorted	0.0				
		TD - 6.0 ft bgs EUB 1055					

PROJECT FUSRAP/SLDS TRPA Spals Pile Class 2/3 HOLE NO. CA-26/SLD/1250
ENG FORM 5056A-R, AUG 94 [Proponent: CECW-EG]

Figure 4-2 (Concluded)

HTRW DRILLING LOG			DISTRICT ST. LOUIS		HOLE NUMBER C2-27/SLD101052		
1. COMPANY NAME SHAW ENVIRONMENTAL			2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2 SHEETS		
3. PROJECT FUSRAP/SLDS			4. LOCATION TRRA Spunk Pile - City Park				
5. NAME OF DRILLER Dan Gotto			6. MANUFACTURER'S DESIGNATION OF DRILL CME 75				
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3.25" HSA and 3" x 2' split spoon			8. HOLE LOCATION See location sketch				
Driven with a 140# hammer over 30" drop Cal Due: 1-25-02			9. SURFACE ELEVATION				
PID: 013579 Nat: 149963 LUD: 149963			10. DATE STARTED 4-9-07		11. DATE COMPLETED 4-9-07		
RVG: 12.0000 Cal Due: 11-16-07 Background: 6700			15. DEPTH GROUNDWATER ENCOUNTERED N/A				
12. OVERBURDEN THICKNESS N/A			16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A				
13. DEPTH DRILLED INTO ROCK N/A			17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A				
14. TOTAL DEPTH OF HOLE 6.0 ft bgs			19. TOTAL NUMBER OF CORE BOXES 0				
18. GEOTECHNICAL SAMPLES 0		DISTURBED 0		UNDISTURBED 0		21. TOTAL CORE RECOVERY 0 %	
20. SAMPLES FOR CHEMICAL ANALYSIS 0		VOC 0		METALS 0		OTHER (SPECIFY) RAI	
22. DISPOSITION OF HOLE backfilled		BACKFILLED backfilled		MONITORING WELL N/A		23. SIGNATURE OF INSPECTOR Blaire Corb	
LOCATION SKETCH/COMMENTS Witnessed by: <i>Dan Roberts</i> SCALE: Not to Scale							
PROJECT FUSRAP/SLDS HOLE NO. C2-27/SLD101052							

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER CA-27/SLD 01252
PROJECT EUSRAP/SLDS		INSPECTOR E. L. Link		SHEET 2 OF 2		
DEPTH (ft)	DESCRIPTION OF MATERIALS (a)	FIELD SAMPLE DEPTH (ft) (b)	TESTING SAMPLE DEPTH (ft) (c)	ANALYTICAL LABORATORY NO. (d)	BLOW COUNT (e)	REMARKS (f)
ML	dark brown silt with ribs, some sand, few gravel med dense poorly graded	+100 0.0	2.0/2.0	SLD 10253 1115	6	cinders are silt sized
ML	light gray gravel with some sand, few silt black cinders with slag, some silt some sand, med dense, poorly graded	+100 0.0			6	
		0 0.0			5	
		-100 0.0		SLD 10253 1117	5	
		0 0.0	2.0/2.0		7	
	gray silt with some clay, few sand med dense, poorly graded	-300 0.0			5	med dense poorly sorted
	brown silt with some clay, some sand, med dense, poorly graded	-200 0.0			4	
		-200 0.0		SLD 101754 1125	11	
	silt sized black cinders with some silt, some brick, few clay med dense poorly graded	0 0.0	2.0/2.0		15	
		-100 0.1			8	
		0 0.0			5	med dense poorly sorted
		0 0.0		SLD 101755 1127	11	
	silt sized weathered black cinders / dark gray fine sand, light gray fine sand with some silt	0 0.0				
	TD-6.0 ft bgs EUB-1125					

PROJECT EUSRAP/SLDS TRPA Spills Pile class 2/3 HOLE NO CA-27/SLD 01252
ENG FORM 5056A-R, AUG 94 (Proponent: ECU-EG)

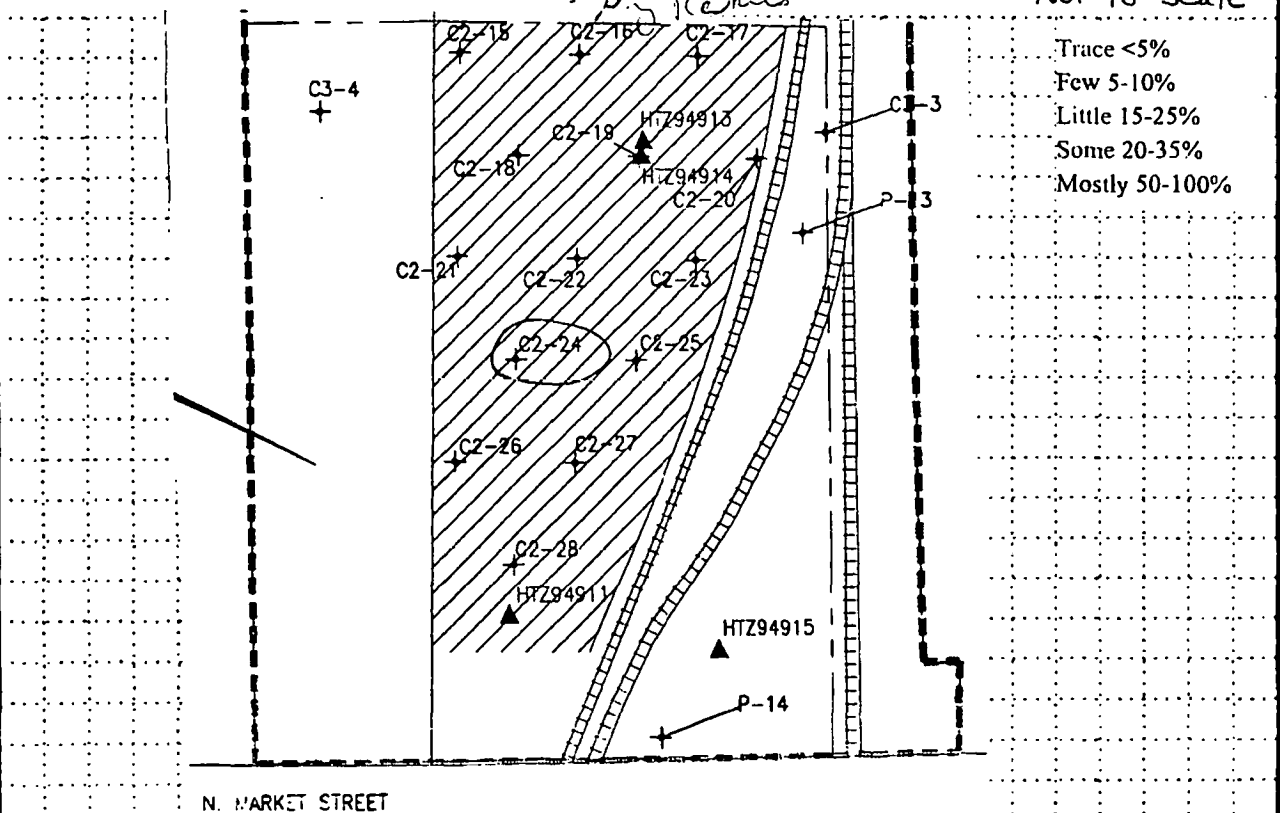
Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT ST. LOUIS		HOLE NUMBER C2-24/SLD 101256	
1. COMPANY NAME SHAW ENVIRONMENTAL		2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2	
3. PROJECT FUSRAP/SLDS		4. LOCATION TRRA Spills Pile - City Properties			
5. NAME OF DRILLER Dan Gotto		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3.25" HSA and 3" x 2' split spoon		8. HOLE LOCATION See location sketch			
Driven with a 140# hammer over 30" drop Cal Due: 1-75-08		9. SURFACE ELEVATION			
PID: 013579 NJ 149963 LUD: 1499103		10. DATE STARTED 4-9-07		11. DATE COMPLETED 4-9-07	
BKG: 0.1100m Cal Due: 11-16-07 Background: 11-16-07		12. OVERBURDEN THICKNESS N/A			
13. DEPTH DRILLED INTO ROCK N/A		15. DEPTH GROUNDWATER ENCOUNTERED N/A			
14. TOTAL DEPTH OF HOLE 6.054 bgs		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A			
18. GEOTECHNICAL SAMPLES		UNDISTURBED		19. TOTAL NUMBER OF CORE BOXES	
20. SAMPLES FOR CHEMICAL ANALYSIS		OTHER (SPECIFY)		OTHER (SPECIFY)	
22. DISPOSITION OF HOLE		OTHER (SPECIFY)		21. TOTAL CORE RECOVERY 0%	
23. SIGNATURE OF INSPECTOR		Blaine Carle			

LOCATION SKETCH/COMMENTS

Witnessed by: D. J. Parnis

SCALE: Not to Scale



PROJECT FUSRAP/SLDS	TRRA Spills Pile - Class 213	HOLE NO. C2-24/SLD 101256
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HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER C2-24/SLD11256	
PROJECT FUSRAP/SLDS		INSPECTOR E. COLE		SHEET 2 OF 2			
ELV. CL	DEPTH CL	DESCRIPTION OF MATERIALS (1)	FIELD LOG (2) SPT (3)	DESIGNER SAMPLE EX CORRECTION NO. (4)	ANALYTICAL LABORATORY NO. (5)	BLOW COUNT (6)	REMARKS (7)
ML	1	Brown silt with rtp's, some clay Some gravel, med dense, poorly graded	+200	2.0/2.0	SLD 101256 13112	4	
			0.0			7	
			+100			7	
			0.0				
			0				
			+100		SLD 101257 13112	13	
SM	2		+200	2.0/2.0		11	
			0.0			9	
			0			9	
			+100			9	
			0.0		Archive 1320	13	
			+100			7	
ML	3	dark gray silt with some clay some gravel, med dense, poorly graded	+200	2.0/2.0		6	
			0.0			8	
			+100		Archive 1300	8	
			0.0				
			+100				
			0.0				
ML	4	dark gray silt with some clay moist, med dense, poorly graded	+200				
			0.0				
			+200				
			0.0				
			+100				
			0.0				
ML	5		+100				
			0.0				
			+100				
			0.0				
			+100				
			0.0				
ML	6		+100				
			0.0				
			+100				
			0.0				
			+100				
			0.0				
		TD 6.04 ft bgs EOL 1325					

PROJECT FUSRAP/SLDS TRRA soils Pile classed C2-24/SLD11256
ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

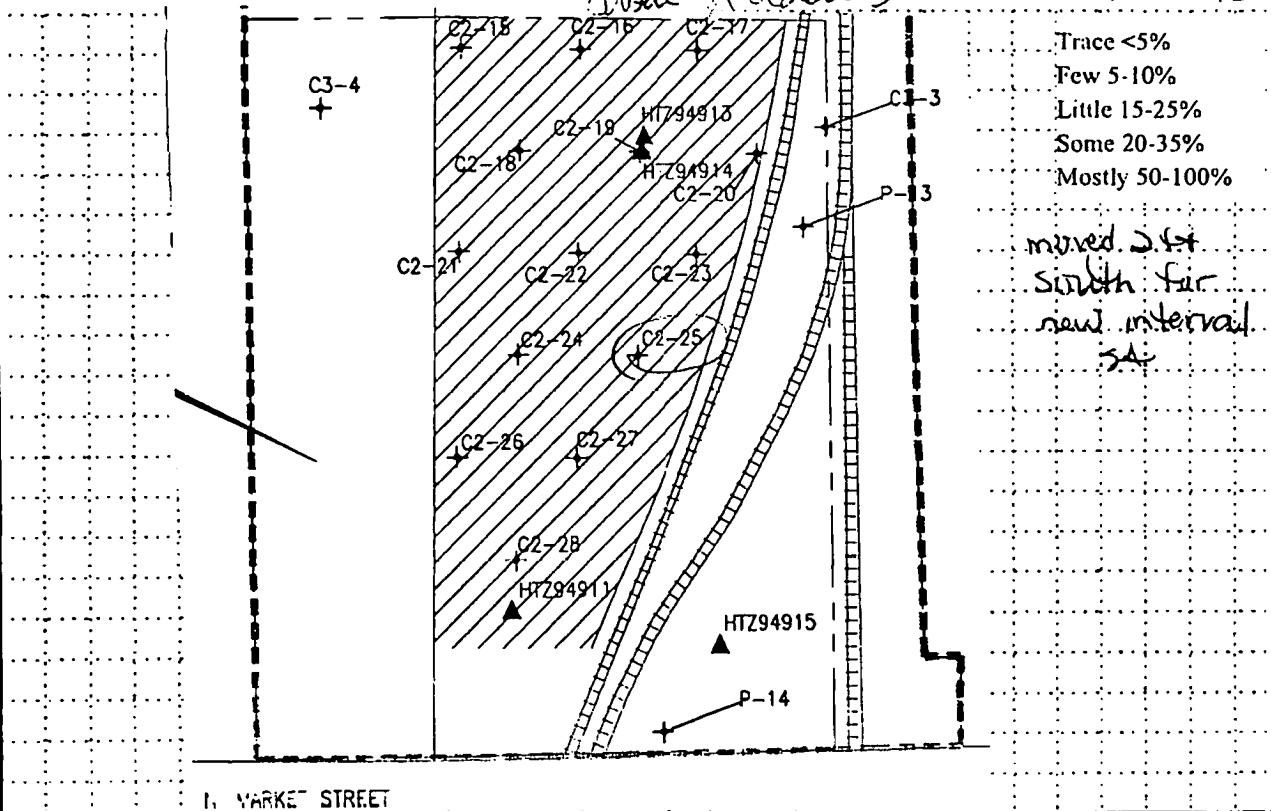
Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT	ST. LOUIS		ROLE NUMBER	C2-25B/SLD10256B	
1. COMPANY NAME SHAW ENVIRONMENTAL		2. DRILLING SUBCONTRACTOR Shaw			SHEET	1 OF 2	
3. PROJECT FUSRAP/SLDS		4. LOCATION TRRA Spills Pile - City Properties					
5. NAME OF DRILLER Dan Gotto		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75					
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3.25" HSA and 3" x 2' split spoon		8. HOLE LOCATION See location sketch					
9. SURFACE ELEVATION		10. DATE STARTED 4-9-07					
11. DATE COMPLETED 4-9-07		12. OVERBURDEN THICKNESS N/A					
13. DEPTH DRILLED INTO ROCK N/A		14. TOTAL DEPTH OF HOLE 6-0 ft bgs					
15. DEPTH GROUNDWATER ENCOUNTERED N/A		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A					
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A		18. GEOTECHNICAL SAMPLES					
19. TOTAL NUMBER OF CORE BOXES		20. SAMPLES FOR CHEMICAL ANALYSIS					
21. TOTAL CORE RECOVERY		22. DISPOSITION OF HOLE					
23. SIGNATURE OF INSPECTOR		24. SCALE: Not to Scale					

LOCATION SKETCH/COMMENTS

Witnessed by: *Susan L. Adams*

SCALE: Not to Scale



PROJECT	FUSRAP/SLDS TRRA Spills Pile Class 2/3	HOLE NO.	C2-25B/SLD10256B
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HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER C2-25B/SLD10256B	
PROJECT FUSRAP/SLDS		INSPECTOR ECADK		SHEET 2 OF 2		SHEETS	
ELEV. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD SOIL MOISTURE RESULTS (4)	PORECH SAMPLE DEPTHS FOR NO. (5)	ANALYTICAL LABORATORY NO. (6)	BLOW COUNT (7)	REMARKS (8)
	1	augered down to 2 ft bags					
	2						
	3	light gray gravel with mostly silt, some sand, loose, poorly graded	+400 0.1 +200 0.1 -100 0.1	1.85D		12 14 11	
	4	dark gray silt with some sand, few gravel, trace black, trace wood, med dense, poorly graded	0 0.1 -100 0.2 +100 0.2 +200 0.2 +400 0.2	no recovery 1.85D	Archive 135D	6 7 5	
	5					5	
	6					5	
		TD - 6.0 ft bags EOB - 1400				13	

PROJECT
FUSRAP/SLDS TRRA Spills Pile class 2/3

HOLE NO.
C2-25B/SLD10256B

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EQ)

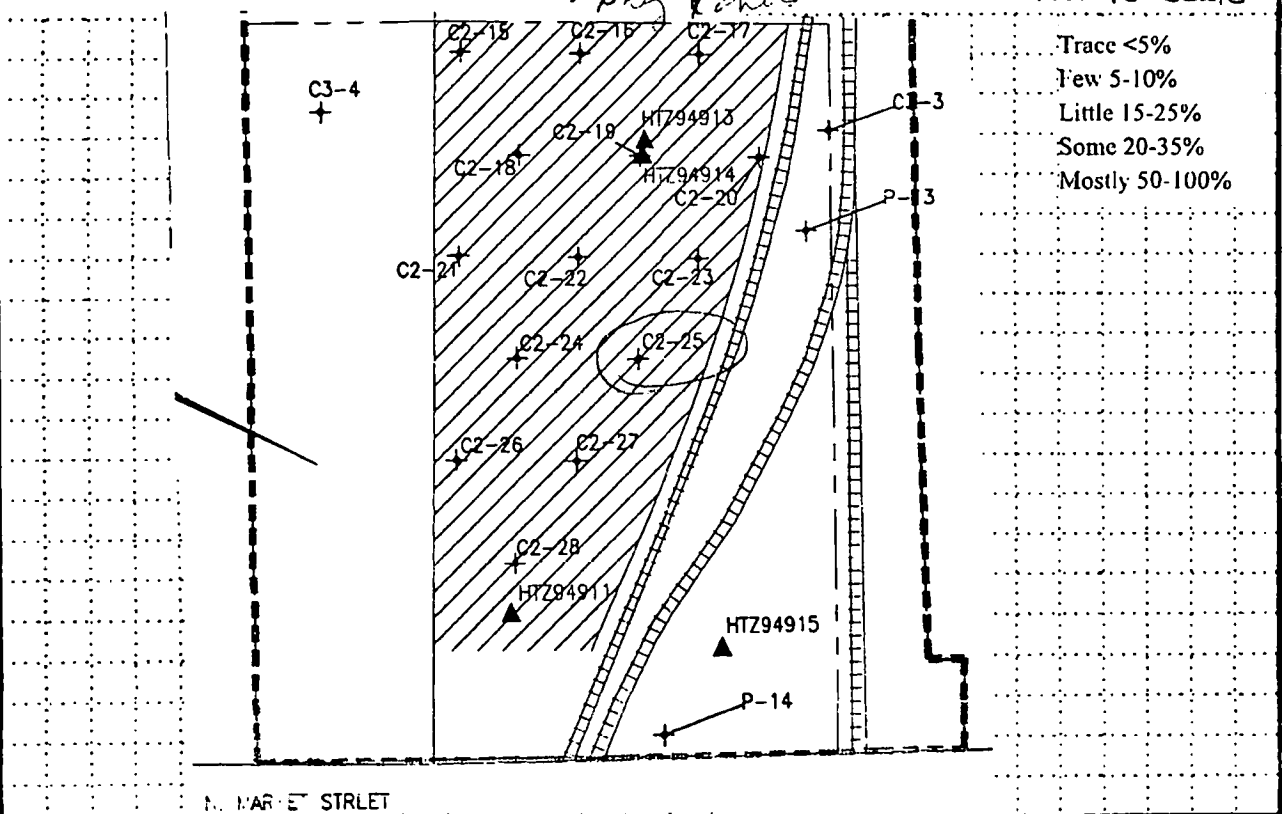
Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT ST. LOUIS		HOLE NUMBER C2-25/SLD 101258	
1. COMPANY NAME SHAW ENVIRONMENTAL		2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2	
3. PROJECT FUSRAP/SLDS		4. LOCATION TRIA soils pile - City Properties		5. NAME OF DRILLER Dan Gotto	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3.25" HSA and 3" x 2" split spoon		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75		8. HOLE LOCATION See location sketch	
9. SURFACE ELEVATION		10. DATE STARTED 4-9-07		11. DATE COMPLETED 4-9-07	
12. OVERBURDEN THICKNESS N/A		15. DEPTH GROUNDWATER ENCOUNTERED N/A		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
13. DEPTH DRILLED INTO ROCK N/A		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A		14. TOTAL DEPTH OF HOLE 60 ft bgs	
18. GEOTECHNICAL SAMPLES		20. SAMPLES FOR CHEMICAL ANALYSIS		21. TOTAL CORE RECOVERY 0%	
DISTURBED 0		VOC 0		METALS 0	
UNDISTURBED 0		OTHER (SPECIFY) 0		OTHER (SPECIFY) 0	
22. DISPOSITION OF HOLE		BACKFILLED 0		MONITORING WELL 0	
		N/A 0		OTHER (SPECIFY) 0	
		23. SIGNATURE OF INSPECTOR		Blaine Corle	

LOCATION SKETCH/COMMENTS

Witnessed by: Dan Gotto

SCALE: Not to Scale



PROJECT FUSRAP/SLDS TRIA soils pile class 2/3	HOLE NO. C2-25/SLD 101258
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HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER C2-25/SLD
PROJECT FUSRAPISLDS		INSPECTOR E Cook		SHEET 2 OF 2	SHEETS	
DEPTH (ft)	DESCRIPTION OF MATERIALS (in)	FIELD SAMPLE RESULTS (in)	LABORATORY SAMPLE RESULTS (in)	BLOW COUNT (in)	REMARKS (in)	
ML						
5m	brown silt with mostly gravel some med. loose, poorly graded	+100	1.9/2.0	SLD		
1	light gray sand with mostly gravel, some silt, very loose, poorly graded	-100	0.1	1935	20	
		-100	0.1		20	
		-100	0.1		12	
2		+100	0.1	SLD 1912 (w) 1332	18	
3						insufficient sample
4						insufficient sample
5						
6						
	TD - 6.0 ft bgs EUB 1335					

PROJECT FUSRAPISLDS TRRA Spills File Class AB HOLE NO. C2-25/SLD/D258

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EQ)

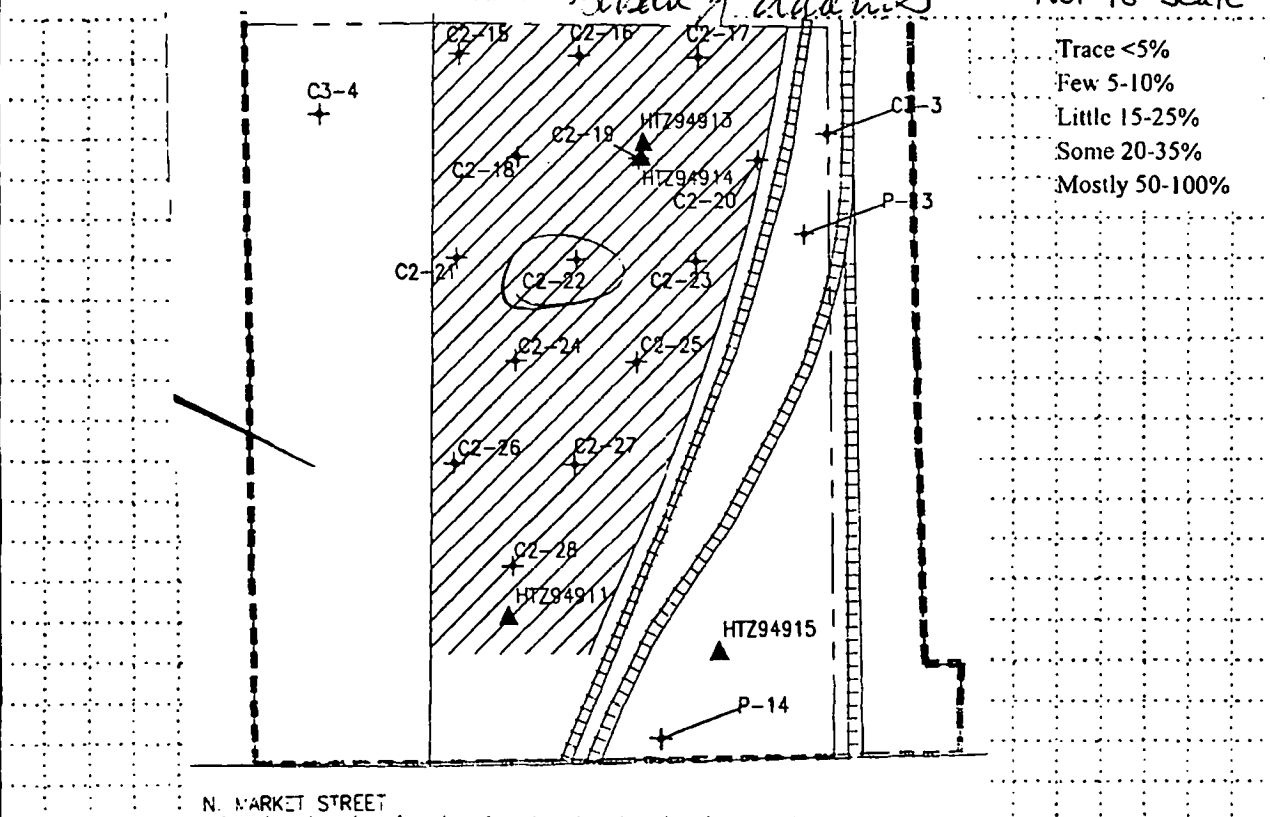
Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT	ST. LOUIS		HOLE NUMBER	C2-22/SLD 01260	
1. COMPANY NAME SHAW ENVIRONMENTAL		2. DRILLING SUBCONTRACTOR Shaw			SHEET	1 OF 2	
3. PROJECT FUSRAP/SLDS		4. LOCATION TRRA Spills File - City Properties					
5. NAME OF DRILLER Dan Gotto		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75					
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3.25" HSA and 3" x 2' split spoon		8. HOLE LOCATION See location sketch					
Driven with a 140# hammer over 30" drop Cal Due: 1-25-07		9. SURFACE ELEVATION					
PID: D13873 NJ: 149763 LUD: 149963 BKG: 0-0000 Cal Due: 11-16-07 Background: 6-4-07		10. DATE STARTED 4-9-07		11. DATE COMPLETED 4-9-07			
12. OVERBURDEN THICKNESS N/A		15. DEPTH GROUNDWATER ENCOUNTERED N/A					
13. DEPTH DRILLED INTO ROCK N/A		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A					
14. TOTAL DEPTH OF HOLE 6.0 ft by S		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A					
18. GEOTECHNICAL SAMPLES 0		DISTURBED 0		UNDISTURBED 0		19. TOTAL NUMBER OF CORE BOXES 0	
20. SAMPLES FOR CHEMICAL ANALYSIS		VOC 0		METALS 0		OTHER (SPECIFY) RAD 0	
21. TOTAL CORE RECOVERY 0 %		OTHER (SPECIFY) 0		OTHER (SPECIFY) 0			
22. DISPOSITION OF HOLE Backfilled		MONITORING WELL N/A		OTHER (SPECIFY) 0		23. SIGNATURE OF INSPECTOR Blane Corle	

LOCATION SKETCH/COMMENTS

Witnessed by: *Shawn J. Adams*

SCALE: Not to Scale



PROJECT	FUSRAP/SLDS	TRRA Spills File Class 2/3	HOLE NO.	C2-22/SLD 01260
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HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER C2-22/KDD1260	
PROJECT FUSRAP/SLDS		INSPECTOR E Cook		SHEET 2 OF 2			
ELEV. (ft)	DEPTH (ft)	DESCRIPTION OF MATERIALS (ft)	FIELD MEASUREMENTS (ft)	TESTED SAMPLE NO. & DATE	ANALYTICAL RESULTS	BLOW COUNT (ft)	REMARKS (ft)
	1	brown silt with some clay roots some gravel med dense poorly graded	0.0	20/20	SLD 10260 1413	5	
	2	brown silt with some gravel, some sand, some cinders/slag, loose, poorly graded	0.0		SLD 10261 1415	6	
	3	brown/black cinders with silt, some slag, few sand, med dense, poorly graded	0.0		SLD 10262 1430	7	
	4		0.0			8	
	5		0.0	19/20	SLD 10263 1422	9	
	6		0.0			5	
	7		0.0			4	
	8		0.0			5	
	9		0.0			4	
	10		0.0			4	
	11		0.0			4	
	12		0.0			4	
	13		0.0			4	
	14		0.0			4	
	15		0.0			4	
	16		0.0			4	
	17		0.0			4	
	18		0.0			4	
	19		0.0			4	
	20		0.0			4	
	21		0.0			4	
	22		0.0			4	
	23		0.0			4	
	24		0.0			4	
	25		0.0			4	
	26		0.0			4	
	27		0.0			4	
	28		0.0			4	
	29		0.0			4	
	30		0.0			4	
	31		0.0			4	
	32		0.0			4	
	33		0.0			4	
	34		0.0			4	
	35		0.0			4	
	36		0.0			4	
	37		0.0			4	
	38		0.0			4	
	39		0.0			4	
	40		0.0			4	
	41		0.0			4	
	42		0.0			4	
	43		0.0			4	
	44		0.0			4	
	45		0.0			4	
	46		0.0			4	
	47		0.0			4	
	48		0.0			4	
	49		0.0			4	
	50		0.0			4	
	51		0.0			4	
	52		0.0			4	
	53		0.0			4	
	54		0.0			4	
	55		0.0			4	
	56		0.0			4	
	57		0.0			4	
	58		0.0			4	
	59		0.0			4	
	60		0.0			4	
	61		0.0			4	
	62		0.0			4	
	63		0.0			4	
	64		0.0			4	
	65		0.0			4	
	66		0.0			4	
	67		0.0			4	
	68		0.0			4	
	69		0.0			4	
	70		0.0			4	
	71		0.0			4	
	72		0.0			4	
	73		0.0			4	
	74		0.0			4	
	75		0.0			4	
	76		0.0			4	
	77		0.0			4	
	78		0.0			4	
	79		0.0			4	
	80		0.0			4	
	81		0.0			4	
	82		0.0			4	
	83		0.0			4	
	84		0.0			4	
	85		0.0			4	
	86		0.0			4	
	87		0.0			4	
	88		0.0			4	
	89		0.0			4	
	90		0.0			4	
	91		0.0			4	
	92		0.0			4	
	93		0.0			4	
	94		0.0			4	
	95		0.0			4	
	96		0.0			4	
	97		0.0			4	
	98		0.0			4	
	99		0.0			4	
	100		0.0			4	
	101		0.0			4	
	102		0.0			4	
	103		0.0			4	
	104		0.0			4	
	105		0.0			4	
	106		0.0			4	
	107		0.0			4	
	108		0.0			4	
	109		0.0			4	
	110		0.0			4	
	111		0.0			4	
	112		0.0			4	
	113		0.0			4	
	114		0.0			4	
	115		0.0			4	
	116		0.0			4	
	117		0.0			4	
	118		0.0			4	
	119		0.0			4	
	120		0.0			4	
	121		0.0			4	
	122		0.0			4	
	123		0.0			4	
	124		0.0			4	
	125		0.0			4	
	126		0.0			4	
	127		0.0			4	
	128		0.0			4	
	129		0.0			4	
	130		0.0			4	
	131		0.0			4	
	132		0.0			4	
	133		0.0			4	
	134		0.0			4	
	135		0.0			4	
	136		0.0			4	
	137		0.0			4	
	138		0.0			4	
	139		0.0			4	
	140		0.0			4	
	141		0.0			4	
	142		0.0			4	
	143		0.0			4	
	144		0.0			4	
	145		0.0			4	
	146		0.0			4	
	147		0.0			4	
	148		0.0			4	
	149		0.0			4	
	150		0.0			4	
	151		0.0			4	
	152		0.0			4	
	153		0.0			4	
	154		0.0			4	
	155		0.0			4	
	156		0.0			4	
	157		0.0			4	
	158		0.0			4	
	159		0.0			4	
	160		0.0			4	
	161		0.0			4	
	162		0.0			4	
	163		0.0			4	
	164		0.0			4	
	165		0.0			4	
	166		0.0			4	
	167		0.0			4	
	168		0.0			4	
	169		0.0			4	
	170		0.0			4	
	171		0.0			4	
	172		0.0			4	
	173		0.0			4	
	174		0.0			4	
	175		0.0			4	
	176		0.0			4	
	177		0.0			4	
	178		0.0			4	
	179		0.0			4	
	180		0.0			4	
	181		0.0			4	
	182		0.0			4	
	183		0.0			4	
	184		0.0			4	
	185		0.0			4	
	186		0.0			4	
	187		0.0			4	
	188		0.0			4	
	189		0.0			4	
	190		0.0			4	
	191		0.0			4	
	192		0.0			4	
	193		0.0			4	
	194		0.0			4	
	195		0.0			4	
	196		0.0			4	
	197		0.0			4	
	198		0.0			4	
	199		0.0			4	
	200		0.0			4	
	201		0.0			4	
	202		0.0			4	
	203		0.0			4	
	204		0.0			4	
	205		0.0			4	
	206		0.0			4	
	207		0.0			4	
	208		0.0			4	
	209		0.0			4	
	210		0.0			4	
	211		0.0			4	

HTRW DRILLING LOG				DISTRICT ST. LOUIS		HOLE NUMBER C2-23/SLD 01264	
1. COMPANY NAME SHAW ENVIRONMENTAL				2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2 SHEETS	
3. PROJECT FUSRAP/SLDS				4. LOCATION TRX 4 Spills Plc - City Properties			
5. NAME OF DRILLER Dan Gotto				6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3.25" HSA and 3" x 2' split spoon				8. HOLE LOCATION See location sketch			
9. SURFACE ELEVATION				10. DATE STARTED 7-9-07			
11. DATE COMPLETED 7-9-07				12. OVERBURDEN THICKNESS N/A			
13. DEPTH DRILLED INTO ROCK N/A				14. TOTAL DEPTH OF HOLE 6.0 ft bgs			
15. DEPTH GROUNDWATER ENCOUNTERED N/A				16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A			
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A				18. GEOTECHNICAL SAMPLES			
19. TOTAL NUMBER OF CORE BOXES				20. SAMPLES FOR CHEMICAL ANALYSIS			
21. TOTAL CORE RECOVERY				22. DISPOSITION OF HOLE			
23. SIGNATURE OF INSPECTOR				24. LOCATION SKETCH/COMMENTS			

WITNESSED BY: *Dan J. Adams* SCALE: Not to Scale

Trace <5%
Few 5-10%
Little 15-25%
Some 20-35%
Mostly 50-100%

PROJECT FUSRAP/SLDS TRX 4 Spills Plc Class 2/3		HOLE NO. C2-23/SLD 01264	
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HTRW DRILLING LOG (CONTINUATION SHEET)							HOLE NUMBER 12-23/SLD 101264
PROJECT FUSRAP/SLDS		INSPECTOR E. COLE		SHEET 2 OF 2		SHEETS	
ELV. (ft)	DEPTH (ft)	DESCRIPTION OF MATERIALS (ft)	FIELD SOIL SAMPLE RESULTS (ft)	DESIGNER'S NUMBER OF CORRECTION (ft)	ANALYTICAL LABORATORY NO. (ft)	BLOW COUNT (ft)	REMARKS (ft)
WV		light gray gravel with dark brown silt with some sand, some, some, some	1200 0.0	1.8/2.0	S/D 101264 555	20	
	1		+100 0.1			15	
			+400 0.0		SLD 10205 1600	8	
	2	silt sized black cinders with some silt, few clay, few gravel, trace of med dense, poorly graded	1100 0.0	2.0/2.0	Archive 547	15	
			+400 0.0			13	
	3		1000 0.0			5	
			+200 0.0			3	
		medium brown/black silt with clay, some cinders, med dense, poorly graded	1100 0.0			8	
	4	silt sized black cinders with some silt, some sand, few gravel, med dense, poorly graded	1100 0.1	2.0/2.0	Archive 1542	37	
			+100 0.1			4	
	5	red brick with some silt, loose, poorly graded	1300 0.1			4	
SM		black cinders with some silt, med dense, poorly graded	+200 0.2			5	cinders are silt sized
		gray clay fire s. med dense, poorly graded					
WV	6	mottled brown silt/black cinders with some sand, med dense, poorly graded	+200 0.1			6	cinders are silt sized
		TD-6.0-91 bgs EOB-1600					

PROJECT FUSRAP/SLDS TRPA Spills Ale Class B HOLE NO 12-23/SLD 101264
ENG FORM 5056A-R, AUG 94 (Proponent: CECW:EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG			DISTRICT ST. LOUIS		HOLE NUMBER <i>12-20/SLD101266</i>	
1. COMPANY NAME SHAW ENVIRONMENTAL			2. DRILLING SUBCONTRACTOR <i>Shaw</i>			SHEET <i>1</i> OF <i>2</i>
3. PROJECT FUSRAP/SLDS			4. LOCATION <i>TREAT Spills Pile - City Properties</i>			
5. NAME OF DRILLER Dan Gotto			6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT <i>CME 75 using 3.25" HSA and 3" x 2' split pipe.</i>			8. HOLE LOCATION See location sketch			
9. SURFACE ELEVATION			10. DATE STARTED <i>4-10-07</i>			
11. DATE COMPLETED <i>4-10-07</i>			12. OVERBURDEN THICKNESS N/A			
13. DEPTH DRILLED INTO ROCK N/A			14. TOTAL DEPTH OF HOLE <i>6.0 ft bgs</i>			
15. DEPTH GROUNDWATER ENCOUNTERED N/A			16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A			
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A			18. GEOTECHNICAL SAMPLES			
19. TOTAL NUMBER OF CORE BOXES 0			20. SAMPLES FOR CHEMICAL ANALYSIS			
21. TOTAL CORE RECOVERY 0 %			22. DISPOSITION OF HOLE			
23. SIGNATURE OF INSPECTOR <i>E. J. Carr</i>			24. LOCATION SKETCH/COMMENTS			
25. WITNESSED BY <i>Dan Gotto</i>			26. SCALE Not to Scale			
Trace <5% Few 5-10% Little 15-25% Some 20-35% Mostly 50-100%						
PROJECT FUSRAP/SLDS			HOLE NO. <i>12-20/SLD101266</i>			

1 Nov 98

HTRW DRILLING LOG (CONTINUATION SHEET)						WOLE NUMBER C2-20/SLD/101266	
PROJECT FUSRAP/SLDS	INSPECTOR E Cent	SHEET 2 OF 2					
FLY. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD POSITIONING DATA (4)	SOOTH SAMPLE DATA FOR A.C. (5)	ANALYTICAL DATA (6)	BLOW COUNT (7)	REMARKS (8)
ML	1	light silt with some gravel roots	+600	2.0/2.0	SLD	6	-1-2
		black silt with some silt some sand, med dense, poorly graded	0.0		101266		
			+500		101266		
	2	black cinders with some gravel some silt some sand med dense, poorly graded	+1000		SLD	4	unders are silt sized cinders are silt sized cinders are silt sized
		black cinders with some silt some sand fine gravel med dense poorly graded	0.0		10267		
			0		10267		
	3	mottled black cinders brown silt with some sand, med dense, poorly graded	+1000	2.0/2.0		6	
			0.0				
			+300		Archive		
	4	silt sized black cinders with mostly brown silt, some sand, med dense, poorly graded	0		Archive	5	
			0.0		10312		
			+500	1.6/2.0	Archive		
5	mottled black cinders brown silt with some sand fine gravel med dense poorly graded	+1000			4		
		0.0					
		+400					
6	red brick	0.0			3		
		0.0					
		no recovery					
BRICK							
SM							
		TD 6.0 ft bag					
		EUB 1040					

PROJECT
FUSRAP/SLDS
ENG FORM 5056A-R, AUG 94

TERA Spills Pile class 2/3

WOLE NO.
C2-20/SLD/101266
(Proponent: CECW-EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG				DISTRICT ST. LOUIS		HOLE NUMBER <u>C2-15/SLDS/01268</u>	
1. COMPANY NAME SHAW ENVIRONMENTAL				2. DRILLING SUBCONTRACTOR <u>Shaw</u>		SHEET <u>1</u> OF <u>2</u> SHEETS	
3. PROJECT FUSRAP/SLDS				4. LOCATION <u>TRRA Spills Pile - City Properties</u>			
5. NAME OF DRILLER <u>Dan Gotto</u>				6. MANUFACTURER'S DESIGNATION OF DRILL <u>CME 75</u>			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT <u>CME 75 using 3.25" HSA and 3" x 2' split spoon</u>				8. HOLE LOCATION <u>See location sketch</u>			
9. SURFACE ELEVATION				10. DATE STARTED <u>4-11-07</u>			
11. DATE COMPLETED <u>4-11-07</u>				12. OVERBURDEN THICKNESS <u>N/A</u>			
13. DEPTH DRILLED INTO ROCK <u>N/A</u>				14. TOTAL DEPTH OF HOLE <u>6.0 ft bgs</u>			
15. GEOTECHNICAL SAMPLES				16. TOTAL NUMBER OF CORE BOXES			
17. SAMPLES FOR CHEMICAL ANALYSIS				18. TOTAL CORE RECOVERY %			
19. DISPOSITION OF HOLE				20. SIGNATURE OF INSPECTOR			
21. LOCATION SKETCH/COMMENTS				22. SCALE: Not to Scale			
23. WITNESSED BY: <u>Dan Rakus</u>				24. LOCATION SKETCH/COMMENTS			
25. PROJECT				26. HOLE NO.			

HTRW DRILLING LOG

DISTRICT ST. LOUIS

HOLE NUMBER C2-15/SLDS/01268

1. COMPANY NAME **SHAW ENVIRONMENTAL**

2. DRILLING SUBCONTRACTOR Shaw

SHEET 1 OF 2 SHEETS

3. PROJECT **FUSRAP/SLDS**

4. LOCATION TRRA Spills Pile - City Properties

5. NAME OF DRILLER Dan Gotto

6. MANUFACTURER'S DESIGNATION OF DRILL CME 75

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3.25" HSA and 3" x 2' split spoon

8. HOLE LOCATION See location sketch

9. SURFACE ELEVATION

10. DATE STARTED 4-11-07

11. DATE COMPLETED 4-11-07

12. OVERBURDEN THICKNESS N/A

13. DEPTH DRILLED INTO ROCK N/A

14. TOTAL DEPTH OF HOLE 6.0 ft bgs

15. GEOTECHNICAL SAMPLES

16. TOTAL NUMBER OF CORE BOXES

17. SAMPLES FOR CHEMICAL ANALYSIS

18. TOTAL CORE RECOVERY %

19. DISPOSITION OF HOLE

20. SIGNATURE OF INSPECTOR

21. LOCATION SKETCH/COMMENTS

22. SCALE: Not to Scale

23. WITNESSED BY: Dan Rakus

24. LOCATION SKETCH/COMMENTS

25. PROJECT

26. HOLE NO.

27. LOCATION SKETCH/COMMENTS

28. SCALE: Not to Scale

29. WITNESSED BY: Dan Rakus

30. LOCATION SKETCH/COMMENTS

31. PROJECT

32. HOLE NO.

33. LOCATION SKETCH/COMMENTS

34. SCALE: Not to Scale

35. WITNESSED BY: Dan Rakus

36. LOCATION SKETCH/COMMENTS

37. PROJECT

38. HOLE NO.

39. LOCATION SKETCH/COMMENTS

40. SCALE: Not to Scale

41. WITNESSED BY: Dan Rakus

42. LOCATION SKETCH/COMMENTS

43. PROJECT

44. HOLE NO.

45. LOCATION SKETCH/COMMENTS

46. SCALE: Not to Scale

47. WITNESSED BY: Dan Rakus

48. LOCATION SKETCH/COMMENTS

49. PROJECT

50. HOLE NO.

51. LOCATION SKETCH/COMMENTS

52. SCALE: Not to Scale

53. WITNESSED BY: Dan Rakus

54. LOCATION SKETCH/COMMENTS

55. PROJECT

56. HOLE NO.

57. LOCATION SKETCH/COMMENTS

58. SCALE: Not to Scale

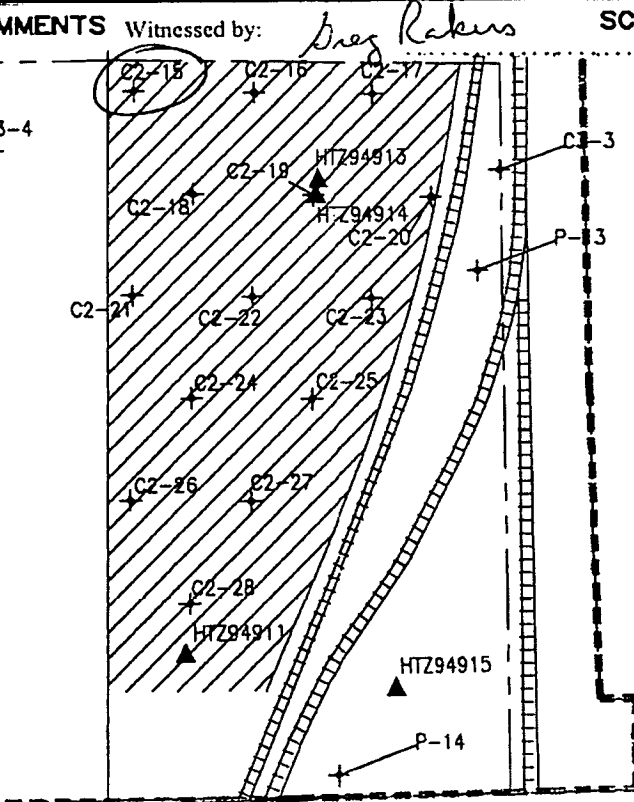
59. WITNESSED BY: Dan Rakus

60. LOCATION SKETCH/COMMENTS

61. PROJECT

62. HOLE NO.

63. LOCATION SKETCH/COMMENTS



PROJECT **FUSRAP/SLDS**

HOLE NO. C2-15/SLDS/01268

LOCATION SKETCH/COMMENTS

SCALE: Not to Scale

WITNESSED BY: Dan Rakus

LOCATION SKETCH/COMMENTS

PROJECT

HOLE NO.

LOCATION SKETCH/COMMENTS

SCALE: Not to Scale

WITNESSED BY: Dan Rakus

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER C2-15/SLD10/268	
PROJECT FUSRAP/SLDS		INSPECTOR E Cook		SHEET 2 of 2		SHEETS	
DEPTH (1)	DESCRIPTION OF MATERIALS (2)	FIELD PENETROMETER RESULTS (3)	TESTED SAMPLE RESULTS FOR NO. (4)	QUALITY SAMPLE NO. (5)	BLOW COUNT (6)	REMARKS (7)	
1	silt sized black cinders with some sand, some silt, few gravel med dense, poorly graded	0	1.9/2.0	SLD 101268 1050	4	Cinders are silt sized	
		0.0			4		
		0			3		
		0.0			2		
2	silt sized mottled black cinders brown clay med some silt, some sand, med dense, poorly graded	-200	2.0/2.0	SLD 101270 1100	9		
		0.0			9		
3	silt sized black cinders with some silt, some clay, few sand, med dense, poorly graded	0	2.0/2.0	SLD 101271 1055	7		
		0.0			5		
		0			5		
4	silt sized black cinders with some sand some silt trace brick, trace gravel, trace wood, med dense poorly graded	-100	2.0/2.0	SLD 101271 1055	3		
		0.0			3		
		0.0			4		
5		-100					
		0.0					
6	TD 6.0 ft bgs EUB-1105						

mk

PROJECT FUSRAP/SLDS TERRA Spinks Pile class 2/3

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG				DISTRICT ST. LOUIS		HOLE NUMBER C2-16/SLD1012	
1. COMPANY NAME SHAW ENVIRONMENTAL				2. DRILLING SUBCONTRACTOR shaw		SHEET 1 OF 2	
3. PROJECT FUSRAP/SLDS				4. LOCATION TRPA Spills Pile - CNE Properties			
5. NAME OF DRILLER Dan Gotto				6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3 25" HSA and 3" x 2' split spoon				8. HOLE LOCATION See location sketch			
9. SURFACE ELEVATION				10. DATE STARTED 4-11-07			
11. DATE COMPLETED 4-11-07				12. OVERBURDEN THICKNESS N/A			
13. DEPTH DRILLED INTO ROCK N/A				14. TOTAL DEPTH OF HOLE 8-0 ft bgs			
15. DEPTH GROUNDWATER ENCOUNTERED N/A				16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A			
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A				18. GEOTECHNICAL SAMPLES			
18. GEOTECHNICAL SAMPLES		DISTURBED		UNDISTURBED		19. TOTAL NUMBER OF CORE BOXES	
20. SAMPLES FOR CHEMICAL ANALYSIS		VOC		METALS		OTHER (SPECIFY)	
21. TOTAL CORE RECOVERY		BACKFILLED		MONITORING WELL		OTHER (SPECIFY)	
22. DISPOSITION OF HOLE		23. SIGNATURE OF INSPECTOR		24. SIGNATURE OF DRILLER		25. SIGNATURE OF WITNESS	
26. SIGNATURE OF PROJECT MANAGER		27. SIGNATURE OF QUALITY ASSURANCE		28. SIGNATURE OF RECORDS		29. SIGNATURE OF ARCHIVIST	
LOCATION SKETCH/COMMENTS Witnessed by <i>[Signature]</i> SCALE: Not to Scale Trace <5% Few 5-10% Little 15-25% Some 20-35% Mostly 50-100%							
PROJECT FUSRAP/SLDS TRPA Spills Pile Class 2/3 HOLE NO. C2-16/SLD1012							

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER	
PROJECT			OPERATOR			SHEET	
FUSAP/SLDS			E Cook			2072	
DEPTH	DESCRIPTION OF MATERIALS	FIELD MEASUREMENTS	REMARKS	BLOW COUNT	REMARKS		
ML	brown silt with some gravel, some sand, med dense, poorly graded	+1280	2.0/2.0	SLD 101572 1605	4	1, 2	
SW	medium sand, brown, med dense, well graded	+500			4		
1	black cinders with some silt, some sand, med dense, poorly graded	0.0		SLD 101572 1605	4	cinders are silt size d	
ML	black cinders with some silt, some sand, med dense, poorly graded	+700			14		
2	black cinders with some silt, some sand, med dense, poorly graded	0.0			3		
3	black cinders with some silt, some sand, med dense, poorly graded	+700	2.0/2.0	SLD 101572 1605	10		
ML	black cinders with some silt, some sand, med dense, poorly graded	0.0			17	poorly graded cinders are silt size d	
4	black cinders with some silt, some sand, med dense, poorly graded	+300			13		
SM	gray fine sand with mostly silt, med dense, poorly graded	+2000	2.0/2.0	Archive 1542	4		
brick	brick	+300		SLD 101572 1605	6		
5	dark gray silt with some cinders, some sand, med dense, poorly graded	+1000		Archive	8		
6	black cinders with some silt, some sand, med dense, poorly graded	+800		Archive 1550	12		
ML	black cinders with some silt, some sand, med dense, poorly graded	0.0	2.0/2.0	Archive 1675	1		
7	black cinders with some silt, some sand, med dense, poorly graded	+1300		Archive 1675	2	cinders are silt size d	
8	black cinders with some silt, some sand, med dense, poorly graded	+700		Archive 1675	5		
		+200		Archive 1675	7		
TD - 8.0 ft bgs							
EGB-1640							
PROJECT FUSAP/SLDS TRRA Sports Pile class 2/3						HOLE NO 2072	
ENG FORM 5056A-R, AUG 94						Proponent: CECW-EG	

Figure 4-2 (Concluded)

HTRW DRILLING LOG			DISTRICT ST. LOUIS		HOLE NUMBER P-14/SLD10274		
1. COMPANY NAME SHAW ENVIRONMENTAL			2. DRILLING SUBCONTRACTOR Shaw			SHEET 1 OF 2 SHEETS	
3. PROJECT FUSRAP/SLDS			4. LOCATION TRRA Spills Plk - City of St. Louis				
5. NAME OF DRILLER Dan Gotto			6. MANUFACTURER'S DESIGNATION OF DRILL CME 75				
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3 25" HSA and 3" x 2' split spoon			8. HOLE LOCATION See location sketch				
9. SURFACE ELEVATION			10. DATE STARTED 4-10-07				
11. DATE COMPLETED 4-10-07			12. OVERBURDEN THICKNESS N/A				
13. DEPTH DRILLED INTO ROCK N/A			14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A				
15. TOTAL DEPTH OF HOLE 60 ft bgs			16. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A				
17. GEOTECHNICAL SAMPLES 0		18. DISTURBED 0		19. UNDISTURBED 0		20. TOTAL NUMBER OF CORE BOXES 0	
21. SAMPLES FOR CHEMICAL ANALYSIS 0		22. VOC 0		23. METALS 0		24. OTHER (SPECIFY) 0	
25. BACKFILLED 0		26. MONITORING WELL 0		27. OTHER (SPECIFY) 0		28. SIGNATURE OF INSPECTOR Blaine Leve	
LOCATION SKETCH/COMMENTS Witnessed by: N/A SCALE: Not to Scale							
PROJECT FUSRAP/SLDS TRRA Spills Plk - TRRA Property HOLE NO. P-14/SLD10274							

HTRW DRILLING LOG (CONTINUATION SHEET)							HOLE NUMBER
PROJECT FUSRAP/SLDS			INSPECTOR E COOK		SHEET 2 OF 2		101274
ELV. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD PENETROMETER RESULTS (4)	TESTED SAMPLE NO. (5)	ANALYTICAL DATA (6)	BLOW COUNT (7)	REMARKS (8)
ML	1	gray silt with mostly gravel, some sand, few clay, loose, poorly graded	+400 0.0		SLD 101274 1345	25	
		silt sized black cinders with some sand, some silt, med dense, poorly graded	+200 0.0			20	
		gravel with black silt, some sand, very loose, poorly graded	0 0.0			19	
		brown silt with some gravel, some sand, some clay, med dense, poorly graded	-200 0.0			27	
SW	3	light brown medium sand, med dense, poorly graded	+500 0.0	20/2.0	SLD 101276 1335	23	
		0 0.0	16				
		0 0.0	11				
		0 0.0	14				
ML	4	silt sized black cinders with some silt, some sand, few gravel, yellow brick, med dense, poorly graded	+200 0.0	20/2.0		11	
			+100 0.0			5	
SC	5	brown silt with some clay, some sand, moist, med dense, poorly graded	-100 0.0		SLD 101277 1325	4	
		greenish gray fine sand with some silt, some clay, moist, med dense, poorly graded	0 0.0			6	
	6	TD - 6.0 ft bgs EUB 1345					

PROJECT FUSRAP/SLDS TRRA Soils File PDI

NOTE EG P-14/SLD 101274

ENG FORM 5056A-R, AUG 94 (Proponent: EECW-EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG				DISTRICT ST. LOUIS		HOLE NUMBER C2-19/SLD/D1278	
1. COMPANY NAME SHAW ENVIRONMENTAL				2. DRILLING SUBCONTRACTOR shaw		SHEET 1 OF 2	
3. PROJECT FUSRAP/SLDS				4. LOCATION TRRA Soils Pile - City Properties			
5. NAME OF DRILLER Dan Gotto				6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3.25" HSA and 3" x 2' split spoon Driven with a 140# hammer over 30" drop Cal Due: 1-7-18				8. HOLE LOCATION See location sketch			
9. SURFACE ELEVATION				10. DATE STARTED 4-12-07			
11. DATE COMPLETED 4-10-07				12. OVERBURDEN THICKNESS N/A			
13. DEPTH DRILLED INTO ROCK N/A				15. DEPTH GROUNDWATER ENCOUNTERED NA			
14. TOTAL DEPTH OF HOLE 6.0 ft bgs				16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A			
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A				18. GEOTECHNICAL SAMPLES			
19. TOTAL NUMBER OF CORE BOXES				20. SAMPLES FOR CHEMICAL ANALYSIS			
21. TOTAL CORE RECOVERY				22. DISPOSITION OF HOLE			
23. SIGNATURE OF INSPECTOR B. Lino (C218)				24. LOCATION SKETCH/COMMENTS			
25. WITNESSED BY Dan Gotto				26. SCALE: Not to Scale			
Trace <5% Few 5-10% Little 15-25% Some 20-35% Mostly 50-100% moved 10 ft with east for hotspot							
PROJECT FUSRAP/SLDS TRRA Soils Pile - Class 2/3				HOLE NO. C2-19/SLD/D1278			

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER 12-19/SLD101078	
PROJECT FUSRAP/SLDS		INSPECTOR E. C. R. T.		SHEET 2 OF 2		SHEETS	
ELEV. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD SPT RESULTS (4)	NOTES (5)	QUALITY ADJUSTED (6)	BLOW COUNT (7)	REMARKS (8)
ML	1	black silt with cinders, 12-15 med dense, poorly graded	1000 0.0	2.0/2.0	SLD 1012.78 0.905	6	
		silt sized mottled black cinders for run silt with some sand, few brick, med dense, poorly graded	1000 0.0			5	
			1000 0.0		SLD 1012.79 0.907	11	
			0 0.0			18	
SP	2	silt sized black cinders with some silt, some sand, silt, med dense, poorly graded	0 0.0	2.0/2.0		9	
			0 0.0			5	
SP	3	mottled light brown sand/brown sand with few brick med dense poorly graded	0 0.0			5	
			0 0.0			5	
ML	4	silt sized black cinders with some silt, some sand, trace brick, med dense poorly graded	0 0.0	1.9/2.0	SLD 1012.80 0.907	7	
			0 0.0			6	
SM	5	fine gray sand with some silt med dense poorly graded	0 0.0			3	med dense, poorly graded
ML		mottled brown silt / black cinders some sand, trace wood, trace glass	0 0.0			2	
SM		fine gray fine sand with some silt med dense, poorly graded	0 0.0		SLD 1012.81 0.903	3	
6		TD 6.04 bgs EUS-0710					

PROJECT FUSRAP/SLDS TRPT Spills Pile Class 2/3 HOLE NO. 12-19/SLD101078
ENG FORM 5056A-R, AUG 94 (Proponent: CECH-EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG				DISTRICT ST. LOUIS		HOLE NUMBER C2-17/SLD 01282	
1. COMPANY NAME SHAW ENVIRONMENTAL				2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2 SHEETS	
3. PROJECT FUSRAP/SLDS				4. LOCATION TPRA Spills Site - CNA, 2 pipes			
5. NAME OF DRILLER Dan Gotto				6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3.25" HSA and 3" x 2' split spoon				8. HOLE LOCATION See location sketch			
9. SURFACE ELEVATION				10. DATE STARTED 4-10-07			
11. DATE COMPLETED 4-10-07				12. OVERBURDEN THICKNESS N/A			
13. DEPTH DRILLED INTO ROCK N/A				14. TOTAL DEPTH OF HOLE 6.0 ft bgs			
15. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A				16. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A			
17. GEOTECHNICAL SAMPLES				18. TOTAL NUMBER OF CORE BOXES			
19. SAMPLES FOR CHEMICAL ANALYSIS				20. TOTAL CORE RECOVERY			
21. DISPOSITION OF HOLE				22. SIGNATURE OF INSPECTOR			
23. LOCATION SKETCH/COMMENTS				24. SCALE: Not to Scale			

WITNESSED BY: *[Signature]*

N. MARKET STREET

PROJECT FUSRAP/SLDS TPRA Spills Site class 2/3	HOLE NO. C2-17/SLD 01282
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HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER CA-17/SLD 101282	
PROJECT FUSRAP/SLDS		INSPECTOR E. COOK		SHEET 2 OF 2			
BLV. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD SOIL CLASS (4)	DESIGN SAMPLE OR CORRECTION (5)	QUALITY SAMPLER (6)	BLOW COUNT (7)	REMARKS (8)
ML		brown silt with some roots few sand few clay med dense poorly graded	4100	2.0/2.0	SLD 101282 1435	2	
SL		fine sand with med fine gravel poorly graded	0.0				
ML	1	black cinders with some silt some sand few wood med dense poorly graded	4100 0.0			3	cinders are silt sized
			4100 0.0		SLD 101283 1437	4	
	2		0 0.0			8	
						5	insufficient sample
	3					5	
						4	
	4					5	
						7	insufficient sample
	5					6	
						8	
	6					13	
		TD-6044695 E08-1445					

PROJECT FUSRAP/SLDS TERRA soils Pile Class 2/3 HOLE NO. CA-17/SLD 101282
ENG FORM 5036A-R, AUG 94 (Proponent: CECW-EQ)

Figure 4-2 (Concluded)

HTRW DRILLING LOG			DISTRICT ST. LOUIS		HOLE NUMBER 12-17B/SLD 1012826		
1. COMPANY NAME SHAW ENVIRONMENTAL			2. DRILLING SUBCONTRACTOR Shaw			SHEET 1 OF 2 SHEETS	
3. PROJECT FUSRAP/SLDS			4. LOCATION TPRA Spools Pile - City Properties				
5. NAME OF DRILLER Dan Gotto			6. MANUFACTURER'S DESIGNATION OF DRILL CME 75				
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3 25" HSA and 3" x 2' split spoon			8. HOLE LOCATION See location sketch				
9. SURFACE ELEVATION			10. DATE STARTED 4-10-07				
11. DATE COMPLETED 4-10-07			12. OVERBURDEN THICKNESS N/A				
13. DEPTH DRILLED INTO ROCK N/A			14. TOTAL DEPTH OF HOLE 6.0 ft bgs				
15. DEPTH GROUNDWATER ENCOUNTERED N/A			16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A				
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)			18. GEOTECHNICAL SAMPLES				
19. TOTAL NUMBER OF CORE BOXES 0			20. SAMPLES FOR CHEMICAL ANALYSIS				
21. TOTAL CORE RECOVERY 0 %			22. DISPOSITION OF HOLE				
23. SIGNATURE OF INSPECTOR B. L. L. L.			24. LOCATION SKETCH/COMMENTS				
25. WITNESSED BY inches			26. SCALE Not to Scale				
N. MARKET STREET Trace <5% Few 5-10% Little 15-25% Some 20-35% Mostly 50-100% moved 3 ft north to retrieve missing intervals							
PROJECT FUSRAP/SLDS			HOLE NO. 12-17B/SLD 1012826			CLASS 2/3	

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER C2-17B/SLD 101282B	
PROJECT FUSRAP BLDS		INSPECTOR E COOK		SHEET 2 OF 2 SHEETS			
ELEV. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD SAMPLES (4)	DOCTOR SAMPLE NO. (5)	ANALYTICAL NO. (6)	BLOW COUNT (7)	REMARKS (8)
	1	bored down to 2 ft bgs to retrieve missing interval					
ML	2	silt sized black cinders with some silt, some sand medium to black cinders with brown silt, trace wood, some clay med dense, poorly graded	+500 0.0 +200 0.0	1.7/2.0	Archive 1458	6 4	cinders are silt size &
S	3	brown fine sand with some silt, some clay, med dense, poorly graded	0 0.0 +200 0.0			4 6	
	4	brown silt with some black cinders some sand, some silt trace log k med dense, poorly graded	+300 0.0 -200 0.0	no recovery 2.0/2.0	Archive 1457	7 5	
ML	5	silt sized black cinders with brown silt, some sand med dense, poorly graded	-200 0.0 -200 0.0			5 7	
SM	6	green-gray fine sand with some silt med dense, poorly graded	-200 0.0				
		TD 6.0 ft bgs EOB 1500					

PROJECT FUSRAP/SLDS TRIA Spoils Pile class 2/3 HOLE NO C2-17B/SLD 101282B
ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EQ)

Figure 4-2 (Concluded)

HTRW DRILLING LOG				DISTRICT ST. LOUIS		HOLE NUMBER C2-18/SLDID1287	
1. COMPANY NAME SHAW ENVIRONMENTAL				2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2 SHEETS	
3. PROJECT FUSRAP/SLDS				4. LOCATION TRRA Spills Pile - City Properties			
5. NAME OF DRILLER Dan Gotto				6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 1.25" HSA and 3" x 2' split spoon				8. HOLE LOCATION See location sketch			
Driven with a 140# hammer over 35" drop Cal Due: 1-75-08				9. SURFACE ELEVATION			
PID: 013879 NJ: 149963 LUD: 149963				10. DATE STARTED 4-11-07		11. DATE COMPLETED 4-11-05	
RVG = 0.0 (21m) Cal Due: 11-16-07 Background: SATURATED				15. DEPTH GROUNDWATER ENCOUNTERED N/A			
12. OVERBURDEN THICKNESS N/A				16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A			
13. DEPTH DRILLED INTO ROCK N/A				17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A			
14. TOTAL DEPTH OF HOLE 6.0 ft b15				18. GEOTECHNICAL SAMPLES			
18. GEOTECHNICAL SAMPLES		DISTURBED ☐		UNDISTURBED ☐		19. TOTAL NUMBER OF CORE BOXES ☐	
20. SAMPLES FOR CHEMICAL ANALYSIS		VOC ☐		METALS ☐		OTHER (SPECIFY) ☐	
		RAD ☐		OTHER (SPECIFY) ☐		OTHER (SPECIFY) ☐	
22. DISPOSITION OF HOLE		BACKFILLED ☐		MONITORING WELL ☐		OTHER (SPECIFY) ☐	
		N/A				23. SIGNATURE OF INSPECTOR Blaine Curren	
LOCATION SKETCH/COMMENTS Witnessed by: Dan Rakus SCALE: Not to Scale Trace <5% Few 5-10% Little 15-25% Some 20-35% Mostly 50-100% split spoons opened, described, and sampled in RAD trailer							
PROJECT FUSRAP/SLDS TRRA Spills Pile class 2/3						HOLE NO. C2-18/SLDID1287	

HTRW DRILLING LOG (CONTINUATION SHEET)						HOUSE NUMBER	
PROJECT	RESPECTOR	SHEET 2 of 2 SHEETS					
DEPT	DEPTH	DESCRIPTION OF MATERIALS	FIELD LOGGING	SOCKET SAMPLE	ANALYTICAL	BLOW COUNT	REMARKS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ML		brn silt with roots, some clay lenses	+1100	2.0/2.0	SLD	8	cinders are. it spread
bm		dark brown gravel with some silt	0.0		10/1284		
		low sand, very loose, poorly graded	+1200		1435	5	
1		light brown gravel with some sand	0.0		SLD	3	
		very loose, poorly graded	+900		10/1285	3	
		black cinders with some silt	0.0		1438		
		some sand, slag, med dense, poorly graded	500				
2		grit sized	0.0				
		black cinders with some sand	+1000	2.0/2.0	Archive	4	
		some silt trace bricks, med dense, poorly graded	2.0		1450		
3			+400			6	
			0.0			10	
4			+400			8	
			0.0			4	
5			+200			2	
			0.0			2	
6			+500			8	
			0.1				
BRICK		red brick	+300				
ML		grit sized	0.0				
		black cinders with some sand, some silt, moist, med dense, poorly graded	+200				
			0.0				
		TD 6.0 ft bps					
		EOB-1455					

ENG FORM 5056A-R, AUG 94

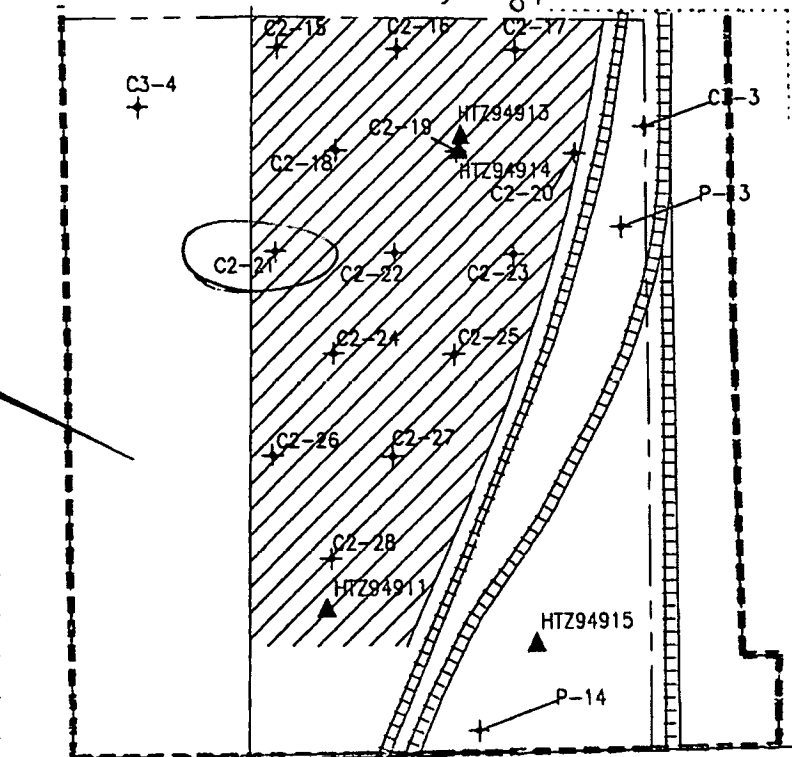
Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT ST. LOUIS		HOLE NUMBER C2-21/SLD101286	
1. COMPANY NAME SHAW ENVIRONMENTAL		2. DRILLING SUBCONTRACTOR shaw		SHEET 1 OF 2 SHEETS	
3. PROJECT FUSRAP/SLDS		4. LOCATION TRRA Spills Pile - City Properties			
5. NAME OF DRILLER Dan Gotto		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3 25" HSA and 3" x 2' split spoon		8. HOLE LOCATION See location sketch			
Driven with a 140# hammer over 30" drop Cal Due: 1-25-02		9. SURFACE ELEVATION			
PID: 013879 Nat: 149962 LUD: 149965		10. DATE STARTED 4-11-07		11. DATE COMPLETED 4-11-07	
RVG: 020000 Cal Due: 11-16-07 Background: 5800		12. OVERBURDEN THICKNESS N/A			
13. DEPTH DRILLED INTO ROCK N/A		15. DEPTH GROUNDWATER ENCOUNTERED N/A			
14. TOTAL DEPTH OF HOLE 60 ft bgs		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A			
18. GEOTECHNICAL SAMPLES		DISTURBED		UNDISTURBED	
20. SAMPLES FOR CHEMICAL ANALYSIS		VOC		OTHER (SPECIFY)	
22. DISPOSITION OF HOLE		BACKFILLED		MONITORING WELL	
		N/A		OTHER (SPECIFY)	
				23. SIGNATURE OF INSPECTOR Blaine Little	

LOCATION SKETCH/COMMENTS

Witnessed by: **Doug Rakus**

SCALE: Not to Scale



Trace <5%
Few 5-10%
Little 15-25%
Some 20-35%
Mostly 50-100%

N. MARKET STREET

PROJECT FUSRAP/SLDS	TRRA Spills Pile class 2/3	HOLE NO. C2-21/SLD101286
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HTRW DRILLING LOG (CONTINUATION SHEET)							PROJECT NO.
PROJECT		INSPECTOR		SHEET			SHEETS
FUSAP/SLDS		E. Cook		20			2
REV.	DEPTH	DESCRIPTION OF MATERIALS	FIELD LOG (ft)	TESTING SAMPLE OR LOG FOR SO	ANALYTICAL SAMPLE NO.	BLOW COUNT	REMARKS
ml		brown silt with gravel, fine sand, med dense, poorly graded	-300	18/2.0	SLD 101286	5	
6m		dark brown gravel with some silt, loose, poorly graded	0.0		1123		
		brown gravel with few sand, very loose, poorly graded	-200			6	
ml		brown silt with some clay, few gravel, med dense, poorly graded	-400		SLD 101287	5	
6m		light gray gravel with few silt, very loose, poorly graded	0		1125	8	
		silt sand	0	nd revery			
		black cinders with some sand, some silt, slag, few gravel, med dense, poorly graded	0.0	2.0/2.0		11	
ml		green gray silt with mostly fine sand, some clay, moist, med dense, poorly graded	+300		Sub 1140	5	
		green gray fine sand with some clay, some silt, moist, med dense, poorly graded	0			4	
SC		green gray fine sand with some clay, some silt, moist, med dense, poorly graded	0			4	
		mottled gray silt with clay with silt, black cinders, few sand, med dense, poorly graded	-200	2.0/2.0		2	
ml		black cinders with sand, loose, poorly graded	-300			4	
		red brick	-400			4	
6m		green silt, fine sand with some silt, med dense, poorly graded	+100		Archive	16	
		TD 60 ft bgs					
		EUB 1140					

ENG FORM 5056A-R, AUG 94

Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT ST. LOUIS	HOLE NUMBER C3-4/SLD101288
1. COMPANY NAME SHAW ENVIRONMENTAL	2. DRILLING SUBCONTRACTOR Shaw	SHEET 1 OF 2 SHEETS	
3. PROJECT FUSRAP/SLDS	4. LOCATION TRPA Soils Pile - City Properties		
5. NAME OF DRILLER Dan Gotto	6. MANUFACTURER'S DESIGNATION OF DRILL CME 75		
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3.25" HSA and 3" x 2' split spoon	8. HOLE LOCATION See location sketch		
9. SURFACE ELEVATION			
10. DATE STARTED 4/11/07			
11. DATE COMPLETED 4-11-07			
12. OVERBURDEN THICKNESS N/A			
13. DEPTH DRILLED INTO ROCK N/A			
14. TOTAL DEPTH OF HOLE 6.7 ft bgs			
15. DEPTH GROUNDWATER ENCOUNTERED N/A			
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A			
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A			
18. GEOTECHNICAL SAMPLES ☐ DISTURBED ☐ UNDISTURBED		19. TOTAL NUMBER OF CORE BOXES ☐	
20. SAMPLES FOR CHEMICAL ANALYSIS ☐ VOC ☐ METALS ☐ OTHER (SPECIFY)	☐ RAD ☐ OTHER (SPECIFY)	21. TOTAL CORE RECOVERY ☐ %	
22. DISPOSITION OF HOLE backfilled		23. SIGNATURE OF INSPECTOR Blaine 10/16	
LOCATION SKETCH/COMMENTS Witnessed by: <i>Dan Gotto</i> SCALE: Not to Scale			
PROJECT FUSRAP/SLDS HOLE NO. C3-4/SLD101288			

HTRW DRILLING LOG (CONTINUATION SHEET)							HOLE NUMBER C3-4 SLD 101288
PROJECT FUSRAP/SLDS		INSPECTOR E. COOK		SHEET 2 OF 2			
DATE (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD MEASUREMENTS (4)	SOIL SAMPLE NO. (5)	BLOW COUNT (6)	REMARKS (7)	
correct		8 1/2 inches concrete	X				
	1	coarse sand with fine gravel, brown loose, poorly graded	+100 2.0	1.5/2.0	SLD 101288 1015	4	
ML	2	coarse sand with gravel, light gray fine, poorly graded	+500 0.0			3	
		black cinders with some silt, some sand, slag, trace brick, trace gravel, med dense, poorly graded	+600 0.0		SLD 101289 1017	20	
			+100 0.0			35	
			-100 0.0	no wire 2.0/2.0		4	
5m	3		0 0.0			8	
	4		0 0.0			10	
			+200 0.0		SLD 101290 1030	6	
	5	green gray fine sand with some silt, med dense, poorly graded	0 0.0	2.0/2.0		5	
ML		black cinders with some sand some silt, med dense, poorly graded	0 0.0			3	
		green-gray silt with med fine sand, some clay med dense, poorly graded	0 0.0			3	
	6	black cinders with some sand, some silt, med dense poorly graded	0 0.0		SLD 101291 1025	7	
			0 0.0				
		TD - 6.7 ft bgs EUB 1030					

REMARKS: cinders are silt sized

REMARKS: cinders are silt sized

PROJECT: FUSRAP/SLDS TRRA Sports Pile Class 2/3

NOTE NO. C3-4/SLD 101288

ENG FORM 5056A-R, AUG 94

(Proponent) (ECW-EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG (CONTINUATION SHEET)							HOLE NUMBER SLD101294
PROJECT FUSRAP/SLDS			INSPECTOR E. COOT		SHEET 2 OF 2 SHEETS		
ELEV. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD TESTS SPT (4)	DEPTH SAMPLE OR CORE (5)	QUALITY SAMPLING (6)	BLOW COUNT (7)	REMARKS (8)
ML		brown silt with some gravel few sand few clay, loose, poorly graded	-100 0.0	20/20	SLD 101294 1052	5	
SP	1	brown med sand with some fine sand trace gravel, med dense poorly graded	0 0.0		SLD 101295 1059	7	
		silt sized black cinders with some silt some clay trace gravel trace glass, med dense, poorly graded	-300 0.0			8	
	2	black cinders with some silt some sand few gravel, med dense, poorly graded	-100 0.0	20/20		12	
		silt sized black cinders with some silt some clay, few sand, med dense, poorly graded	100 0.0			6	cinders are silt sized
	3		200 0.0		SLD 101296 1042	6	cinders are silt sized
			200 0.0			5	
ML	4	silt sized black cinders with some silt some sand some clay trace gravel, med dense, poorly graded	-100 0.0	2.0/2.0		6	
			200 0.0			2	
	5	silt sized black cinders with some silt some clay few sand, med dense, poorly graded	-100 0.0			3	
		black cinders with some silt some sand few clay, med dense, poorly graded	200 0.0		SLD 101297 1025	5	cinders are silt sized
	6	black cinders with some silt some clay few sand, med dense, poorly graded	100 0.0			4	cinders are silt sized
		TD 6.0 ft bbs 205-1055					

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT St. Louis		HOLE NUMBER: SLD101298	
1. COMPANY NAME Shaw E & I		2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2	
3. PROJECT FUSRAP/SLDS		4. LOCATION TRRT Spills Pile C2-7			
5. NAME OF DRILLER Dan Gotto		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" ID HSA w/ 3" x 2" split spoon sampler driven w/ 140# hammer over 30' hole		8. HOLE LOCATION see location sketch			
9. SURFACE ELEVATION		10. DATE STARTED 5-14-07			
11. DATE COMPLETED 5-14-07		12. OVERBURDEN THICKNESS NA			
13. DEPTH DRILLED INTO ROCK NA		14. TOTAL DEPTH OF HOLE 6.0 ft bgs			
15. DEPTH GROUNDWATER ENCOUNTERED NA		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA			
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA		18. GEOTECHNICAL SAMPLES			
DISTURBED ☒		UNDISTURBED ☒		19. TOTAL NUMBER OF CORE BOXES ☒	
20. SAMPLES FOR CHEMICAL ANALYSIS		METALS ☒		OTHER (SPECIFY) RAD	
21. TOTAL CORE RECOVERY ☒		OTHER (SPECIFY) ☒		OTHER (SPECIFY) ☒	
22. DISPOSITION OF HOLE Bentonite		MONITORING WELL ☒		23. SIGNATURE OF INSPECTOR Elaine Gotto	

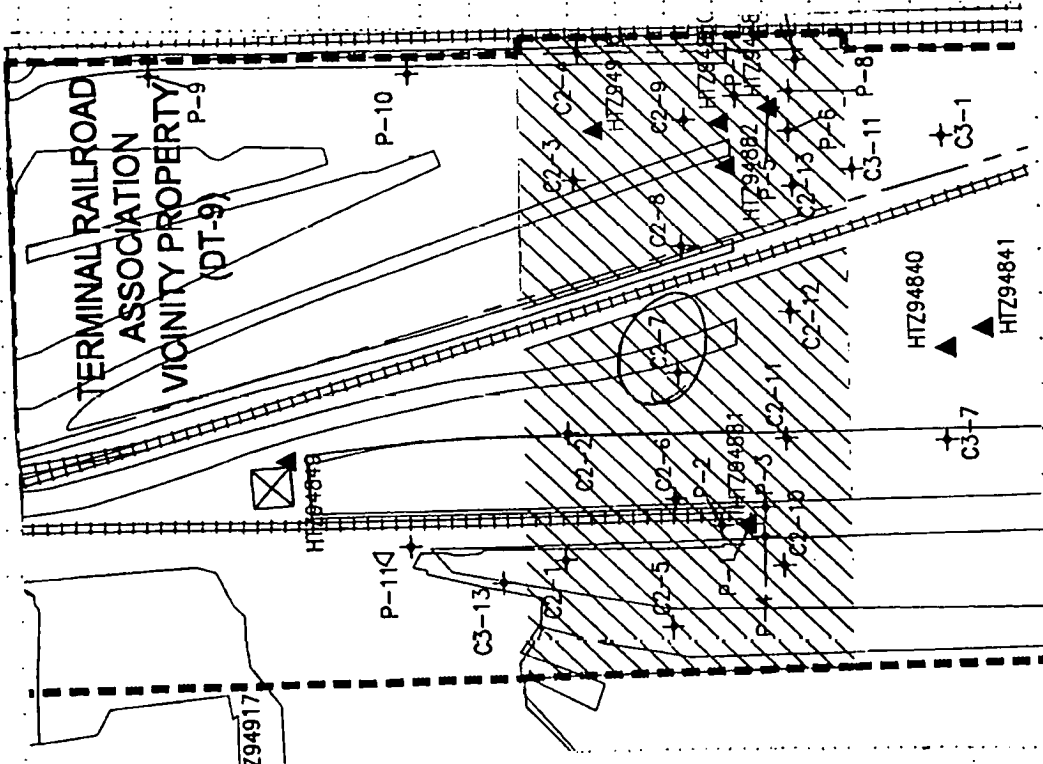
LOCATION SKETCH/COMMENTS

witnessed by: **RW**

SCALE: NDT +0 Scale

Terms Used to Describe %

trace <5%
few 5-10%
little 10-25%
some 20-30%
mostly/with 50-100%



PROJECT

FUSRAP/SLDS - TRRT Spills Pile

HOLE NO.

SLD101298

HTRW DRILLING LOG		DISTRICT	St. Louis		HOLE NUMBER	SLD 101300	
1. COMPANY NAME		2. DRILLING SUBCONTRACTOR		SHEET		SHEETS	
Shaw E & I		Shaw		1		2	
3. PROJECT			4. LOCATION				
FUSRAP/SLDS			TRRT Spills Pile C2-11				
5. NAME OF DRILLER			6. MANUFACTURER'S DESIGNATION OF DRILL				
Dan Gotto			CMF 7.5				
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT			8. HOLE LOCATION				
4 1/4" ID HSA w/ 3 1/2" split spoon sampler driven w/ 140# hammer over 30' drop			see location sketch				
9. SURFACE ELEVATION			10. DATE STARTED				
NA			5-14-07				
11. DATE COMPLETED			5-14-07				
12. OVERBURDEN THICKNESS			13. DEPTH DRILLED INTO ROCK				
NA			NA				
14. TOTAL DEPTH OF HOLE			15. DEPTH GROUNDWATER ENCOUNTERED				
NA			NA				
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED			17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)				
NA			NA				
18. GEOTECHNICAL SAMPLES			DISTURBED		UNDISTURBED		19. TOTAL NUMBER OF CORE BOXES
			0		0		0
20. SAMPLES FOR CHEMICAL ANALYSIS			ROC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)
			0	0	RAD	0	0
22. DEPOSITION OF HOLE			SAO FILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR	
			Bentonite	0	0	Blaine Corliss	

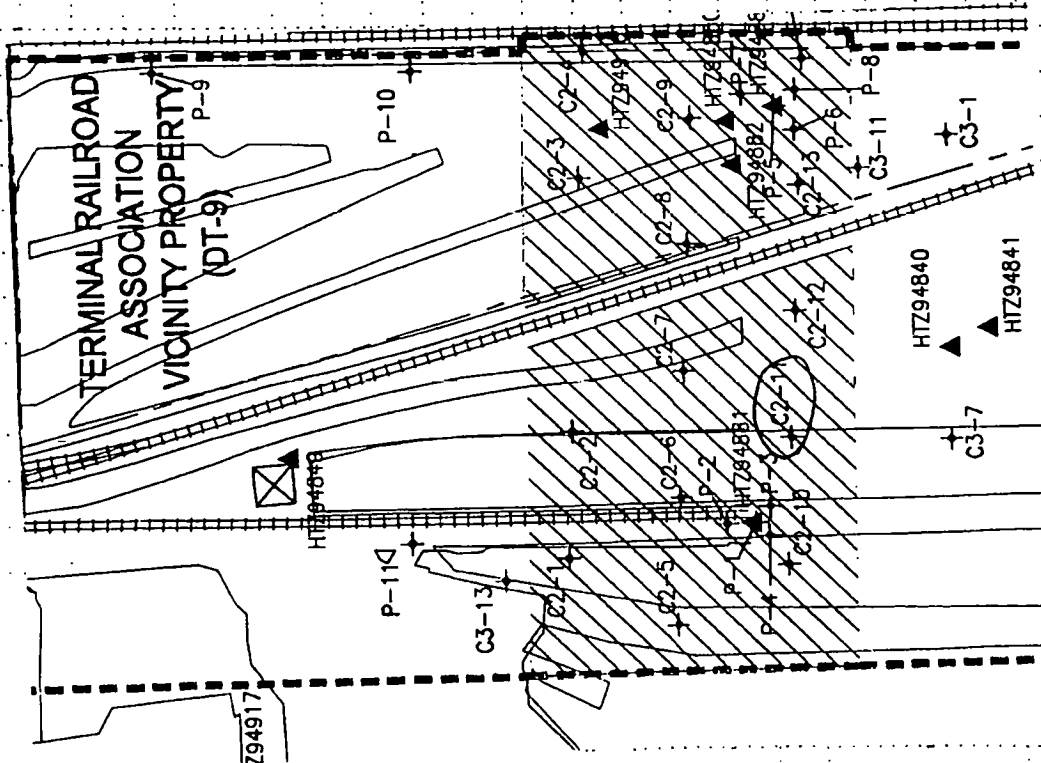
LOCATION SKETCH/COMMENTS

witnessed by: R. Ward

SCALE: NOT TO SCALE

Terms Used to Describe %

trace <5%
few 5-10%
little 10-25%
some 20-30%
mostly/with 50-100%



PROJECT

FUSRAP/SLDS - TRRT Spills Pile

HOLE NO.

SLD101300

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER SLD101300	
PROJECT FUSRAP/SLDS			INSPECTOR E Cook			SHEET 2 of 2	
ELEV. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD TESTS (4)	TESTED SAMPLE OR CORE FOR NO. (5)	QUALITY SAMPLE NO. (6)	BLOW COUNT (7)	REMARKS (8)
ML	1	brown silt with some clay, some gravel, few sand, med dense poorly graded	-300 0.0 -300 0.0	20620	SLD 101300 1023	5	
			-300 0.0			6	
SP	2	light brown coarse sand with some med sand few gravel, med dense, poorly graded	-300 0.0 -100 0.0		SLD 101301 1025	3	
			-300 0.0			14	
	3	silt sized black cinders with some silt some sand few gravel, med dense, poorly graded	-300 0.0 100 0.0	1.9/2.0		3	
			-300 0.0		SLD 101302 1015	3	
ML	4	silt sized black cinders with some silt some sand some gravel, med dense, poorly graded	-300 0.0 -100 0.0	1.8/2.0		5	
			-300 0.0			7	
	5	black cinders with some silt some clay, med, loose, poorly graded	-200 0.0			2	cinders are silt sized
			-300 0.0			2	
	6	silt sized black cinders with some silt some sand few gravel trace brick med dense, poorly graded	-300 0.0 -100 0.0		Archive 1007	3	
			-100 0.0	no recovery		8	
	6	TD-6. off logs EUB 1030					

PROJECT
FUSRAP/SLDS
ENG FORM 5056A-R, AUG 94

POLE NO.
SLD101300
(Proponent: CECW-EG)

Figure 4-2 (Concluded)

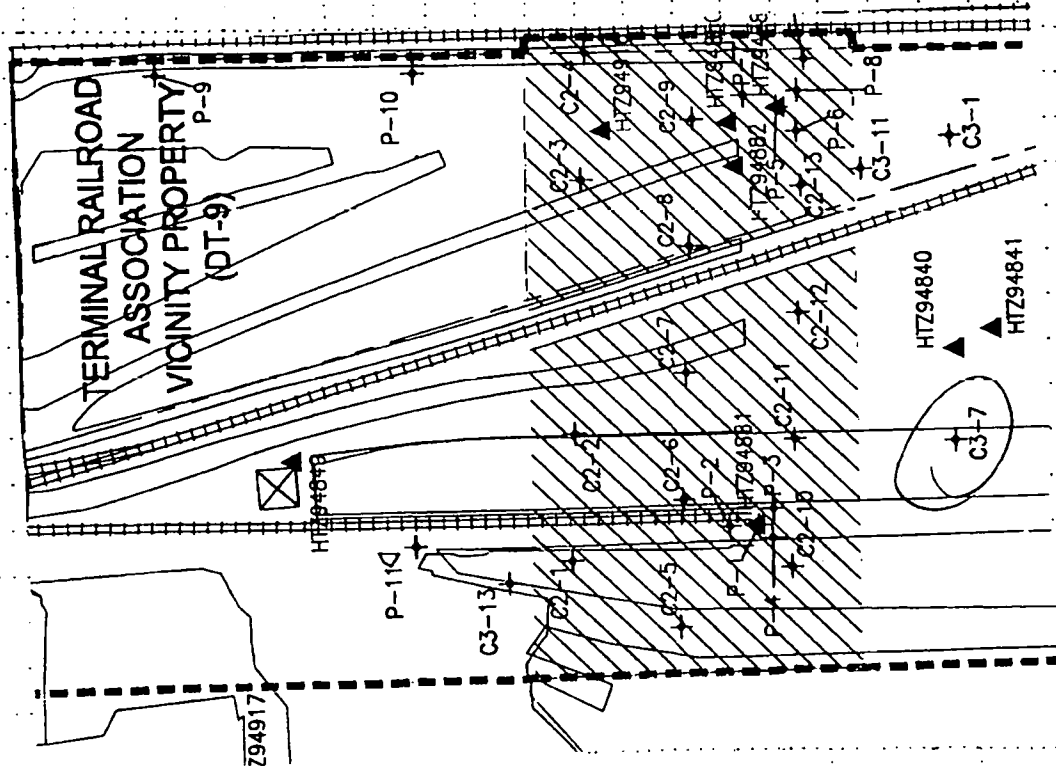
SLD 101302 ec

HTRW DRILLING LOG		DISTRICT St. Louis		HOLE NUMBER: SLD101302	
1. COMPANY NAME Shaw E & I		2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2	
3. PROJECT FUSRAP/SLDS		4. LOCATION TRRT Spills Pile C3-7			
5. NAME OF DRILLER Dan Gotto		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" ID HSA w/ 3" x 2' split spoon Sampler driven w/ 140# hammer ext 30' dia		8. HOLE LOCATION see location sketch			
9. SURFACE ELEVATION NA		10. DATE STARTED 5-14-07			
11. DATE COMPLETED 5-14-07		12. OVERBURDEN THICKNESS NA			
13. DEPTH DRILLED INTO ROCK NA		14. TOTAL DEPTH OF HOLE 6.0 ft bgs			
15. DEPTH GROUNDWATER ENCOUNTERED NA		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA			
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA		18. GEOTECHNICAL SAMPLES			
DISTURBED ☒		UNDISTURBED ☒		19. TOTAL NUMBER OF CORE BOXES 0	
20. SAMPLES FOR CHEMICAL ANALYSIS		ROCK ☒		METALS ☒	
OTHER (SPECIFY) RAD		OTHER (SPECIFY) 0		OTHER (SPECIFY) 0	
21. TOTAL CORE RECOVERY 0 %		22. DEPOSITION OF HOLE		23. SIGNATURE OF INSPECTOR Blaine Cox	
Bentonite ☒		MONITORING WELL ☒		OTHER (SPECIFY) 0	

LOCATION SKETCH/COMMENTS

witnessed by: **Ward** SCALE: NOT TO SCALE
Terms Used to Describe %

trace <5%
few 5-10%
little 10-25%
some 20-30%
mostly/with 50-100%



SLD 101302 PR

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER SLD 101302 PR	
PROJECT FUSRAP/SLDS			INSPECTOR T. Cook		SHEET 2 of 2		
REV. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD STRATIGRAPHY (4)	DETERMINED SAMPLE (5) (6) (7) (8) (9)	ANALYTICAL SAMPLE NO. (10)	BLOW COUNT (11)	REMARKS (12)
	1					7	insufficient sample
						5	
						8	
						9	
ML	2	brown silt with sand, few gravel med dense, poorly graded	-600 0.0	1812-0		6	
		black silty clay with some sand some silt fine clay, med dense, poorly graded	-110 0.0			2	
CL	3	brown clay with silt, some silt, some brick, med plasticity, med stiff	-100 0.0		Archie 0945	3	
		gray clay with some silt, some sand, med plasticity, med stiff	-100 0.0			3	cinders are silt sized
ML	4	light gray clay with some silt, some sand, med plasticity, med stiff	-100 0.0	no recovery		2	
		black silty clay with some sand, some silt, med dense, poorly graded	-200 0.0	185-0		4	
		black silty clay with some sand, some silt, med dense, poorly graded	-300 0.0			13	
SM	5	black sand with much silt, few gravel, cinders, moist, med density, poorly graded	-100 0.0		Archie 0855	30	
			-100 0.0	no recovery			
	6	TD - 600 ft base EUB 0905					

PROJECT: FUSRAP/SLDS Terminal RR Spoils Pile

ENG FORM 5056A-R, AUG 94

SLD 101302 PR
(Proprietor: ECHW-EG)

Figure 4-2 (Concluded)

SLD 101302B

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER SLD 101302B	
PROJECT FUSRAP/SLDS			INSPECTOR E Code			SHEET 2 of 2	
FLY. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (4)	WELL LOG (3)	TEST OR CORR. NO. (5)	ANALYTICAL SAMPLE NO. (6)	BLOW COUNT (7)	REMARKS (8)
ML	1	brown silt with some clay some gravel, roots, med dense poorly graded	500	2.0/2.0	SLD 101302B 0917	3	
		improved bluish (fine) brown silt with some sand some clay trace brick trace gravel, med dense, poorly graded	100		5		
			2		SLD 101302B 0920	3	
			300		8		
	2	TD - 20 ft bgs EUB - 0920					
	3						
	4						
	5						
	6						

PROJECT: FUSRAP/SLDS Terminal - Sports Pile

ENG FORM 5056A-R, AUG 94

HOLE NO: SLD 101302B

(Proponent: CECW-EG)

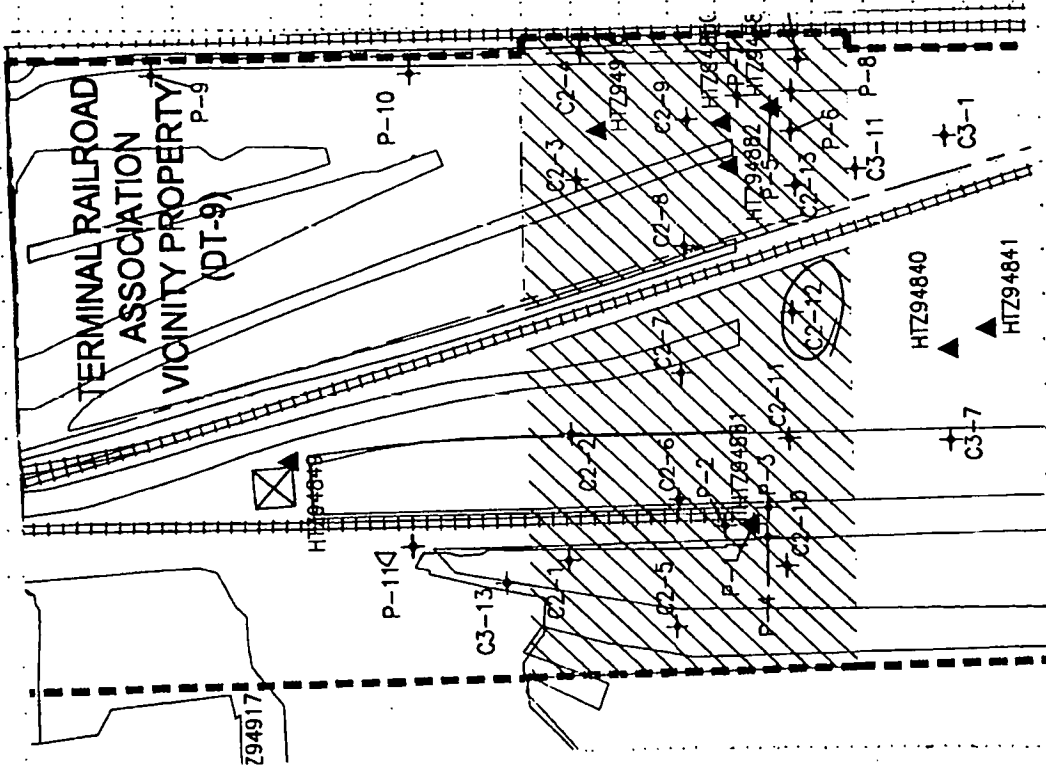
Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT St. Louis		HOLE NUMBER: SLD 10304	
1. COMPANY NAME Shaw E & I		2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2	
3. PROJECT FUSRAP/SLDS		4. LOCATION TRRT Spills Pile C2-12			
5. NAME OF DRILLER Dan Goto		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" ID HSA w/ 3" x 2" split spoon sampler driven w/ 140# hammer pier 3" ID		8. HOLE LOCATION See location sketch			
PID (100mm isobutylene) NAI		9. SURFACE ELEVATION			
SN: 502309 SN: 149963		10. DATE STARTED 5-14-07		11. DATE COMPLETED 5-14-07	
Cal date: 8-3-07 Cal date: 11-16-07		15. DEPTH GROUNDWATER ENCOUNTERED NA			
Bkg: 0.02pm Bkg: 55.00		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA			
12. OVERBURDEN THICKNESS NA		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA			
13. DEPTH DRILLED INTO ROCK NA		14. TOTAL DEPTH OF HOLE 6.0 ft bgs			
18. GEOTECHNICAL SAMPLES		19. TOTAL NUMBER OF CORE BOXES			
DISTURBED ☒		UNDISTURBED ☒			
20. SAMPLES FOR CHEMICAL ANALYSIS		21. TOTAL CORE RECOVERY			
TOC ☒		METALS ☒		OTHER (SPECIFY) RAD	
SAC/FILLED ☒		MONITORING WELL ☒		OTHER (SPECIFY) Bentonite	
22. DISPOSITION OF HOLE		23. SIGNATURE OF INSPECTOR E. Lonne Corle			

LOCATION SKETCH/COMMENTS

witnessed by: **V. Warden** SCALE: NOT TO Scale
Terms Used to Describe %

trace <5%
few 5-10%
little 10-25%
some 20-30%
mostly/with 50-100%



PROJECT: **FUSRAP/SLDS - TRRT Spills Pile**

HOLE NO. **SLD 10304**

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER SLD 101304	
PROJECT FUS RHP/SLDS		INSPECTOR E Cook		SHEET 2 of 2 SHEETS			
EST. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD TESTS RESULTS (4)	DEPTH SAMPLE OR CORRECTION (5)	QUALITY CONTROL NO. (6)	BLOW COUNT (7)	REMARKS (8)
ML		brown silt with some clay some sand few gravel, med dense poorly graded	~100 0.0	2.0/0.0	SLD 101304 1322	11	
ML	1	brown gravel with some sand some silt, very loose poorly graded	~100 0.0			8	
ML		black cinders with some sand coarse sand and black clay cinders black cinders with some silt some clay few sand med dense poorly graded	100 0.0			6	cinders are silt sized
ML	2	brown silt with some clay some silt few clay med dense poorly graded	100 0.0		SLD 101305 1325	33	
ML		silt sized black cinders with some silt some sand few clay few gravel med dense poorly graded	100 0.0	1.7/2.0		9	
ML	3		500 0.0		SLD 101306 1315	33	
ML			100 0.0			26	
ML	4	silt sized black cinders with some silt some sand few clay, med dense, poorly graded	100 0.0	no recovery 2.0/0.0		16	
ML		black cinders with some silt some sand, moist, med dense, poorly graded	100 0.0			2	
ML	5	green-gray clay with some silt med plasticity, med stiff	300 0.0			3	cinders are silt sized
CL		silt sized black cinders with some silt	300 0.0		SLD 101307 1302	4	
ML	6	some clay few gravel, med dense, poorly graded	0 0.0			3	
		TD-6.0 ft bgs EOB-1325					

PROJECT FUS RHP/SLDS Terminal ER Spoils Pile HOLE NO. SLD 101304
ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

Figure 4-2 (Concluded)

1 Nov 98

HTRW DRILLING LOG (CONTINUATION SHEET)							HOLE NUMBER SLD11298
PROJECT FLSRAP/SLDS		INSPECTOR E Cook		SHEET 2 OF 2 SHEETS			
REV. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD TESTING RESULTS (4)	DEPTH SAMPLE OR CORE (5)	QUALITY CHECK NO. (6)	BLOW COUNT (7)	REMARKS (8)
ML		brown silt with some sand some gravel, few clay, med dense, poorly graded	100 0.0	2.0/2.0	SLD 101298 1118	7	
			100 0.0			8	
GP	1	gravel with few sand, very loose poorly graded	100 0.0			10	
GP		brown med sand, med dense, well graded	100 0.0			8	
	2	black cinders with some silt, some clay, some sand few slag, med dense, poorly graded	100 0.0	1.3/2.0	SLD 101299 1120	7	cinders are silt size d
			100 0.0			6	
ML	3		100 0.0		Archive 1111	4	
			100 0.0	no return		5	
	4	silt sized black cinders with some silt some clay, few sand, few slag med dense, poorly graded	200 0.0	2.0/2.0	Archive 1100	2	
			0 0.0			2	
GP	5	fine sand with some silt some clay green army clay with some silt some sand, med plasticity, med stiff	100 0.0			4	med dense, poorly sorted
CL			100 0.0			3	
ML	6	brown silt with some clay and sand med dense, poorly graded	100 0.0				
		TD-6.0 ft bas EOB 1120					

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

Figure 4-2 (Concluded)

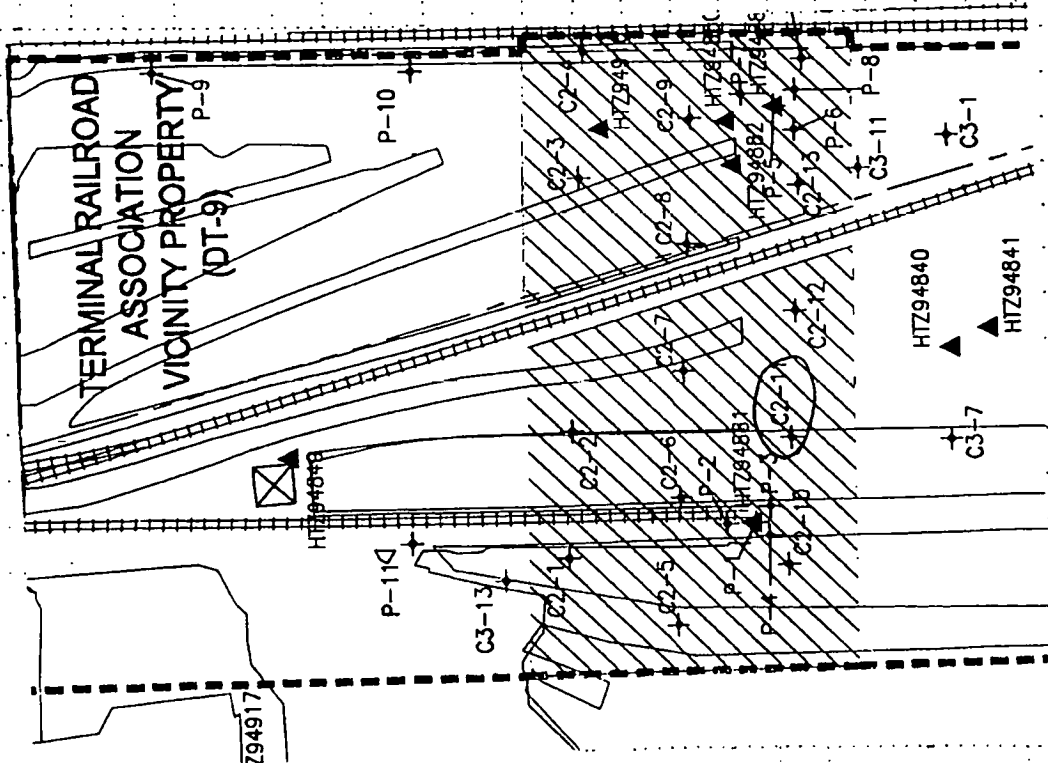
HTRW DRILLING LOG		DISTRICT	St. Louis		HOLE NUMBER	SLD 101300	
1. COMPANY NAME		2. DRILLING SUBCONTRACTOR		SHEET		SHEETS	
Shaw E & I		Shaw		1		2	
3. PROJECT			4. LOCATION				
FUSRAP/SLDS			TRRT spoils pile C2-11				
5. NAME OF DRILLER			6. MANUFACTURER'S DESIGNATION OF DRILL				
Dan Gotto			CMF 7.5				
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT			8. HOLE LOCATION				
4 1/4" ID HSA w/ 3 1/2" split spoon sampler driven w/ 140# hammer over 30' drop			see location sketch				
9. SURFACE ELEVATION			10. DATE STARTED				
PID (100mm isobutylene) NAI			5-14-07				
3N: 502309 3N: 149963			11. DATE COMPLETED				
cal date: 8-3-07 cal date: 11-16-07			5-14-07				
Bkg: 0.00m Bkg: 59.00			15. DEPTH GROUNDWATER ENCOUNTERED				
12. OVERBURDEN THICKNESS			NA				
13. DEPTH DRILLED INTO ROCK			16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED				
NA			NA				
14. TOTAL DEPTH OF HOLE			17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)				
			NA				
18. GEOTECHNICAL SAMPLES		DISTURBED		UNDISTURBED		19. TOTAL NUMBER OF CORE BOXES	
		0		0		0	
20. SAMPLES FOR CHEMICAL ANALYSIS		ROC		METALS		SYNTH (SPECIFY)	
		0		0		RAD	
22. DEPOSITION OF HOLE		SAO FILLED		MONITORING WELL		OTHER (SPECIFY)	
		Bentonite		0		0	
						23. SIGNATURE OF INSPECTOR	
						Blaine Corliss	

LOCATION SKETCH/COMMENTS

witnessed by: R. Ward

SCALE: NOT TO SCALE
Terms Used to Describe %

trace <5%
few 5-10%
little 10-25%
some 20-30%
mostly/with 50-100%



PROJECT

FUSRAP/SLDS - TRRT spoils pile

HOLE NO.

SLD101300

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER SLD101300				
PROJECT FUSRAP/SLDS			INSPECTOR E Cook			SHEET 2 of 2				
ELEV. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD TESTS (4)	TESTED SAMPLE OR CORE FOR NO. (5)	QUALITY SAMPLE NO. (6)	BLOW COUNT (7)	REMARKS (8)			
ML	1	brown silt with some clay, some gravel, few sand, med dense poorly graded	-300 0.0 -300 0.0	20620	SLD 101300 1023	5				
						6				
						3				
SP	2	light brown coarse sand with some med sand few gravel, med dense, poorly graded	-300 0.0 -100 0.0	1.9/2.0	SLD 101301 1025	14				
						3				
ML	3	silt sized black cinders with some silt some sand few gravel, med dense, poorly graded	-300 0.0 100 0.0	1.8/2.0	SLD 101302 1015	3	cinders are silt sized			
						3				
	4	silt sized black cinders with some silt some sand some gravel, med dense, poorly graded	-300 0.0 -100 0.0					5		
						7				
	5	black cinders with some silt some clay, med, loose, poorly graded	-200 0.0 -300 0.0					2		
						2				
	6	silt sized black cinders with some silt some sand few gravel trace brick med dense, poorly graded	-300 0.0 -100 0.0					3		
						8				
	6	TD-6.0ft bbs EUB 1030								

PROJECT
FUSRAP/SLDS
ENG FORM 5056A-R, AUG 94

POLE NO.
SLD101300
(Proponent: CECW-EG)

Figure 4-2 (Concluded)

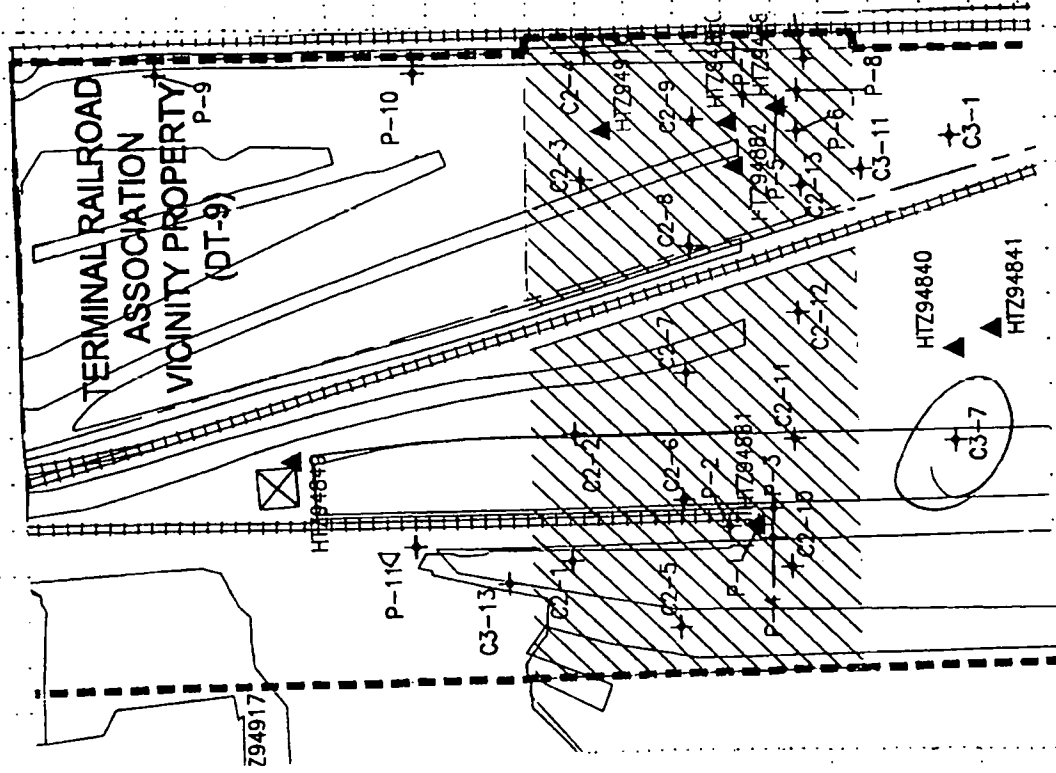
SLD 101302 ec

HTRW DRILLING LOG		DISTRICT St. Louis		HOLE NUMBER: SLD101302	
1. COMPANY NAME Shaw E & I		2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2	
3. PROJECT FUSRAP/SLDS		4. LOCATION TRRT Spills Pile C3-7			
5. NAME OF DRILLER Dan Gotto		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" ID HSA w/ 9" x 2' split spoon Sampler driven w/ 140# hammer ext 30' dia		8. HOLE LOCATION see location sketch			
9. SURFACE ELEVATION		10. DATE STARTED 5-14-07		11. DATE COMPLETED 5-14-07	
12. OVERBURDEN THICKNESS NA		15. DEPTH GROUNDWATER ENCOUNTERED NA			
13. DEPTH DRILLED INTO ROCK NA		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA			
14. TOTAL DEPTH OF HOLE 6.0 ft bgs		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA			
18. GEOTECHNICAL SAMPLES		19. TOTAL NUMBER OF CORE BOXES			
20. SAMPLES FOR CHEMICAL ANALYSIS		21. TOTAL CORE RECOVERY			
22. DEPOSITION OF HOLE		23. SIGNATURE OF INSPECTOR			

LOCATION SKETCH/COMMENTS

witnessed by: **Ward** SCALE: NOT TO SCALE
Terms Used to Describe %

trace <5%
few 5-10%
little 10-25%
some 20-30%
mostly/with 50-100%



SLD 101302 PR

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER SLD 101302 PR	
PROJECT FUSRAP/SLDS			INSPECTOR T. Cook		SHEET 2 of 2		
REV. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD STRATIGRAPHY (4)	DEPT. SAMPLE (5) (6) (7) (8) (9)	ANALYTICAL SAMPLE NO. (10)	BLOW COUNT (11)	REMARKS (12)
	1					7	insufficient sample
						5	
						8	
						9	
ML	2	brown silt with sand, few gravel med dense, poorly graded	-600 0.0	1812-0		6	cinders are silt sized
		black cinders with some sand some silt fine clay, med dense, poorly graded	-110 0.0			2	
CL	3	brown clay with silt, silt, fine brick, med plasticity, med stiff	-100 0.0		Archie 0945	3	
ML	4	med black cinders / brown silt with some sand fine clay, med dense, poorly graded	-100 0.0	no recovery		3	
		sand with some silt, few gravel, black, moist, cinders, med dense, poorly graded	-200 0.0	185-0		2	
		black silt with some clay some sand few gravel fine brick, med dense, poorly graded	-300 0.0			4	
SM	5	black sand with mostly silt, few gravel, cinders, moist, med density, poorly graded	-100 0.0		Archie 0855	13	
			-100 0.0			30	
	6	TD - 60 ft bas EUB 0905	0.0	no recovery			

PROJECT FUSRAP/SLDS Terminal RR Spoils Pile

ENG FORM 5056A-R, AUG 94

SLD 101302 PR
(Proprietor: ECHW-EG)

Figure 4-2 (Concluded)

SLD 101302B

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER SLD 101302B	
PROJECT FUSRAP/SLDS			INSPECTOR E Code			SHEET 2 of 2	
FLY. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (4)	FIELD LOG (3)	TEST LOG (5)	ANALYTICAL RESULTS (6)	BLOW COUNT (7)	REMARKS (8)
ML	1	brown silt with some clay some gravel, roots, med dense poorly graded	500	2.0/2.0	SLD 101302B 0917	3	
		improved bluish (fine) brown silt with some sand some clay trace brick trace gravel, med dense, poorly graded	100		5		
			2		SLD 101302B 0920	3	
			300		8		
	2	TD - 20 ft bgs EUB - 0920					
	3						
	4						
	5						
	6						

PROJECT: FUSRAP/SLDS Terminal - Sports Pile

ENG FORM 5056A-R, AUG 94

HOLE NO: SLD 101302B

(Proponent: CECW-EG)

Figure 4-2 (Concluded)

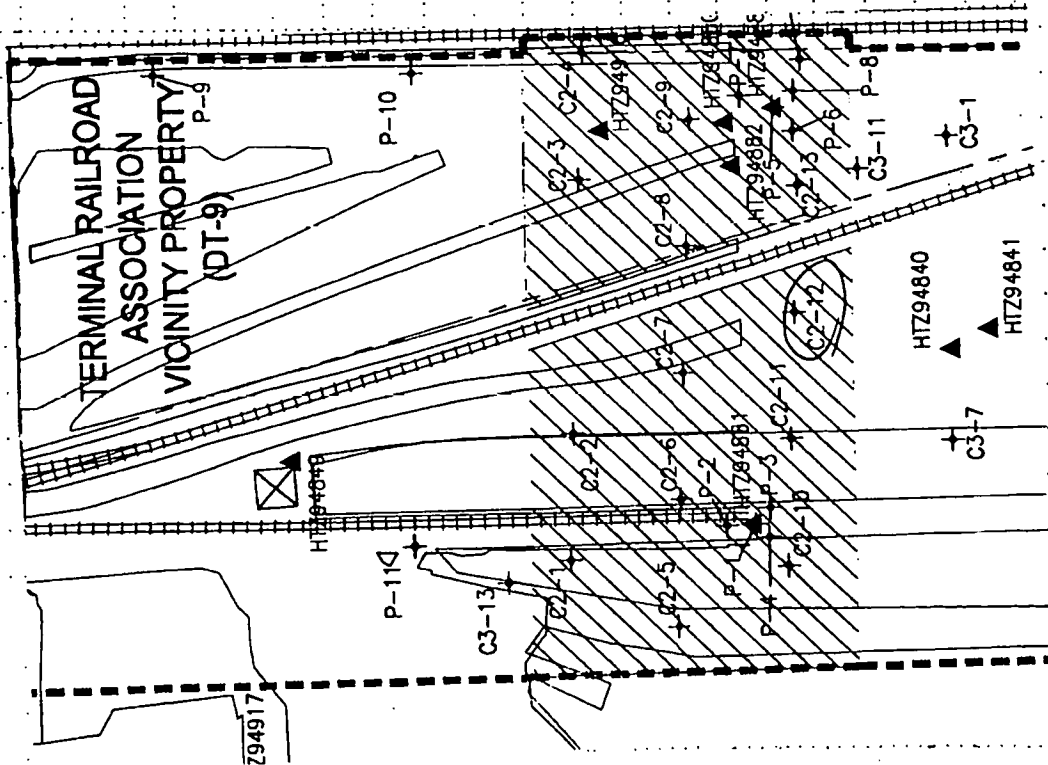
HTRW DRILLING LOG				DISTRICT <u>St. Louis</u>		HOLE NUMBER: <u>SD 101304</u>	
1. COMPANY NAME <u>Shaw E & I</u>				2. DRILLING SUBCONTRACTOR <u>Shaw</u>		SHEET <u>1</u> OF <u>2</u>	
3. PROJECT <u>FUSRAP/SLDS</u>				4. LOCATION <u>TRRT soils Pile C2-12</u>			
5. NAME OF DRILLER <u>Dan Gotto</u>				6. MANUFACTURER'S DESIGNATION OF DRILL <u>CME 75</u>			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT		<u>4 1/4" ID HSA w/ 3" x 2' split spoon</u> <u>sampler driven w/ 140# hammer over 30' hole</u>		8. HOLE LOCATION		<u>see location sketch</u>	
PID (100mm isobutylene) <u>NAI</u>		SN: <u>502309</u>		9. SURFACE ELEVATION			
cal date: <u>8-3-07</u>		cal date: <u>11-16-07</u>		10. DATE STARTED <u>5-14-07</u>		11. DATE COMPLETED <u>5-14-07</u>	
Bkg: <u>0.0 ppm</u>		Bkg: <u>55.02</u>		15. DEPTH GROUNDWATER ENCOUNTERED			
12. OVERBURDEN THICKNESS <u>NA</u>				16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED <u>NA</u>			
13. DEPTH DRILLED INTO ROCK <u>NA</u>				17. OTHER WATER LEVEL MEASUREMENTS (SPECFY) <u>NA</u>			
14. TOTAL DEPTH OF HOLE <u>6.0 ft bgs</u>							
18. GEOTECHNICAL SAMPLES		DISTURBED <u>0</u>		UNDISTURBED <u>0</u>		19. TOTAL NUMBER OF CORE BOXES <u>0</u>	
20. SAMPLES FOR CHEMICAL ANALYSIS		TOC <u>0</u>		METALS <u>0</u>		OTHER (SPECIFY) <u>RAD</u>	
		SACFILLED <u>0</u>		MONITORING WELL <u>0</u>		OTHER (SPECIFY) <u>0</u>	
22. DISPOSITION OF HOLE		<u>Bentonite</u>		23. SIGNATURE OF INSPECTOR		<u>B. Lonne</u>	

LOCATION SKETCH/COMMENTS

witnessed by: R. W. Austin

SCALE: NOT to Scale

trace <5%
few 5-10%
little 10-25%
some 20-30%
mostly/with 50-100%



PROJECT

FUSRAP/SLDS - TRRT Spools Pile

1. DATE

SLD 171304

HTRW DRILLING LOG		DISTRICT St. Louis	HOLE NUMBER SLD101320
1. COMPANY NAME Shaw E & I		2. DRILLING SUBCONTRACTOR Shaw	SHEET 1 OF 2
3. PROJECT FUSRAP/SLDS		4. LOCATION TRRT Spills Pile - P-3	
5. NAME OF DRILLER Dan Gotto		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" ID HSA w/ 3" x 2" split spoon sampler driven w/ 140# hammer over 30' hole		8. HOLE LOCATION see location sketch	
PID (100ppm isobutylene) NA SN: 502309 cal date: 8-2-07 Bkg: 0.000m		9. SURFACE ELEVATION SN: 14996760 1499674 cal date: 11-16-07 Bkg: 5100	
12. OVERBURDEN THICKNESS NA		10. DATE STARTED 5-15-07	
13. DEPTH DRILLED INTO ROCK NA		11. DATE COMPLETED 5-15-07	
14. TOTAL DEPTH OF HOLE 6.0 ft bgs		15. DEPTH GROUNDWATER ENCOUNTERED NA	
15. GEOTECHNICAL SAMPLES DISTURBED ☒ UNDISTURBED ☒		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA	
20. SAMPLES FOR CHEMICAL ANALYSIS ROC ☒ METALS ☒ OTHER (SPECIFY) RAD		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA	
22. DEPOSITION OF HOLE Bentonite		21. TOTAL CORE RECOVERY ☒ %	
23. SIGNATURE OF INSPECTOR Blaine Cobb			

LOCATION SKETCH/COMMENTS

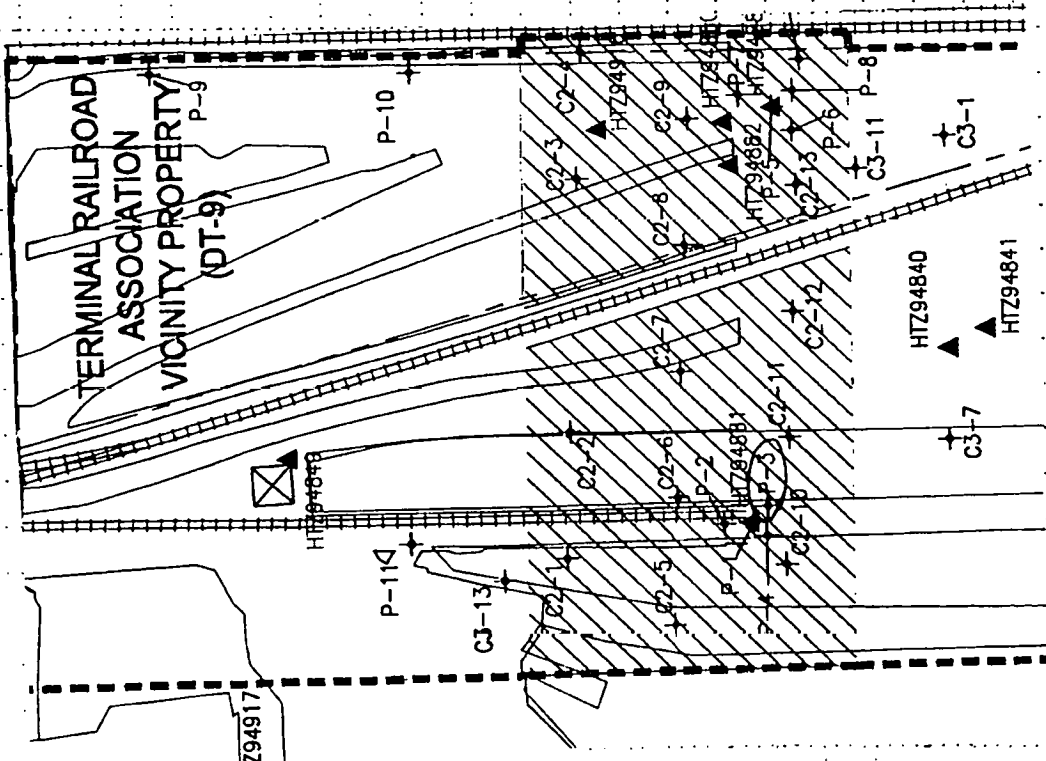
witnessed by: **NA**

moved 10 ft southwest to high area reading

SCALE: NOT to Scale

Terms Used to Describe %

trace <5%
few 5-10%
little 10-25%
some 20-30%
mostly/with 50-100%



PROJECT

FUSRAP/SLDS - TRRT Spills Pile

HOLE NO. **SLD101320**
SLD101312

1 Nov 98

HTRW DRILLING LOG (CONTINUATION SHEET)							HOLE NUMBER
PROJECT		INSPECTOR					SHEET
FUSRAP/SLDS		EC001					2 of 2
DATE	DEPTH	DESCRIPTION OF MATERIALS	FIELD SAMPLES	TESTED SAMPLES	ANALYTICAL	BLOW COUNT	REMARKS
	1	brn silt with some sand & gravel black cinders with some silt Some sand some clay trace Gravel, med dense, poorly graded	3W 0.0 500 0.0 400 0.0	1.6/2.0	SLD 101312 0853 SLD 101312 0855	101320 4 5	
ml	2	silt sized black cinders with some silt some sand few slag few clay, med dense, poorly graded black cinders with some silt some sand few gravel few clay, med black cinders with some silt some sand few brick, med density, poorly graded	300 0.0 0 0.0 500 0.0 400 0.0	1.7/2.0		8 8 9 4	
	3				SLD 101322 0845	4	
	4					4	insufficient sample
	5					2	
	6					2	
		TD-6.0ft bgs EUB 0900					changed NAI meter
PROJECT		FUSRAP/SLDS		Terminal RR - Spoils Pile			HOLE NO.
							101320 SLD 101320

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

Figure 4-2 (Concluded)

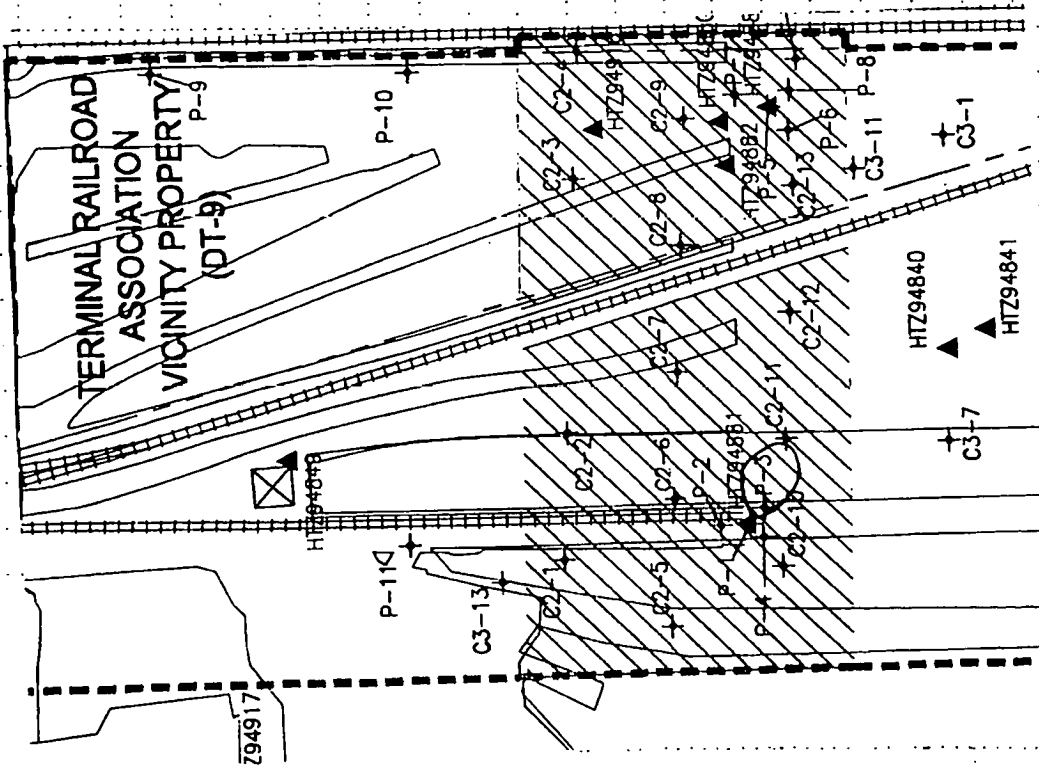
HTRW DRILLING LOG		DISTRICT	HOLE NUMBER
1. COMPANY NAME Shaw E & I		2. DRILLING SUBCONTRACTOR Shaw	ST. LOUIS SLD 101312
3. PROJECT FUSRAP/SLDS		4. LOCATION TRRA Spills Pile P-3	
5. NAME OF DRILLER Dan Gotto		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" ID HSA w/ 3 1/2" split spoon sampler driven w/ 140# hammer per 3 1/2" dia		8. HOLE LOCATION see location sketch	
PID (100ppm isobutylene) NAE		9. SURFACE ELEVATION	
SN: 502309 SN: 149963		10. DATE STARTED 5-15-07	
cal date: 2-3-07 cal date: 11-16-07		11. DATE COMPLETED 5-15-07	
Bkg: 0.000 Bkg: 5.00		15. DEPTH GROUNDWATER ENCOUNTERED NA	
12. OVERBURDEN THICKNESS NA		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA	
13. DEPTH DRILLED INTO ROCK NA		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA	
14. TOTAL DEPTH OF HOLE 6-0 ft bgs		18. GEOTECHNICAL SAMPLES	
18. GEOTECHNICAL SAMPLES		19. TOTAL NUMBER OF CORE BOXES	
20. SAMPLES FOR CHEMICAL ANALYSIS		21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE		23. SIGNATURE OF INSPECTOR	

LOCATION SKETCH/COMMENTS

witnessed by: NAE

SCALE: NOT TO SCALE
Terms Used to Describe %

trace <5%
few 5-10%
little 10-25%
some 20-30%
mostly/with 50-100%



PROJECT

FUSRAP/SLDS - TRRA Spills Pile

HOLE NO. SLD 101312
SLD 101312

1 Nov 98

SLD 101320B

ec

HTRW DRILLING LOG (CONTINUATION SHEET)						
PROJECT		INSPECTOR		SHEET		
FUSRAP/SLDS		E Cook		2 of 2		
REV.	DEPTH	DESCRIPTION OF MATERIALS	FIELD TESTS (HBM)	TESTS FOR AG	ANALYTICAL	BLOW COUNT
(1)	(2)	(3)	(4)	(5)	(6)	(7)
		augered down to 4ft bgs				
	1					
	2					
	3					
	4	silted black cinders with some silt some sand some clay, trace gravel, med dense, partly graded	200 0.0	18 1/2-0		8
	5		300 0.0			10
			300 0.0			2
	6		500 0.0	rd recovery	SLD 101320B	4
		TD-60 ft bgs EUB 0910				

PROJECT FUSRAP/SLDS TERRA Spills Pile

ENG FORM 5056A-R, AUG 94

NO. 101320B

(Proponent: CECW-EG)

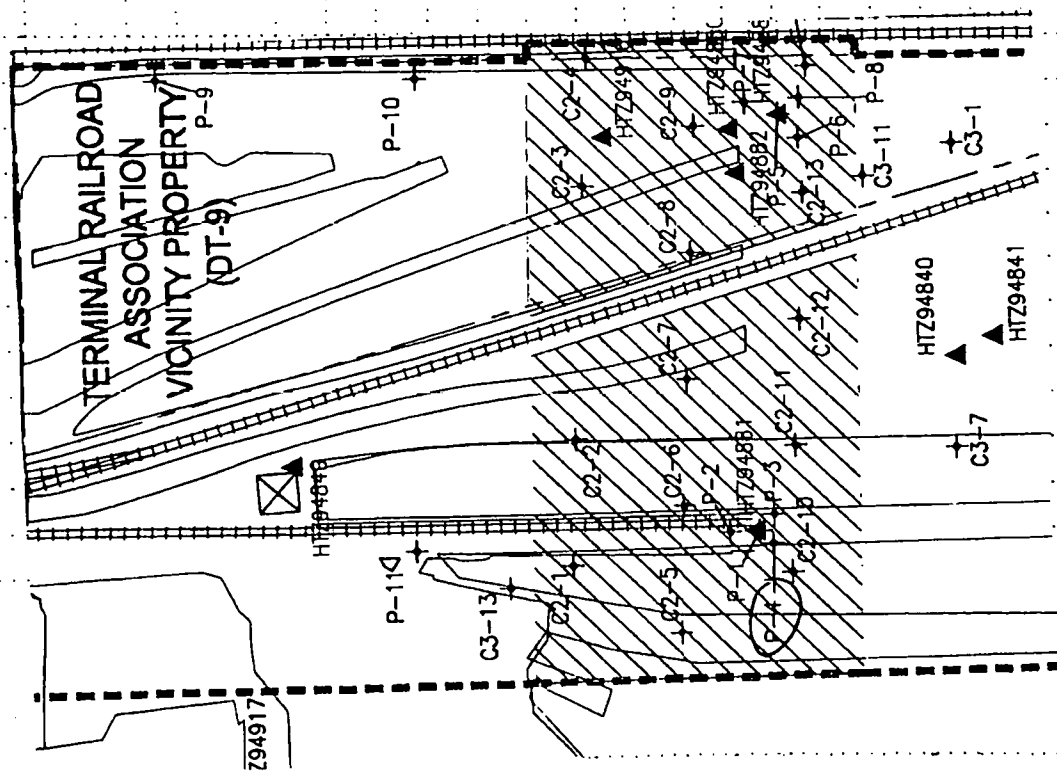
Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT St. Louis		HOLE NUMBER SLD101324	
1. COMPANY NAME Shaw E & I		2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2	
3. PROJECT FUSRAP/SLDS			4. LOCATION TRRT Spills Pile - P4		
5. NAME OF DRILLER Dan Gotto			6. MANUFACTURER'S DESIGNATION OF DRILL CMF 7.5		
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" ID HSA w/ 3 1/2" x 2 1/2" split spoon sampler driven w/ 140# hammer over 3 1/2" ID			8. HOLE LOCATION see location sketch		
PID (100mm isobutylene) NAI			9. SURFACE ELEVATION		
SN: SD2309 SN: 419963 179754			10. DATE STARTED 5-15-07		
cal date: 8-3-07 cal date: 1-11-07 11-21-07			11. DATE COMPLETED 5-15-07		
Bkg: 0-0000 Bkg: SWD			12. OVERBURDEN THICKNESS NA		
13. DEPTH DRILLED INTO ROCK NA			15. DEPTH GROUNDWATER ENCOUNTERED NA		
14. TOTAL DEPTH OF HOLE 6-0 ft bgs			16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA		
18. GEOTECHNICAL SAMPLES			19. TOTAL NUMBER OF CORE BOXES		
20. SAMPLES FOR CHEMICAL ANALYSIS		DISTURBED		UNDISTURBED	
ROCK		METALS		OTHER (SPECIFY)	
				RAD	
22. DISPOSITION OF HOLE		SACK FILLED		MONITORING WELL	
		Bentonite			
				23. SIGNATURE OF INSPECTOR Blaine Corde	

LOCATION SKETCH/COMMENTS

witnessed by: **NA**

SCALE: **NOT TO Scale**
 Terms Used to Describe %
 trace <5%
 few 5-10%
 little 10-25%
 some 20-30%
 mostly/with 50-100%



HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER SLD 101324	
PROJECT FUSRAP/SLDS		INSPECTOR E Cook		SHEET 2 OF 2 SHEETS			
REV. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD TESTS RESULTS (4)	TESTS OR CORE OR NO. (5)	ANALYTICAL LABORATORY NO. (6)	BLOW COUNT (7)	
ML	1	brown silt with some gravel, some black cinders with some silt, some clay, few sand trace gravel, 10000, poorly graded	500	2.0/2.0	SLD 101324 1023	5	
			0.0			19	
			300			0.0	15
			300			0.0	11
GC	2	brown silt with some clay, few fine, med dense poorly graded brown gravel with mostly silt, some clay, loose, poorly graded	300	1.7/2.0	SLD 101325 1025	3	
			0.0			4	
ML	3	silt sized black cinders with some sand some clay, few brick, med dense, poorly graded	300	no recovery	SLD 101326 1017	4	
			0.0			7	
			200			0.0	4
			300			0.0	4
CL	4	green gray clay with some silt med plasticity, med stiff	500	2.0/2.0	SLD 101327 1028	10	
			0.0			12	
			300			0.0	10
			200			0.0	10
	5	TD 60 ft bgs EUB-1030					

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT	HOLE NUMBER	
1. COMPANY NAME Shaw E & I		2. DRILLING SUBCONTRACTOR Shaw	ST. LOUIS SLD101328	
3. PROJECT FUSRAP/SLDS		4. LOCATION TRT Spills Pile C2-1		
5. NAME OF DRILLER Dan Gotto		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75		
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" ID HSA w/ 3 1/2" x 2 1/2" split spoon Sampler driven w/ 140# hammer over 2 1/2" ID		8. HOLE LOCATION see location sketch		
9. SURFACE ELEVATION NA		10. DATE STARTED 5-15-07		
11. DATE COMPLETED 5-15-07		12. OVERBURDEN THICKNESS NA		
13. DEPTH DRILLED INTO ROCK NA		14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA		
15. DEPTH GROUNDWATER ENCOUNTERED NA		16. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA		
17. TOTAL DEPTH OF HOLE 6.0 ft bgs		18. GEOTECHNICAL SAMPLES		
19. TOTAL NUMBER OF CORE BOXES 0		20. SAMPLES FOR CHEMICAL ANALYSIS		
21. TOTAL CORE RECOVERY 0 %		22. DISPOSITION OF HOLE		
23. SIGNATURE OF INSPECTOR Blaine Corle		24. BENTONITE Bentonite		
25. MONITORING WELL 0		26. OTHER (SPECIFY) RAD		
27. OTHER (SPECIFY) 0		28. OTHER (SPECIFY) 0		
29. OTHER (SPECIFY) 0		30. OTHER (SPECIFY) 0		

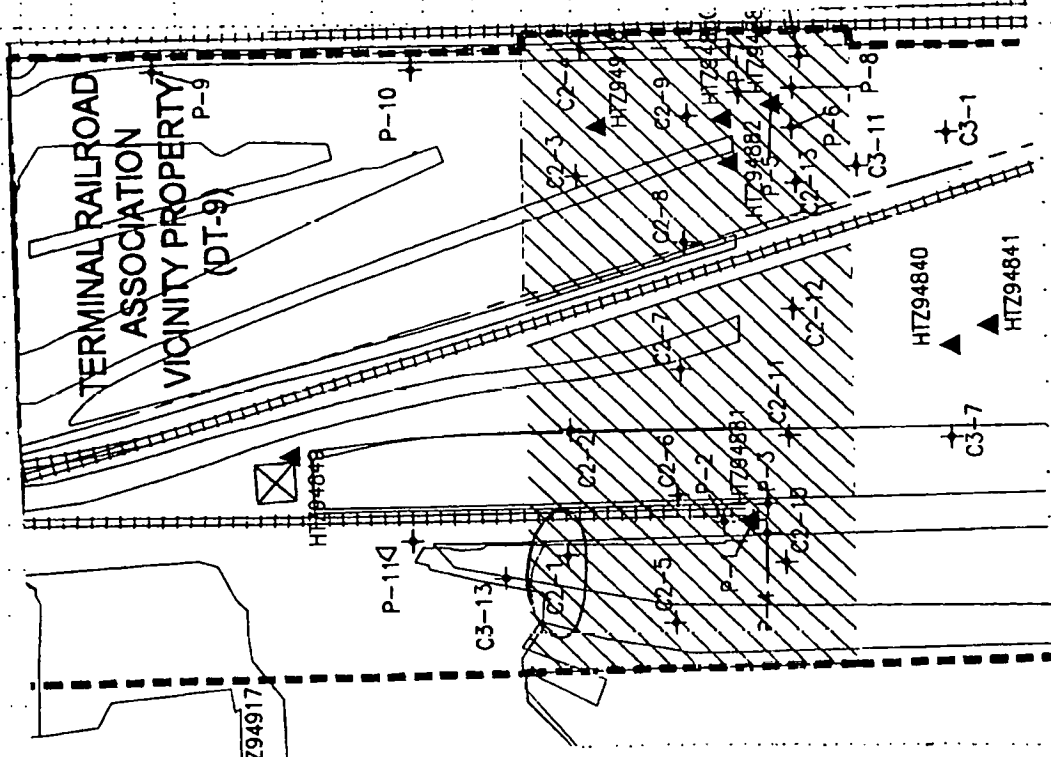
LOCATION SKETCH/COMMENTS

witnessed by: *V. Winters*

SCALE: NOT TO SCALE

Terms Used to Describe

trace <5%
few 5-10%
little 10-25%
some 20-30%
mostly/with 50-100%



PROJECT

FUSRAP/SLDS - TRT Spills Pile

HOLE NO.

SLD101328

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER SLD101328	
PROJECT FASRAP/SLDS		INSPECTOR ECook		SHEET 2 of 2			
ELY. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD TESTS (4)	TESTS (5)	QUALITY (6)	BLOW COUNT (7)	REMARKS (8)
ML		brown silt with some sand few gravel wood	100	20/20	SLD 101328 1118	5	-1, 2
WOOD		silt sized	0.0				
ML		black cinders with some silt, some slag, some gravel, medium	200			6	
SP	1	red brick with some silt, some silt, loose, poorly graded	200		SLD 101329 1120	6	cinders are silt size
		black cinders with some silt, some slag, some sand fine clay few gravel, med dense poorly graded	0.0			11	
ML	2		0.0	1.7/2.0	SLD 101330 1130	8	
			0.0			8	
	3	silt sized red brick with few black cinders few silt, loose, poorly graded	0.0			9	
		wood	0.0			8	
WOOD			100	no recovery			insufficient sample
	4		0.0				
	5						
	6	TD-6.0 ft bgs EOB 1135					

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

Figure 4-2 (Concluded)

DISTRICT

St. Louis

HOLE NUMBER

SLD101328B

1. COMPANY NAME

Shaw E & I

2. DRILLING SUBCONTRACTOR

Shaw

SHEET

1 of 2

3. PROJECT

FUSRAP/SLDS

4. LOCATION

TRRT Spills Pile C2-1

5. NAME OF DRILLER

Dan Gotto

6. MANUFACTURER'S DESIGNATION OF DRILL

CMF 75

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT

4 1/4" ID HSA w/ 9 1/2" split spoon
sampler driven w/ 140# hammer over 3/8" dia

8. HOLE LOCATION

see location sketch

9. SURFACE ELEVATION

10. DATE STARTED

5-15-07 5-16-07

11. DATE COMPLETED

5-16-07

15. DEPTH GROUNDWATER ENCOUNTERED

NA

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED

NA

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)

NA

18. GEOTECHNICAL SAMPLES

DISTURBED

UNDISTURBED

19. TOTAL NUMBER OF CORE BOXES

20. SAMPLES FOR CHEMICAL ANALYSIS

YES

NO

OTHER (SPECIFY)

OTHER (SPECIFY)

OTHER (SPECIFY)

21. TOTAL CORE RECOVERY

22. DISPOSITION OF HOLE

SACK FILLED

MONITORING WELL

OTHER (SPECIFY)

23. SIGNATURE OF INSPECTOR

Blaine Cook

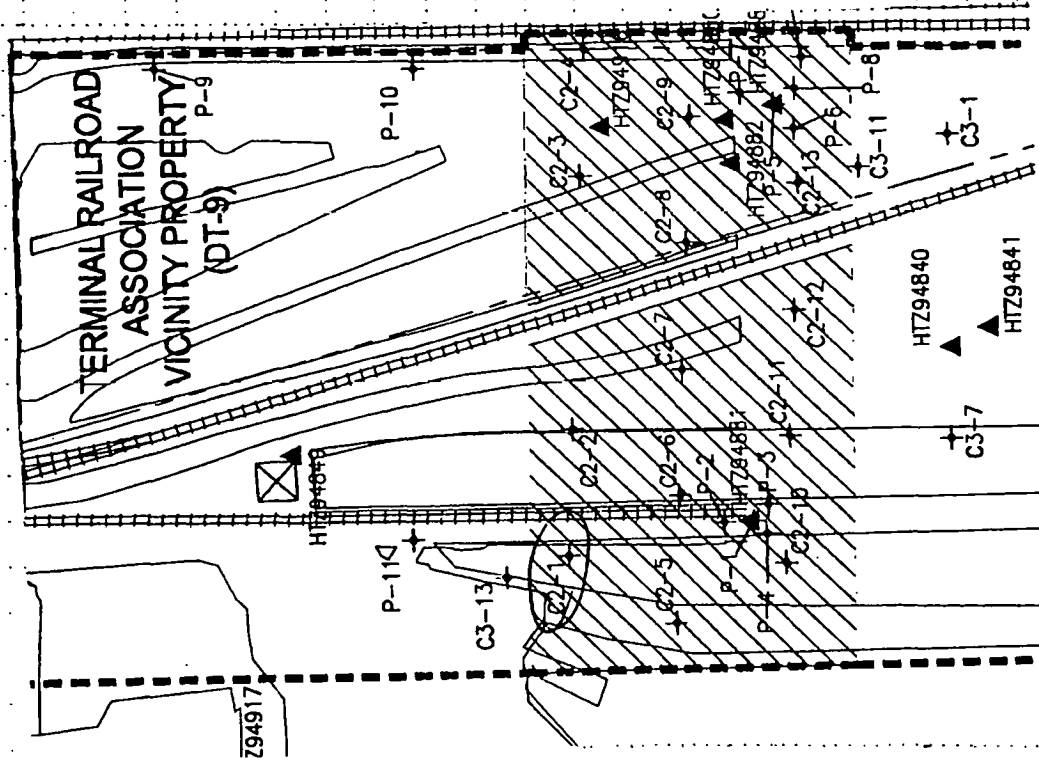
LOCATION SKETCH/COMMENTS

witnessed by: P. Winters
moved 2 ft south of original location

SCALE: NOT TO SCALE

Terms Used to Describe

trace <5%
few 5-10%
little 10-25%
some 20-30%
mostly with 50-100%



PROJECT

FUSRAP/SLDS - TRRT Spills Pile

HOLE NO.

SLD101328B

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER SLD 101328B	
PROJECT FLSRAP/SLDS			INSPECTOR E. Cook		SHEET 2 of 2		
ELV. (ft)	DEPTH (ft)	DESCRIPTION OF MATERIALS (1)	FIELD SPT RESULTS (2)	SCOTT SAMPLER NO. (3)	ANALYTICAL LAB. NO. (4)	BLOW COUNT (5)	REMARKS (6)
		augered down to 4 ft bgs					
	1						
	2						
	3						
	4						
	4	STM-STAD mottled black cinders with gray gray clay, some silt, some sand, wet, loose, poorly grad. graded	100	2.0/2.0		3	
	5		0.0			3	
	5		0.0			4	
	5		0.0			6	
	6		100		SLD 10331 0942		
	6	TD-60 ft bgs EOB - 0910					

PROJECT
FLSRAP/SLDS TERRA spoils pile

HOLE NO.
SLD 101328B

ENG FORM 5056A-R, AUG 94

(Proponent: CEC/F-EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG (CONTINUATION SHEET)							HOLE NUMBER SLD 101332
PROJECT FUSRAP/SLDS		INSPECTOR E Cook		SHEET 2 OF 2 SHEETS			
REV. (4)	DEPTH (1)	DESCRIPTION OF MATERIALS (2)	FIELD STRAINING RESULTS (3)	DESIGN SAMPLE OR CORE FOR NO. (5)	QUALITY CHECK NO. (6)	BLOW COUNT (7)	REMARKS (8)
		brown silt with some clay, some sand some gravel, med dense poorly graded	-200 0.0	1.5/2.0	SLD 101332 1030	4	
	1	light brown silt with medly gravel, some sand few clay loose, poorly graded	200 0.0			6	
			-200 0.0		SLD 101333 1032	8	
	2	black cinders with some silt, some sand some clay few gravel med dense		no recovery		6	
		black cinders with some silt, some clay few gravel, med dense, poorly graded	0 0.0	2.0/2.0		6	cinders are silt size d, and poorly graded
			-100 0.0			8	cinders are silt sized
	3		-100 0.0			8	
			0 0.0		Archive	10	
	4	silt sized black cinders with some silt, some sand, trace gravel, trace brick few clay, med dense, poorly graded	100 0.0	1.9/2.0	Archive 1017	2	
			0 0.0			1	
	5		-100 0.0			3	
		black cinders with some silt, some clay few gravel, few brick, med dense, poorly graded	0 0.0			8	cinders are silt sized
	6	TD-6 0.04 b95 EUB 1035					

PROJECT FUSRAP/SLDS TRRA Spoils Pile HOLE NO SLD 101332
ENG FORM 5056A-R, AUG 94 (Proponent: CECW/EG)

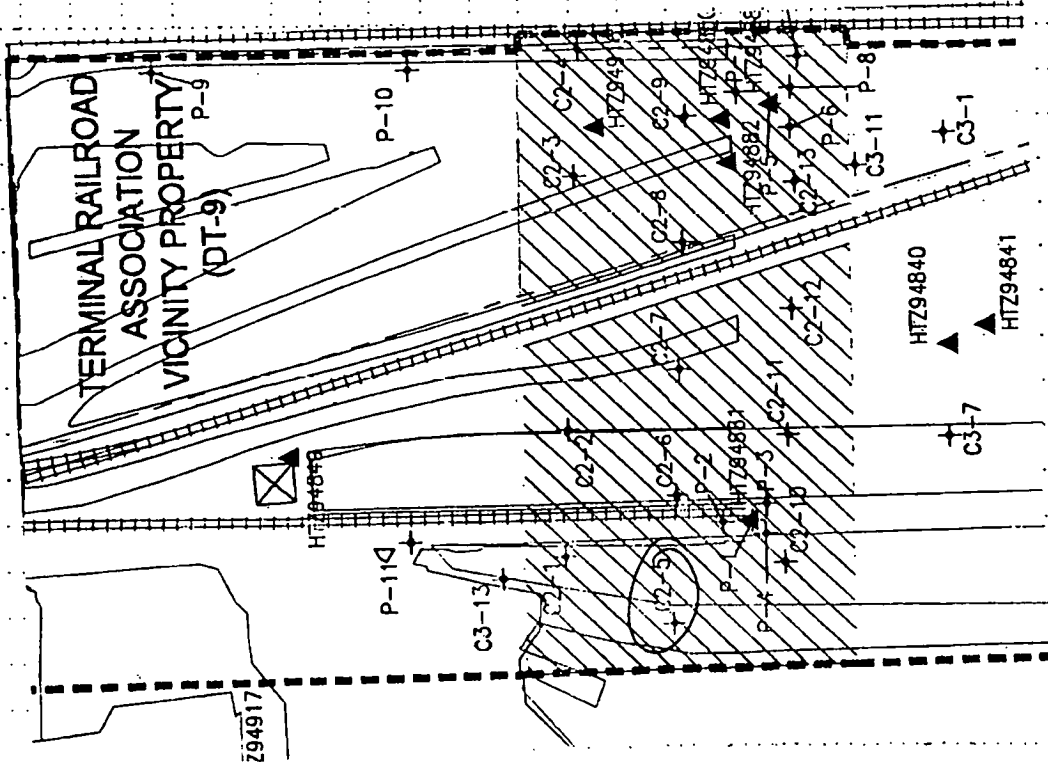
Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT	HOLE NUMBER	
1. COMPANY NAME Shaw E & I		2. DRILLING SUBCONTRACTOR Shaw	SLD101334	
3. PROJECT FUSRAP/SLDS		4. LOCATION TRRT Spills Pile C2-5		
5. NAME OF DRILLER Dan Gotto		6. MANUFACTURER'S DESIGNATION OF DRILL CMF 75		
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" ID HSA w/ 3 1/2" x 2' split spoon sampler driven w/ 140# hammer over 30' hole		8. HOLE LOCATION see location sketch		
9. SURFACE ELEVATION		10. DATE STARTED 5-16-07		
11. DATE COMPLETED 5-16-07		12. OVERBURDEN THICKNESS NA		
13. DEPTH DRILLED INTO ROCK NA		15. DEPTH GROUNDWATER ENCOUNTERED NA		
14. TOTAL DEPTH OF HOLE 6.0 ft bis		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA		
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA		18. GEOTECHNICAL SAMPLES		
19. TOTAL NUMBER OF CORE BOXES		20. SAMPLES FOR CHEMICAL ANALYSIS		
DISTURBED		UNDISTURBED		
21. TOTAL CORE RECOVERY		22. DISPOSITION OF HOLE		
23. SIGNATURE OF INSPECTOR		24. SCALE: NOT TO SCALE		
Bentonite		Terms Used to Describe %		
RAD		trace <5%		
OTHER (SPECIFY)		few 5-10%		
OTHER (SPECIFY)		little 10-25%		
OTHER (SPECIFY)		some 20-30%		
OTHER (SPECIFY)		mostly/with 50-100%		

LOCATION SKETCH/COMMENTS

witnessed by: R. W. Wadley

SCALE: NOT TO SCALE
Terms Used to Describe %
trace <5%
few 5-10%
little 10-25%
some 20-30%
mostly/with 50-100%



PROJECT

FUSRAP/SLDS - TRRT Spills Pile

HOLE NO.

SLD101334

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER SLD 101334		
PROJECT EUS RAP/SLDS			INSPECTOR E CODE		SHEET 2 of 3			
ELV. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD TESTS (4)	TESTED SAMPLE OR TEST NO. (5)	QUALITY CHECK NO. (6)	BLOW COUNT (7)	REMARKS (8)	
6	1	gray gravel with some sand some silt some clay, very loose, poorly graded	0 0.0	1.8/2.0	SLDS 101334 1107	40		
		brown silt with some gravel some clay few sand, looser poorly graded	-100 0.0			13		
			-100 0.0			3		
			200 0.0	SLD 101335 1110	5			
			0.0	no meaning				
		2		200 0.0	1.8/2.0		8	
				200 0.0		Archive 1115	6	
				100 0.0			3	
				0.0			6	
		3		100 0.0			7	
0.0					5			
0.0					7			
0.0					7			
4	silt sized black clinders with some silt, some sand, some clay, few gravel few brick, few slag med dense, poorly graded	0.0	no meaning					
		100 0.0	1.7/2.0					
		300 0.0						
		300 0.0		Archive				
5		0.0						
		0.0						
6	brick	0.0						
		0.0						
6	TD-b. over bags EUS 1120	0.0	no meaning					
		0.0						

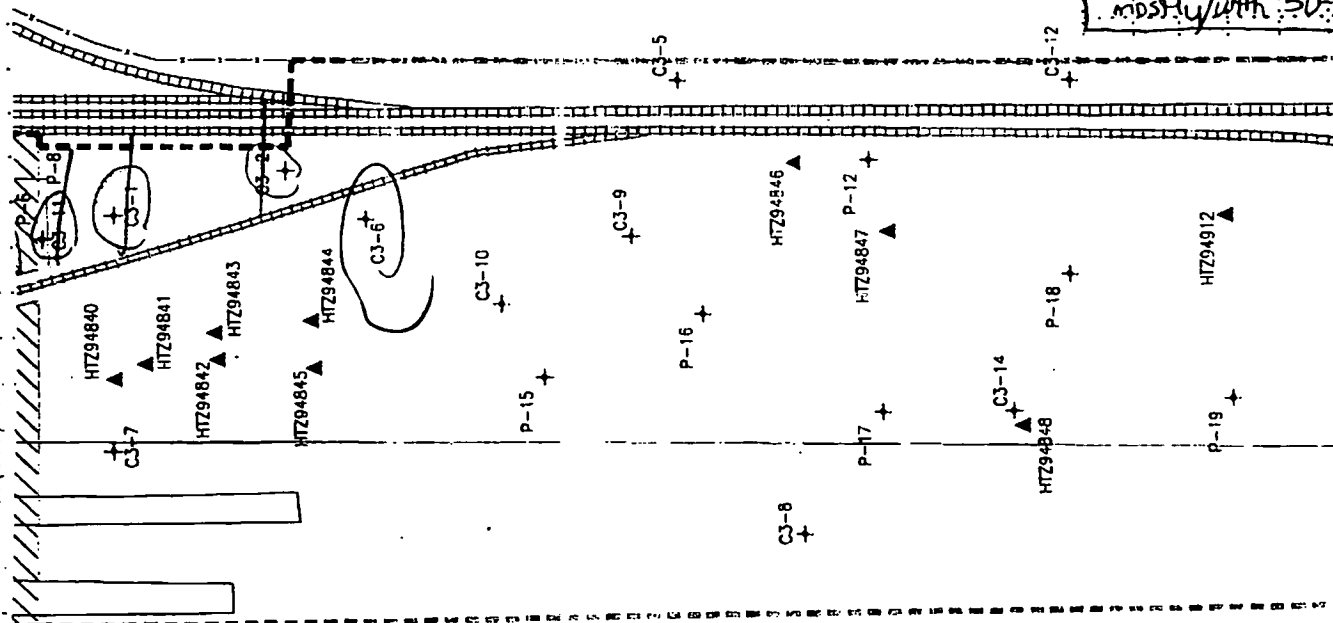
Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT St. Louis		HOLE NUMBER: SLD101336	
1. COMPANY NAME Shaw E & J		2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2	
3. PROJECT FUSRAP/SLDS		4. LOCATION TKRA Spills Pile - P3-16			
5. NAME OF DRILLER Dan Goto		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" ID HSA w/ 3 1/2" split spoon Sampler driven w/ 140# hammer for 30' depth		8. HOLE LOCATION see location sketch			
PID: 100mm isobutylene NAI		9. SURFACE ELEVATION			
SN: 502309 SN: 172046		10. DATE STARTED 5-16-07			
Cal date: 8-3-07 mid date: 11-2-1-07		11. DATE COMPLETED 5-16-07			
Bkg: 0.00mm Bkg: 5000		15. DEPTH GROUNDWATER ENCOUNTERED NA			
12. OVERBURDEN THICKNESS NA		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA			
13. DEPTH DRILLED INTO ROCK NA		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA			
14. TOTAL DEPTH OF HOLE 6.0 ft bgs		19. TOTAL NUMBER OF CORE BOXES			
18. GEOTECHNICAL SAMPLES		DISTURBED ☒		UNDISTURBED ☒	
20. SAMPLES FOR CHEMICAL ANALYSIS		ROCK ☒		METALS ☒	
		OTHER (SPECIFY) RAD		OTHER (SPECIFY) ☒	
22. DISPOSITION OF HOLE		SACRIFICED ☒		MONITORING WELL ☒	
Bentonite		☒		23. SIGNATURE OF INSPECTOR 3 Jan 07B	
21. TOTAL CORE RECOVERY ☒					

LOCATION SKETCH/COMMENTS

witnessed by: **D. W. [Signature]**

SCALE: NOT TO SCALE
Terms Used to Describe %
trace <5%
few 5-10%
little 10-25%
some 20-30%
mostly/with 50-100%



PROJECT

FUSRAP/SLDS TKRA Spills Pile

HOLE NO.

SLD101336

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER SLD M1336	
PROJECT FUSRAP/SLDS		INSPECTOR E Cook		SHEET 2 OF 3		SHEET 3 OF 3	
DATE	DEPTH (ft)	DESCRIPTION OF MATERIALS (ft)	FIELD SCREENING RESULTS (ft)	DETECT SAMPLE OR CORE NO. NO.	ANALYTICAL SAMPLE NO.	BLOW COUNT (ft)	REMARKS (ft)
ML	1	brown silt with mostly gravel some clay, fine sand, loose, poorly graded	0 0.0	20/20	SLD 101336 1335	6	
		silt sized black cinders with some silt, some clay, fine sand, med dense, poorly graded	0 0.0			10	
			0 0.0			12	
	2		0 0.0	20/20	SLD 101337 1337	15	
			20/20 2.2			6	
			400 0.0			6	
	3		200 0.0		Archive 1343	7	
			0 0.0			5	
			300 0.0			2	
	4	silt sized black cinders with some silt some gravel, few clay, med dense, poorly graded	600 0.0	20/20	Archive 1350	1	
			0 0.0			3	
			400 0.0			4	
5	mottled black cinders/green- gray silt with some clay, few sand trace brick, med dense poorly graded	0 0.0					
6	ID - (6.1) ft bag EOB - 1345						

PROJECT FUSRAP/SLDS TRRT Spills Pile HOLE NO. SLD M1336
ENG FORM 5056A-R, AUG 94 (Proponent: CECW:EG)

Figure 4-2 (Concluded)

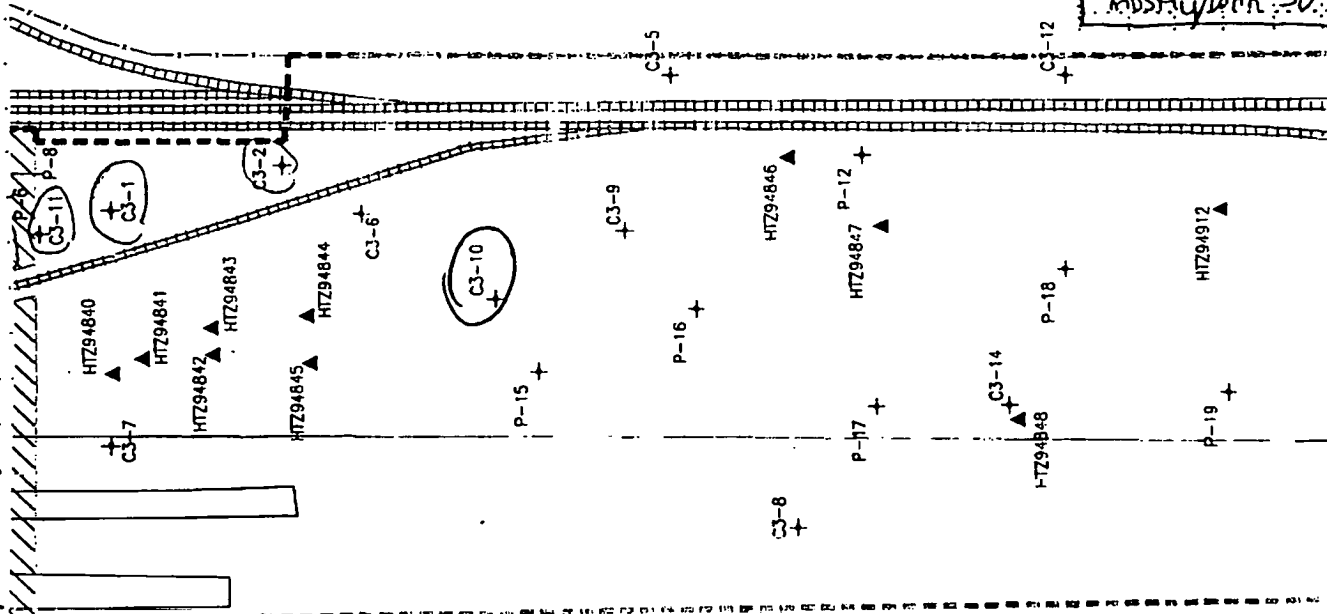
HTRW DRILLING LOG		DISTRICT	St. Louis		HOLE NUMBER	SLD101338	
1. COMPANY NAME		2. DRILLING SUBCONTRACTOR		SHEET		SHEETS	
Shaw E & I		Shaw		1		2	
3. PROJECT		4. LOCATION		5. NAME OF DRILLER		6. MANUFACTURER'S DESIGNATION OF DRILL	
FUSRAP/SLDS		TKRA Spoils Pile - C3-10		Dan Gotto		CME 75	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT		8. HOLE LOCATION		9. SURFACE ELEVATION		10. DATE STARTED	
4 1/4" ID HSA w/ 9 1/2" split spoon sampler driven w/ 140# hammer per 30' drop		see location sketch				5-16-07	
PID (100mm isobutylene) NAE		11. DATE COMPLETED		12. OVERBURDEN THICKNESS		13. DEPTH DRILLED INTO ROCK	
SN: 502309		5-16-07		NA		NA	
Cal date: 8-3-07		5-16-07		14. TOTAL DEPTH OF HOLE		15. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
Bkg: 0.0 ppm		5-16-07		6.0 ft bgs		NA	
18. GEOTECHNICAL SAMPLES		19. TOTAL NUMBER OF CORE BOXES		20. SAMPLES FOR CHEMICAL ANALYSIS		21. TOTAL CORE RECOVERY	
DISTURBED		0		ROCK		0 %	
UNDISTURBED		0		METALS		0	
		0		OTHER (SPECIFY)		0	
		0		OTHER (SPECIFY)		0	
		0		OTHER (SPECIFY)		0	
22. DISPOSITION OF HOLE		23. SIGNATURE OF INSPECTOR		Bentonite		Blaine Corle	
				0		0	

LOCATION SKETCH/COMMENTS

witnessed by: R. W. Winters

SCALE: NOT TO SCALE

Terms Used to Describe %
 trace < 5%
 few 5-10%
 little 10-25%
 some 20-30%
 mostly/with 50-100%



PROJECT

FUSRAP/SLDS TKRA Spoils Pile

HOLE NO.

SLD101338

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER SLD 101338		
PROJECT FUS RAPIS LIDS		INSPECTOR E Cook		SHEET 2 OF 2 SHEETS				
ELV. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD SCREENING RESULTS (4)	TESTS SAMPLE NO. (5)	ANALYTICAL LAB. NO. (6)	BLOW COUNT (7)	REMARKS (8)	
ML	1	brown silt with some clay, some sand some gravel, mod dense, poorly graded	200 0.0	1.7/2.0	SLD 101338 1405	4	cinders are silt size d	
			100 0.0		SLD 101339 1407	6		
		light brown silt with some clay some gravel, mod dense, poorly graded	0 0.0			8		
	2	black cinders with mostly slag, some silt, mod dense, poorly graded	0 0.0	no remaining 20/20				59
			200 0.0			8		
			200 0.0			24		
	3		600 0.0		SLD 101340 1415	19		
			200 0.0			14		
			400 0.0		3			
	4	silt sized black cinders with some silt, some clay, some sand, trace wood, few gravel, trace slag, mod dense, poorly graded	300 0.0	2.0/2.0				5
			200 0.0			4		
			0 0.0			6		
5								
6								
		TD-6.0 ft bgs EUB 1415						

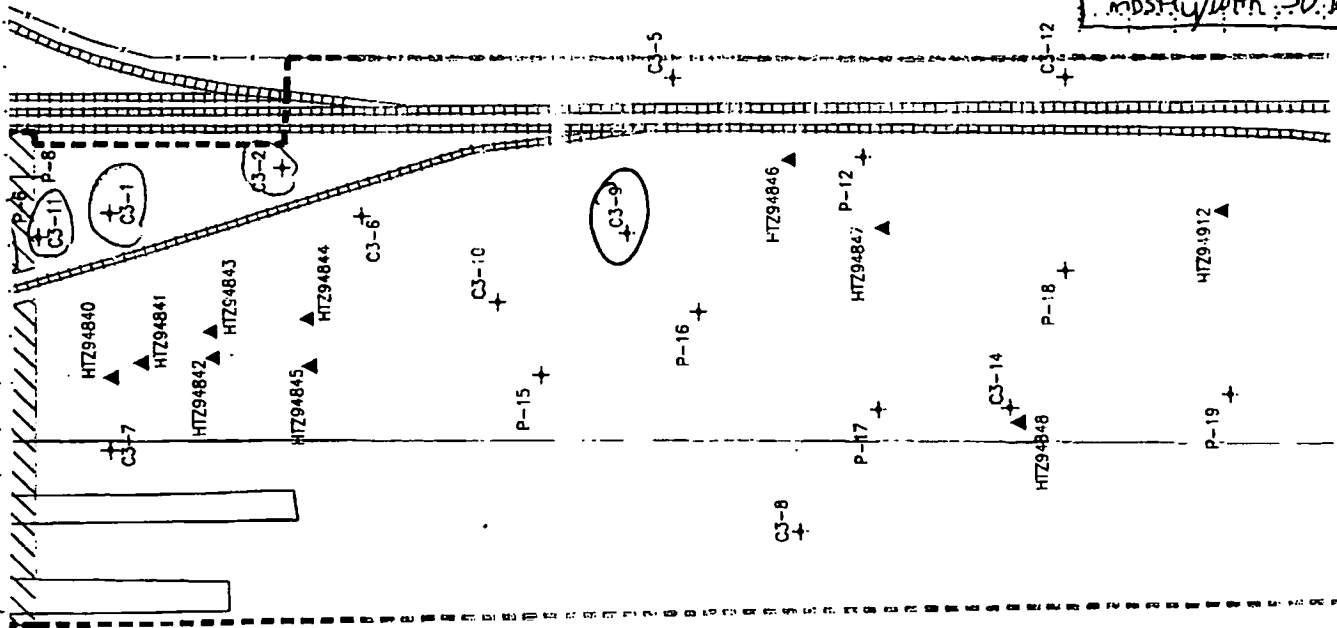
PROJECT FUS RAPIS LIDS TRRA Spills Pile HOLE NO SLD 101338
ENG FORM 5056A-R, AUG 94 (Proponent): CECW:EG

Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT St. Louis		HOLE NUMBER SLD10342	
1. COMPANY NAME Shaw E & I		2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2	
3. PROJECT FUSRAP/SLDS		4. LOCATION TKRA Spills Pile - C3-9			
5. NAME OF DRILLER Dan Gotto		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" ID HSA w/ 3 1/2" split spoon sampler driven w/ 140# hammer ext 30' dia		8. HOLE LOCATION see location sketch			
9. SURFACE ELEVATION		10. DATE STARTED 5-16-07			
11. DATE COMPLETED 5-16-07		12. OVERBURDEN THICKNESS NA			
13. DEPTH DRILLED INTO ROCK NA		15. DEPTH GROUNDWATER ENCOUNTERED 4.6 ft			
14. TOTAL DEPTH OF HOLE 6.0 ft bas		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA			
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA		18. GEOTECHNICAL SAMPLES			
DISTURBED ☒		UNDISTURBED ☒		19. TOTAL NUMBER OF CORE BOXES ☒	
20. SAMPLES FOR CHEMICAL ANALYSIS		TOC ☒		METALS ☒	
OTHER (SPECIFY) RAD		OTHER (SPECIFY) ☒		OTHER (SPECIFY) ☒	
22. DISPOSITION OF HOLE Bentonite		SAO FILLED ☒		MONITORING WELL ☒	
23. SIGNATURE OF INSPECTOR B. Tamm		DATE 6/1/06		21. TOTAL CORE RECOVERY ☒	

LOCATION SKETCH/COMMENTS

witnessed by: **R. W. Winters** SCALE: NOT TO SCALE
 Terms Used to Describe %
 trace <5%
 few 5-10%
 little 10-25%
 some 20-30%
 mostly/with 50-100%



PROJECT

FUSRAP/SLDS TKRA Spills Pile

HOLE NO.

SLD10342

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER SLD101342
PROJECT FLSRAP/SLDS		INSPECTOR E. COOK		SHEET 2 OF 2 SHEETS		
ELV. (b)	DEPTH (f)	DESCRIPTION OF MATERIALS (d)	FIELD LOGGING REMARKS (e)	SOIL SAMPLE SYMBOL FOR NO. (g)	ANALYTICAL SAMPLE NO. (h)	BLOW COUNT (i)
ML	1	black cinders with some silt, some gravel, few clay, few sand, loose, poorly graded	0 0.0	1.5/2.0	SLD 101342 1440	3
			100 0.0			4
			100 0.0		SLD 101343 1445	4
			no recovery			8
SM	2	med brown sand, med dense, well graded	-200 0.0	2.0/2.0		5
ML	3	black cinders with some silt, some clay, some sand, trace slag, med dense, poorly graded	-200 0.0			7
			-200 0.0			15
			0 0.0	Archive 1450	11	
			0 0.0		4	
SM	4	med black coarse sand with some cinders, some silt, wet loose, poorly graded	0 0.0	1.8/2.0		76
ML	5	black cinders with some silt, some sand, wet, saturated, very loose, poorly graded	0 0.0			23
			-200 0.0	Archive 1435	6	
			0 0.0			
			0 0.0			
	6	TD-6.0 ft bas EUB-1450				

ENG FORM 5056A-R, AUG 94

(Proponent: ECH-EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT St. Louis		HOLE NUMBER SLD111344	
1. COMPANY NAME Shaw E & I		2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2	
3. PROJECT FUSRAP/SLDS		4. LOCATION TRRA Spoils Pile - C3-5			
5. NAME OF DRILLER Dan Goto		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" ID HSA w/ 9 1/2" split spoon sampler driven w/ 140# hammer pier 30 ft		8. HOLE LOCATION see location sketch			
PID (100mm isobutylene) NAI (2)		9. SURFACE ELEVATION			
SN: 502309 SN: 173046 172059		10. DATE STARTED 5-17-07		11. DATE COMPLETED 5-17-07	
Cal date: 8-3-07 mid date: 11-3-07 2-14-08		15. DEPTH GROUNDWATER ENCOUNTERED NA			
Bkg: 0.0 ppm Bkg: 8200		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA			
12. OVERBURDEN THICKNESS NA		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA			
13. DEPTH DRILLED INTO ROCK NA		14. TOTAL DEPTH OF HOLE 6.0 ft bis			
18. GEOTECHNICAL SAMPLES		DISTURBED ☒		UNDISTURBED ☒	
19. TOTAL NUMBER OF CORE BOXES ☒					
20. SAMPLES FOR CHEMICAL ANALYSIS		TOC ☒		METALS ☒	
		OTHER (SPECIFY) RAD		OTHER (SPECIFY) ☒	
22. DISPOSITION OF HOLE		SACK FILLED ☒		MONITORING WELL ☒	
		Bentonite ☒		OTHER (SPECIFY) Blaine link	
21. TOTAL CORE RECOVERY ☒					

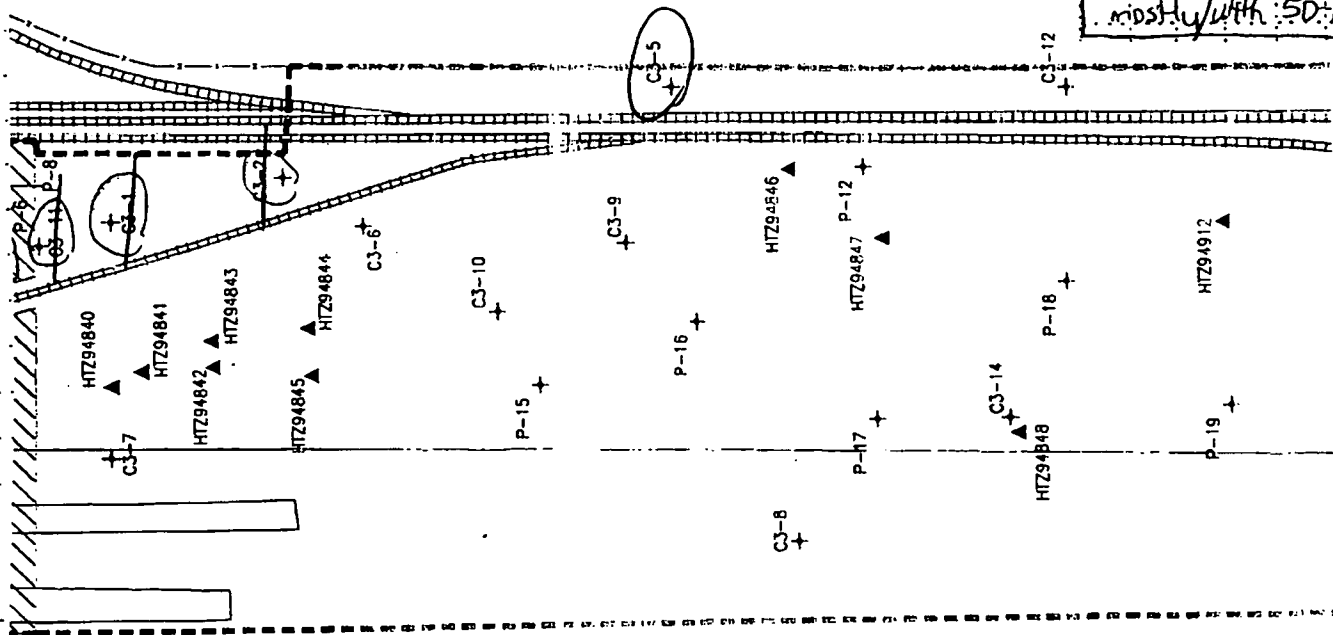
LOCATION SKETCH/COMMENTS

witnessed by: **V. Winters**

SCALE: NOT to Scale

Terms Used to Describe %

trace <5%
few 5-10%
little 10-25%
some 20-30%
mostly/with 50-100%



PROJECT

FUSRAP/SLDS TRRA Spoils Pile

HOLE NO.

SLD111344

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER SLD 101344	
PROJECT FUSRAP/SCDS		INSPECTOR E Cook		SHEET 2 OF 2		SHEET	
ELY. CL.	DEPTH (ft)	DESCRIPTION OF MATERIALS (ft)	FIELD MEASUREMENTS (ft)	TESTING SAMPLE & TEST TYPE (ft)	ANALYTICAL LABORATORY NO.	BLOW COUNT (ft)	REMARKS (ft)
mc		brown silt with some clay, some sand few gravel med dense poorly graded	0 / 2.0	2.0/2.0	SLD 101344 0920	13	
bc		fine gravel with some sand some silt some clay, loose poorly graded	500 / 0.0			22	
	1	black cinders with some silt some sand, some gravel few clay, med dense, poorly graded	600 / 0.0			6	cinders are silt sized
			800 / 0.0		SLD 101344 0922	7	
	2	silt sized black cinders with some silt some sand few gravel, med dense, poorly graded	-100 / 0.0	2.0/2.0		13	
		brown silt with some clay some sand few gravel, med dense, poorly graded	300 / 0.0		Archive 0915	33	
		brown silt with some gravel some sand, loose, poorly graded	400 / 0.0			28	
		gray silt with mucky, very few gravel, med dense, poorly graded	0 / 2.0			10	
	4	reddish brown silt, med dense, poorly graded	-200 / 0.0	2.0/2.0		4	black cinders are silt sized
		med black cinders/tight mucky gray silt with some sand, loose	100 / 0.0			5	cinders are silt sized
		black cinders with some silt some clay some sand, med dense, poorly graded	-200 / 0.0			7	
	5	silt sized black cinders with some silt, some sand some gravel w/ fine med dense, poorly graded	-200 / 0.0		Archive 0915	9	
	6	TD-6.0 ft bas EOB-0925					

PROJECT FUSRAP/SCDS TRRA Sports Pile HOLE NO. SLD 101344
ENG FORM 5056A-R, AUG 94 (Proponent: ECRW-EG)

Figure 4-2 (Concluded)

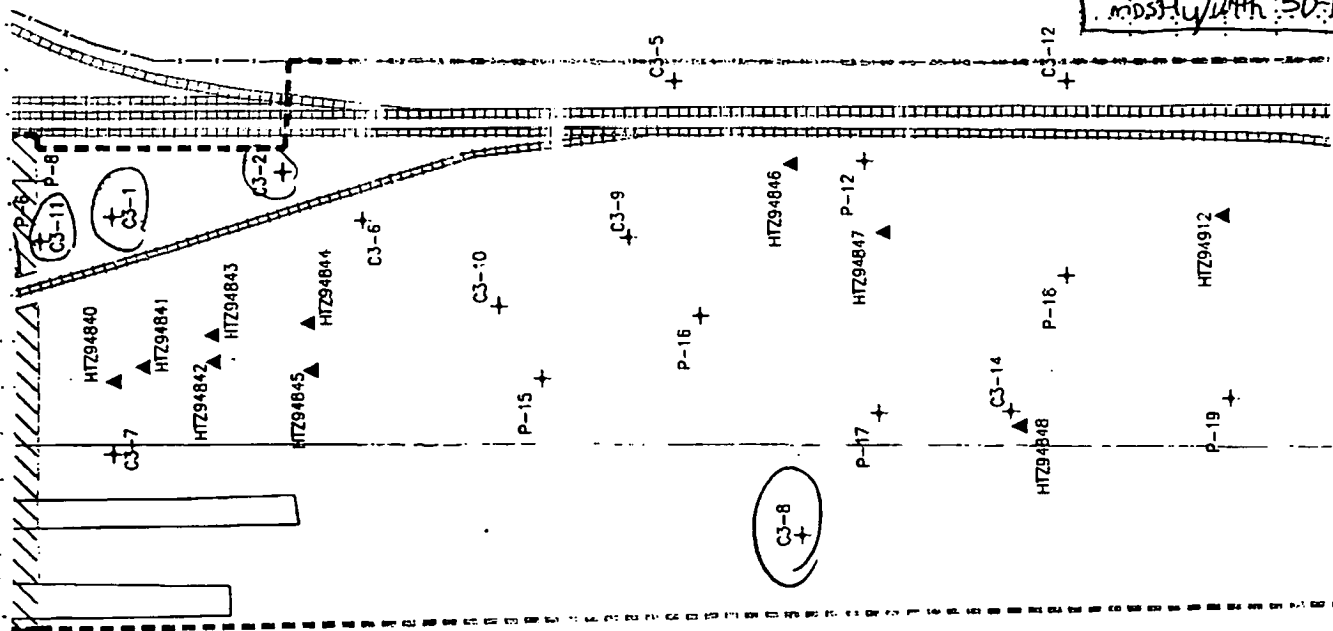
HTRW DRILLING LOG		DISTRICT St. Louis		HOLE NUMBER SLD101346	
1. COMPANY NAME Shaw E & I		2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2	
3. PROJECT FUSRAP/SLDS		4. LOCATION TRRA Spoils Pile - C3-8			
5. NAME OF DRILLER Dan Gatto		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" ID HSA w/ 9" x 2' split spoon sampler driven w/ 140# hammer per 30' drop		8. HOLE LOCATION see location sketch			
9. SURFACE ELEVATION		10. DATE STARTED 5-21-07		11. DATE COMPLETED 5-21-07	
12. OVERBORDEN THICKNESS NA		15. DEPTH GROUNDWATER ENCOUNTERED NA			
13. DEPTH DRILLED INTO ROCK NA		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA			
14. TOTAL DEPTH OF HOLE 6.5 ft bgs		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA			
18. GEOTECHNICAL SAMPLES		19. TOTAL NUMBER OF CORE BOXES			
DISTURBED ☒		UNDISTURBED ☒			
20. SAMPLES FOR CHEMICAL ANALYSIS		21. TOTAL CORE RECOVERY			
TOX ☒		METALS ☒		OTHER (SPECIFY) RAD	
SAC-FILLED ☒		MONITORING WELL ☒		OTHER (SPECIFY) ☒	
22. DISPOSITION OF HOLE Bentonite		23. SIGNATURE OF INSPECTOR B. Lonne			

LOCATION SKETCH/COMMENTS

witnessed by: **R. Winters**

SCALE: NOT TO SCALE

Terms Used to Describe %
 trace <5%
 few 5-10%
 little 10-25%
 some 20-30%
 mostly/with 50-100%



PROJECT **FUSRAP/SLDS TRRA Spoils Pile**

HOLE NO. **SLD101346**

HTRW DRILLING LOG (CONTINUATION SHEET)							NOTE NO. 5L2101346
PROJECT FUSRAP/SLDS		INSPECTOR E Cook		SHEET 2 OF 2		SHEETS	
DEPTH (ft)	DESCRIPTION OF MATERIALS	FIELD SPT (blows/ft)	FIELD SAMPLE NO.	ANALYTICAL NO.	BLOW COUNT	REMARKS	
1	Concrete - augered thru	—	—	—	—	insufficient sample	
2					14		
					16		
					20		
					37		
3	silt sized black cinders with some silt some clay some sand, med dense, poorly graded	-200 0.0			4		
		-200 0.0			5		
		-100 0.0			5		
4	silt sized black cinders with some silt some clay some sand, med dense	-300 0.0		Archive 1420	5	poorly graded cinders are silt sized	
	black cinders with some silt some clay med dense, poorly graded	0 0.0	2.0/2.0		4	cinders are silt sized	
5	black cinders with some silt some clay med dense, poorly graded	200 0.0			3	cinders are silt sized	
	black cinders with some silt some sand, med dense, poorly graded	0 0.0		Archive 1410	2	cinders are silt sized	
6		-100 0.0			3		
TD 6.5 ft bgs EOB 1425							

PROJECT FUSRAP/SLDS TRRT Spills Pile

ENG FORM 5056A-R, AUG 94

NOTE NO. 5L2101346 (Proponent: ECH/EG)

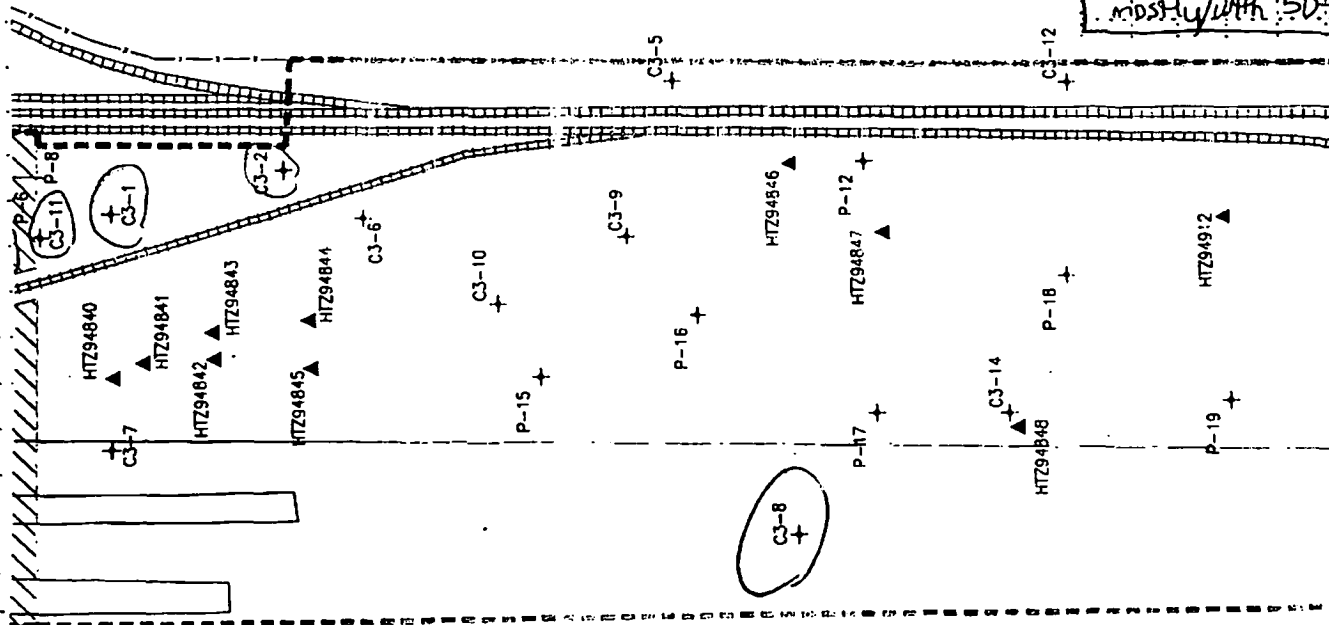
Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT St. Louis		HOLE NUMBER: SLD101346B	
1. COMPANY NAME Shaw E & I		2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 of 2	
3. PROJECT FUSRAP/SLDS		4. LOCATION TKRA Spills Pile - C3-8			
5. NAME OF DRILLER Dan Gotto		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" ID HSA w/ 3" x 2" split spoon sampler driven w/ 140# hammer over 3' into P		8. HOLE LOCATION see location sketch			
9. SURFACE ELEVATION		10. DATE STARTED 5-22-07			
11. DATE COMPLETED 5-22-07		12. OVERBURDEN THICKNESS NA			
13. DEPTH DRILLED INTO ROCK NA		14. TOTAL DEPTH OF HOLE 25 ft bias			
15. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA		16. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA			
17. GEOTECHNICAL SAMPLES		DISTURBED ☒		UNDISTURBED ☒	
18. SAMPLES FOR CHEMICAL ANALYSIS		VOC ☒		METALS ☒	
19. TOTAL NUMBER OF CORE BOXES ☒		OTHER (SPECIFY) RAD		OTHER (SPECIFY) ☒	
20. DISPOSITION OF HOLE		SACRIFICED ☒		MONITORING WELL ☒	
21. SIGNATURE OF INSPECTOR Blaine Leis		22. TOTAL CORE RECOVERY ☒		23. SIGNATURE OF INSPECTOR Blaine Leis	

LOCATION SKETCH/COMMENTS

witnessed by: **R. W. B. B.** SCALE: NOT TO SCALE
Terms Used to Describe %

trace <5%
few 5-10%
little 10-25%
some 20-30%
mostly/with 50-100%



PROJECT

FUSRAP/SLDS TKRA Spills Pile

HOLE NO.

SLD101346

HTRW DRILLING LOG (CONTINUATION SHEET)							PROJECT NUMBER SECTION 46B
PROJECT FUSRAP/SLDS		INSPECTOR E. Cant		SHEET 2 OF 2			
ITEM (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD PENETRATION TESTS (4)	WATER SAMPLE ANALYSIS (5)	TEST/AL DATA (6)	BLOW COUNT (7)	REMARKS (8)
Concrete		Concrete				—	
	1	silt-sized black cinders with some silt, some sand, med dense, poorly graded	400 0.1	2.0/2.0	SCD 11/13/46 0849	9	
ML	2	silt-sized black cinders some silt, some sand few gravel, med dense, poorly graded black cinders, some silt, some gravel med dense, poorly graded black cinders, some silt, some sand, med dense, poorly graded	100 0.1 0.1 0.1 0.1		SCD 10/24/97 0851	10 13	cinders are silt- sized cinders are silt-sized
	3	TD-2.5 ft bgs ZOB 0855				20	
	4						
	5						
	6						

PROJECT FUSRAP/SLDS TRRT spalls Pile

ENG FORM 5056A-R, AUG 94

NO. 160
SCD 10/346-B
(Proprietor: ECH:10)

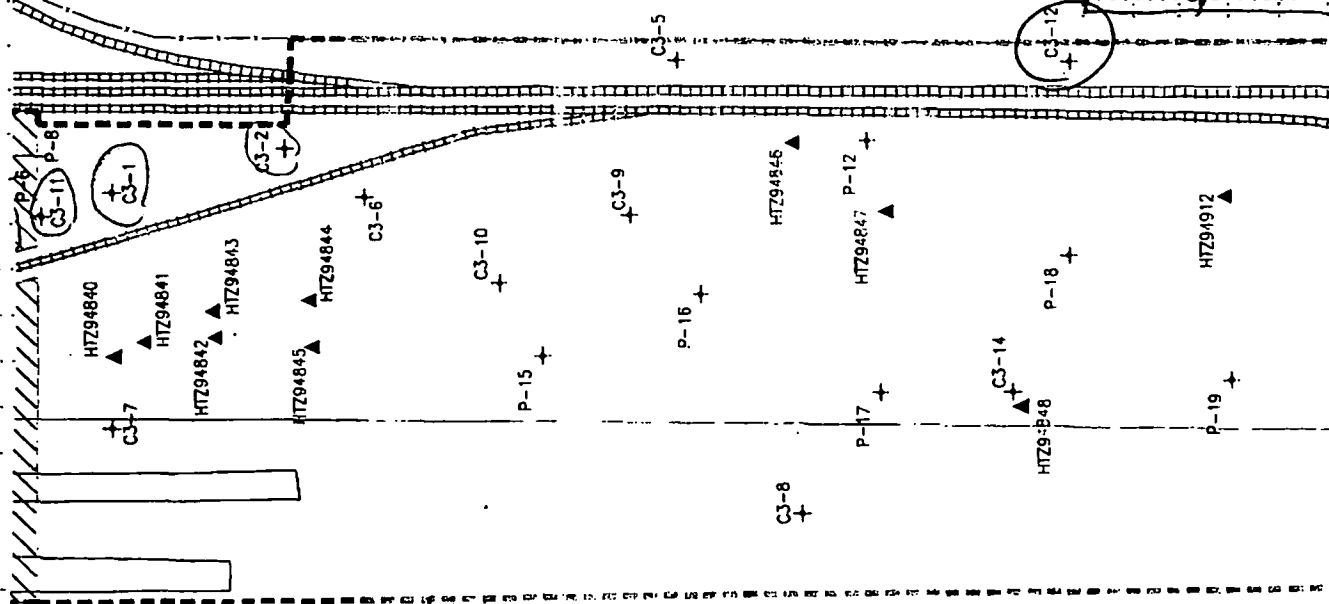
Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT St. Louis		HOLE NUMBER: SLD101366	
COMPANY NAME Shaw E & I		2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2	
3. PROJECT FUSRAP/SLDS			4. LOCATION TKRA Spills Pile - C3-12		
5. NAME OF DRILLER Dan Gotto			6. MANUFACTURER'S DESIGNATION OF DRILL CMF 75		
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" ID HSA w/ 9" x 2' split spoon sampler driven w/ 140# hammer over 30' depth			8. HOLE LOCATION see location sketch.		
PID: 100mm isobutylene NAI			9. SURFACE ELEVATION		
SN: 502309 SN: 172059			10. DATE STARTED 5-17-07		
Cal date: 8-3-07 cal date: 2-19-08			11. DATE COMPLETED 5-17-07		
Bkg: 0.12gpm Bkg: 82.10			15. DEPTH GROUNDWATER ENCOUNTERED NA		
12. OVERBURDEN THICKNESS NA			16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA		
13. DEPTH DRILLED INTO ROCK NA			17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA		
14. TOTAL DEPTH OF HOLE 6.0 fbas			19. TOTAL NUMBER OF CORE BOXES NA		
18. GEOTECHNICAL SAMPLES		DISTURBED ☒		UNOBTAINED ☒	
20. SAMPLES FOR CHEMICAL ANALYSIS		ROC ☒		METALS ☒	
		OTHER (SPECIFY) RAD		OTHER (SPECIFY) ☒	
22. DEPOSITION OF HOLE		SACK FILLED ☒		MONITORING WELL ☒	
		Bentonite		23. SIGNATURE OF INSPECTOR Blaine Curre	

LOCATION SKETCH/COMMENTS

witnessed by: **P. Wauters**

SCALE: **NOT TO SCALE**
Terms Used to Describe %
trace <5%
few 5-10%
little 10-25%
some 20-30%
mostly/with 50-100%



PROJECT:

FUSRAP/SLDS TKRA Spills Pile

HOLE NO.

SLD101366

HTRW DRILLING LOG (CONTINUATION SHEET)							PROJECT NUMBER SLD 101366
PROJECT FLSRAP/SLDS		INSPECTOR E. G. DICK		SHEET 2 OF 2			
DEPTH (ft)	DESCRIPTION OF MATERIALS (ft)	FIELD LOG (ft)	TEST LOG (ft)	TEST LOG (ft)	BLOW COUNT (ft)	REMARKS (ft)	
1	gray silt with some gravel some clay few sand large poorly graded	100	1.7/2.0	SLD 101366 1125	30	unders are silt sized	
	black cinders with some silt some sand some gravel few clay, med dense, poorly graded	200	0.0		10		
		300	0.0	SLD 101367 1127	8	cinders are silt sized	
2		200	0.0	no recovery	8		
	black cinders with some silt some gravel few clay med dense poorly graded	0	0.0	Arch 12 1125	9	cinders are silt sized	
3	black cinders with some silt some sand some clay med dense poorly graded	-100	0.0		8	cinders are silt sized	
	black cinders with some silt some sand some gravel med dense, poorly graded	-200	0.0		4	unders are silt sized	
4			no recovery		21		
	black cinders with some silt some clay some sand trace brick trace gravel med dense poorly graded	0	0.0	2.0/7.0	4	cinders are silt sized	
5	molated green gray silt with dark gray silt some clay few sand med dense, poorly graded	100	0.0		11		
		0	0.0		7		
		300	0.0	test no 100	7		
6	TD 6.0 ft bis EUB 11'35"						

ENG FORM 5056A-R, AUG 94

(Proprietor: CECH-EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG			DISTRICT ST. LOUIS		HOLE NUMBER SLD101368	
1. COMPANY NAME SHAW ENVIRONMENTAL			2. DRILLING SUBCONTRACTOR		SHEET 1 OF 2	
3. PROJECT FUSRAP/SLDS			4. LOCATION TRRA Spills Pile C3-3			
5. NAME OF DRILLER Dan Gotto			6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3 25" HSA and 3" x 2' split spoon			8. HOLE LOCATION See location sketch			
9. SURFACE ELEVATION			10. DATE STARTED 5-17-07			
11. DATE COMPLETED 5-17-07			12. OVERBURDEN THICKNESS N/A			
13. DEPTH DRILLED INTO ROCK N/A			14. TOTAL DEPTH OF HOLE 6-04-695			
15. DEPTH GROUNDWATER ENCOUNTERED N/A			16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A			
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)			18. GEOTECHNICAL SAMPLES			
19. TOTAL NUMBER OF CORE BOXES			20. SAMPLES FOR CHEMICAL ANALYSIS			
21. TOTAL CORE RECOVERY			22. DISPOSITION OF HOLE			
23. SIGNATURE OF INSPECTOR			24. LOCATION SKETCH/COMMENTS			

WITNESSED BY: **R. Wanda**
SCALE: **Not to Scale**

N. MARKET STREET

PROJECT FUSRAP/SLDS	HOLE NO. SLD101368	TRRA Spills Pile
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HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER SLD 101368
PROJECT FUSRAP/SLDS		INSPECTOR L. Cook		SHEET 2 of 2 SHEETS		
DEPTH (ft)	DESCRIPTION OF MATERIALS (1)	FIELD LOG (ft) (2)	TESTED SAMPLE DEPTH (ft) (3)	ANALYTICAL LABORATORY (4)	BLOW COUNT (ft) (5)	REMARKS (6)
0	light brown silt with some clay, some gravel dark brown silt with some gravel some clay few sand, loose, poorly graded	100 0.0	20/20	SLS 101368 895	25	
1	light gray fine gravel with some silt, some clay few sand, loose, poorly graded	0 0.0			10	cinders are silt sized
2	black cinders with some silt, some clay few slag few sand, med dense, poorly graded	100 0.0			6	
		300 0.0		SLD 101368 1000	8	
		400 0.0	20/20 1.5/2.0	SLS Archives 1000	11	
3	mottled, dark gravel/black cinders with some silt, some sand, some clay, loose, poorly graded	+200 0.0			12	cinders are silt sized
		100 0.0			6	
4	black silt with some silt, some clay few gravel few sand med dense	no recovery			8	poorly graded cinders are silt sized
	black cinders with some silt, some clay, few sand, few brick few slag, med dense, poorly graded	100 0.0	1.8/2.0		8	
5		200 0.0			22	
		0 0.0		Archives 0950	12	
		300 0.0	no recovery		20	
6	TD-6-044 bags EUB-1005					

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG			DISTRICT ST. LOUIS		HOLE NUMBER SLD101370	
1. COMPANY NAME SHAW ENVIRONMENTAL			2. DRILLING SUBCONTRACTOR shaw			SHEET 1 OF 2 SHEETS
3. PROJECT FUSRAP/SLDS			4. LOCATION TRRA Spills Pile P-13			
5. NAME OF DRILLER Dan Gotto			6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT CME 75 using 3.25" HSA and 3" x 2" split spoon			8. HOLE LOCATION See location sketch			
9. SURFACE ELEVATION			10. DATE STARTED 5-17-07			
11. DATE COMPLETED 5-17-07			12. OVERBURDEN THICKNESS N/A			
13. DEPTH DRILLED INTO ROCK N/A			14. TOTAL DEPTH OF HOLE 6.0 ft bgs			
15. DEPTH GROUNDWATER ENCOUNTERED N/A			16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A			
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A			18. GEOTECHNICAL SAMPLES			
19. TOTAL NUMBER OF CORE BOXES 0			20. SAMPLES FOR CHEMICAL ANALYSIS			
21. TOTAL CORE RECOVERY 0 %			22. DISPOSITION OF HOLE			
23. SIGNATURE OF INSPECTOR Blanca Lopez			24. LOCATION SKETCH/COMMENTS			
25. WITNESSED BY N/A			26. SCALE: Not to Scale			
Trace <5% Few 5-10% Little 15-25% Some 20-35% Mostly 50-100% move to south so can access location						
PROJECT FUSRAP/SLDS			HOLE NO. SLD101370			

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER SLD 101370	
PROJECT FUSRAP/SLDS		INSPECTOR E Cook		SHEET 2 OF 2		SHEETS	
QTY. (I)	DEPTH (I)	DESCRIPTION OF MATERIALS (I)	WATER CONTENT % (I)	WATER CONTENT % (I)	WATER CONTENT % (I)	BLOW COUNT (I)	REMARKS (I)
ML	1	brown silt with some gravel some clay, loose poorly graded	-100	20/20	SLD 101370	15	
		silt sized black cinders with some silt, some clay, some sand, med dense, poorly graded	0	0.0		8	
			100	0.0	SLD 10371	7	
CL	2	mottled light brown/reddish brown clay with some sand, some silt high plasticity, med stiff	0	0.0		9	
			400	0.0	SLD 101372	6	
			300	0.0		6	
			200	0.0		4	
ML	3		300	0.0		5	
			0	0.0	no recovery	5	
			0	0.0	20/20	5	
			-200	0.0		9	
			-200	0.0		4	
SC	6	gray silt with some sand, some black cinders, few clay med dense poorly graded	0	0.0	SLD 101373	16	
		silt sized black cinders with silt some clay, few sand trace brittle med dense poorly graded	0	0.0			
		TD 60.5 ft EUB 1045					

ENG FORM 5056A-R, AUG 94

(Prepared: CECW-EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG				DISTRICT <u>St. Louis</u>		HOLE NUMBER: <u>SLD101374</u>	
1. COMPANY NAME <u>Shaw E & I</u>				2. DRILLING SUBCONTRACTOR <u>Shaw</u>		SHEET <u>1</u> OF <u>2</u>	
3. PROJECT <u>FUSRAP/SLDS</u>				4. LOCATION <u>TKRA Spills Pile - P18</u>			
5. NAME OF DRILLER <u>Dan Goto</u>				6. MANUFACTURER'S DESIGNATION OF DRILL <u>CME 7.5</u>			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT <u>4 1/4" ID HSA w/ 3 1/2" split spoon Sampler driven w/ 140# hammer per 30' hole</u>				8. HOLE LOCATION <u>see location sketch</u>			
9. SURFACE ELEVATION				10. DATE STARTED <u>5-7-07</u>			
11. DATE COMPLETED <u>5-17-07</u>				12. OVERBURDEN THICKNESS <u>NA</u>			
13. DEPTH DRILLED INTO ROCK <u>NA</u>				14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED <u>NA</u>			
15. TOTAL DEPTH OF HOLE <u>6.054 bgs</u>				16. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) <u>NA</u>			
17. GEOTECHNICAL SAMPLES		DISTURBED <u>0</u>		UNDISTURBED <u>0</u>		18. TOTAL NUMBER OF CORE BOXES <u>0</u>	
19. SAMPLES FOR CHEMICAL ANALYSIS		VOC <u>0</u>		METALS <u>0</u>		OTHER (SPECIFY) <u>RAD</u>	
20. DISPOSITION OF HOLE		BAGGED <u>0</u>		MONITORING WELL <u>0</u>		OTHER (SPECIFY) <u>0</u>	
21. SIGNATURE OF INSPECTOR <u>Blaine [signature]</u>		22. TOTAL CORE RECOVERY <u>0%</u>		23. SCALE: NOT TO Scale		Terms Used to Describe %	
LOCATION SKETCH/COMMENTS witnessed by: <u>NA</u> trace <5% few 5-10% little 10-25% some 20-30% mostly/with 50-100%							
PROJECT: <u>FUSRAP/SLDS TKRA Spills Pile</u>						HOLE NO. <u>SLD101374</u>	

HTRW DRILLING LOG (CONTINUATION SHEET)						NO. OF SHEETS
PROJECT		INSPECTOR		SHEET		
FWRAP/SLDS		E Cook		2 OF 2		
DEPTH (ft)	DESCRIPTION OF MATERIALS (a)	TEST RESULTS (b)	TEST SAMPLE LOCATION (ft)	ANALYSIS RESULTS (c)	BLOW COUNT (d)	REMARKS (e)
ML	brown silt with some gravel some clay few sand, loose, poorly graded	-100 0.0	2.0/2.0	SLD 101574 1310	4	
SW	brown med sand, med dense, poorly graded	-100 0.0			4	
		-200 0.0			4	
ML	silt med black cinders with some silt some sand few sbg few clay med dense, poorly graded	-100 0.0		SLD 101375 1312	4	
2		300 0.0	1.6/2.0		6	
		400 0.0		SLD 101374 1315	26	
3	silt med black cinders with some silt some brick few clay, med dense poorly graded	100 0.0			8	
4			no recovery		5	insufficient sample
5						
6						
TD-6.0ft EOB-1315						
PROJECT FWRAP/SLDS TRRA Spills Pile						NO. OF SHEETS 2 OF 2

ENG FORM 5056A-R, AUG 94

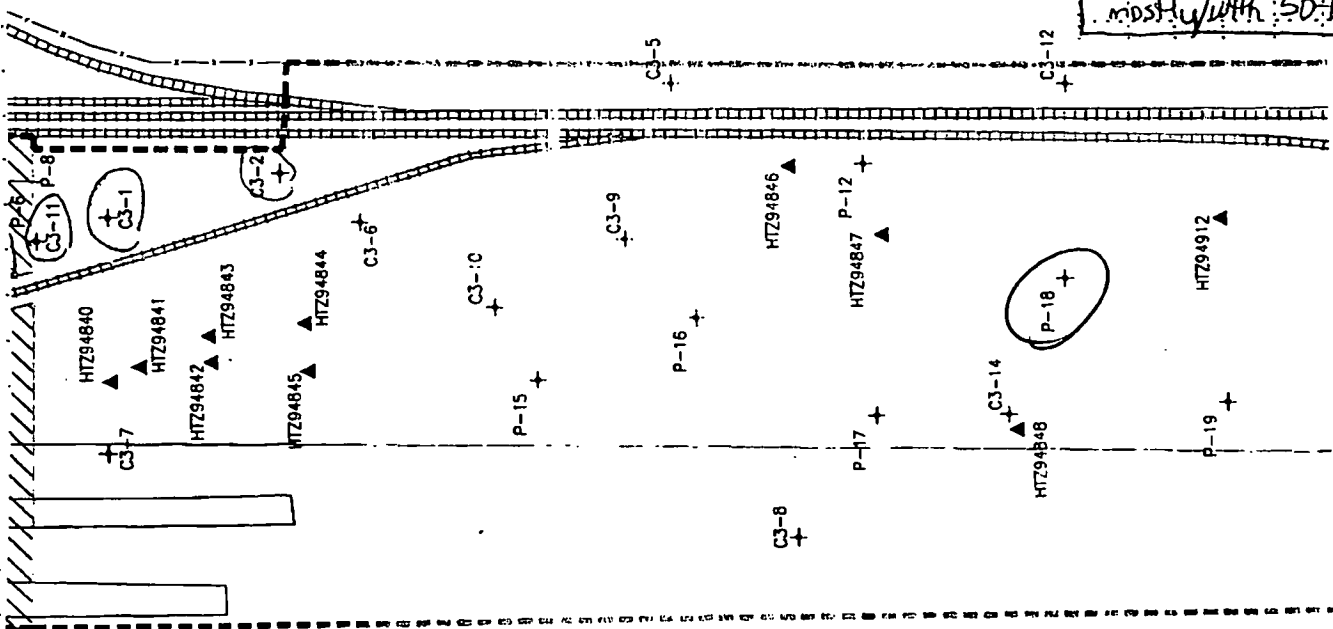
(Prepared by: ECFW-EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT St. Louis	HOLE NUMBER: SLD101374B
1. COMPANY NAME Shaw E & I		2. DRILLING SUBCONTRACTOR Shaw	SHEET 1 OF 2
3. PROJECT FUSRAP/SLDS		4. LOCATION TKRA Spills Pile - P-18	
5. NAME OF DRILLER Dan Gotto		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" ID HSA w/ 3" x 2' split spoon sampler driven w/ 140# hammer over 30' hole		8. HOLE LOCATION see location sketch	
9. SURFACE ELEVATION		10. DATE STARTED 5-17-07	
11. DATE COMPLETED 5-17-07		12. OVERBURDEN THICKNESS NA	
13. DEPTH DRILLED INTO ROCK NA		15. DEPTH GROUNDWATER ENCOUNTERED NA	
14. TOTAL DEPTH OF HOLE 6.0 ft bgs		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA	
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA		18. GEOTECHNICAL SAMPLES	
DISTURBED ☒		UNDISTURBED ☒	
19. TOTAL NUMBER OF CORE BOXES 0		20. SAMPLES FOR CHEMICAL ANALYSIS	
TOC ☒		METALS ☒	
OTHER (SPECIFY) RAD		OTHER (SPECIFY) ☒	
21. TOTAL CORE RECOVERY 0 %		22. DISPOSITION OF HOLE	
SAC FILL ☒		MONITORING WELL ☒	
OTHER (SPECIFY) Bentonite		23. SIGNATURE OF INSPECTOR Elaine Gotto	

LOCATION SKETCH/COMMENTS

witnessed by: **NA**
moved 2 ft north from original location
SCALE: NOT TO Scale
Terms Used to Describe %
trace <5%
few 5-10%
little 10-25%
some 20-30%
mostly/with 50-100%



PROJECT: **FUSRAP/SLDS TKRA Spills Pile** HOLE NO. **SLD101374B**

1 Nov 98

HTRW DRILLING LOG (CONTINUATION SHEET)							ROLE NUMBER SLD 101374B
PROJECT FUSRAP/SLDS		INSPECTOR E Cook		SHEET 2 OF 2			DATE 2.01.2
DEPTH (ft)	DESCRIPTION OF MATERIALS (ft)	FIELD SAMPLE RESULTS (ft)	TEST SAMPLE CL. NO. FOR NO.	ANALYTICAL LAB. NO. (ft)	ALLOW CORRECTION (ft)	REMARKS (ft)	
1	augured down to 4 ft bgs						
2							
3							
4							
CL	4	silt sized gray clay with some silt, some sand, few boulders, high plasticity, med stiff	4W 0.0	20/20		3	
ML	5	silt sized black cinders with some silt, some sand, few boulders, med stiff, med dense, poorly sorted	2W 0.0			3	
CL	6	green gray clay with some silt, few sand, med plasticity, med stiff	3W 0.0	SLD 101374B		3	
	6	TD-6 0.4 bgs EUB 1330	100 0.0			4	

PROJECT FUSRAP/SLDS TRRA Spills Pile

ROLE NO. SLD 101374B

ENG FORM 5056A-R, AUG 94

(Proponent: ECH-EG)

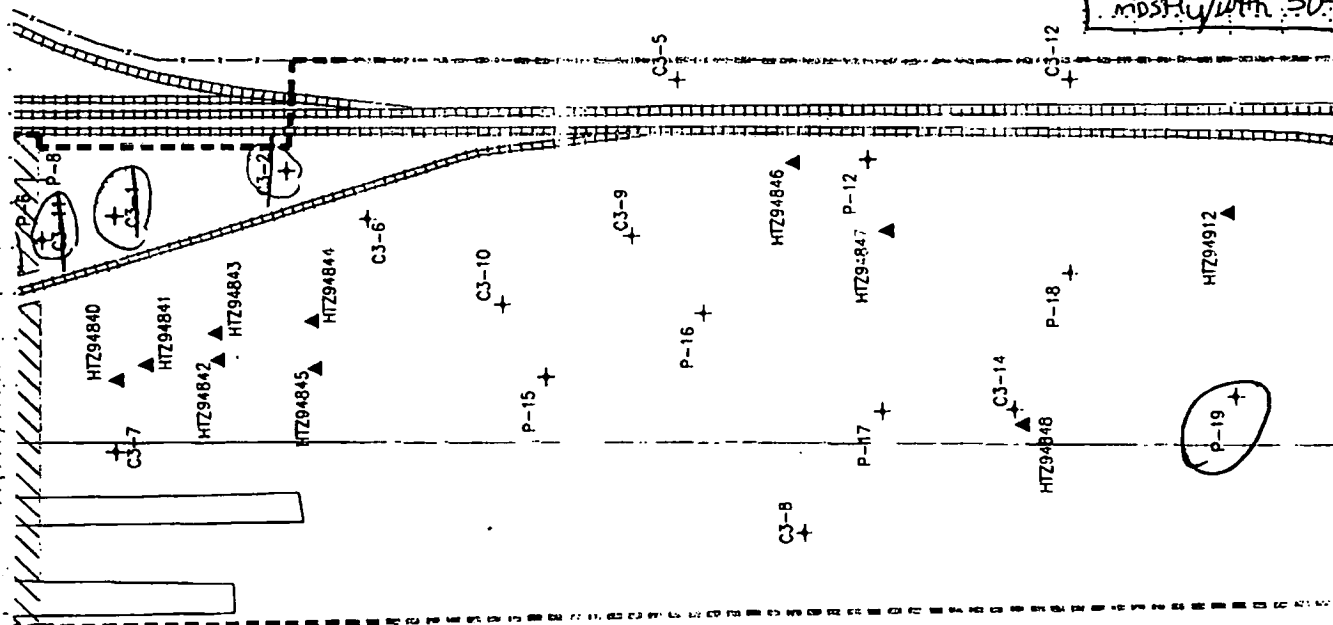
Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT St. Louis		HOLE NUMBER: SLD101378	
1. COMPANY NAME Shaw E & I		2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2	
3. PROJECT FUSRAP/SLDS		4. LOCATION TKRA Spills Pile - P-19			
5. NAME OF DRILLER Dan Gotto		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" ID HSA w/ 9 1/2" split spoon sampler driven w/ 140# hammer over 37' deep		8. HOLE LOCATION see location sketch			
PID (100mm isobutylene) NAI		9. SURFACE ELEVATION			
SN: 502309 SN: 172059		10. DATE STARTED 5-17-07		11. DATE COMPLETED 5-17-07	
Cal date: 8-3-07 mid date: 2-19-08		15. DEPTH GROUNDWATER ENCOUNTERED NA			
Bkg: 0.0 ppm Bkg: 8.200		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA			
12. OVERBURDEN THICKNESS NA		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA			
13. DEPTH DRILLED INTO ROCK NA		14. TOTAL DEPTH OF HOLE 6.0 ft bgs			
18. GEOTECHNICAL SAMPLES		DISTURBED ☒		UNDISTURBED ☒	
19. TOTAL NUMBER OF CORE BOXES ☒		20. SAMPLES FOR CHEMICAL ANALYSIS		21. TOTAL CORE RECOVERY ☒ %	
22. DISPOSITION OF HOLE		SAC FILLED ☒		MONITORING WELL ☒	
23. SIGNATURE OF INSPECTOR Blaine Corp		OTHER (SPECIFY) RAD		OTHER (SPECIFY) ☒	

LOCATION SKETCH/COMMENTS

witnessed by: **NA**

SCALE: NOT TO SCALE
Terms Used to Describe %
trace <5%
few 5-10%
little 10-25%
some 20-30%
mostly/with 50-100%



PROJECT

FUSRAP/SLDS TKRA Spills Pile

HOLE NO.

SLD101378

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER SLD101378	
PROJECT FUSRAP/SLDS		INSPECTION B Look		SHEET 2 OF 2			
REV. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD PENETROMETER RESULTS (4)	TESTER SAMPLE PL. (4) (5) FOR LOG (5)	QUALITY CHECKED (6)	BLOW COUNT (7)	REMARKS (8)
ML		brown silt with some gravel some clay few sand, med dense, poorly graded	-400 0.0	2.0/2.0	SLD 101378 1400	4	
GM	1	brown gravel with some sand few silt, very loose, poorly graded	-200 0.0			5	
		black cinders with some silt some clay, some slag, med dense, poorly graded	-200 0.0			7	
ML	2		-100 0.0		SLD 101378 1400	13	
			-200 0.0	1.8/2.0		4	
	3	green gray silt with some sand some clay, med dense, poorly graded	-200 0.0			4	
			0 0.0		SLD 101378 1400	5	
	4		-200 0.0	no recovery		5	
GM		gray sand with some brick some silt, med dense, poorly graded	-200 0.0	2.0/2.0		3	
			0 0.0		SLD 101378 1355	6	
ML	5	gray sand with some silt some brick, med dense, poorly graded	-200 0.0			9	
GM		gray sand with some brick some silt, med dense, poorly graded	-200 0.0			7	
	6	TD-6.0ft logs EUB 1410					

ENG FORM 5056A-R, AUG 94

Figure 4-2 (Concluded)

HTRW DRILLING LOG				DISTRICT St. Louis		HOLE NUMBER: SLD101382	
1. COMPANY NAME Shaw E & I				2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2	
3. PROJECT FUSRAP/SLDS				4. LOCATION TKRA Spills Pile - P12			
5. NAME OF DRILLER Dan Gotto				6. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" ID HSA w/ 9 1/2" split spoon sampler driven w/ 140# hammer over 30' hole				8. HOLE LOCATION see location sketch			
9. SURFACE ELEVATION				10. DATE STARTED 5-17-07			
11. DATE COMPLETED 5-17-07				12. OVERBURDEN THICKNESS NA			
13. DEPTH DRILLED INTO ROCK NA				14. TOTAL DEPTH OF HOLE 6.0 ft bgs			
15. DEPTH GROUNDWATER ENCOUNTERED NA				16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA			
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA				18. GEOTECHNICAL SAMPLES			
19. TOTAL NUMBER OF CORE BOXES				20. SAMPLES FOR CHEMICAL ANALYSIS			
21. TOTAL CORE RECOVERY				22. DISPOSITION OF HOLE			
23. SIGNATURE OF INSPECTOR Blaine Corle				24. LOCATION SKETCH/COMMENTS			

LOCATED BY: **NA**

SCALE: NOT to Scale

Terms Used to Describe %

trace < 5%

few 5-10%

little 10-25%

some 20-30%

mostly/with 50-100%

REC: **FUSRAP/SLDS TKRA Spills Pile**

HOLE NO: **SLD101382**

HTRW DRILLING LOG (CONTINUATION SHEET)						
PROJECT		INSPECTOR		HOLE NUMBER		
FWSRAPISLDS		E. Cook		SLD101382		
DEPTH (ft)	DESCRIPTION OF MATERIALS	FIELD SAMPLE RESULTS	TESTING SAMPLE RESULTS FOR NO.	ANALYTICAL RESULTS FOR NO.	BLOW COUNT (ft)	REMARKS
0-1	gray gravel with some silt, some black cinders with gray gravel	-300 0.0	2.0/2.0	SLD 101382 1411	15	black cinders are silt-sized
1-2	Some silt, some clay, med. dense, poorly graded	-200 0.0			9	
2-3	black cinders with some silt, some sand, few clay, med. dense, poorly graded	-300 0.0			4	
3-4	black cinders with some silt, some sand, few clay, med. dense, poorly graded	-400 0.0		SLD 101383 1415	18	
4-5		-100 0.0	2.0/2.0		7	
5-6		-200 0.0			11	
6-7	gray silt with some sand, some clay, few brick, med. dense, poorly graded	-400 0.0			10	
7-8		-100 0.0		SLD 101384 1430	10	
8-9	silt sized black cinders with some silt, some clay, few sand med dense, poorly graded	-500 0.0	2.0/2.0		3	
9-10		-200 0.0		SLD 101385 1437	2	
10-11		-300 0.0			2	
11-12		-400 0.0			3	
12-13		-200 0.0				
TD - 6.0 ft bgs EUB-1435						

PROJECT FWSRAPISLDS TRRA Spoils File HOLE NO. SLD101382
ENG FORM 5056A-R, AUG 94 (Proponent: ECRW:EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT St. Louis	WELL NUMBER: SLD101386
1. COMPANY NAME Shaw E & I		2. DRILLING SUBCONTRACTOR Shaw	SHEET 1 OF 2
3. PROJECT FUSRAP/SLDS		4. LOCATION TKRA Spills Pile - P17	
5. NAME OF DRILLER Dan Gotto		6. MANUFACTURER'S DESIGNATION OF DRILL CMF 75	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" ID HSA w/ 3 1/2" x 2' split spoon sampler driven w/ 140# hammer over 30' hole		8. HOLE LOCATION see location sketch	
9. SURFACE ELEVATION NA		10. DATE STARTED 5-21-07	
11. DATE COMPLETED 5-21-07		12. OVERBURDEN THICKNESS NA	
13. DEPTH DRILLED INTO ROCK NA		14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA	
15. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA		16. TOTAL DEPTH OF HOLE 16.0 ft bgs	
17. GEOTECHNICAL SAMPLES		18. TOTAL NUMBER OF CORE BOXES 0	
19. SAMPLES FOR CHEMICAL ANALYSIS		20. TOTAL CORE RECOVERY 0 %	
21. DISPOSITION OF HOLE		22. SIGNATURE OF INSPECTOR Blaine Carls	
23. BENTONITE		24. MONITORING WELL	
25. OTHER (SPECIFY)		26. OTHER (SPECIFY)	
27. OTHER (SPECIFY)		28. OTHER (SPECIFY)	

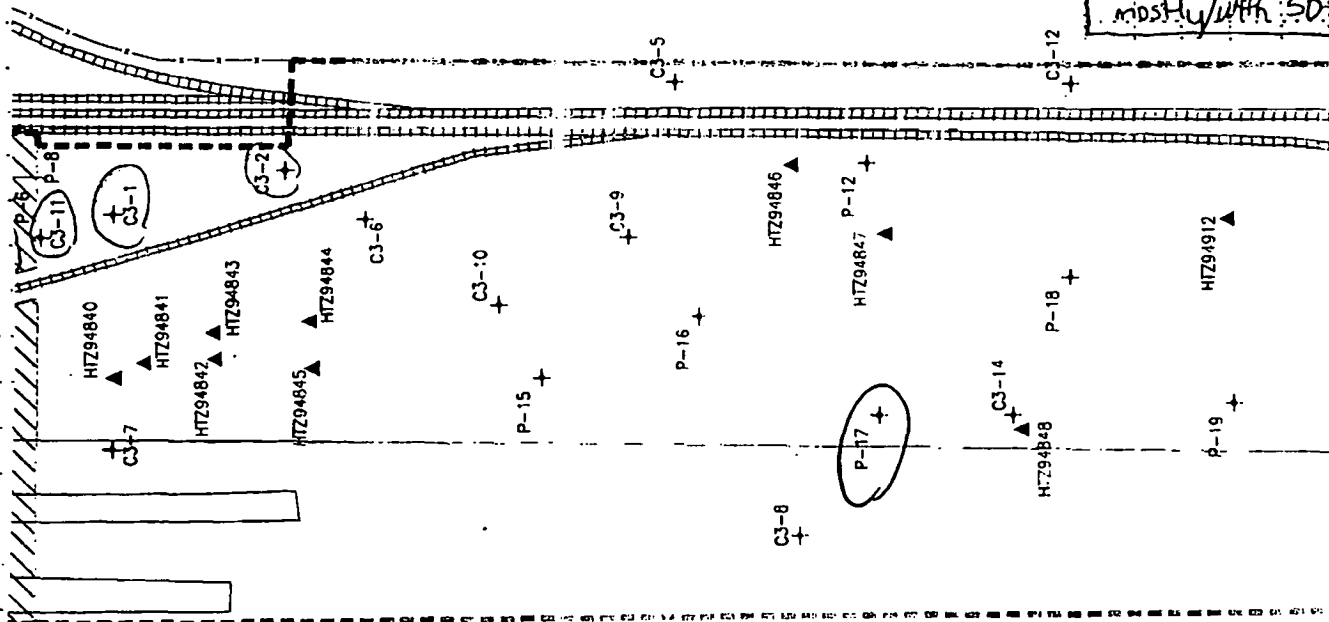
LOCATION SKETCH/COMMENTS

witnessed by: **NA**

SCALE: NOT TO SCALE

Terms Used to Describe %

trace <5%
few 5-10%
little 10-25%
some 20-30%
mostly/with 50-100%



PROJECT **FUSRAP/SLDS TKRA Spills Pile** WELLS NO. **SLD101386**

HTRW DRILLING LOG (CONTINUATION SHEET)							HOLE NUMBER SLD 101386
PROJECT EUS RAP SLDs		INSPECTOR E. COOK		SHEET 2 OF 2		SHEET	
DEPTH (ft)	DESCRIPTION OF MATERIALS	FIELD TESTS (ft)	TESTS (ft)	TESTS (ft)	TESTS (ft)	TESTS (ft)	REMARKS
ML	brown silt with some clay some sand, med dense, poorly graded	-400	20/20	SLD 101386 1134	5		
	silt sized	0.0					
SM	black cinders with some silt, few gravel loose, poorly graded	-300			5		
	light brown sand with some silt some gravel, med dense, poorly graded	-600			10		
2	dark gray silt with some sand, med dense, poorly graded	-100		SLD 101387 1136	11		
		-400	2.0/20		5		
3		-500			13		
	black cinders with some silt some sand few gravel, med dense, poorly graded	-300			10		black cinders are silt sized
ML	green-gray silt with some sand few clay, med dense, poorly graded	-300		SLD 101388 1140	7		
		0.0	1.8/20		2		
5		-400			3		
		-200			2		
6		-200		SLD 101389 1150	4		
		0.0	no return				
TD-6.0 ft bags EUB-1150							

ENG FORM 5056A-R, AUG 94

(Prepared by: ECU:EG)

Figure 4-2 (Concluded)

WOLE NUMBER:
SND1390

SHEET 1 OF 2

4. LOCATION
TRRT Spauls A/c - P110

6. MANUFACTURER'S DESIGNATION OF DRILL
Cm F 7.5

8. HOLE LOCATION
see location sketch

9. SURFACE ELEVATION

10. DATE STARTED

11. DATE COMPLETED : 5-21-75

15. DEPTH GROUNDWATER ENCOUNTERED _____

NA

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA

UNDISTURBED

19. TOTAL NUMBER OF CORE BOXES

100

METALS

OTHER (SPECIFY)

OTHER (SPECIFY _____)

OTHER (SPECIFY) _____

21. TOTAL COME

MONITORING WELL

RAD
OTHERS

23. SIGNATURE OF INSPECTOR

Bentonite

2

D

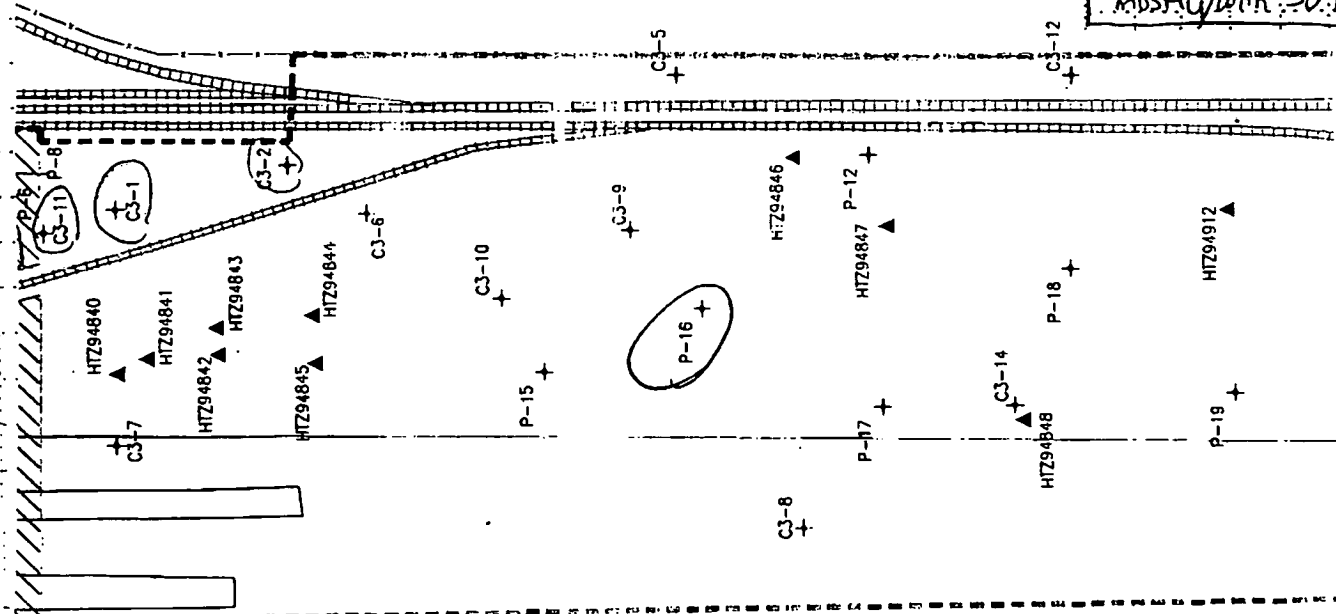
Blaine Clark

witnessed by: NA

SCALE: NOT TO Scale

Terms Used to Describe %

trace	<5%
few	5-10%
little	10-25%
some	20-30%
mostly/with	50-100%



FILE NO. 52-17390

HTRW DRILLING LOG (CONTINUATION SHEET)							PROJECT NO.
PROJECT		INSPECTOR		DATE		SHEET	
FWSRAP/SLDS		E Cook		52D101390		2 OF 2	
DEPTH (ft)	DEPTH (ft)	DESCRIPTION OF MATERIALS	FIELD SOIL TEST RESULTS	TESTING METHOD	WATER CONTENT (%)	SHRINKAGE (%)	REMARKS
ML	1	light gray silt with med. fine gravel, some clay, loose, poorly graded	700 0.0	1.8/2.0	50.5 10.0 0.857	10	Cinders are silt size &
		black silt sized black cinders with some silt, some gravel, some sand, some clay, loose, poorly graded	0 0.0			12	
			400 0.0		50.5 10.0 0.900	11	
			100 0.0			17	
GP	2	light brown silt with med. fine gravel, some sand, trace clay, very loose, poorly graded	100 0.0	2.0/2.0		11	
		black cinders with some silt, some sand, trace gravel, med. dense, poorly graded	200 0.0			13	
			500 0.0			22	
			100 0.0		50.5 10.0 0.903	21	
ML	3		200 0.0			5	
			400 0.0			4	
			300 0.0			7	
			200 0.0		50.5 10.0 0.950	6	
CL	4	silt sized black cinders with some silt, some sand, med. dense, poorly graded	200 0.0				
		green-gray clay with some silt, high plasticity, med. stiff	400 0.0				
			300 0.0				
			200 0.0				
	5						
	6	TD - 60 ft bas EOB 0905					

ENG FORM 5056A-R, AUG 94

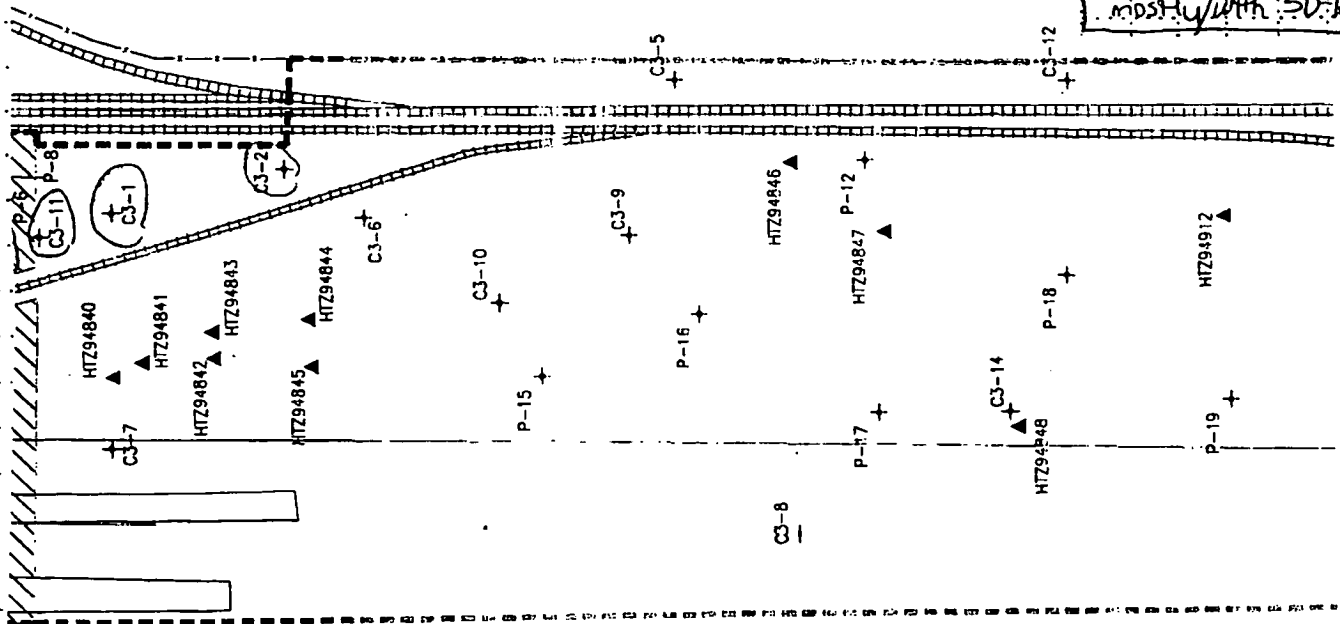
Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT St. Louis		HOLE NUMBER: SLD101394	
1. COMPANY NAME Shaw E & I		2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2	
3. PROJECT FUSRAP/SLDS			4. LOCATION TKRA Spills File - P15		
5. NAME OF DRILLER Dan Gotto			6. MANUFACTURER'S DESIGNATION OF DRILL CM E 75		
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" ID HSA w/ 3 1/2" x 2' split spoon sampler driven w/ 140# hammer w/ 30" drop			8. HOLE LOCATION See location sketch		
9. SURFACE ELEVATION NA			10. DATE STARTED 5-21-07		
11. DATE COMPLETED 5-21-07			12. OVERBURDEN THICKNESS NA		
13. DEPTH DRILLED INTO ROCK NA			14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA		
15. TOTAL DEPTH OF HOLE 6.0 ft bgs			16. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA		
18. GEOTECHNICAL SAMPLES		19. TOTAL NUMBER OF CORE BOXES		20. SAMPLES FOR CHEMICAL ANALYSIS	
DISTURBED ☒		UNDISTURBED ☒		TOTAL ☒	
21. TOTAL CORE RECOVERY ☒		22. DISPOSITION OF HOLE		23. SIGNATURE OF INSPECTOR	
Bentonite ☒		Monitoring Well ☒		Blaine (07/07)	

LOCATION SKETCH/COMMENTS

witnessed by: **NA**

SCALE: NOT TO SCALE
Terms Used to Describe %
trace <5%
few 5-10%
little 10-25%
some 20-30%
mostly/with 50-100%



PROJECT: **FUSRAP/SLDS TKRA Spills File** HOLE NO. **SLD101394**

HTRW DRILLING LOG (CONTINUATION SHEET)							PROJECT NUMBER SLD 101394
PROJECT FUSRAP/SLDS		INSPECTOR E Cook		SHEET 2 of 3		REMARKS	
DEPTH (ft)	DEPTH (m)	DESCRIPTION OF MATERIALS (a)	FIELD BOREHOLE ELEVATION (ft)	TESTED SAMPLE ELEVATION (ft)	TESTED SAMPLE DEPTH (ft)	BLOW COUNT (b)	REMARKS (c)
ML		brown silt with some gravel some clay few sand, loose, poorly graded	-800 0.0	2.0/2.0	SLD 101394 0850	4	
SM		brown sand - med to coarse few fine sand few silt, med dense, poorly graded	-1100 0.0			6	
ML	1	black cinders with some silt, some clay few sand, med dense poorly graded	-700 0.0			9	cinders are silt size L
	2	black cinders with some silt some clay fine sand few gravel, med dense, poorly graded	-700 0.0		SLD 101395 0852	15	cinders are silt size d
GC		light gray gravel with some sand some silt few clay, very loose, poorly graded	-700 0.0	1.7/2.0		14	
	3	brown silt with some sand few clay, med dense, poorly graded	-400 0.0		SLD 101396 0857	8	
ML	4	black cinders with some silt some gravel, few sand few clay loose, poorly graded	-600 0.0	TD FFine m 2.0/2.0		16	cinders are silt size d
	5	brown silt with some fine sand, few clay, med dense, poorly graded	-500 0.0			12	
			-400 0.0			8	
			-100 0.0		SLD 101397	8	
	6	TD-6.0 ft bas EOB-1000					

EHG FORM 5056A-R, AUG 94

(Proponent: ECHW-EG)

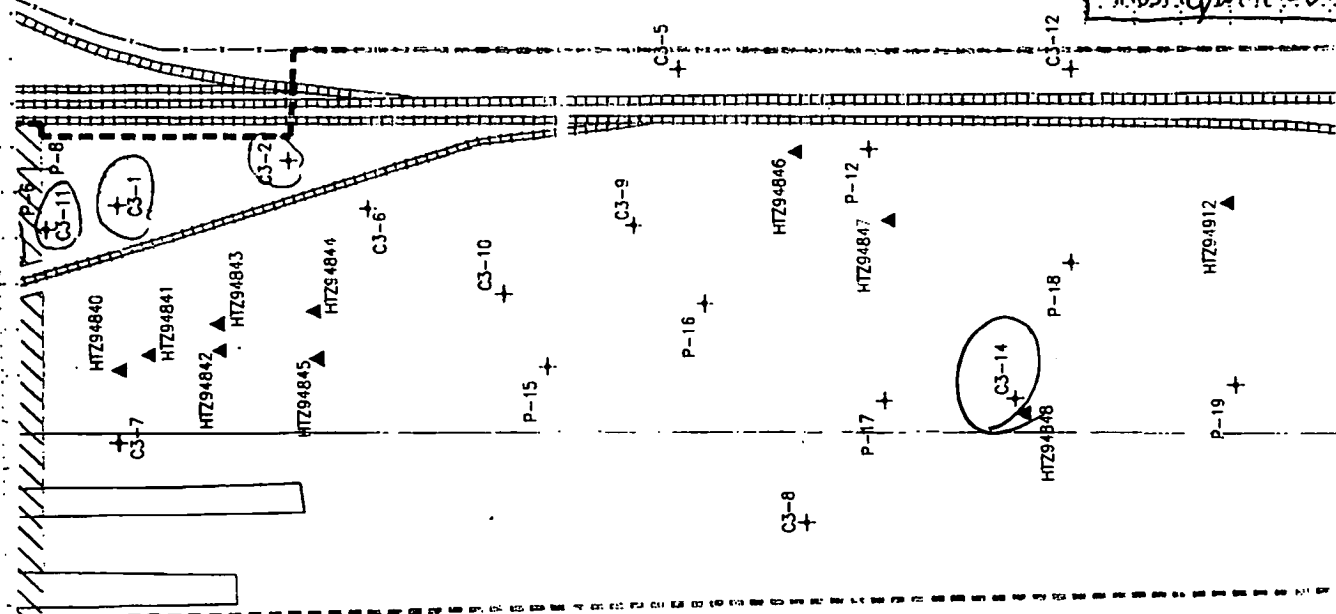
Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT St. Louis		HOLE NUMBER SLD10398	
COMPANY NAME Shaw E. & I		2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2	
3. PROJECT FUSRAP/SLDS		4. LOCATION TKRA Spills Pile - C3-14			
5. NAME OF DRILLER Dan Gotto		6. MANUFACTURER'S DESIGNATION OF DRILL CMF 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" ID HSA w/ 9" x 2 1/2" split spoon sampler driven w/ 140# hammer over 3000 ft		8. HOLE LOCATION see location sketch			
PID (100mm isobutylene) NAI		9. SURFACE ELEVATION			
SN: 502209 SN: 122059		10. DATE STARTED 5-21-07 11. DATE COMPLETED 5-21-07			
Cal date: 8-3-07 cal date: 2-19-08		15. DEPTH GROUNDWATER ENCOUNTERED NA			
Bkg: 0.000 Bkg: 8400		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA			
12. OVERBURDEN THICKNESS NA		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA			
13. DEPTH DRILLED INTO ROCK NA		14. TOTAL DEPTH OF HOLE 605' bas			
18. GEOTECHNICAL SAMPLES		DISTURBED ☒		UNDISTURBED ☒	
20. SAMPLES FOR CHEMICAL ANALYSIS		VOC ☒		METALS ☒	
		OTHER (SPECIFY) RAD		OTHER (SPECIFY) ☒	
22. DISPOSITION OF HOLE		BACKFILLED ☒		MONITORING WELL ☒	
		Bentonite ☒		OTHER (SPECIFY) ☒	
				23. SIGNATURE OF INSPECTOR Blaine Corle	

LOCATION SKETCH/COMMENTS

witnessed by: **P. Wankin** SCALE: NOT TO Scale

Terms Used to Describe %
 trace <5%
 few 5-10%
 little 10-25%
 some 20-30%
 mostly/with 50-100%



PROJECT **FUSRAP/SLDS TKRA Spills Pile**

HOLE NO. **SLD10398**

HTRW DRILLING LOG (CONTINUATION SHEET)							HOLE NUMBER SLD101398 SHEET 2 of 2
PROJECT	SECTION	DESCRIPTION OF MATERIALS	FIELD ELEVATION (ft)	SECTION ELEVATION (ft)	INITIAL LABORATORY NO.	BLOW COUNT	REMARKS
FUSRAP/SLDS	E CODE	100	2.0/2.0	SLD 101398	4	-1, -2	
		0.0					
4	1	black cinders with some silt some med dense poorly graded	0.0			5	cinders are silt sized
		0.0				5	
ML	2	200	0.0	SLD 101398	3		
		0.0	1.9/2.0		5		
SM	3	coarse sand, black, with some silt few brick med dense poorly graded	0.0			6	
		0.0			3		
CL	4	dark gray clay with some silt, trace brick, med. plasticity mod stiff	0.0	no recording	SLD 101400	6	
		0.0	2.0/2.0		2		
CL	5	green-gray clay with some silt, some fine sand, med. plasticity, med stiff	0.0			4	
		0.0			3		
6		200	0.0	SLD 101401	6		
		0.0					
		TD-6.0 x 6.25 EUB 1120					

ENG FORM 5056A-R, AUG 94

(Proponent: CECH/EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER SLD 101304	
PROJECT FUS RTR/SLDS		INSPECTOR E Cook		SHEET 2 of 2 SHEETS			
EST. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD SAMPLE RESULTS (4)	DEPT. SAMPLE OR CORR. FOR NO. (5)	QUALITY CONTROL NO. (6)	BLOW COUNT (7)	REMARKS (8)
ML		brown silt with some clay some sand few gravel, med dense poorly graded	~100 0.0	2.0/0.0	SLD 101304 1322	11	
ML	1	brown gravel with some sand some silt, very loose poorly graded	~100 0.0			8	
		black cinders with some silt coarse sand and black clay cinders	100 0.0			6	cinders are silt sized
	2	black cinders with some silt clay few sand med dense poorly graded	100 0.0		SLD 101305 1325	33	
		brown silt with some clay some silt few clay med dense poorly graded	100 0.0			9	
	3	silt sized black cinders with some silt some sand few clay few gravel med dense poorly graded	100 0.0	1.7/2.0	SLD 101306 1315	33	
ML			500 0.0			26	
	4	silt sized black cinders with some silt some sand few clay med dense, poorly graded	100 0.0	no recovery		16	
		black cinders with some silt some sand, moist, med dense, poorly graded	100 0.0	2.0/0.0		2	
	5	black cinders with some silt some sand, moist, med dense, poorly graded	300 0.0			3	cinders are silt sized
CL		green-gray clay with some silt med plasticity, med stiff	300 0.0		SLD 101307 1302	4	
ML		silt sized black cinders with some silt	0 0.0			3	
	6	some clay few gravel, med dense, poorly graded	0 0.0				
		TD-6.0 ft bgs EOB-1325					

PROJECT FUS RTR/SLDS Terminal ER Spoils Pile HOLE NO. SLD 101304
ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG (CONTINUATION SHEET)							HOLE NUMBER SLD 101308
PROJECT FUS RAP/SLDS			INSPECTOR E Cook		SHEET 2 of 2 SHEETS		
FLY. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD MEASUREMENTS (4)	SOIL SAMPLE DEPTH (5)	QUALITY CONTROL (6)	BLOW COUNT (7)	REMARKS (8)
ML		brown silt with some sand some clay few gravel, med dense poorly graded	-100 0.0	20/20	SLD 101308 13.52	6	
6m	1	gray gravel with some sand few silt, clay, lime, poorly graded	0 0.0			7	
			100 0.0			5	
	2	silt sized black cinders with some silt some sand few brick few gravel med dense, poorly graded	100 0.0		SLD 101308 13.55	7	
			-100 0.0	18/20		9	
	3	silt sized black cinders with some silt some sand some gravel few clay trace brick, med dense, poorly graded	-100 0.0			16	
ML			100 0.0		Archae 1345	10	
	4	silt sized black cinders with some silt some sand few clay trace gravel, med dense, poorly graded	100 0.0	no recovery		10	
			100 0.0	1-5/2-0		4 (6)	
	5		300 0.0		Archae 1342	5	
			100 0.0			4	
	6		---	no recovery		4	
		TD-6.0 ft bbs EOB 1400					

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT	St. Louis		HOLE NUMBER:	SLD10131D	
1. COMPANY NAME		2. DRILLING SUBCONTRACTOR		SHEET		SHEETS	
Shaw E & I		Shaw		1		2	
3. PROJECT			4. LOCATION				
FUSRAP/SLDS			TRRt soils pile C2-10				
5. NAME OF DRILLER			6. MANUFACTURER'S DESIGNATION OF DRILL				
Dan Gotto			CME 75				
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT			8. HOLE LOCATION				
4 1/4" ID HSA w/ 3 1/2" x 2" split spoon sampler driven w/ 140# hammer over 30" H ₂ O			see location sketch				
PID (100mm isobutylene) NAE			9. SURFACE ELEVATION				
SN: 507309 SN: 149963			10. DATE STARTED				
cal date: 8-3-07 cal date: 11-16-07			5-14-07				
Bkg: 2.00pm Bkg: 55.01			11. DATE COMPLETED				
12. OVERBURDEN THICKNESS			15. DEPTH GROUNDWATER ENCOUNTERED				
NA			NA				
13. DEPTH DRILLED INTO ROCK			16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED				
NA			NA				
14. TOTAL DEPTH OF HOLE			17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)				
6-0 ft bas			NA				
18. GEOTECHNICAL SAMPLES		DISTURBED		UNDISTURBED		19. TOTAL NUMBER OF CORE BOXES	
		0		0		0	
20. SAMPLES FOR CHEMICAL ANALYSIS		ROCK		METALS		OTHER (SPECIFY)	
		0		0		RAD	
22. DISPOSITION OF HOLE		SAC FILLED		MONITORING WELL		OTHER (SPECIFY)	
		Bentonite		0		0	
						23. SIGNAL LINE GE INSPECTOR	
						Blaine Corb	

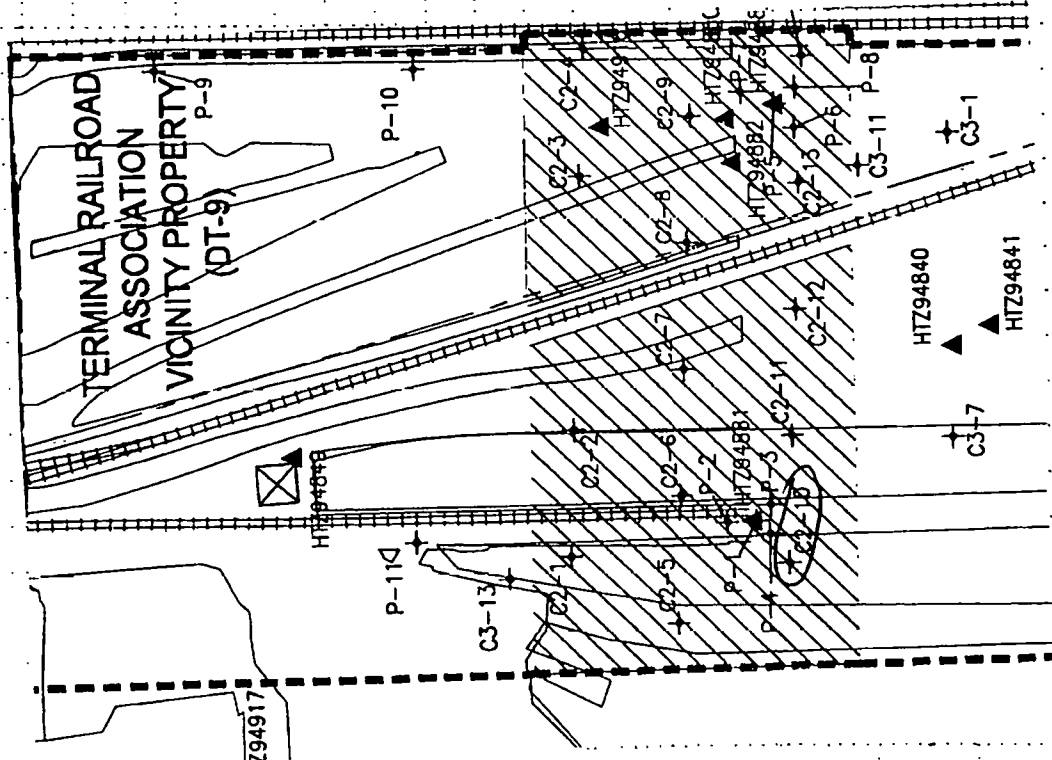
LOCATION SKETCH/COMMENTS

witnessed by: P. W. Antio

SCALE: NOT TO SCALE

Terms Used to Describe %

trace <5%
few 5-10%
little 10-25%
some 20-30%
mostly/with 50-100%



PROJECT:

FUSRAP/SLDS - TRRt soils pile

HOLE NO.

SLD10131D

1 Nov 98

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER SLD10131D	
PROJECT FUSRAP/SLDS		INSPECTOR E. COOK		SHEET 2 OF 2 SHEETS			
REL. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD PENETROMETER (4)	SOIL SAMPLE NO. FOR LOG (5)	SOIL TEST SAMPLE NO. (6)	BLOW COUNT (7)	REMARKS (8)
ML		brown silt with some clay few sand trace gravel. roots in top 0.1 ft. med dense, poorly graded	-100 0.0		SLD 10131D 1435	4	
GL	1	brown gravel with some sand few silt trace clay, med dense, poorly graded	-150 0.0			3	
			100 0.0			5	
	2		200 0.0		SLD 10131D 1436	4	
			400 0.0	1.5/2.0		5	
	3		200 0.0			4	
ML			300 0.0		SLD 10131D 1437	3	
	4	silt-sized black clingers with some silt. some sand few clay few gravel trace brick, med dense, poorly graded	0.0	no recovery		3	
			100 0.0	1.3/2.0		2	
	5		100 0.0		Archive 1420	1	
			100 0.0	no recovery		2	
	6					3	
		TD-60 ft bgs EDB-1440					

ENG FORM 5056A-R, AUG 94

(Proponent: ECR/EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG				DISTRICT <u>St. Louis</u>		HOLE NUMBER: <u>SLD101312</u>	
1. COMPANY NAME <u>Shaw E & I</u>				2. DRILLING SUBCONTRACTOR <u>Shaw</u>		SHEET <u>1</u> OF <u>2</u>	
3. PROJECT <u>FUSRAP/SLDS</u>				4. LOCATION <u>TRRT Spills Pile P-1</u>			
5. NAME OF DRILLER <u>Dan Gotto</u>				6. MANUFACTURER'S DESIGNATION OF DRILL <u>CME 75</u>			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT		<u>4 1/4" ID HSA w/ 3" x 2' split spoon</u> <u>sampler driven w/ 140# hammer over 30' hole</u>		8. HOLE LOCATION		<u>see location sketch</u>	
PID (100mm isobutylene) <u>NA</u>				9. SURFACE ELEVATION			
SN: <u>502300</u>		SN: <u>172046</u>		10. DATE STARTED <u>5-15-07</u>		11. DATE COMPLETED <u>5-15-07</u>	
Cal date: <u>8-3-07</u>		Cal date: <u>11-21-07</u>		15. DEPTH GROUNDWATER ENCOUNTERED <u>NA</u>			
Bkg: <u>C.D. ppm</u>		Bkg: <u>5/100</u>		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED <u>NA</u>			
12. OVERBURDEN THICKNESS <u>NA</u>				17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) <u>NA</u>			
13. DEPTH DRILLED INTO ROCK <u>NA</u>							
14. TOTAL DEPTH OF HOLE <u>6.0 ft bgs</u>							
18. GEOTECHNICAL SAMPLES		DISTURBED <u>0</u>		UNDISTURBED <u>0</u>		19. TOTAL NUMBER OF CORE BOXES <u>0</u>	
20. SAMPLES FOR CHEMICAL ANALYSIS		ROCK <u>0</u>		METALS <u>0</u>		OTHER (SPECIFY) <u>RAD</u>	
		SAC FILLED <u>0</u>		MONITORING WELL <u>0</u>		OTHER (SPECIFY) <u>0</u>	
22. DISPOSITION OF HOLE		<u>Bentonite</u>		<u>0</u>		23. SIGNATURE OF INSPECTOR <u>Blaine Lerche</u>	
		<u>0</u>		<u>0</u>		21. TOTAL CORE RECOVERY <u>0</u> %	

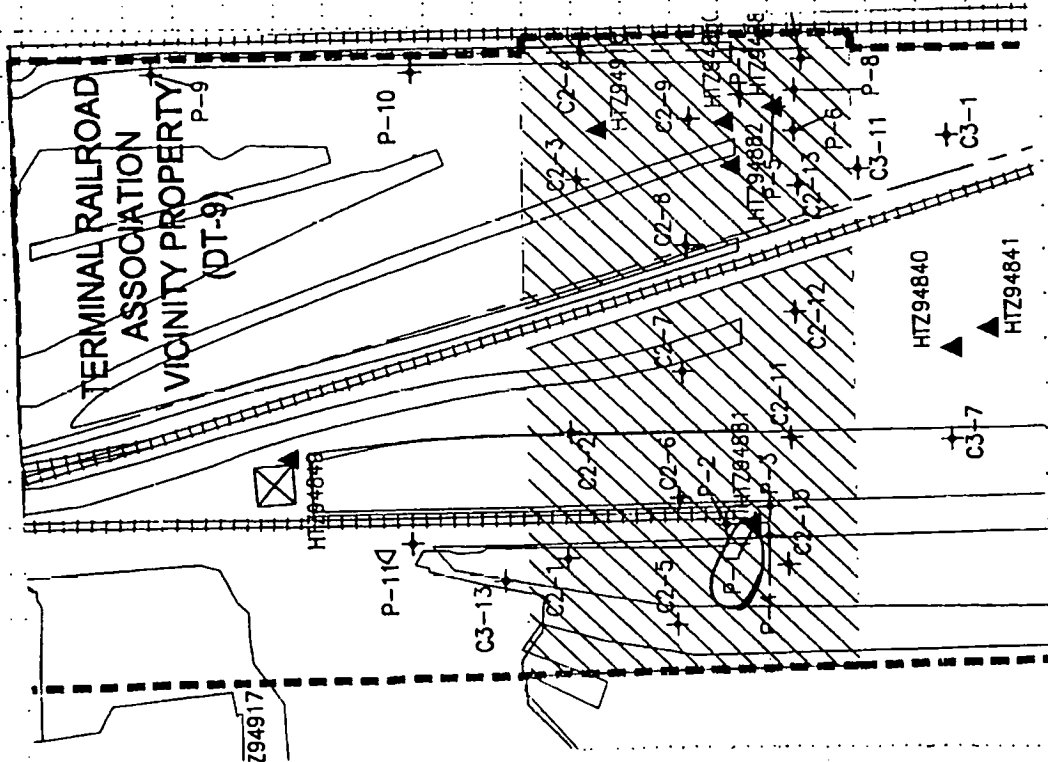
LOCATION SKETCH/COMMENTS

witnessed by: NA

SCALE: NOT to Scale

Terms Used to Describe PO

trace <5%
few 5-10%
little 10-25%
some 20-30%
mostly/with 50-100%



3515C

FUSRAP/SLDS - Tree Spills Pile

1. NAME

52D1013 R

HTR DRILLING LOG (CONTINUATION SHEET)							HOLE NUMBER SLD101312
PROJECT FUSRAP/SLDS		INSPECTOR E Cook		SHEET 201		SHEETS 3	
BLV. (1)	DEPTH (2)	DESCRIPTION OF MATERIALS (3)	FIELD SOILS ANALYSIS (4)	SOILS SAMPLE IDENT. NO. (5)	ANALYTICAL LAB. NO. (6)	BLOW COUNT (7)	REMARKS (8)
ML	1	brown silt with some clay, some sand, trace gravel, med dense, poorly graded	600 0.0	1-8/2-0	SLD 101322 1057	2	1, -2
		black cinders with some clay, some silt, few gravel, trace brick, loose, poorly graded	600 0.0				
			300 0.0				
			900 0.0				
			900 0.0				
SC	3	silt sized black cinders with some silt, some clay, some sand, few gravel, trace plastic, loose, poorly graded	500 0.0	2-0b-0	SLD 100314 1050	3	
			100 0.0				
ML	4	brown sand with black cinders, some silt, some clay, loose, poorly graded	300 0.0	2-0b-0		5	
		black cinders with some silt, some clay, some sand, med dense, poorly graded	100 0.0				
		red brick with mostly silt, some clay	100 0.0				
		silt sized black cinders with some silt, some clay, fine sand, loose, poorly graded	100 0.0				
			200 0.0				
	5		200 0.0		SLD 10315 1058	14	
			0 0.0				
			0 0.0				
			0 0.0				
			0 0.0				
	6	TD-6.0 ft base					
		EUB 1100					

Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT St. Louis		HOLE NUMBER: SLD 101316	
1. COMPANY NAME Shaw E & I		2. DRILLING SUBCONTRACTOR Shaw		SHEET 1 OF 2	
3. PROJECT FUSRAP/SLDS		4. LOCATION TRRA Spills Pile P-2			
5. NAME OF DRILLER Dan Gotto		6. MANUFACTURER'S DESIGNATION OF DRILL CMF 75			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" ID HSA w/ 3" x 2" split spoon Sampler driven w/ 140# hammer over 30" dia		8. HOLE LOCATION see location sketch			
9. SURFACE ELEVATION		10. DATE STARTED 5-16-07		11. DATE COMPLETED 5-16-07	
12. OVERBURDEN THICKNESS NA		15. DEPTH GROUNDWATER ENCOUNTERED NA			
13. DEPTH DRILLED INTO ROCK NA		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA			
14. TOTAL DEPTH OF HOLE 6.0 ft bgs		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA			
18. GEOTECHNICAL SAMPLES		19. TOTAL NUMBER OF CORE BOXES			
DISTURBED ☒		UNDISTURBED ☒			
20. SAMPLES FOR CHEMICAL ANALYSIS		21. TOTAL CORE RECOVERY			
ROCK ☒		METALS ☒		OTHER (SPECIFY) RAD	
22. DISPOSITION OF HOLE		23. SIGNATURE OF INSPECTOR			
SACRIFICED ☒		MONITORING WELL ☒		OTHER (SPECIFY) Sludge Core	

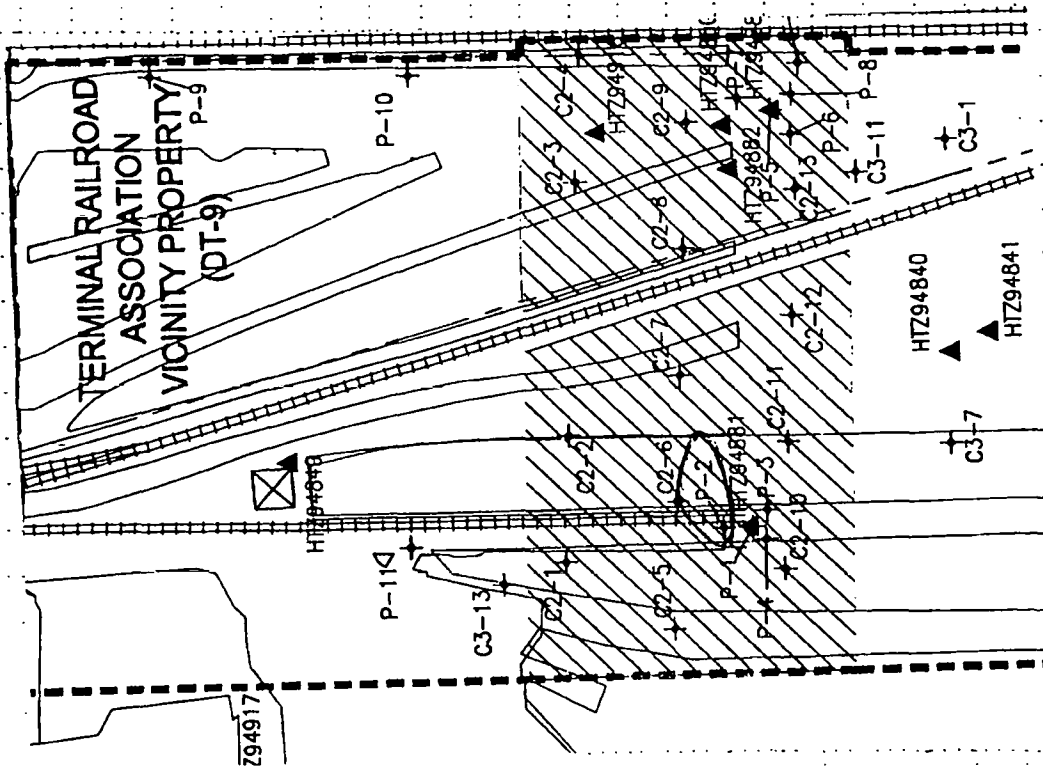
LOCATION SKETCH/COMMENTS

witnessed by: **NA**

SCALE: **NOT to Scale**

Terms Used to Describe %

trace <5%
few 5-10%
little 10-25%
some 20-30%
mostly/with 50-100%



PROJECT

FUSRAP/SLDS - TRRA Spills Pile

HOLE NO.

SLD 101316

HTRW DRILLING LOG (CONTINUATION SHEET)						HOLE NUMBER SLD 101316	
PROJECT FUSRAPISLDS	INSPECTOR ECOL	SHEET 2 OF 2 SHEETS					
DEPTH (ft)	DEPTH (m)	DESCRIPTION OF MATERIALS (ft)	FIELD PENETROMETER (ft)	DEPTH SAMPLE OR CORE (ft)	QUALITY (ft)	BLOW COUNT (ft)	REMARKS (ft)
SP		very fine sand with black cinders, some silt, some dense, poorly graded	200	20/20	SLD 101316 1147	3	
			0.0			4	
			200			4	
			0.0			5	
			100			3	
			0.0			10	
			200		SLD 101317 1150	10	
			0.0	1.7/20	SLD 101318 1149	8	
		silt sized black cinders with some silt some clay, some sand fine gravel, loose, poorly graded	200			3	
			0.0			10	
			0			10	
			100			8	
		light gray sand with some clay some silt, few brick, medium poorly graded	0.0			3	
		black cinders with some silt some sand some clay fine brick trace gravel		no recovery		5	
			300	20/20		6	
		silt sized black cinders with some silt some sand, some clay, few brick trace gravel, loose, poorly graded	0.0		SLD 101319 1135	8	
			400				
			0.0				
			200				
			0.0				
			0				
		dark gray silt with some clay some gravel, medium dense, poorly graded	0.0				
		TD - 6.0 ft bgs EOB - 1155					

ENG FORM 5056A-R, AUG 94

(Proponent: CECW:EG)

Figure 4-2 (Concluded)

HTRW DRILLING LOG		DISTRICT	WELL NUMBER
1. COMPANY NAME Shaw E & I		2. DRILLING SUBCONTRACTOR Shaw	SLD101402 SHEET 1 of 2
3. PROJECT FUSRAP/SLDS		4. LOCATION TRT Spills Pile P11	
5. NAME OF DRILLER Dan Gotto		6. MANUFACTURER'S DESIGNATION OF DRILL CMF 75	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" ID HSA w/ 9" x 2 1/2" split spoon Sampler driven w/ 140# hammer over 30' H ₂ O		8. HOLE LOCATION see location sketch	
9. SURFACE ELEVATION NA		10. DATE STARTED 5-21-07	
11. DATE COMPLETED 5-21-07		12. OVERBURDEN THICKNESS NA	
13. DEPTH DRILLED INTO ROCK NA		14. TOTAL DEPTH OF HOLE 6.0 ft bgs	
15. DEPTH GROUNDWATER ENCOUNTERED NA		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA	
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA		18. GEOTECHNICAL SAMPLES	
DISTURBED 0		UNDISTURBED 0	
19. TOTAL NUMBER OF CORE BOXES 0		20. SAMPLES FOR CHEMICAL ANALYSIS	
TOC 0		METALS 0	
OTHER (SPECIFY) RAD		OTHER (SPECIFY) 0	
OTHER (SPECIFY) 0		OTHER (SPECIFY) 0	
21. TOTAL CORE RECOVERY 0 %		22. DISPOSITION OF HOLE Bentonite	
MONITORING WELL 0		23. SIGNATURE OF INSPECTOR Blaine Cook	
OTHER (SPECIFY) 0			

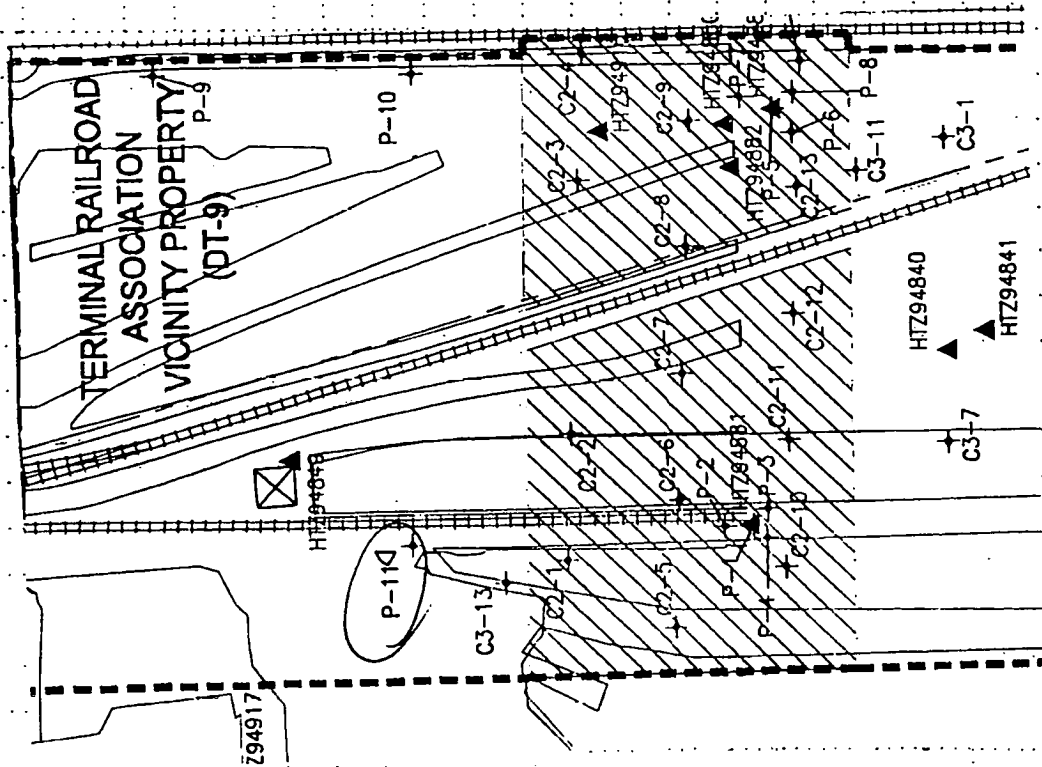
LOCATION SKETCH/COMMENTS

witnessed by: NA

SCALE: NDT to Scale

Terms Used to Describe %

trace <5%
few 5-10%
little 10-25%
some 20-30%
mostly/with 50-100%



PROJECT

FUSRAP/SLDS - TRT Spills Pile

WELL NO.

SLD101402

1 Nov 98

HTRW DRILLING LOG (CONTINUATION SHEET)						
PROJECT		E CODE		HOLE NO. 525/101402		
FUSRAP/SLDS				SHEET 202		
DEPTH (ft)	DESCRIPTION OF MATERIALS	FIELD PENETROMETER (psi)	SOIL SAMPLE NO.	LABORATORY NO.	FLOW COUNT (ft)	REMARKS
1	dark gray silt with some silt, loose, poorly graded	-400	2.0/2.0	SCS 101402 1505	3	
2	black cinders with some silt, some sand, trace brick, med dense, poorly graded	-600	0.0		6	
3	silt sized black cinders with some silt, some sand, few gravel, med dense, poorly graded	-400	0.0		8	
4	silt sized black cinders with some silt, some clay, few slag, med dense, poorly graded	-400	0.0	SCS 101403 1507	10	
5	silt sized black cinders with some silt, some gravel, few sand, loose, poorly graded	-400	0.0		20	
6	dark gray clay with some silt, some sand, trace brick, med plasticity, med stiff	-400	0.0		10	
7	dark gray silt with some sand, some clay, trace brick, med dense, poorly graded	-100	0.0	SCS 101404 1500	13	
8	dark gray silt with some sand, some clay, trace brick, med dense, poorly graded	-100	0.0		13	
9	dark gray silt with some sand, some clay, trace brick, med dense, poorly graded	-400	0.0	SCS 101405 1505	3	
10	dark gray silt with some sand, some clay, trace brick, med dense, poorly graded	-400	0.0		4	
11	dark gray silt with some sand, some clay, trace brick, med dense, poorly graded	-200	0.0		4	
12	dark gray silt with some sand, some clay, trace brick, med dense, poorly graded	-400	0.0		4	
13	TD-6054 bas EUB-1510					

ENG FORM 5056A-R, AUG 94

(Proponent: (ECW, HQ)

Figure 4-2 (Concluded)

103455

HTRW DRILLING LOG (CONTINUATION SHEET)							103455
PROJECT: FUSRAP/SLDS		INSPECTOR: ECODE		HOLE NUMBER: SL010355			(MPC)
				SHEET 2 OF 2			
DEPTH (ft)	DESCRIPTION OF MATERIALS	FIELD MEASUREMENTS (ft)	TEST SAMPLE NO.	ANALYTICAL LABORATORY	BLOW COUNT	REMARKS	
ML	0-1.0 brown silt with some sand (fine) some gravel, some clay, med dense poorly graded	0 / 0.0	2.0/2.0	SLD 10355 0955	8	(MPC) 103455	
	1-2.0 light brown silt with mostly gravel some sand, loose, poorly graded	0 / 0.0			8		
	2-3.0 silt sized black cinders with some silt, some sand, few clay, med dense poorly graded	0 / 0.0		SLD 10355 0955	10	(MPC) 103456	
		-100 / 0.0			42		
	3-4.0 silt sized black cinders with some silt, some sand, few clay trace clay, med dense, poorly graded	400 / 0.0	2.0/2.0		5		
		300 / 0.0			41		
		400 / 0.0		Archae 1005	25		
		200 / 0.0			21		
	4-5.0 silt sized black cinders with some silt, some sand, few clay, med dense, poorly graded	200 / 0.0	2.0/2.0		3		
		100 / 0.0			2		
5-6.0 silt sized mottled black cinders green-gray clay with few sand med dense, poorly graded	100 / 0.0			4			
	300 / 0.0		Archae 0955	2			
TD-6.0 ft bgs EUB 1005							

PROJECT: FUSRAP/SLDS TRRA Spills Pk
ENG FORM 5056A-R, AUG 94
NOTE NO. SL010355 (MPC)
(Proponent: ECH-EG)

103455

Figure 4-2 (Concluded)

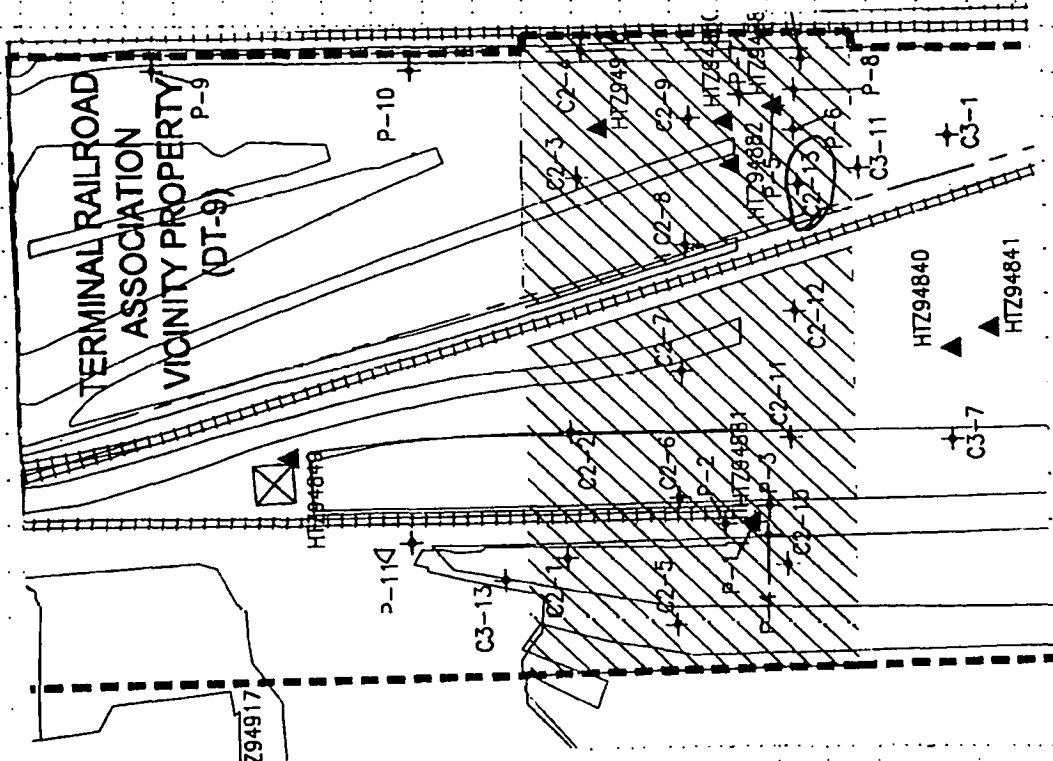
103457

HTRW DRILLING LOG		DISTRICT	HOLE NUMBER
1. COMPANY NAME Shaw E & I		2. DRILLING SUBCONTRACTOR Shaw	SLD10357 (MFC)
3. PROJECT FUSRAP/SLDS		4. LOCATION TRRA Spills Pile C2-13	
5. NAME OF DRILLER Dan Gortto		6. MANUFACTURER'S DESIGNATION OF DRILL CME 75	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/4" ID HSA w/ 9 1/2" x 2' split spoon sampler driven w/ 140# hammer per 30" ft		8. HOLE LOCATION see location sketch	
9. SURFACE ELEVATION NA		10. DATE STARTED 5-22-07	
11. DATE COMPLETED 5-27-07		12. OVERBURDEN THICKNESS NA	
13. DEPTH DRILLED INTO ROCK NA		14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA	
15. DEPTH GROUNDWATER ENCOUNTERED NA		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA	
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA		18. GEOTECHNICAL SAMPLES	
18. GEOTECHNICAL SAMPLES		19. TOTAL NUMBER OF CORE BOXES 0	
20. SAMPLES FOR CHEMICAL ANALYSIS		21. TOTAL CORE RECOVERY 0 %	
22. DISPOSITION OF HOLE		23. SIGNATURE OF INSPECTOR Blanca Cor	
22. DISPOSITION OF HOLE		23. SIGNATURE OF INSPECTOR	

LOCATION SKETCH/COMMENTS

witnessed by: **P. Winters**

SCALE: NOT TO SCALE
Terms Used to Describe %
trace <5%
few 5-10%
little 10-25%
some 20-30%
mostly/with 50-100%



PROJECT: **FUSRAP/SLDS - TRRA Spills Pile**

HOLE NO. **SLD10357** (MFC)
103457

HTRW DRILLING LOG (CONTINUATION SHEET)							103457
PROJECT		INSPECTOR		SHEET		SHEETS	
FUSRAPISLDS		E Code		2 of 2		103457	
DEPTH (ft)	DESCRIPTION OF MATERIALS	WALL THICKNESS (in)	SOIL SAMPLE NO.	SOIL SAMPLE NO.	BLOW COUNT (ft)	REMARKS	
ML	dark brown silt with mostly gravel, some sand some clay loose, poorly graded	-200 0.0	1.8/2.0	SLD 103457 0935	4	(MPC) 103457	
6m	light brown gravel with some sand some silt, very loose, poorly graded	-200 0.0			4		
	black cinders with some silt some sand few clay, med dense poorly graded	-300 0.0		SLD 103458 0937	3	(MPC) 103458	
2		0 0.0	no recovery		3		
		100 0.0	2.0/2.0		10		
		100 0.0			8		
3		100 0.0		Archive 0945	9		
		0 0.0			8		
4	silt sized black cinders with some silt. some sand trace gravel, med dense, poorly graded	0 0.0	1.7/2.0		3		
		0 0.0			6	Cinders are silt size d	
5	mottled black cinders/brown silt with some sand few gravel few brick, med dense, poorly graded	200 0.0		Archive 0923	5		
		0 0.0	no recovery		3		
6							
TD-6.0ft bgs EOB 0945							

PROJECT FUSRAPISLDS TRRT Spools Pile

ENG FORM 5056A-R, AUG 94

NOTE NO. SLD 103457 (Proposed: ECHWEG)

104357

Figure 4-2 (Concluded)

AR-077