

Iowa Army Ammunition Plant

Installation Action Plan







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Iowa Army Ammunition Plant

Middletown, Iowa





Iowa Army Ammunition Plant FY2005 Installation Action Plan Approval Signatures



The purpose of the Installation Action Plan (IAP) is to outline the total multi-year restoration program for an installation. The plan will define Installation Restoration Program (IRP) requirements and propose a comprehensive approach and associated costs to conduct future investigations and remedial actions at each Solid Waste Management Unit (SWMU) at the installation and other areas of concern.

Statement of Purpose

In an effort to coordinate planning information between the IRP manager, major army commands (MACOMs), installations, executing agencies, regulatory agencies, and the public, an IAP has been completed for the Iowa Army Ammunition Plant (IAAAP). The IAP is used to track requirements, schedules and tentative budgets for all major Army installation restoration programs.

All site-specific funding and schedule information has been prepared according to projected overall Army funding levels and is therefore subject to change during the document's annual review. Under current project funding, all remedies will be in place at the IAAAP by the end of 2008.

The following people contributed to the formulation and completion of this FY 2005 Installation Action Plan for Iowa Army Ammunition Plant:

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AEC, and the installations believe that environmental restoration information should be make available openly. This 2005 Iowa Army Ammunition Plant Installation Action Plan was forwarded to the following people:

Eric Orth - RAB Co-Chair (Document provided to all RAB members) Dan Cook - Iowa Department of Natural Resources Scott Marquess - Environmental Protection Agency Don Flater/Dan McGhee - Iowa Department of Public Health Mike Coffey - U.S. Fish and Wildlife

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Acronyms & Abbreviations

AEDB-R	Army Environmental Data Base-Restoration (formerly DSERTS)
AMC	Army Materiel Command
BAECP	Burlington Atomic Energy Commission Plant
bgs	Below Ground Surface
CADR	Corrective Action Design Report
CAMU	Corrective Action Management Unit
CEA	Cap Extension Area
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CEWES	Corps of Engineers Waterways Experiment Station
СТА	Central Test Area
CTC	Cost-to-Complete
CWP	Contaminated Waste Processor
CV	cubic vards
DERA	Defense Environmental Restoration Account (now ER.A)
DERP	Defense Environmental Restoration Program
DNT	Dinitrotoluene
DOE	Department of Energy
DSERTS	Defense Site Environmental Restoration Tracking System (now AEDB-R)
DU	Depleted Uranium
FDA	Explosive Disposal Area
EE/CA	Engineering Evaluation/Cost Analysis
FPA	Environmental Protection Agency
FRA	Environmental Restoration Army (formerly DERA)
ERC.	Emergency Response Center
ESD	Explanation of Significant Differences
	Explosive Waste Incinerator
	Explosive Waste memerator
FS	Feasibility Study
FUSRAP	Formerly Litilized Sites Remedial Action Program
FY	Fiscal Year
GOCO	Government-owned contractor-operated
GW	Groundwater
HMX	High Melting Explosives (Octabydro-1 3 5 7-tetranitro-1 3 5 7-tetrazocine)
HRS	Hazard Ranking Score
ΙΔΔΔΡ	Iowa Army Ammunition Plant
	Intergency Agreement
	Installation Action Plan
	Installation Action Filan
	Iowa Department of Natural Resources
	Iowa Department of Public Health
	Industrial Prenaredness Plan
IRΔ	Interim Remedial Action
	Installation Restoration Program
	Load Assemble Back
	Load, Assemble, Fack
	Low Tomporature Thermal Description
	Low Temperature Thermai Description
	Leaking Underground Storage Lank
	Madular Artillary Chargo System
	Multi-Agoney Padiation Survey and Site Investigation Manual
MMDD	Military Munitions Rosponse Program

Acronyms & Abbreviations

MNA	Monitored Natural Attenuation
MSC	Major Sub-Command
MW	Monitoring Well
NFA	No Further Action
NPL	National Priorities List
OSC	Operations Support Command
OU	Operable Unit
PA	Preliminary Assessment
PCB	Polychlorinated Biphenyl
PCP	Pentachlorophenol
PEP	Pyrotechnic
POL	Petroleum, Oil & Lubricants
PP	Proposed Plan
dad	Parts Per Billion
ppm	Parts Per Million
RA	Remedial Action
RA(C)	Remedial Action (Construction)
RA(O)	Remedial Action (Operation)
RAB	Restoration Advisory Board
RAD	Radionuclides
RBCA	Risk Based Corrective Action
RC	Response Complete
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RDX	Roval Demolition Explosive (Hexahvdro-1.3.5-trinitro-1.3.5-triazine) also known as cvclonite
REM	Removal
RI	Remedial Investigation
ROD	Record of Decision
RRSE	Relative Risk Site Evaluation
S&A	Supervision & Administration
S&R	Supervision & Review
SECOM	Security Command
SI	Site Inspection
STP	Sewage Treatment Plant
SVE	Soil Vapor Extraction
SVOC	Semi-Volatile Organic Compounds
SWMU	Solid Waste Management Unit
TIA	Temporary Inactive
TNT	Trinitrotoluene
USACE	United States Army Corps of Engineers
USACHPPM	United States Army Center for Health Promotion and Preventive Medicine
USAEC	United States Army Environmental Center
USAEHA	United States Army Environmental Hygiene Agency (now USACHPPM)
USATHAMA	United States Army Toxic and Hazardous Material Agency (now USAEC)
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compounds
WAM	Wide Area Mine
WES	Waterways Experiment Station

		- Summarv	
STATUS: II	NPL since Aug 1990 with a HRS sco	re of 29.73	
TOTAL # OF AEDB-R SITES:	52 AEDB-R sites 28 Active ER,A Eligible Sites 24 Response Complete	3 MMRP sites	
DIFFERENT SITE TYPES:	 5 Burn Areas 2 Contaminated Buildings 3 Disposal Pit/ Dry Wells 5 Landfills 3 Surface Impoundment/Lagoons 3 Waste Treatment Plants 1 Underground Storage Tank 5 Industrial Discharges 1 Mixed Waste Area 1 Fire/Crash Training Area 2 Surface Disposal Areas 1 Incinerator 3 Storage Areas 11 Spill Site Areas 4 Explosive Ordnance Dispo 1 Contaminated Groundwate 1 Oil Water Separator 		
CONTAMINANTS OF CONCERN:	Explosives, Metals, Radionuclides, SVOCs, VOCs, Pesticides, PCBs, POL, Nitrates, Sulfates, Freon, Herbicides		
MEDIA OF CONCERN:	Soil, Groundwater, Surface Water, Sediment		
COMPLETED REM/IRA/RA:	• REM: Coal Pile '93\$ 22.7K• Pesticide Pit '95\$ 423.3K• Explosive Sump Removal\$ 938.3K• Alternative Water Supply, Off-Post Residents '94\$ 172.9K• North Burn Pads\$ 800.0K• North Burn Pads Landfill\$ 2,200.0K• East Burn Pads\$ 2,000.0K• Former Line 1 Impoundment/Line 800 Pinkwater\$ 12,710K• Fire Training Pit\$ 1,760K• Remove & Dispose Blue Sludge\$ 25.8K• Former Fuel Station USTs\$ 63.8K		
CURRENT IRP PHASES:	RI/FS: 8 sites RD: 3 sites	RA(C): 2 sites	
PROJECTED IRP PHASES:	RD: 1 site RA(C): 2 sites LTM: 1 site	RA(O): 1 site	
IDENTIFIED POSSIBLE REM/IRA/RA:	RA (14 sites)		
FUNDING: DURATION:	Prior Years (1980-2004): \$ 87,83 FY2005: \$ 9,28 Future Requirements: \$ 11,56 Total: \$ 108,68	86,300 85,000 <u>89,000</u> 90,300	
	Year of Inception: Year of IRP Completion excluding LTN Year of LTM Completion: Removal from the NPL:	1991 M: 2008 2038 2017	

Installation Information Iowa AAP is located adjacent to Middletown, Des Moines County, Iowa. Iowa SITE DESCRIPTION: AAP is approximately 10 miles west of the largest city in Des Moines County, Burlington, with an estimated population of 27,208 people. The installation consists of 19,011 acres. **PROGRAM MANAGE-US Army Environmental Center MENT**: **IRP EXECUTING** Iowa Army Ammunition Plant • U.S. Army Corps of Engineers, Omaha District, Northwest Division AGENCIES: REGULATORY Federal: - U.S. Environmental Protection Agency, Region VII Federal **PARTICIPATION:** Facilities and Special Emphasis Branch, Superfund Division - U.S. Fish and Wildlife Service State: - Iowa Department of Natural Resources - Iowa Department of Public Health **REGULATORY STATUS:** NPL Installation Site with Federal Facilities Compliance Agreement under CERCLA Section 120 (IAG) Admin Docket No. VII-F-90-0029 State of Iowa Registry of Hazardous Waste or Hazardous Substance Disposal Sites & Hazardous Waste Remedial Fund MAJOR CHANGES TO IAP Performance-Based Contract was awarded in June 2004. The costs for FROM PREVIOUS YEAR : the PBC will be tracked under a PBC line item.

Installation Description

- **DESCRIPTION:** Iowa AAP (IAAAP) is an active Joint Munitions Command facility operated by the civilian contractor, American Ordnance LLC. IAAAP's current mission is to load, assemble and pack (LAP) ammunition items, including projectiles, mortar rounds, warheads, demolition charges, and munitions components such as fuzes, primers, and boosters.
 - **HISTORY:** IAAAP was founded in 1941 and has undergone modernization and expansion. Production of supplies for World War II began in September 1941 and ended in August 1945. From 1946 to 1951, the IAAAP was operated by the government to produce ammonium nitrate and store munitions. Ammunition production resumed in 1949 and has continued to the present. The former Atomic Energy Commission operated facilities on the site from 1947 to 1975.

Contamination Assessment

IAAAP is located on U.S. Highway 34 approximately 8 miles to the west of Burlington, IA. The facility is a government-owned, contractor-operated (GO CO) military industrial installation under the jurisdiction of the U.S. Army Joint Munitions Command, headquartered in Rock Island, Illinois. Its primary mission is to manufacture, load, assemble and pack (LAP) ammunition items.

IAAAP was established in July 1941 as the Iowa Ordnance Plant. The plant's mission was to load, assemble, and pack ammunition. It produced munitions for World War II until August 1945. Plant operations reverted to U.S. Army control from 1946 until 1951 with a mission of ammunition storage and surveillance. The former Atomic Energy Commission occupied portions of the IAAAP from 1947 to 1975. The plant has been a GOCO since 1951 when Mason and Hanger-Silas Mason Co., Inc. began operations. The IAAAP is currently an active installation.

The primary source of contamination at the site is attributable to past operating practices in which explosivescontaminated wastewater and sludge were discharged to uncontrolled on-site lagoons and impoundments. Additional sources of contamination included open burning of explosives materials and munitions, and land filling of waste material. Process wastewaters currently are treated and recycled, while only a small portion of the treated wastewater, containing residual explosives and other contaminants regulated under the plant's NPDES permit, is discharged to surface.

The installation was proposed for the National Priorities List (NPL) in August 1989 due to surface water contaminated with explosives leaving the installation boundary. IAAAP's Hazard Ranking Score (HRS) is 29.73. A Federal Facility Agreement (FFA) was signed by the U.S. Environmental Protection Agency (USEPA) Region VII and the U.S. Army in September 1990 and became effective in December of 1990.

The FFA originally listed 30 Solid Waste Management Units (SWMUs) as IAAP-1 through IAAP-30; these sites are represented in AEDB-R as sites IAAP-001 through IAAP-030. The Deactivation Furnace Site, IAAP-023, has been included with the Demolition Area Site, IAAP-021, because it is within the Demolition Area. Since publication of the FFA, sites IAAP-031 through IAAP-043 were identified in the February 1991 USATHAMA Draft Potential Areas of Concern Supplement document. Sites IAAP-032 through IAAP-035 were collectively listed under the number IAAP-032 because of close location to one another. The Line 800 Pinkwater Lagoon was added as IAAP-044 (Remedial Investigation, JAYCOR & ICAIR Lifesystems, 21 May 1996). Former Fuel Station USTs (IAAP-045) was added in the fall 1999 AEDB-R submission. This site was separated from IAAP-006 to better manage the soil and groundwater cleanup efforts from the 1988 LUST removal. Sites IAAP-046 and IAAP-047 were created to address the Off Post Groundwater and the Central Test Area respectively.

Preliminary Assessments (PAs) and Site Investigations (SIs) were conducted in 1991. The Site Wide Remedial Investigation was completed in 1996. The Interim Operable Unit (OU)1 Soils ROD, signed in March 1998, addressed the excavation, relocation and placement of contaminated soils from fifteen sites to the Inert Disposal Area, IAAP-020. The Final Soils ROD, signed in September 1998, addresses the treatment of the most highly contaminated fraction of that soil.

In July 2002, portions of the IAAAP used by the former AEC were designated by the U.S. Army Corps of Engineers (Corps) to be under the Formerly Utilized Sites Remedial Action Plan (FUSRAP). Thus far, seven areas have been identified as "FUSRAP" areas. These areas include Line 1 (IAAP-001), Firing Sites Area (IAAP-030), West Burn Pads Area [south of the road] (part of IAAP-032), Warehouse 3-01 (located in IAAP-003), Yard G, Yard C, and Yard L (near Warehouse L-37-1, -2, -3). Additionally, four areas were screened by FUSRAP in 2004 to determine if radiological contaminates from AEC are present. These "Screening" areas include the Inert Disposal Area (IAAP-020), Demolition Area/Deactivation Furnace (IAAP-021), Former Line 1 Impoundment (IAAP-016), and the Explosive Disposal Area. The explosive Disposal Area includes the North

Contamination Assessment

Burn Pads (IAAP-036), North Burn Pads Landfill (IAAP-037), West Burn Pads [Area north of road] (part of IAAP-032), and the East Burn Pads (part of IAAP-032). If radiological contamination attributable to the AEC is found at a "Screening" area, this area will be added to the "FUSRAP" areas list. The Corps will respond to all releases and threats of releases of hazardous substances, pollutants, or contaminates, with the exception of ground and surface water contamination, at all "FUSRAP" areas.

In FY02, nine "G" designated sites were created to better manage groundwater clean-up. They were IAAP-002G, IAAP-003G, IAAP-004G, IAAP-010G, IAAP-012G, IAAP-020G, IAAP-032G, IAAP-039G and IAAP-044G. Two other sites, IAAP-011 and IAAP-044, were consolidated so they may be better managed as they are contiguous.

Three Operable Units are identified at the IAAAP. Operable Unit 1 addresses Soils; OU 2 addressed Interim Soils but was merged with OU 1 for better management; OU 3 addresses groundwater (and surface water) issues; and OU 4 addresses miscellaneous sites and is considered the overall site OU.



Projected Milestones

FY05

IAAP-002,003, 004, 007, 044, 047 RD Field Work IAAP-046 Off-Site Groundwater Pilot Study IAAP-020 Soil Treatment Brush Creek Point Source Control Baseline Ecological Risk Assessment

FY06

IAAP-007, 044, 047 Soil Removal IAAP-020 Soil Treatment IAAP-013, 018, 025, 028, 041 Supplemental RI IAAP-013, 018, 025, 028, 041, 016, 017. 039, 044 Feasibility Study

No Further ER,A Action Sites

- IAAP-001 Line 1 Ammo LAP (Missile/Former AEC)
- IAAP-006 Line 5A & 5B Ammo Assembly
- IAAP-008 Line 7 Ammo LAP (Fuze/Blank)
- IAAP-011 Line 800 Ammo Renov
- IAAP-012 Explosive Disposal Area (East Burn Pads)
- IAAP-014 Boxcar Unloading Area
- IAAP-019 Contaminated Clothing Laundry
- IAAP-021 Demolition Area/Deactivation Furnace
- IAAP-022 Unidentified Substance (Oil) Waste Site
- IAAP-024 Contaminated Waste Processor
- IAAP-026 Sewage Treatment Plant/ Drying Beds
- IAAP-027 Fly Ash Landfill (New Bldg 400-139)
- IAAP-029 Line 3A Sewage Treatment Plant/Dry Beds
- IAAP-030 Firing Site Area
- IAAP-031 Yard B Ammo Box Chipper Disposal Pit
- IAAP-032 Burn Cages, BCLF, West Burn Pads, WBPLF
- IAAP-038 Building 600-86 Septic System
- IAAP-042 Abandoned Coal Storage Yard
- IAAP-043 Fly Ash Disposal Area
- IAAP-045 Former Fuel Station USTs

Remediation Activities

COMPLETED REM/IRA/RA: ||1992

• IAAP-042, Abandoned Coal Storage Yard: Removal completed, the area wasbackfilled and vegetated with native grasses.

1994

• The Army connected off-post residents south of the Plant to a rural water supply thereby removing the exposure pathway of contaminants to them.

1995

• Removal Actions at the Pesticide Pit and Explosive Sumps were completed under Rapid Response Program.

 Soils from the Pesticide Pit were transported to an approved off-site incinerator.

• Soils from the sumps were temporarily held and subsequently placed in Trench 6 of the Inert Landfill in 1997.

1996

• The RI was completed.

• Corrective Action Management Unit was completed.

1997

• Over 80,000 cy of soil was removed from the Former Line 1 Impoundment Area and the Line 800 Pinkwater Lagoon.

 Soils from the sumps which were excavated in 1995 and stored at the IDA were placed into Trench 6.

• Blue sludge which was also stored at the IDA was placed in Trench 6.

1998

- Capped 5 cells at the IDA.
- Removed impacted soil from East Burn Pads and the North Burn Pads.
- Completed Bio-Slurry Study.
- Completed Humic Polymer Study.

• Began Supplemental RI activities for Eco-risk, Line 800 Pinkwater lagoon, and other areas.

• Signed Interim and Final RODs.

1999

- Completed soil removals at the East Burn Pads.
- Completed soil removals at the Fire Training Pit.
- Completed soil treatment of Fire Training Pit soil.
- Conducted small field study of Low Temperature Thermal Desorption treatment for explosive contaminated soils.
- Placed monitoring wells around Corrective Action Management Unit (IDA Trench 7).
- Placed 11 Long Term Monitoring Wells.

Remediation Activities

COMPLETED REM/IRA/RA: |||2000

- Completed Soil Removal at the West Burn Pad Area
- Completed Cap Extension for the Inert Disposal Area
- Completed Soil Removal around Production Buildings at Lines 5A/5B

2001

• No Removal or remedial Actions were completed this year

• Army connected 34 residents south of the plant to rural water supply.

These connections were for residents who refused service in 1994

2002

• Completed Treatment of WBPA Soils

• Completed Soil Removal at the Former Fuel Station

2003

• Completed Supplemental Soil Removal at the Fire Training Pit

2004

- Obtained NFA Certificate from State of Iowa for Former Fuel Station
- Completed remedial actions for Phase IV soil sites

Cost Estimates

PRIOR YEAR FUNDS (1980-1993)

Year	Site Information	Expenditures	FY Total
FY 80	Initial Assessments & Preliminary Survey	411.5 K	570 0 K
	Former Site investigation - 15 wells	159.4 K	570.9 K
FY 83	Follow-on Contamination Study	124.9 K	124.9 K
FY 85	Limited Sampling & Analysis	196.1 K	
	Alternatives Analysis	362.7 K	558.8 K
FY 86	Data Management	18.2 K	
	Imagery Acquisition & Interpretation	24.0 K	42.2 K
FY 87	Remedial Actions Assessment	215 2 K	
1107	Limited Confirmatory Sampling & Support	210.2 K	
	Inert Landfill GW Quality Assessment	450.0 K	689.6 K
FV 88	Inert Landfill GW Quality Assessment	21 O K	
1100	Install Frost-Free Hydrant on Monitoring Well	0.8 K	21.8 K
FY 89	Petroleum Leak/Spill Area Assessment	213.1 K	
	Pink Water Lagoon Additional RI/FS	37.3 K	
	Pink Water Lagoon Remedial Action Design	5.0 K	
	Inert Landfill and RI/FS Contract	275.0 K	530.4 K
FY 90	Inert Landfill/Line 6 Contract Modification/S&A	1,629.2 K	1,629.2 K
FY 91	Remedial Investigation/Feasibility Study	3 328 0 K	
	Corps of Engineers S&A	11.3 K	3,339.3 K
EV 92	Remedial Investigation/Feasibility Study	3 955 2 K	
1152	Coal Pile Closure/Removal	22.7 K	3,977.9 K
EA 03	Accelerated GW Assessment (IAADQ2-012)	643 3 K	
1133	Installation Support (IAAP92-029)	12 1 K	
	Sump Removals	10.6 K	
	Procure Bottled Water	0.9 K	
	Public Water Line Construction (IAAP93-010)	168.9 K	
	RI Stormwater Samplers (IAAP92-006)	41.4 K	877.2 K

PRIOR YEAR FUNDS (1994-1996)

Year	Site Information	Expenditures	Total
FY 94	RI/FS (IAAP92-012) Installation Support (IAAP92-029) Bottled Water (IAAP93-009) Biostudy of Explosives (CEWES) (IAAP94-031) Survey/ID/Abandon Well Project (IAAP93-005) Restoration of MWs RD/RA Inert Landfill RD line 1/Line 800 RD/RA S&A Explosive Sump Removal Pesticide Pit Removal	808.8 K 31.3 K 3.1 K 150.0 K 5.8 K 8.8 K 65.0 K 50.0 K 30.0 K 842.2 K 114.3 K	2,109.3 K
FY 95	RI/FS Gas Station (IAAP94-030) RI/FS - Contract Modification Installation Support Environmental Monitoring GW Quality Assessment/Trench 5 Treatability Study - WES Remove/Dispose Blue Sludge Remedial Action - Explosive Sumps Remedial Action - Explosive Sumps Remedial Action - Pesticide Pit Remedial Action - Line 1/800 Lagoon Removal Action - Fire Training Pit RD/RA Corps S&A Inert Landfill Closure	61.4 K 1,329.1 K 245.8 K 298.9 K 482.0 K 180.0 K 11.8 K 96.1 K 206.3 K 5,950.5 K 105.0 K 50.0 K 2,496.6 K	11,513.5 K
FY 96	Remedial Action - Fire Training Pit Inert Landfill Closure (IAAP92-S004) Remedial Action - Line 1/800 RI/FS - Fuel Station Environmental Monitoring RI/FS & Treatability Study Remove/Dispose of Blue Sludge Installation Support/GOCO Explosive Sump Removal Burn Pad Closures Phytoremediation Study Pesticide Pit Removal Bioremediation of Explosives Soil RD/RA S&A	1,018.0 K 315.0 K 1,736.0 K 187.0 K 704.0 K 1,520.0 K 14.0 K 450.0 K 450.0 K 204.0 K 318.0 K 10.0 K 48.0 K	7.292 K

Cost Estimates

Cost Estimates

PRIOR YEAR FUNDS (1997-2000)

Year	Site Information	Expenditures	Total
FY 97	Removal Action - Line 1/800	2,783.5 K	
	Explosive Sump Removal	5.5 K	
	Inert Landfill Closure	696.5 K	
	Fire Training Pit RA	28.7 K	
	RD/RA (Supl. RI/GW Data Gaps)	1,569.0 K	
	Focused FS - soils REM	3,475.1 K	
	Installation Support	134.6 K	
	Monitoring of IRP Wells	214.8 K	
	RI/FS Fuel Station	11.8 K	
	RAB	8.0 K	8,927.5 K
FY 98	Inert Landfill Closure	742.5 K	
	Removal @ Lines 1 & 800	1,042.5 K	
	Focused Soils Removal	3,638.5 K	
	Interim Groundwater RD/RA	133.9 K	
	Fuel Station RI/FS/RA	16.0 K	
	Long Term Well Monitoring and Maintenance	465.4 K	
	Fire Training Pit Closure	100.0 K	
	Prepare Soils Proposed Plan /ROD	300.0 K	
	RAB	8.5 K	6,447.3 K
FY 99	Removal Actions at Lines 1/800	400.0 K	
	Removal Action at the Inert Landfill	300.0 K	
	Removal Action at Fire Training Pit	585.0 K	
	Interim Groundwater RD/RA(Data Gaps)	1,180.9 K	
	Focused FS Removals	5,380.0 K	
	Long Term Well Monitoring and Maintenance	908.0 K	
	RAB	4.9 K	8,758.8 K
FY 00	Fire Training Pit	5.0 K	
	Removal Action at the Inert Disposal Area	533.1 K	
	Removal Action at Line 1 Impoundment/800 Lagoon	629.4 K	
	Focused FS Removals	1,980.5 K	
	Installation Support	15.2 K	
	Former Fuel Station USTs	5.1 K	
	Periodic Groundwater Monitoring	1,208.3 K	
	Interim Groundwater RD/RA	110.0 K	
	Line 1 and Firing Site	802.7 K	
	RAB	4.4 K	5,293.7 K

PRIOR YEAR FUNDS (2001-2003)

Year	Site Information	Expenditures	Total
FY 01	Fire Training Pit	2.0 K	
	Inert Disposal Area	696.3 K	
	Line 1 & 800	83.2 K	
	Ecological Risk Assessment	25.0 K	
	Focused FS Removals	1,512.3 K	
	Periodic Groundwater Monitoring	675.7 K	
	Supplemental Remedial Investigation	1,528.8 K	
	RAB	8.0 K	
	Line 1 & Firing Site	70.4 K	
	Off-Post Water Connection	146.4 K	
	Federal Facilities Agreement Schedule	55.0 K	4,803.1 K
FY 02	Fire Training Pit	11.7 K	
	Inert Disposal Area	691.8 K	
	Line 1 & 800	85.6 K	
	Ecological Risk Assessment	199.4 K	
	Focused Soils Removal	897.9 K	
	Fuel Station	58.7 K	
	RAB	9.0 K	
	Periodic Groundwater Monitoring	1,001.4 K	
	Supplemental Remedial Investigation	2,314.9 K	
	Line 1 & Firing Site	60.0 K	
	Federal Facilities Agreement Schedule	140.6 K	
	Program Support	117.5 K	
	Off Post RI	727.5 K	
	Supplemental RI (Soil)	201.0 K	
	Tar Investigation	20.0 K	6,537.0 K
FY 03	Focused Groundwater RI/FS	166.0 K	
	Focused FS Soil Removal	2589.0 K	
	Operations & Maintenance	851.0 K	
	Eco-Risk	50.0 K	
	Periodic Groundwater Monitoring/Maintenance	836.3 K	
	FFA Schedule	76.0 K	
	Off-post RI/FS	125.5 K	
	RAB	6.2 K	
	GIS Support	26.0 K	
	UXO Survey	288.0 K	
	Fire Training Pit	4.8 K	
	Program Support	125.5 K	
	Supplemental RI (Soil)	61.9 K	5,206.2 K

Cost Estimates

PRIOR YEAR FUNDS (2004)

Year	Site Information	Expenditures	Total
FY 04	Fire Training Pit	1.6 K	
	Ecological Risk Assessment	198.8 K	
	Focused FS Soil Removal	51.8 K	
	Periodic Groundwater Monitoring	579.6 K	
	Supplemental Remedial Investigation - Soil	85.7 K	
	Focused Groundwater RI/FS	127.5 K	
	Off-site Groundwater	30.0 K	
	Project Support	132.5 K	
	Operations and Maintenance	57.3 K	
	Performance-Based Contract	7,320.8 K	8,585.6 K
	Performance-Based Contract	7,320.8 K	8,585.6 K

TOTAL FUNDING 1980-2004:

\$87,836,300

Cost Estimates

(RESTORATION ADVISORY BOARD (RAB) STATUS

A Restoration Advisory Board (RAB) was established in August 1997. The RAB has been very active since its inception by meeting approximately every two months to receive training and provide input to the environmental restoration process. Members are from the surrounding towns of Burlington, West Burlington, Danville, Farmington and Wever. Government members are from the Installation, the U.S. Environmental Protection Agency, and the State of Iowa. The RAB continues to review documents, provides input to the community relations plan, and helps establish project priorities.

A separate program and Citizens' Advisory Board has been formed by DOE to address health-related issues of former Atomic Energy Commission workers.

Administrative Record

The Installation maintains an administrative record at the locations listed below:

- 1. Danville City Hall, 105 West Shepherd Street, Danville, IA 52623
- 2. Lee County Health Department, 2218 Avenue H, Fort Madison, IA 52627
- 3. Burlington Public Library, 501 North 4th, Burlington, IA 52601



Iowa Army Ammunition Plant ER, A Eligible Active Sites

LINE 2 AMMO LAP (ARTILLERY/SHAPED) IAAP-002

SITE DESCRIPTION

The IRP site consists of the contamination from past munition production. Any contamination from current activities will be addressed under compliance (non-ER,A funding). The past contamination has resulted from the practice of washing spilled explosives from floors, equipment and sump failures.

Line 2 is a production line that has been in operation since the inception of IAAAP, except for a brief hiatus from 1947 to 1949, and occupies nearly 140 acres, including 31 buildings and covered walkways. It is used to load, assemble and pack 120 mm ammunition and blank ammunition. The melt building appears to be where the highest volumes of wastes were produced. The buildings include equipment rooms, explosives magazines and nine sump buildings.

The PA/SI was completed in 1991, and an initial RI was completed in May 1996. The Interim Soil ROD requires the removal of an estimated 1950 cy (885 cy of metals only, 770 cy of explosives

STATUS

RRSE RATING: High CONTAMINANTS: Metals, Explosives MEDIA OF CONCERN: Soil, Surface Water, Sediment COMPLETED IRP PHASE: PA/SI, RI/FS CURRENT IRP PHASE: RD FUTURE IRP PHASE: RD, RA(C)

only, and 295 cy of metals and explosives) of soil contaminated with metals and explosives. Per the ROD, this soil will be taken to the Inert Disposal Area (IAAP-020) and sorted by contaminant level and type.

PROPOSED PLAN

This site is included in the Performance-Based Contract (PBC) awarded in 2004. Based on the results of a proposed pilot study, soils will be excavated and treated per the ROD, or treated in situ.



LINE 2 AMMO LAP - GROUNDWATER IAAP-002G

SITE DESCRIPTION

The IRP site consists of the groundwater contamination from past munition production. Any contamination from current activities will be addressed under compliance (non-ER,A funding). The past contamination has resulted from the practice of washing spilled explosives from floors, equipment and sump failures.

Line 2 is a production line that has been in operation since the inception of IAAAP, except for a brief hiatus from 1947 to 1949, and occupies nearly 140 acres, including 31 buildings and covered walkways. It is used to load, assemble and pack 120mm ammunition and blank ammunition. The melt building appears to be where the highest volumes of wastes were produced. The buildings include equipment rooms, explosives magazines and nine sump buildings.

TNT and RDX in concentrations of up to 2 ppm have been found in the groundwater in shallow localized plumes within 30 feet of the ground surface.

STATUS

RRSE RATING: High CONTAMINANTS: Explosives MEDIA OF CONCERN: Groundwater COMPLETED IRP PHASE: PA/SI CURRENT IRP PHASE: RI/FS FUTURE IRP PHASE: RI/FS, RD, RA(C), RA(O), LTM

The PA/SI was completed in 1991, and an initial RI was completed in May 1996. A Supplemental RI was completed in 2003 to fill GW data gaps found in the RI, dated May 1996.

PROPOSED PLAN

This site is included in the Performance-Based Contract (PBC) awarded in 2004. The remedial approach for this site, as well as others in the Brush Creek watershed, will be assessed in the FS. At present, it is presumed that localized areas of contamination will be remediated.



LINE 3 AMMO LAP (ARTILLERY) IAAP-003

SITE DESCRIPTION

The IRP site consists of the contamination from past munition production. Any contamination from current activities will be addressed under compliance (non-ER,A funding). The practice during the early years of production was to dispose of wastewater at the Line 800 Pink Water Lagoon. This line was upgraded to include self-contained Pinkwater Reroute Systems in July 1995 and September 1998.

Line 3 is a production line that has been in operation since 1941, except for a short time between 1945 and 1949. This line fills and assembles artillery projectiles, occupies about 150 acres and consists of 26 buildings and covered walkways. The buildings include equipment rooms, explosives magazines, and nine sump buildings for explosive waste processing. The two melt buildings appear to be the areas where the highest volumes of wastes were produced during operations.

From 1977 to 1984, metal cleaning operations were conducted at

STATUS

RRSE RATING: High CONTAMINANTS: Metals, Explosives, Rad, SVOC MEDIA OF CONCERN: Soil, Surface Water, Sediment COMPLETED IRP PHASE: PA/SI, RI/FS CURRENT IRP PHASE: RD, RA(C) FUTURE IRP PHASE: RC

Line 3. This process consisted of several stainless steel dip tanks where ammunition casings were immersed in a sulfuric/hydrochloric acid bath, followed by a chromic acid rinse, then rinsed with water. Sludge that accumulated in the bottom of the sulfuric acid tank was removed, treated with sodium hydroxide, and disposed of in the Line 3A Pond (IAAP-041).

The Interim ROD requires the removal of an estimated 3,500 cy (550 cy of metals only, 1,880 cy of explosives only, 840 cy of metals and explosives, 110 cy of SVOCs and explosives, and 120 cy of Rad).

The PA/SI was completed in 1991, and an initial RI was completed in May 1996. The Interim ROD requires the removal of an estimated 3,500 cy of contaminated soil including 120 cy of soil that the Army now believes to contain radionuclides only at background levels. Per the ROD, this soil will be taken to the Inert Disposal Area (IAAP-020) and sorted by contaminant level and type.

Note: Building 3-01 will be addressed under FUSRAP.



This site is included in the Performance-Based Contract (PBC) awarded in 2004. Based on the results of a



proposed pilot study, soils will be excavated and treated per the ROD, or treated in situ.

LINE 3 AMMO LAP - GROUNDWATER IAAP-003G

SITE DESCRIPTION

The IRP site consists of the groundwater contamination from past munition production. Any contamination from current activities will be addressed under compliance (non-ER,A funding). The practice during the early years of production was to dispose of wastewater at the Line 800 Pink Water Lagoon. This line was upgraded to include self-contained Pinkwater Reroute Systems in July 1995 and September 1998.

Line 3 is a production line that has been in operation since 1941, except for a short time between 1945 and 1949. This line fills and assembles artillery projectiles, occupies about 150 acres and consists of 26 buildings and covered walkways. The buildings include equipment rooms, explosives magazines, and nine sump buildings for explosive waste processing. The two melt buildings appear to be the areas where the highest volumes of wastes were produced during operations.

From 1977 to 1984, metal cleaning operations were conducted at

STATUS

RRSE RATING: High CONTAMINANTS: Explosives MEDIA OF CONCERN: Groundwater COMPLETED IRP PHASE: PA/SI CURRENT IRP PHASE: RI/FS FUTURE IRP PHASE: RD, RA(C), RA(O)

Line 3. This process consisted of several stainless steel dip tanks where ammunition casings were immersed in a sulfuric/hydrochloric acid bath, followed by a chromic acid rinse, then rinsed with water. Sludge that accumulated in the bottom of the sulfuric acid tank was removed, treated with sodium hydroxide, and disposed in the Line 3A Pond (IAAP-041).

RDX in concentrations of 0.5-2.2 ppm has been found in the groundwater in a shallow localized plume within 30 feet of the ground surface. Recent data shows a downward trend in groundwater concentrations.

The PA/SI was completed in 1991, and an initial RI was completed in May 1996. Supplemental RI work was completed in 2003 to better delineate groundwater contamination.

PROPOSED PLAN

This site is included in the Performance-Based Contract (PBC) awarded in 2004. The remedial approach for this site, as well as others in the Brush Creek watershed, will be assessed in the FS. At the present, it is presumed that monitored natural attenuation will be the remedy.



LINE 3A AMMO LAP (ARTILLERY) IAAP-004

SITE DESCRIPTION

The IRP site consists of the contamination from past munition production. Any contamination from current activities will be addressed under compliance (non-ER,A funding). This line was upgraded to include a self-contained Pinkwater Reroute System in December 1996.

Line 3A was constructed in 1941 and began operations in 1943. The line was shut down from 1945 to 1949 then resumed operations until 1989. Line 3A encompasses 119 acres and is currently active. The line is a load, assemble and pack operation for 155mm artillery rounds. The melt building appears to be the area where the highest volumes of wastes were produced during operations.

Metal cleaning operations were also conducted here from 1977 to 1985. The process included several stainless steel dip tanks where ammunition casings were immersed in a sulfuric/hydro-chloric acid bath, followed by a chromic acid bath and water rinsing.

STATUS

RRSE RATING: High CONTAMINANTS: Metals, Explosives MEDIA OF CONCERN: Soil COMPLETED IRP PHASE: PA/SI, RI/FS CURRENT IRP PHASE: RD FUTURE IRP PHASE: RA(C)

The PA/SI was completed in 1991, and an initial RI was completed in May 1996. The Interim ROD requires the removal of an estimated 2,040 cy (1350 cy of explosives-contaminated soil only, and 690 cy of metals and explosives-contaminated soil). Per the ROD, this soil will be taken to the Inert Disposal Area (IAAP-020) and sorted by contaminant level and type.

PROPOSED PLAN

This site is included in the Performance-Based Contract (PBC) awarded in 2004. Based on the results of a proposed pilot study, soils will be excavated and treated per the ROD, or treated in situ.



LINE 3A AMMO LAP - GROUNDWATER IAAP-004G

SITE DESCRIPTION

The IRP site consists of the groundwater contamination from past munition production. Any contamination from current activities will be addressed under compliance (non-ER,A funding). This line was upgraded to include a self-contained Pinkwater Reroute System in December 1996.

Line 3A was constructed in 1941 and began operations in 1943. The line was shut down from 1945 to 1949 then resumed operations until 1989. Line 3A encompasses 119 acres and is currently active. The line is a load, assemble and pack operation for 155mm artillery rounds. The melt building appears to be the area where the highest volumes of wastes were produced during operations.

Metal cleaning operations were also conducted here from 1977 to 1985. The process included several stainless steel dip tanks where ammunition casings were immersed in a sulfuric/hydro-chloric acid bath, followed by a chromic acid bath and water rinsing.

STATUS

RRSE RATING: High CONTAMINANTS: Explosives MEDIA OF CONCERN: Groundwater, Surface Water COMPLETED IRP PHASE: PA/SI CURRENT IRP PHASE: RI/FS, RD, RA(C), RA(O) FUTURE IRP PHASE: RC

Two isolated, shallow plumes (RDX, low level) have been identified to date. The PA/SI was completed in 1991, and the initial RI was completed in May 1996.

PROPOSED PLAN

This site is included in the Performance-Based Contract (PBC) awarded in 2004. The remedial approach for this site, as well as others outside the Brush Creek watershed, will be assessed in a single FS. At the present, it is presumed that monitored natural attenuation will be the remedy.



LINE 4A & 4B AMMO ASSEMBLY IAAP-005

SITE DESCRIPTION

The IRP site consists of the contamination from past munition production. Any contamination from current activities will be addressed under compliance (non-ER,A funding).

Lines 4A and 4B are located in the north-central portion of the plant and are approximately 1000 feet apart. Line 4A encompasses 20 acres and Line 4B encompasses 17 acres. Both lines were constructed in 1941 for component assembly.

Line 4A produced detonators and was in operation between 1942 and 1945; it was reopened in 1982. It is currently leased to a private corporation (ICI), who reworked the line to make air-bag initiators, and operations have ceased. There are 12 buildings in the area which consists of an assembly building, mixer buildings, lead azide magazine, detonator service magazine and change houses. Hazardous substances at Line 4A include lead azide, RDX, lead styphnate, tetracene, barium nitrate, TNT, HMX, and metals. Fourteen in-ground sumps (treatment tanks) underwent RCRA closure in 1995.

STATUS

RRSE RATING: Medium CONTAMINANTS: Metals, Explosives MEDIA OF CONCERN: Groundwater, Soil COMPLETED IRP PHASE: PA/SI, RI/FS, RD CURRENT IRP PHASE: RA(C) FUTURE IRP PHASE: RC

Line 4B is an assembly facility for components manufactured elsewhere. Operations began in 1941 and ceased in 1945. Production resumed in 1962 and the line was used for missile assembly in the late 1960s. Line 4B consists of a fuse assembly and equipment building, detonator service magazine, rest houses and change houses. Hazardous substances of concern are TNT, RDX, Composition B, HMX, and LX-14. Previous materials included tetryl, booster pellets and fuze ingredients. The PA/SI was completed in 1991, and the initial RI was completed in May 1996. The Interim ROD requires the removal of 153 cy of contaminated soil from Line 4A and none from Line 4B. Remedial design sampling, conducted in 2004, did not locate soil contaminants above action levels.

PROPOSED PLAN

Remedial action report is pending. NFA anticipated.



LINE 6 AMMO PRODUCTION (DETONATOR) IAAP-007

SITE DESCRIPTION

The IRP site consists of the contamination from past munition production. Any contamination from current or future activities will be addressed under compliance (non-ER,A funding).

Line 6 is a detonator production area encompassing 30 acres and located in the center of the installation. Constructed in 1941 and operated until 1981, this line is currently inactive. Line 6 consists of 34 buildings for the production, storage, and shipping of detonators, relays, and hand grenade fuses.

The primary waste stream was related to the production of detonators and included lead azide, lead styphnate, tetracene, RDX, barium nitrate and mercury fulminate. Treatment of black powder was performed in Building 6-68 as a RCRA permitted unit. This unit underwent RCRA closure in 1995 and will no longer be maintained or used by the Army (modified caretaker status). As part of the RCRA closure, 800 cy of contaminated soil were removed in 1994.

STATUS

RRSE RATING: Low CONTAMINANTS: Metals MEDIA OF CONCERN: Soil COMPLETED IRP PHASE: PA/SI, RI/FS CURRENT IRP PHASE: RD, RA(C) FUTURE IRP PHASE: RC

The PA/SI was completed in 1991, and an initial RI was completed in May 1996. The Interim ROD requires the removal of approximately 445 cy of contaminated (metals) soil that was not addressed under the RCRA closure. This soil will be taken to the Inert Disposal Area (IAAP-020) and sorted by contaminant level and type. The principal concern at this site is the potential for surface runoff to migrate to nearby streams, which in turn recharge groundwater off post. Groundwater at the site shows no significant contamination. During the historical site assessment, it was determined there was a potential UXO concern at this site.

The Army has determined that the facilities at this Line are excess and will persue Non-ER,A funding for building demolition and debris removal, which is listed as an option in the PBC.

PROPOSED PLAN

This site is included in the Performance-Based Contract (PBC) awarded in 2004. Based on the results of a proposed pilot study, soils will be excavated and treated per the ROD, or treated in situ. Prior to any intrusive



activities, a geophysical investigation and any necessary surface UXO clearance will be conducted.

NFA is expected for the groundwater (RI study May 21, 1996 - section 6.7).

LINE 8 AMMO LAP (FUZE/ROCKET) IAAP-009

SITE DESCRIPTION

The IRP site consists of the contamination from past munition production. Any contamination from current or future activities will be addressed under compliance (non-ER,A funding).

Line 8 was a production Line that was constructed in 1941 and was used during World War II to produce Amatol (an explosive mixture of ammonium nitrate and TNT). The Emergency Export Co. utilized the ammonium nitrate crystallization equipment to produce fertilizer to support the Marshall Plan. Subsequent activities were fuze and rocket igniter load, assemble and pack operations. Prior to closing of the production activities around 1950, Line 8 consisted of four process buildings, a gate house, and tank farm to store ammonium nitrate liquor. Ammunition inspection activities took place from 1976 to 1993. Only two buildings remain and will no longer be maintained or used by the Army (modified caretaker status).

STATUS

RRSE RATING: Medium CONTAMINANTS: Metals MEDIA OF CONCERN: Soil, Groundwater COMPLETED IRP PHASE: PA/SI, RI/FS, RD CURRENT IRP PHASE: RA(C) FUTURE IRP PHASE: RC

The PA/SI was completed in 1991, and an initial RI was completed

in May 1996. The Interim ROD requires the removal of approximately 476 cy of lead-contaminated soil. This soil will be taken to the Inert Disposal Area (IAAP-020) and sorted by contaminant level and type. Remedial design sampling, conducted in 2004, did not locate soil contaminants above action levels.

The Army has determined that the facilities at this Line are excess and will persue non-ER,A funding for building demolition and debris removal, which is listed as an option in the PBC.

PROPOSED PLAN

Remedial action report is pending. NFA anticipated.



LINE 9 AMMO LAP (MINE) IAAP-010

SITE DESCRIPTION

This site consists of the contamination from past munition production. Any contamination from current or future activities will be addressed under compliance (non-ER,A funding).

Line 9 is about 9 acres in size and was built in 1942 for use as a production facility and produced mine and mine fuses during the Vietnam War. This Line is in modified caretaker status.

The PA/SI was completed in 1991, and an initial RI was completed in May 1996. The Interim ROD requires the removal of an estimated 469 cy of metals-contaminated soil. Remedial design sampling, conducted in 2004, located soil contaminants above action levels. Approximately 200 cy of soil was removed and disposed of at the IDA (IAAP-020) per the ROD.

The Army has determined that the facilities at this Line are excess and will pursue non-ER,A funding for building demolition and debris removal, which is listed as an option in the PBC.

STATUS

RRSE RATING: Medium CONTAMINANTS: Metals MEDIA OF CONCERN: Soil COMPLETED IRP PHASE: PA/SI, RI/FS, RD CURRENT IRP PHASE: RA(C) FUTURE IRP PHASE: RC



Remedial action report is pending. NFA anticipated.



LINE 9 AMMO LAP - GROUNDWATER IAAP-010G

SITE DESCRIPTION

This site consists of the groundwater contamination from past munition production. Any contamination from current or future activities will be addressed under compliance (non-ER,A funding).

Line 9 is about 9 acres in size and was built in 1942 for use as a production facility that produced mine and mine fuses during the Vietnam War. This Line is in modified caretaker status.

The PA/SI was completed in 1991, and an initial RI was completed in May 1996. During the Supplemental RI, completed in 2003, high levels of freon were found in groundwater.

Freon-113 in concentrations of up to 220 ppm has been found in the groundwater. The plume likely extends over approximately five acres, and has been found to produce concentrations that displace oxygen at levels that represent a risk to human health. This information has been provided to AO Safety.

STATUS

RRSE RATING: High CONTAMINANTS: Freon, Explosives MEDIA OF CONCERN: Groundwater COMPLETED IRP PHASE: PA/SI CURRENT IRP PHASE: RI/FS, RD, RA(C), RA(O) FUTURE IRP PHASE: RC

The Army has determined that the facilities at this Line are excess and will pursue non-ER,A funding for building demolition and debris removal, which is listed as an option in the PBC.

PROPOSED PLAN

This site is included in the Performance-Based Contract (PBC) awarded in 2004. The remedial approach for this site, as well as others in the Brush Creek watershed, will be assessed in the FS. At present, it is presumed that localized areas of contamination will be remediated.


EXPLOSIVE DISPOSAL AREA (EAST BURN PADS) - GROUNDWATER IAAP-012G

SITE DESCRIPTION

The Explosive Disposal Area (EDA) east burn pads, located in the northeast corner of IAAAP, consisted of 8 raised earthen burning pads enclosed in a fenced area of approximately 12 acres. Activities included open burning of explosives-contaminated metals, propellant explosives, and pyrotechnic (PEP) contaminated materials. Each pad was bermed on three sides to restrict horizontal movement of metal projectiles. The pads were in operation from 1941 until 1982, when the Explosive Waste Incinerator was built.

The PA/SI was completed in 1991, and an initial RI was completed in May 1996. The Interim ROD required the removal of contaminated soil, and 8,270 cy of soil was removed in I998 (funded as an IRA). This soil was taken to the Inert Disposal Area (IAAP-020) and sorted by contaminant level and type.

Low levels of explosives and VOCs have been found in shallow groundwater and upper bedrock (30 feet bgs).

STATUS

RRSE RATING: Medium CONTAMINANTS: Metals, Explosives, VOC MEDIA OF CONCERN: Groundwater COMPLETED IRP PHASE: PA/SI CURRENT IRP PHASE: RI/FS, RD, RA(C), RA(O) FUTURE IRP PHASE: RC



This site is included in the Performance-Based Contract (PBC) awarded in 2004. The remedial approach for this site, as well as others outside the Brush Creek watershed, will be assessed in a single FS. At the present, it is presumed that monitored natural attenuation will be the remedy.

INCENDIARY DISPOSAL AREA (EAST YARD D) IAAP-013

SITE DESCRIPTION

Based upon an interview with a former installation employee, this site was located east of Yard D and Spring Creek and north of K Road. It was used for incendiary material burial during the mid-1940s. It was believed to be small (approximately 40' x 60') and surrounded by a barbed wire fence. The exact size, location, and material buried at this site cannot be determined because there are no records of this activity ever being performed at the IAAAP. Some indications do exist that magnesium may have been the material disposed of at this site. Previous samples taken during the SI may not have been appropriately located.

IAAP-013 will be expanded to include a cratered area found during a 2000 site walkover, located west of the Incendiary Disposal Area. These craters are approximately 4 ft wide and 2 ft deep and are spread over approximately 10 acres. A fence with "Danger" signs intersects the cratered area.

Additional soil and sediment samples were collected in 2004.

STATUS

RRSE RATING: Low CONTAMINANTS: Metals, Explosives MEDIA OF CONCERN: Soil COMPLETED IRP PHASE: PA/SI CURRENT IRP PHASE: RI/FS FUTURE IRP PHASE: RC



This site is included in the Performance-Based Contract (PBC) awarded in 2004. A supplemental RI will be completed.



OLD FLY ASH WASTE PILE IAAP-015

SITE DESCRIPTION

The Old Fly Ash Waste Pile is located in the southeastern portion of the IAAAP. It was used to deposit fly ash from the Main Heating Plant and the building 1-62 Heating Plant from 1940 until 1976. It lies east of Plant Road H between Yards D and E. The eastern boundary of the site slopes steeply down to Brush Creek; the top of the site is approximately 40 feet vertical above the creek. Ash was dumped directly on the ground surface. Sludge from the Sewage Disposal Plant was placed on this site once or twice a year since the early 1940s. It is unclear when this practice stopped. There is no record of the amounts of ash or sludge placed here. The majority of the surface of the Fly Ash Waste Pile is vegetated. Surface runoff flows into Brush Creek.

The PA/SI was completed in 1991, and the limited RI was completed in May 1996.

In 1999, it was discovered that the steep slope of this Old Fly Ash Waste Pile has begun to fall away into Brush Creek. It appears

STATUS

RRSE RATING: Medium CONTAMINANTS: Metals, Sulfates MEDIA OF CONCERN: Surface Water, Sediment COMPLETED IRP PHASE: PA/SI CURRENT IRP PHASE: RI/FS FUTURE IRP PHASE: RC

there may be an impact to Brush Creek. Further evaluation is necessary. Uncontrolled dumping of vegetation and solid waste, including tires, bricks, and 5-gallon cans, was found at this site in May 1999.

Additional soil, fly ash, sediment and groundwater samples were collected in 2004.

PROPOSED PLAN

This site is included in the Performance-Based Contract (PBC) awarded in 2004. A supplemental RI will be completed.



LINE 1 FORMER WASTEWATER IMPOUNDMENT IAAP-016

SITE DESCRIPTION

This site consists of the Line 1 Former Wastewater Impoundment and upgradient settling basins.

The Line 1 Former Wastewater Impoundment was formed by damming a portion of the upper reaches of Brush Creek. The primary function of the impoundment was to allow settling of particulate matter from explosives-contaminated wastewater from Line 1 (a former AEC and Army site) before it discharged downstream. This impoundment received large volumes of discharge from 1948 to 1957. The wastes included TNT, coal pile runoff, and condensate from the coal-fired power plant. Fly ash would be added to the impoundment liquid to absorb the explosives and reduce the color. It was estimated that the impoundment was 3.6 acres in size and as large as 7.5 acres (1,300 to 2,400 feet long) during periods of high flow. The embankment was breached after 1957; Brush Creek flowed through the breach and the former impounded area was allowed to re-vegetate naturally. RI work for the Impoundment area was completed in 1991.

STATUS

RRSE RATING: High CONTAMINANTS: Explosives MEDIA OF CONCERN: Soil, Surface Water, Sediment COMPLETED IRP PHASE: PA/SI, RI/FS, RA(C) CURRENT IRP PHASE: RA(O) FUTURE IRP PHASE: RC

The Army Decision Document was approved in 1995, and the Action Memo was approved in 1996. A contaminated soils IRA was completed during 1997 when 8,270 cy of explosives-contaminated soils were excavated from this area. The excavated soils contained greater than 3,900 lbs. of explosives. This soil was taken to the Inert Disposal Area (IAAP-020) where it was separated by level of contamination. Approximately 1000cy of higher contaminated soil was placed in Trench 7 and will be treated as required by the ROD. The remainder was placed in a landfill without treatment.

This site has been converted into wetlands. Native plants containing the nitroreductase enzyme are being used to phytoremediate the surface water. Low levels of residual explosives remain in surface water within the impoundment, and they are treated with granular activated carbon prior to discharge into Brush Creek.

The FUSRAP PA identified this area as requiring additional investigation. In August 2004, FUSRAP conducted a screening survey of this site to determine if radiological contaminates from AEC activities are present in soil. Preliminary assessments of all screening results indicate no radiological contamination present at this area.



PROPOSED PLAN

This site is included in the Performance-Based Contract (PBC) awarded in 2004. The remedial approach for this site, as well as others in the Brush Creek watershed, will be assessed in the FS. Surface water management will continue.

PESTICIDE PIT IAAP-017

SITE DESCRIPTION

The Pesticide Pit was in operation between 1968 and 1974 for the disposal of small quantities of insecticides and herbicides. This site is located approximately 25 feet east of the Winnebago School House (Bldg 500-30-6) on an upland terrace surrounded by agricultural fields. The School House is currently vacant and was fenced for safety reasons. The Pesticide Pit was a small plywood structure (8' x 8' x 3') lined with limestone and polyester resin geomembrane. However, the integrity of the structure that contained these wastes was questionable. The pit was capped with clay of unknown thickness during the late 1970s to early 1980s.

The PA/SI was completed in 1991, and the RI in May 1996.

In 1995 based on preliminary RI results, 144 cy of soils were excavated and the site was backfilled with pea gravel and clean soil. Follow-on groundwater sampling and analyses indicated all contaminants were below federal action levels. Remedial actions were completed in 1996. The soils were transported to an off-site incinerator for disposal.

STATUS

RRSE RATING: Medium CONTAMINANTS: Pesticides, Herbicides, Metals MEDIA OF CONCERN: Soil, Groundwater COMPLETED IRP PHASE: PA/SI, 4 IRAs, RI/FS CURRENT IRP PHASE: RC - 2003 FUTURE IRP PHASE: RC - 2003

USACHPPM has completed a review of the data and concurs with the recommendation that no further action is required for soils.

Spring 2001 and June 2004 groundwater sampling indicated slightly elevated levels of chromium.

PROPOSED PLAN

This site is included in the Performance-Based Contract (PBC) awarded in 2004 and NFA is expected for the soil and groundwater. The soils will be addressed in the installation-wide OU4 ROD and groundwater will be addressed in the OU3 Brush Creek watershed ROD.



POSSIBLE DEMOLITION SITE (SOUTH YARD G) IAAP-018

SITE DESCRIPTION

This site was apparently used during the 1940s and possibly into the early 1950s as a demolition area for ammunition items. This demolition area was allegedly located South of Plant Road K near Yard G and across the road from the pistol range.

There are no records to substantiate demolition activities or the kind of ammunition items treated at the site. The exact size of the site is also unknown, but is thought to be as big as 15 acres. Specific waste on the site is unknown. The SI sampling was completed in 1991 and no significant contamination was found.

This site appears to be larger then previously thought, and previous samples may not be representative of the site conditions.

Contaminants listed in the PA for this site included white and red phosphorus, as well as explosives and metals.

Additional soil samples were collected in 2004.

STATUS

RRSE RATING: Low CONTAMINANTS: Explosives, Metals, Phosphorus MEDIA OF CONCERN: Soil COMPLETED IRP PHASE: PA/SI CURRENT IRP PHASE: RI/FS FUTURE IRP PHASE: RC

PROPOSED PLAN

This site is included in the Performance-Based Contract (PBC) awarded in 2004. A supplemental RI will be completed.



INERT DISPOSAL AREA IAAP-020 (PAGE 1 OF 2)

SITE DESCRIPTION

Soils from other Restoration sites are transported to the IDA for segregation according to health risk. Soils classified as a high health risk are placed in the CAMU (trench 7) to be held for treatment. The CAMU was designated by the EPA via a letter dated March 8, 1996. Those classified as a medium health risk are placed in a RCRA-type lined cell (trench 6) and soil that is classified as a low health risk are placed underneath the overall cap at the IDA.

The Inert Disposal Area (IDA) encompasses approximately 20 acres that once included an Inert (sanitary) Landfill, a burning ground, a metal salvage operation, the Former Blue Sludge Lagoon, wastewater sludge drying bed, Cap Extension Area (CEA) and an earthen holding area formerly used to store sludge from Line 3 and Line 800. The IDA is located west of C Road, north of Line 3A in the west central part of the Installation.

The Inert Landfill was in operation from 1941 to September 1992 and employed the trench and fill operation technique. Trenches 1

STATUS

RRSE RATING: Medium CONTAMINANTS: Metals, Explosives MEDIA OF CONCERN: Soil COMPLETED IRP PHASE: PA/SI, 7 IRAs, RI/FS, RD CURRENT IRP PHASE: RA(C) FUTURE IRP PHASE: RA(O)

through 5 were filled primarily with sanitary landfill materials such as unsalvageable or unrecoverable materials (cafeteria and residential refuse and garbage, broken pallets, plastic, tin cans, and scrap wood/lumber paper, cardboard and asbestos insulation in double-lined plastic bags). Ash from open burnings and incinerations was also placed in the landfill. In 1980, a Part A Permit was received for the Inert Landfill and the Blue Sludge Lagoon. Interim status was granted that year. During 1997, a low-permeability synthetic cap was placed over Trenches 1 through 5 (approximately 17 acres). This area was seeded in 1998.

The lagoon holding area was closed in 1984 following the transfer of the blue sludge to a concrete-lined sludge drying bed, where it remained until January 1997. The excavated area was backfilled and capped with clay and a vegetative cover was established. In 1997 the blue sludge was excavated from this drying bed and deposited into Trench 6. Explosives- and metals-contaminated soils from a 1993/4 multi-site sump removal project were placed in Trench 6 in 1997.

The north end of Trench 5 contains special waste, such as ash from the CWP (IAAP-024), EWI (IAAP-025), and open burning of explosives and explosives-contaminated wastes. This area was capped and the RCRA closure plan was completed in April 1988; the plan was amended in February 1997 to address sampling issues. Radionuclides were found in groundwater samples during 1997 routine sampling and were determined to be "within normal background levels for IAAAP" and within safe limits.

IRAs (soil removal and capping) at the Inert Disposal Area (IAAP-020), Former Line 1 Impoundment Area (IAAP-016), and the Line 800 Lagoon (IAAP-044) were initiated in 1996 and completed in 1997.

Soil and debris from the burning grounds was placed underneath the Inert Landfill cap or in Trench 6, whichever was appropriate, based upon contamination levels. In 1997, the cap construction was completed over Trenches 1 through 5. Soils from the East Burn Pads, North Burn Pads, North Burn Pads Landfill and Fire Training Pit were placed into Trenches 6 or 7. VOC-contaminated soils from the Fire Training Pit were removed and treated via a Low Temperature Thermal Desorption (LTTD) unit at Trench 6.

Trench 7 was designated as a CAMU by the EPA on March 8, 1996.

INERT DISPOSAL AREA IAAP-020 (PAGE 2 OF 2)

SITE DESCRIPTION

In FY02, approx. 6,000 cy of soil stored in the CAMU contaminated with explosives and metals were treated and segregated per the Interim Soil ROD.

An Explanation of Significant Differences (ESD) was signed in 2003, and specified enhanced biological treatment as the primary remedy for explosive-contaminated soils.

To date, approximately 190,000 cy of soil have been taken to the IDA. Four percent has undergone biotreatment for soils,1.5 percent has undergone thermal treatment, and nine percent has undergone stabilization for metals. It should be noted that a portion of this volume came from FUSRAP screening areas (IAAP-012, 032, 036, and 037).

During the August 2004 radiological screening of the IDA conducted by FUSRAP, one isolated area of radiological contamination was identified. This area was limited to a small object and the soils around the object (approximately one square yard). Preliminary analysis indicates this object contains Cesium-137. Final analysis of confirmatory soil samples and a dose estimate for IDA workers in underway. Additional investigation of the object will be performed in an attempt to identify it and determine its origin. The soil where the object was found originated from remediation activities at the West Burn Pads Area (IAAP-032).

PROPOSED PLAN

This site is under the Performance-Based Contract awarded in 2004.

Manage remediation waste awaiting treatment and capping, continue to receive contaminated soil from other sites, control and treat stormwater and leachate and maintain existing cap.

After all contaminated soil has been treated, Trench 6, CAMU and the Cap Extension Area will be capped. The site will require long-term maintenance.



INERT DISPOSAL AREA - GROUNDWATER IAAP-020G

SITE DESCRIPTION

The Inert Disposal Area (IDA) encompasses approximately 20 acres that once included an Inert (sanitary) Landfill, a burning ground, a metal salvage operation, the Former Blue Sludge Lagoon, wastewater sludge drying bed, Cap Extension Area (CEA) and an earthen holding area formerly used to store sludge from Line 3 and Line 800. The IDA is located west of C Road, north of Line 3A in the west central part of the Installation.

The Inert Landfill was in operation from 1941 to September 1992 and employed the trench and fill operation technique. Trenches 1 through 5 were filled primarily with sanitary landfill materials such as unsalvageable or unrecoverable materials (cafeteria and residential refuse and garbage, broken pallets, plastic, tin cans, and scrap wood/lumber paper, cardboard and asbestos insulation in doublelined plastic bags). Ash from open burnings and incinerations was also placed in the landfill. In 1980, a Part A Permit was received for the Inert Landfill and the Blue Sludge Lagoon. Interim status was

STATUS

RRSE RATING: High CONTAMINANTS: Metals, Explosives, VOC, SVOC MEDIA OF CONCERN: Groundwater COMPLETED IRP PHASE: PA/SI CURRENT IRP PHASE: RI/FS, RD, RA(C), RA(O) FUTURE IRP PHASE: RC

granted that year. During 1997, a low-permeability synthetic cap was placed over Trenches 1 through 5 (approximately 17 acres). This area was seeded in 1998.

The lagoon holding area was closed in 1984 following the transfer of the blue sludge to a concrete-lined sludge drying bed, where it remained until January 1997. The excavated area was backfilled and capped with clay and a vegetative cover was established. In 1997 the blue sludge was excavated from this drying bed and deposited into Trench 6. Explosives- and metals-contaminated soils from a 1993/4 multi-site sump removal project were placed in Trench 6 in 1997.

The north end of Trench 5 contains special waste, such as ash from the CWP (IAAP-024), EWI (IAAP-025), and open burning of explosives and explosives-contaminated wastes. This area was capped and the RCRA closure plan was completed in April 1988; the plan was amended in February 1997 to address sampling issues. Radionuclides were found in groundwater samples during 1997 routine sampling and were determined to be "within normal background levels for IAAAP" and within safe limits.

Groundwater monitoring began in 1994. Low levels of explosives, VOCs and metals have been found in shallow groundwater (30 feet bgs). High levels of PCP have been found in one well.



PROPOSED PLAN

This site is under the Performance-Based Contract awarded in 2004.

Complete further characterization of groundwater and prepare a MNA FS/PP/ ROD. LTM may be required after cap construction.

EXPLOSIVE WASTE INCINERATOR IAAP-025

SITE DESCRIPTION

The Explosive Waste Incinerator (EWI) was located in the southwest corner of the Explosive Disposal Area (IAAP-012). The EWI was within building BG-199-1 and contained an adjoining air pollution control system. The site treated explosive wastes, sump scrap, and explosives-contaminated waste solvents. Explosivescontaminated carbon was originally treated in the EWI, but is now recycled. Resultant ash was collected and managed as a hazardous waste. The EWI buildings and facilities underwent RCRA closure, and the incinerator was removed from the installation in 1999.

The PA/SI was completed in 1991, and an initial RI was completed in May 1996. One area (drainage ditch) had a detection of RDX at levels above cleanup criteria.

Additional soil and sediment samples were collected in 2004.

STATUS

RRSE RATING: Low CONTAMINANTS: Explosives, Metals MEDIA OF CONCERN: Soil COMPLETED IRP PHASE: PA/SI CURRENT IRP PHASE: RI/FS FUTURE IRP PHASE: RC



This site is included in the Performance-Based Contract (PBC) awarded in 2004. A supplemental RI will be completed.

CONSTRUCTION DEBRIS LANDFILL (NW YARD O) IAAP-028

SITE DESCRIPTION

The Construction Debris Landfill is located in the central portion of the installation. Wastes were placed in a ravine with periodic soil cover. Waste included brick, stone, concrete, wire and 55-gallon drums. It is believed that this site was in operation from 1941 to September 1992. The site was originally reported to be 3 acres; after the initial RI, the site was determined to be 10 acres.

The PA/SI was completed in 1991, and the initial RI was completed in May 1996; no significant contamination was found.

It is believed that unauthorized dumping occurred at this site. Future sampling is recommended to characterize the site.

Additional soil and sediment samples were collected in 2004 to address the full extent of the site.

STATUS

RRSE RATING: Medium CONTAMINANTS: Metals, Explosives, Pesticides/ PCBs MEDIA OF CONCERN: Groundwater COMPLETED IRP PHASE: PA/SI CURRENT IRP PHASE: RI/FS FUTURE IRP PHASE: RC

PROPOSED PLAN

This site is included in the Performance-Based Contract (PBC) awarded in 2004. A supplemental RI will be completed.

WEST BURN PAD AREA - GROUNDWATER IAAP-032G

SITE DESCRIPTION

Due to the complexity in defining site boundaries, sites IAAP-032 (Burn Cages), IAAP-033 (Burn Cage Landfill), IAAP-034 (West Burn Pads), and IAAP-035 (West Burn Pads Landfill), were incorporated into one site.

Burn cages were used for the incineration of inert and explosivescontaminated packaging. The flashing of metals parts also was performed here. The site was used from 1949 to 1982 when the cages were removed. Metal parts, munitions casings and staining on the ground surface were observed during the site inspection in 1991. Ash generated from the burn operations was disposed of in the adjacent landfills. The landfills are approximately three acres in size and heavily vegetated.

The West Burn Pads were used for metals flashing from 1949 to 1982. Ash from the Burn Cages and West Burn Pads were disposed of at the Burn Cage Landfill (1949 to 1982) and the West Burn Pads Landfill (1950 to 1975). The WBPLF also received

STATUS

RRSE RATING: High CONTAMINANTS: Metals, VOCs, Explosives MEDIA OF CONCERN: Groundwater COMPLETED IRP PHASE: PA/SI CURRENT IRP PHASE: RI/FS, RD, RA(C), RA(O) FUTURE IRP PHASE: RC

waste from the East Burn Pads and well as various solid waste to include sanitary and industrial.

This site consists of the contamination from past activities. Any contamination from current and future activities will be addressed with non-ER,A funding.

The PA/SI was completed in 1991, the RI was completed in 1996. Groundwater monitoring began in 1994. Relatively high levels of explosives and freon have been found in groundwater after the soil removal was completed.

Low levels of explosives were detected in the creek south of the WBPLF during 2000. A Supplemental RI was completed in 2003, and a groundwater model was created in 2004.

PROPOSED PLAN

This site is included in the Performance-Based Contract (PBC) awarded in 2004. The remedial approach for this site, as well as others outside the Brush Creek watershed, will be assessed in a single FS. At the present, it is presumed that enhanced bioremediation and monitored natural attenuation will be the remedy.



NORTH BURN PADS (2) (NEAR IAAP-024) IAAP-036

SITE DESCRIPTION

The North Burn Pads consists of Pads 1-N and 2-N. Each pad measures about 20 x 50 ft and was operational from 1968 to 1972. Lead azide and gun powder were burned here. A 275-gallon diesel fuel station was located at the base of Pad 2-N. The station had an above-ground tank used to refuel equipment operating in the area.

The PA/SI was completed in 1991, the RI was completed in May 1996 and found metals and small amounts of explosives.

Contaminated soils were removed (2990 cy) in 1998 as part of the IRA and placed in the appropriate areas at the Inert Disposal Area (IAAP-020). Groundwater monitoring began in 1994 and ended in 2001.

The FUSRAP PA identified this area as requiring additional investigation. In August 2004, FUSRAP conducted a screening survey of this site to determine if radiological contaminates from AEC activities are present in soil. Preliminary assessments of all screening results indicate no radiological contamination present at this area.

STATUS

RRSE RATING: Medium CONTAMINANTS: Explosives, Metals MEDIA OF CONCERN: Groundwater COMPLETED IRP PHASE: PA/SI, RI/FS CURRENT IRP PHASE: RC - 2003 FUTURE IRP PHASE: RC - 2003



No further IRP action is anticipated. Limited investigation to support a NFA Groundwater ROD will be completed.



NORTH BURN PADS LANDFILL IAAP-037

SITE DESCRIPTION

The North Burn Pads Landfill measures approximately 75 x 475 feet and received the remnants (reported to be flashed cans and containers) from the North Burn Pads. Landfill activities occurred from 1968 to 1972.

A cleanup operation was performed in 1980 during which some of the contents of the landfill were taken to the Inert Disposal Area.

Results from the SI in 1991 did not indicate significant contamination; however, RI work was initiated to fill data gaps. RI work completed in May 1996 found metals in soil and groundwater. Predesign sampling in 1997/8 found high levels of explosives in soil and leachate. Groundwater monitoring began in 1994.

RDX in concentrations of less than 10 ppb have been found in the groundwater in upper bedrock (30-40 feet bgs).

The IRA work in 1998 removed 13,890 cy of contaminated soils and debris and placed it in the appropriate areas at the Inert Disposal Area (IAAP-020).

STATUS

RRSE RATING: Low CONTAMINANTS: Explosives, Metals MEDIA OF CONCERN: Surface Water, Soil, Groundwater COMPLETED IRP PHASE: PA/SI, RI/FS, RD, RA(C) CURRENT IRP PHASE: RC - 1998 FUTURE IRP PHASE: RC - 1998

The FUSRAP PA identified this area as requiring additional investigation. In August 2004, FUSRAP conducted a screening survey of this site to determine if radiological contaminates from AEC activities are present in soil. Preliminary assessments of all screening results indicate no radiological contamination present at this area.

PROPOSED PLAN

A groundwater MNA ROD is expected.



FIRE TRAINING PIT IAAP-039

SITE DESCRIPTION

The former Fire Training Pit was an unlined pit that measured approximately $40 \times 16 \times 2$ feet used from 1982 to 1987. During training sessions, 55-gallon drums of solvents and petroleum products were set ablaze, then extinguished by fire fighters.

The PA/SI was completed in 1991, the RI was completed in May 1996. Investigations found localized soil and groundwater contamination consists of significant quantities of VOCs (including chlorinated solvents), SVOCs, metals and low levels of dioxins and furans.

An Engineering Evaluation/Cost Analysis (EE/CA) and an Explanation of Significant Differences (ESD) and Action Memo were prepared for this site. The initial proposed remedy was ex situ soil vapor extraction (SVE). The remedy used was Low Temperature Thermal Desorption (LTTD). This 1998 soil cleanup effort removed 5,200 cy of contaminated soil, half of which was thermally treated. The remaining soil was landfilled or backfilled. This action is believed to have removed the contamination source.

STATUS

RRSE RATING: Low CONTAMINANTS: VOCs, SVOCs, Metals MEDIA OF CONCERN: Soil COMPLETED IRP PHASE: PA/SI, 12 IRAs, RI/FS CURRENT IRP PHASE: RC - 2004 FUTURE IRP PHASE: RC - 2004

In 2001, ~ 500-1,000 cy of contaminated soil and debris was found in secondary locations. This material contains high levels of metals and/or VOCs. In 2003, 616 cy of soil and debris was removed and disposed of in the IDA (IAAP-020).

PROPOSED PLAN

This site is included in the Performance-Based Contract (PBC) awarded in 2004 and NFA is expected for the soil. This site will be addressed in the installation-wide OU4 ROD.



FIRE TRAINING PIT - GROUNDWATER IAAP-039G

SITE DESCRIPTION

The former Fire Training Pit was an unlined pit that measured approximately $40 \times 16 \times 2$ feet used from 1982 to 1987. During training sessions, 55-gallon drums of solvents and petroleum products were set ablaze, then extinguished by fire fighters.

The PA/SI was completed in 1991, the RI was completed in May 1996. Investigations found localized soil and groundwater contamination consists of significant quantities of VOCs (including chlorinated solvents), SVOCs, metals and low levels of dioxins and furans. Groundwater monitoring began in 1994.

High levels of VOCs in concentrations of greater than 30 ppm have been found in shallow groundwater and the upper bedrock (30 feet bgs). Groundwater contamination has migrated to the Spring Creek Tributary.

In 2003, the supplemental RI was completed.

STATUS

RRSE RATING: High CONTAMINANTS: Metals, VOCs, SVOCs MEDIA OF CONCERN: Groundwater COMPLETED IRP PHASE: PA/SI CURRENT IRP PHASE: RI/FS, RD, RA(C), RA(O) FUTURE IRP PHASE: RC

PROPOSED PLAN

This site is included in the Performance-Based Contract (PBC) awarded in 2004. The remedial approach for this site, as well as others outside the Brush Creek watershed, will be assessed in a single FS. At the present, it is presumed that enhanced bioremediation and monitored natural attenuation will be the remedy.



ROUNDHOUSE TRANSFORMER STORAGE AREA IAAP-040

SITE DESCRIPTION

This site consists of the contamination from past activities. Any contamination from current and future activities will be addressed with non-ER,A funding.

This area was used since the 1940s to store transformers pending use or disposal; this site is no longer used for PCB storage. The storage yard is a flat, graded area with crushed stone on a hard base. Transformers found to contain greater than 50 ppm PCB were moved to Building L-37-34, the old storage site. Those transformers having less than 50 ppm PCB were moved to an outside storage concrete pad at Yard L, between buildings L-3 and L-4, new storage site E-18.

The PA/SI was completed in 1991, the RI was completed in May 1996; samples found PCBs and explosives. The Interim ROD requires the removal of approximately 600 cy of PCB-contaminated soil. This soil will be taken to the Inert Disposal Area (IAAP-020) and landfilled in Trench 6 if PCB levels are below 50 ppm. If levels unexpectedly exceed 50 ppm, it will be disposed of off-site.

STATUS

RRSE RATING: Medium CONTAMINANTS: PCBs MEDIA OF CONCERN: Soil, Sediment COMPLETED IRP PHASE: PA/SI, RI/FS, RD, 6 IRAs CURRENT IRP PHASE: RA(C) FUTURE IRP PHASE: RC

Remedial design sampling, conducted in 2004, did not locate soil contaminants above action levels.



Remedial action report is pending. NFA anticipated.



LINE 3A POND IAAP-041

SITE DESCRIPTION

Line 3A Pond is assumed to be an excavated, unlined pit, measuring approximately $60 \times 30 \times 8$ feet. The pond area is relatively flat and slopes gently to the west and south. This site was excavated and backfilled circa 1959.

At Line 3A, casings for bombs were treated with an alkaline degreaser and solvent paint stripper. The casings were then bathed in phosphoric acid. A diluted chromic acid rinse was then applied. Approximately 15,000 gallons of spent sulfuric and hydrochloric acid were disposed of in the pond and neutralized with sodium hydroxide.

The PA/SI was completed in 1991, the RI was completed in May 1996; samples found no explosives or metals above action levels in the soil.

USACHPPM has completed a review of the data and concurs with the recommendation that no further action is required for soils.

Additional soil samples were collected in 2004.

STATUS

RRSE RATING: Medium CONTAMINANTS: Explosives, Metals MEDIA OF CONCERN: Soil COMPLETED IRP PHASE: PA/SI CURRENT IRP PHASE: RI/FS FUTURE IRP PHASE: RC



This site is included in the Performance-Based Contract (PBC) awarded in 2004. A supplemental RI will be completed.



LINE 800 & PINKWATER LAGOON IAAP-044

SITE DESCRIPTION

The Line 800 Pinkwater Lagoon consisted of an unlined, 5 acre impoundment, 4 feet deep, surrounded by an earthen berm. This lagoon was located adjacent to Line 800 (IAAP-011) and an intermittent tributary to Brush Creek. The primary activity at Line 800 was ammunition renovation from 1943 to 1980. From 1980 to present, primary activities at Line 800 include remote disassembly of projectiles and assembly of 75 mm and 105 mm blanks. The Pinkwater Lagoon was constructed in 1943 for the disposal of pinkwater effluent from adjacent Line 800 production facilities and sludges trucked in from other line operations within the installation. In 1943, leaching fields associated with the lagoon to include evaporation furrows were constructed. The lagoon also received metal cleaning sludge from Line 3 operations. In the early 1970s, this lagoon ceased to be used.

Studies conducted in 1991 through 1998 indicated that primary waste disposed at the site included explosives-contaminated wash water and heavy metals from operations at Line 800 and other

STATUS

RRSE RATING: Medium CONTAMINANTS: Metals, Explosives MEDIA OF CONCERN: Soil COMPLETED IRP PHASE: PA/SI, RI/FS, 7 IRAs CURRENT IRP PHASE: RD, RA(C) FUTURE IRP PHASE: RC

production lines. Carbon and fly ash disposal may also have occurred at the site. As a result of the RI sampling 63,236 cy of explosives-contaminated soils were excavated from this area during 1997. The excavated soil contained greater than 80,000 lbs of explosives. This soil was taken to the Inert Disposal Area (IAAP-020) and sorted by contaminant level and type.

Two additional areas of explosives soil contamination were found in 1998. One area in the southwest portion of the lagoon was found to require no action. The other area, in settling basin #1, requires additional characterization and excavation.

The lagoon currently is used as a phytoremediation wetlands treatment cell.

PROPOSED PLAN

This site is included in the Performance-Based Contract (PBC) awarded in 2004. Based on the results of a proposed pilot study, soils will be excavated and treated per the ROD, or treated in situ.



LINE 800 & PINKWATER LAGOON - GROUNDWATER IAAP-044G

SITE DESCRIPTION

The IRP site consists of the groundwater contamination from past activities.

The Line 800 Pinkwater Lagoon consisted of an unlined, 5 acre impoundment, 4 feet deep, surrounded by an earthen berm. This lagoon was located adjacent to Line 800 (IAAP-011) and an intermittent tributary to Brush Creek. The primary activity at Line 800 was ammunition renovation from 1943 to 1945. The Pinkwater Lagoon was constructed in 1943 for the disposal of pink water effluent from adjacent Line 800 production facilities and sludges trucked in from other line operations within the installation. In 1943, leaching fields associated with the lagoon to include evaporation furrows were constructed. The lagoon also received metal cleaning sludge from Line 3 operations. In the early 1970s this lagoon ceased to be used.

Studies conducted in 1991 through 1998 indicated that primary

STATUS

RRSE RATING: High CONTAMINANTS: Explosives MEDIA OF CONCERN: Groundwater COMPLETED IRP PHASE: PA/SI CURRENT IRP PHASE: RI/FS, RD, RA(C), RA(O) FUTURE IRP PHASE: RC

waste disposed at the site included explosives-contaminated wash water and heavy metals from operations at Line 800 and other production lines. Carbon and fly ash disposal may also have occurred at the site. As a result of the RI sampling 74,736 cy of explosives-contaminated soils were excavated from this area during 1997. The supplemental GW RI was completed in July 2001.

High levels of explosives in concentrations of greater than 30 ppm have been found in shallow groundwater (up to 30 feet bgs).

Groundwater discharges into a tributary of Brush Creek.

PROPOSED PLAN

This site is included in the Performance-Based Contract (PBC) awarded in 2004. The remedial approach for this site, as well as others in the Brush Creek watershed, will be assessed in the FS. At present, it is presumed that enhanced bioremediation followed by MNA will be the remedy.



OFF-POST CONTAMINATION IAAP-046

SITE DESCRIPTION

Historical discharges of explosive-contaminated wastewater has resulted in surface water and groundwater contamination off-post, mainly the Brush Creek watershed.

In 1993, off-post contamination of private drinking water wells with explosives (RDX and 2,6 DNT) was confirmed. The IAAAP contracted to connect residents in the contaminated area to the public water supply. This Remedial Action was designed to eliminate the pathway of future exposures to contaminated drinking water and was completed in the fall of 1994. IAAAP is investigating groundwater contamination both on and off-post. The off-post efforts were accelerated in 1998 due to increased stakeholder interest.

High levels (up to 150 ug/L) of RDX were detected in the Brush Creek watershed approximately 2 miles off-post.

In 2001, IAAAP provided connection to Rathbun Regional Water to 34 homeowners who declined in 1993. The total number of homes connected to the Rathbun Regional Water supply is 188.

STATUS

RRSE RATING: High CONTAMINANTS: Explosives MEDIA OF CONCERN: Groundwater, Surface Water COMPLETED IRP PHASE: PA/SI, 16 IRAs CURRENT IRP PHASE: RI/FS, RD, RA(C), RA(O) FUTURE IRP PHASE: RC

The FS and proposed plan were completed in 2004. The preferred alternative is installation of enhanced bioremediation barriers.

During annual groundwater sampling in 2003, groundwater was analyzed by FUSRAP for radionuclides. Only naturally occurring isotopes were detected.

(PROPOSED PLAN)

This site is included in the Performance-Based Contract (PBC) awarded in 2004. The non-PBC executor will complete the ROD. A pilot study consisting of enhanced bioremediation is planned. The presumed remedy is full-scale implementation of enhanced bioremediation with MNA.

CENTRAL TEST AREA IAAP-047

SITE DESCRIPTION

The Central Test Area was used to test fire hand grenades, adaptor boosters, and aerial mines. Very little historical documentation is available on this particular site, but layout drawings are dated back as far as 1943. It is not known exactly when this area was in operation.

Detonations were performed in the field north and east of the Central Test Area. Steel fixtures still exist at this site. Historical documentation indicated that this area is 800 ft northeast of the Central Test Area laboratory.

Approximately 500 ft northwest of Line 4A and 1,200 ft south of Line 5B, but still within the fence line of Line 5, lies Building 600-84. This building was constructed in 1941 and is considered part of the Central Test Area. The walled-in area northeast of the building was used as a test site for the inside charge of grenades. This charge was composed of lead styphynate, black powder, and tetryl booster. The outer charge was TNT and RDX.

STATUS

RRSE RATING: High CONTAMINANTS: Explosives, Metals MEDIA OF CONCERN: Soil COMPLETED IRP PHASE: PA/SI CURRENT IRP PHASE: RI/FS, RD, RA(C) FUTURE IRP PHASE: RC

A test pit existed approximately 815 ft to the northeast of Building 600-84. The test pit was approximately 9 ft x 14 ft with wooden walls covered by steel plates. The floor was earthen with a concrete walkway. A concrete pedestal capped by a steel plate was anchored in the floor of the pit. Soil was sloped up the walls to a height of approximately 5 ft. An operator's building was located 105 ft southwest of the test-fire pit. Only limited information about the operations in this pit can be found.

A small area to the west of the test pit area contains a metal triangular stand or tripod used to hold components to be test detonated.

During the historical site assessment, it was determined there was a potential UXO concern at this site.

PROPOSED PLAN

This site is included in the Performance-Based Contract (PBC) awarded in 2004. Based on the results of a proposed pilot study, soils contaminated above ROD cleanup levels will be excavated and treated per the ROD, or treated in situ. Prior to any intrusive activities, a geophysical investigation and any necessary surface UXO clearance will be conducted.

POTENTIAL AREAS OF CONCERN

During 2000, a hunter located a "Danger, TNT burial site" sign. This sign has not been re-located. The area will be sampled by USACHPPM when it is located. If contamination is detected, it will evaluated for IRP eligibility.

During 2001, a former worker provided information on a potential dig site with unknown buried material northeast of Line 8. This site has not been located. If contamination is detected, it will be evaluated for IRP eligibility.



Iowa Army Ammunition Plant

Response Complete ER,A Sites

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LINE 1 AMMO LAP (MISSILE/FORMER AEC) IAAP-001

SITE DESCRIPTION

This site consists of the contamination from past production. Any contamination from current activities will be addressed under compliance (non-ER,A funding).

Line 1 is an ammunition production line that has been in operation since the inception of IAAAP in 1941. In 2000, the Line was split thereby creating an active area called Line 1A. This area contains approximately 15.9 acres and 151 buildings. Activities in this area include Metrology and Chemical Labs, Tool & Die Shop, Electronic Shop, Ammunition Surveillance, DU Demil, Powerhouse, Research and Development, and production for MACS and WAM. All other areas of Line 1 are now inactive. The active area has been fenced off from the inactive area. The entire site, Lines 1 and 1A combined, occupies approximately 188 acres. The majority of the contamination occurred as a result of building wash downs and sump failures. The Atomic Energy Commission operated a portion of Line 1 between 1947 and 1975.



RRSE RATING: High CONTAMINANTS: Metals, Explosives, Rad MEDIA OF CONCERN: Soil, Groundwater COMPLETED IRP PHASE: PA/SI, RI CURRENT IRP PHASE: RC - 2003

The IRP PA/SI was completed in 1991, and an initial RI was completed in May 1996. The Interim ROD requires the removal of 7410 cy (220 cy metals, 4,850 cy explosives, 1,480 cy explosives and metals, 590 cy VOCs, and 270 cy Rad) contaminated soil. Per the ROD, this soil will be taken to the Inert Disposal Area (IAAP-020) and sorted by contaminant level and type. Note: the characterization of Rad waste is questionable and will be re-examined under FUSRAP.

An IRP Supplemental RI was completed in 2002 to further characterize explosives and metals contamination.

ER,A will address groundwater issues at this site as necessary.

DOE conducted an indoor radiological survey at several buildings on Line 1 and Yard C. Residual radioactive materials, determined to be DU, were found in Buildings 1-11, 1-63-6, 1-12, and 1-61. Additional characterization (in accordance with MARSSIM) is required, and remediation may be necessary.

FUSRAP performed a Preliminary Assessment (published December 2001) of this site and determined it to be a former Atomic Energy Commission area. In July 2002, the Corps designated this area to be under FUSRAP.



LINE 5A & 5B AMMO ASSEMBLY IAAP-006

SITE DESCRIPTION

The IRP site consists of the contamination from past munitions production. Any contamination from current activities will be addressed under compliance (non-IRP funding). In the past, both lines were component lines for pelletizing and assembly of explosive components. A testing platform and a firing pit are located within the site boundary. Principal explosives used at these lines were TNT, RDX and Tetryl.

Lines 5A and 5B were booster and grenade lines situated in the north-central portion of the installation. Line 5A is about 33 acres and Line 5B is 41 acres. Both lines were constructed in 1941 and operated from 1942 to 1945. Production resumed in 1949 during the Korean War and intensified in 1961 during the Vietnam War.

Line 5A is currently in a caretaker status; there are no plans to activate this line in the future. Line 5A is under the Industrial Preparedness Plan (IPP). Line 5B is being rented by Advanced Environmental Technology (AET) for destructive disposal of ammunition.

STATUS

RRSE RATING: High CONTAMINANTS: Metals, Explosives MEDIA OF CONCERN: Soil, Groundwater, Surface Water, Sediment COMPLETED IRP PHASE: PA/SI, RI/FS, RD, RA(C) CURRENT IRP PHASE: RC - 1999

The PA/SI was completed in 1991, and an initial RI was completed in May 1996. Approximately 6,000cy of contaminated soil were removed in FY00-01. During the removal action Building 600-84 and the Central Test Area were discovered as potential areas of concern. AET tested the soil at Building 600-84 and found no contamination. RDX and TNT in concentrations of up to 46 ppb have been found in the groundwater in a shallow localized plume within 30 feet of the ground surface. The presence of UXO in and around the Central Test Area will adversely affect cost and schedule of any remedial action. Also, the area considered to be potentially contaminated with explosives and metals is now thought to be as much as 17 acres. This area will be incorporated into a new AEDB-R site IAAP-047, Central Test Area.



LINE 7 AMMO LAP (FUZE/BLANK) IAAP-008

SITE DESCRIPTION

Line 7 was a production Line that encompassed 9 acres, built in 1941 and has been inactive since 1970. It was a fuze and blank load, assemble and pack operation where artillery primers, rocket igniters and time fuzes were assembled for World War II and the Korean War. Line 7 will no longer be maintained or used by the Army (modified caretaker status).

The IRP site consists of the contamination from past production. Any contamination from current or future activities will be addressed under non-IRP funding.

The PA/SI was completed in 1991, and an initial RI was completed in May 1996. No contaminants above action levels were found.

No further action is required, USACHPPM Phase II Complete.

The Army has determined that the facilities at this Line are excess and will pursue non-ER,A funding for building demolition and debris removal, which is listed as an option in the PBC.

STATUS

RRSE RATING: Low CONTAMINANTS: Metals, Explosives, VOCs, SVOCs, Pesticides/PCBs MEDIA OF CONCERN: Soil COMPLETED IRP PHASE: PA/SI, RI/FS CURRENT IRP PHASE: RC - 1996



LINE 800 AMMO RENOV IAAP-011

SITE DESCRIPTION

This site has been merged with IAAP-044 and IAAP-044G due to proximity and for better management and cost collection. Contaminants from these sites mix making it impossible to delineate which site the contaminants originate in.

This site consists of the contamination from past munition production. Any contamination from current or future activities will be addressed under compliance (non-ER,A funding).

Line 800 is nearly 18 acres in size and has been in operation intermittently since plant inception. From 1943 to present, the primary function of the line was ammunition renovation, where the explosives filler is washed from the projectiles, and 75 mm blank salute ammunition was loaded. Wastes were generated by metal cleaning operations at Line 800, which were identical to the metal cleaning operations at Line 3. Waste sludge from the metal clean-



ing bath was disposed of at the former Blue Sludge Lagoon at the Inert Disposal Area (IDA) (IAAP-020) from 1979-1980. The Blue Sludge material was moved into Trench 6 at the IDA in January 1997. Prior to having the Line 3 Treatment Facility, untreated metal cleaning effluent was discharged to the ditches at Lines 3 and 800.

The PA/SI was completed in 1991 and found explosives concentrations which exceed cleanup criteria in the NW corner of the site and the area adjacent to the east end of Building 800-04 and lead concentrations in excess of cleanup criteria along the west side of Building 800-191.

The RI work was finished in May 1996. The Interim ROD requires the removal of 1325cy of contaminated soil.

Soil activities for this site will be addressed under IAAP-044 Line 800 Pinkwater Lagoon. GW activities for this site will be addressed under IAAP-044G Line 800 Pinkwater Lagoon-GW.



EXPLOSIVE DISPOSAL AREA (EAST BURN PADS) IAAP-012

SITE DESCRIPTION

The Explosive Disposal Area (EDA) east burn pads, located in the northeast corner of IAAAP, consisted of 8 raised earthen burning pads enclosed in a fenced area of approximately 12 acres. Activities included open burning of explosives-contaminated metals, propellant explosive and pyrotechnic (PEP) contaminated materials. Each pad was bermed on three sides to restrict horizontal movement of metal projectiles. The pads were in operation from 1941 until 1982, when the Explosive Waste Incinerator was built.

The PA/SI was completed in 1991, and an initial RI was completed in May 1996. The Interim ROD required the removal of contaminated soil, and12,670 cy of soil were removed in 1998 (funded as an IRA). This soil was taken to the Inert Disposal Area (IAAP-020) and sorted by contaminant level and type.

No further ER,A action is needed at this site.

STATUS

RRSE RATING: Low CONTAMINANTS: Metals, Explosives MEDIA OF CONCERN: Soil COMPLETED IRP PHASE: PA/SI, RI/FS, RD, RA(C) CURRENT IRP PHASE: RC - 1998

The FUSRAP PA identified this area as requiring additional investigation. In August 2004, FUSRAP conducted a screening survey of this site to determine if radiological contaminates from AEC activities are present in soil. Preliminary assessments of all screening results indicate no radiological contamination present at this area.



BOXCAR UNLOADING AREA IAAP-014

SITE DESCRIPTION

This site consists of two areas located adjacent to the railroad tracks in Yard B, situated approximately 750 feet west of the southwestern most corner of the Explosive Disposal Area (IAAP-012). The site was utilized as an unloading and temporary storage area for dunnage lumber. The rail cars at times also transported boxes of explosives; therefore, minute amounts of explosives may have come into contact with the dunnage. The area began receiving shipments in the 1940s and continues to do so. However, in recent years, explosives have been transported primarily by trucks. Minute amounts of TNT and RDX may have come into contact with the area.

Samples taken during the SI in 1987 found no significant contamination.

This site requires NFA under the IRP.

STATUS

RRSE RATING: Low CONTAMINANTS: Metals, Explosives, SVOCs MEDIA OF CONCERN: Soil COMPLETED IRP PHASE: PA/SI CURRENT IRP PHASE: RC - 1991



CONTAMINATED CLOTHING LAUNDRY IAAP-019

SITE DESCRIPTION

This site is not eligible for ER,A funds because of the years of use.

The installation laundry washes coveralls, underwear and towels used by production and maintenance workers. A minute amount of explosives may be present on coveralls worn by workers in areas where explosives are present. The laundry is located in Building 500-125 north of the Main Heating Plant and west of Line 6 on Plant Road A. Laundry operations have occurred from the 1940s through the present. Wastewater is discharged to a sump and then into the sanitary sewer. Construction of a new filtering facility was completed in 1998 and began operation in 2003. The sump will continue to be used as a holding area prior to the waste being sent to the filtration unit for pretreatment and subsequently discharged into the sanitary sewer.

The PA/SI was completed in 1991 and the analytical did not include testing for explosives-contaminated soils, the soil was



RRSE RATING: Medium CONTAMINANTS: Explosives MEDIA OF CONCERN: Soil, Sediment COMPLETED IRP PHASE: PA/SI, RI/FS CURRENT IRP PHASE: RC - 1997

subsequently sampled in July 97 and revealed RDX contamination near an adjacent explosives water sump. The RI work was completed in May 1996.



DEMOLITION AREA/DEACTIVATION FURNACE IAAP-021

SITE DESCRIPTION

The Deactivation Furnace (IAAP-023) was incorporated into this site due to its close proximity. The Furnace subsite was used from 1971 until RCRA closure in 1995.

The lowa Department of Natural Resources does allow open detonation of ammunition items that require an immediate method of disposition due to safety considerations such as ammunition rounds that become armed during the assembly process. The Demolition Area encompasses 10 acres of land and consists of a fenced field with six shallow craters. Open detonation of rejected ammunition items at this site began in the 1940s on a regular basis. Current practices are limited to an emergency-only basis. The IDNR is required to be notified of an open detonation event. This area is not considered to be ER,A-eligible. However, any cleanup actions necessary will be funded under a different program.

STATUS

RRSE RATING: Medium CONTAMINANTS: Metals, Explosives MEDIA OF CONCERN: Soil, Groundwater COMPLETED IRP PHASE: PA/SI, RI/FS, 4 IRAs CURRENT IRP PHASE: RC - 2000

In 1997, EPA approved a change in the RCRA Subpart X interim status. This change allowed for the movement of the open burning of propellant with faulty stabilizer (performed in pans) from the Explosive Disposal Area (IAAP-012) to the Detonation Area. This accommodated the cleanup of former open burning pads at the Explosive Disposal Area in 1998. In 1985, IDNR allowed open burning of propellant determined by the Army to have a faulty stabilizer on a case-by-case basis with an expedited (within 48 hours) approval.

The Deactivation Furnace consists of a feed area, furnace system and air pollution control system. The feed area is housed within a building that provides access to a conveyor system. The furnace was used to destroy small explosive-loaded components such as detonators, primers, and fuses. The furnace incinerated the explosive/propellant content of the munitions and thermally treated the metal casings which were recovered and sold as scrap metal. The ash from these operations were placed in drums and stored as hazardous waste. The Deactivation Furnace has undergone RCRA closure and is now in a temporarily inactive (TIA) status.

The PA/SI was completed in 1991, and an initial RI was completed in May 1996. The Interim ROD requires the removal of 753 cy of lead-contaminated soil from the Deactivation Furnace subsite.

Groundwater contamination will be addressed with a non ER,A source of funding.



The FUSRAP PA identified this area as requiring additional investigation. In August 2004, FUSRAP conducted a screening survey of this site to determine if radiological contaminates from AEC activities are present in soil. Preliminary assessments of all screening results indicate no radiological contamination present at this area.

UNIDENTIFIED SUBSTANCE (OIL) WASTE SITE IAAP-022

SITE DESCRIPTION

This site covered an area approximately 20 by 20 feet. The site is situated in the central portion of the IAAAP, northwest of Yard O along the south side of the railroad track, approximately 150 yards west of Plant Road I.

The unidentified substance thought to be road surfacing oil was discovered on July 16, 1985 (IAG, 1990). The source of the oil spill is thought to have been a leaking railroad tank car (RI/FS Task Order, 1990)

The spill area is located 15 to 20 feet south of the railroad track bed. According to the on-site personnel, this area has been covered with approximately 10 feet of fill material which has created a small incline sloping up and away from the railroad track bed.

The SI sampling was completed in 1991 and no significant contamination was found.

This site requires NFA under the IRP.

STATUS

RRSE RATING: Low CONTAMINANTS: Metals, VOCs, SVOCs MEDIA OF CONCERN: Soil COMPLETED IRP PHASE: PA/SI CURRENT IRP PHASE: RC - 1991



CONTAMINATED WASTE PROCESSOR IAAP-024

SITE DESCRIPTION

This is an active site, therefore it is not eligible for ER,A funds.

The Contaminated Waste Processor (CWP) is used to flash or burn materials that have come in contact with explosives or other energetic substances. The CWP has been operational since 1982. Metal items are made available for sale as salvage after flashing.

The PA/SI was completed in 1991, the RI was completed in May 1996. The RI work found low levels of explosives and metals in soil.

Any future activities will be addressed with non-ER,A funds.

STATUS

RRSE RATING: Medium CONTAMINANTS: Metals, Explosives MEDIA OF CONCERN: Groundwater, Soil COMPLETED IRP PHASE: PA/SI, RI/FS CURRENT IRP PHASE: RC - 1996



SEWAGE TREATMENT PLANT/DRYING BEDS IAAP-026

SITE DESCRIPTION

This is an active site, therefore it is not eligible for ER,A funds.

The Sewage Treatment Plant (STP) is the facility's main sewage treatment plant and has been in operation since the early 1940s. The STP handles all the installation-generated sewage except sewage generated at Line 3A, which has its own sewage treatment system. Since 1982, laundry water from the Contaminated Clothing Laundry has been discharged to the STP.

The STP handles domestic wastes, car wash water, laundry facility wastewater, and wastewater from the x-ray processing plant and is about 1 acre in size. Wastewater is treated by an Imhoff tank, trickling filter, clarifier, and sludge drying beds. The treated wastewater goes through a second treatment prior to discharge.

STATUS

RRSE RATING: Medium CONTAMINANTS: Metals, Explosives MEDIA OF CONCERN: Surface Water COMPLETED IRP PHASE: PA/SI, RI/FS CURRENT IRP PHASE: RC - 2000

The sludge that is produced from the wastewater treatment process is removed and dewatered on two sludge drying beds. The beds are lined with two feet of sand.

The PA/SI was completed in 1991, the RI was completed in May 1996.

Any future activities will be addressed with non-ER,A funds.



FLY ASH LANDFILL (NEW BLDG 400-139) IAAP-027

SITE DESCRIPTION

This is an active site, therefore it is not eligible for ER,A funds.

The Fly Ash Landfill covers 9.5 acres and has been in operation since 1985. The landfill accepts only fly ash from the coal-fired heating plant. The landfill was constructed in accordance with the State of Iowa regulations for coal combustion residue in sanitary landfills. Groundwater monitoring began in 1985 and is funded with non-ER,A funds.

The PA/SI was completed in 1991, and the RI was completed in May 1996; no significant contamination was found.

In 2004, a letter was sent to EPA Region VII, RCRA Division, requesting concurrence with Army's recommendation for no further action.

Any future activities will be addressed with non-ER,A funds.

STATUS

RRSE RATING: Medium CONTAMINANTS: Explosives, Metals MEDIA OF CONCERN: Groundwater, Soil, Surface Water COMPLETED IRP PHASE: PA/SI, RI/FS CURRENT IRP PHASE: RC - 1996


LINE 3A SEWAGE TREATMENT PLANT/DRY BED IAAP-029

SITE DESCRIPTION

This permitted site is located in the western portion of the installation and is the treatment plant and drying bed for Line 3A. Line 3A has its own treatment plant due to its remote location on the installation. The Sewage Treatment Plant (STP) encompasses about one-half acre and consists of an Imhoff tank, a trickling filter, clarifier, chlorine contact chamber and sludge drying beds. The drying beds are lined with two feet of sand. The plant has been operational from 1943 to 1945, then from 1949 to the present. Wastewater treated here was domestic waste and blowdown water from boilers at the steam generating plant near Line 3A.

The PA/SI was completed in 1991, the RI was completed in May 1996. Significant levels of explosives were found in the outfall and downstream surface water.

Samples were collected from the outfalls in October 2000. These samples showed slightly elevated levels of RDX, HMX and TNT.

STATUS

RRSE RATING: Medium CONTAMINANTS: Explosives, Metals MEDIA OF CONCERN: Surface Water COMPLETED IRP PHASE: PA/SI, RI/FS CURRENT IRP PHASE: RC - 2000



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FIRING SITE AREA IAAP-030

SITE DESCRIPTION

The Firing Site area has been in use since the 1940s for testing of static warheads. The fenced site encompasses about 450 acres and is about one mile from the nearest installation boundary.

In 1947, the IAAAP was selected as the first production facility for manufacturing of high explosives components for weapons under the Atomic Energy Commission.

Portions of the Firing Site were under the control of the Atomic Energy Commission from 1948 to 1974. The Atomic Energy Commission operated Sub-Area FS-12 from December 1965 to December 1973. FS-12 was used for destructive testing of ordnance containing depleted Uranium and High Explosives. Area FS-12 was surveyed for radioactivity by the Atomic Energy Commission in 1974 and some contaminated soil was shipped off-site to Sheffield, IL in that same year. In May 2001, a survey conducted by FUSRAP detected numerous fragments of depleted uranium. An aerial radiological survey of the entire plant was conducted in Oct

STATUS

RRSE RATING: Medium CONTAMINANTS: Explosives, Metals, Radionuclides MEDIA OF CONCERN: Groundwater, Soil, Sediment COMPLETED IRP PHASE: PA/SI, RI/FS CURRENT IRP PHASE: RC - 2003 FUTURE IRP PHASE: RC - 2003

02, and detectable emissions from man-made radiological sources were found at Firing Site 12.

The IRP PA/SI was completed in 1991, and the RI in May 1996 found radionuclides and metals in soil and groundwater. A Supplemental RI was completed in 2002.

FUSRAP performed a Preliminary Assessment (published December 2001) of this site and determined it to be a former Atomic Energy Commission area. In July 2002, the Corps designated this area to be under FUSRAP.

Both radiological and non-radiological contamination attributal to former AEC operations will be addressed by FUSRAP for soils. FUSRAP will complete a supplemental RI for this site. FUSRAP will assume responsibility for cleanup of soils. A non-ER,A source of funding will address groundwater because this is an active site.



YARD B AMMO BOX CHIPPER DISPOSAL PIT IAAP-031

SITE DESCRIPTION

The Yard B ammunition box chipper disposal pit has been estimated to measure $120 \times 40 \times 8$ ft. The pit was reportedly used for a three month period sometime between 1972 and 1975. Wastes consisted of shredded ammunition boxes treated with the wood preservative pentachlorophenol (PCP).

Investigations conducted during 1997 have not substantiated the former existence of this site. If this site is ever located it will be investigated.

Bis-2-ethylhexylphthalate has been found in GW.

No further action at this site is required. USACHPPM Phase II is complete.

STATUS

RRSE RATING: Medium CONTAMINANTS: Metals, Explosives MEDIA OF CONCERN: Soil, Groundwater COMPLETED IRP PHASE: PA/SI, RI/FS CURRENT IRP PHASE: RC - 2000



BURN CAGES, BCLF; WEST BURN PADS, WBPLF IAAP-032

SITE DESCRIPTION

Due to the complexity in defining site boundaries, sites IAAP-032 (Burn Cages), IAAP-033 (Burn Cage Landfill), IAAP-034 (West Burn Pads), and IAAP-035 (West Burn Pads Landfill), were incorporated into one site.

Burn cages were used for the incineration of inert and explosivescontaminated packaging. The flashing of metals parts also was performed here. The site was used from 1949 to 1982 when the cages were removed. Metal parts, munitions casings and staining on the ground surface were observed during the site inspection in 1991.

The West Burn Pads were used for metals flashing from 1949 to 1982. Ash from the Burn Cages and West Burn Pads were disposed of at the Burn Cage Landfill (1949 to 1982) and the West Burn Pads Landfill (1950 to 1975). The WBPLF also received waste from the East Burn Pads as well as various solid waste to include sanitary and industrial. The landfills are approximately three acres in size and heavily vegetated.

STATUS

RRSE RATING: High CONTAMINANTS: Explosives, Metals MEDIA OF CONCERN: Surface Water, Soil, Sediment COMPLETED IRP PHASE: PA/SI, RI/FS, RD, RA(C) CURRENT IRP PHASE: RC - 2002

The IRP site consists of the contamination from past activities. Any contamination from current and future activities will be addressed with non-ER,A funding.

The PA/SI was completed in 1991, and the RI was completed in May 1996. The Interim ROD required the removal of 1,451cy of contaminated soil to be taken to the Inert Disposal Area (IAAP-020) and sorted by contaminant level and type. However, pre-design characterization of soils during 1998 located significant levels of barium contamination that were not previously known. Groundwater monitoring began in 1994.

Soil removal (~46,000 cy) was completed in late 2000. Of that removal of ~19,000 cy of soil were treated for barium contamination. Low levels of explosives were detected in the creek south of the WBPLF during 2000. Annual groundwater monitoring did not show an expected decline in explosive concentrations downgradient of the site. These groundwater results, historical records, and a site walk-over in 2001 indicated further soil investigation is warranted in an area that lies across the road to the south of the soil removal area. Also, explosive chunks were found on the surface. USACE notified AO for a safety review and some explosive chunks were removed and sampled.

Historical documents indicate the West Burn pads were used concurrently by the AEC (Atomic Energy



Commission) and the Army from 1949 to 1975. Because of these AEC activities, the West Burn pads were included in FUSRAP for future evaluation. FUSRAP performed a Preliminary Assessment (published December 2001) of this site and determined it to be a former AEC area. In July 2002, the Corps designated this area to be under FUSRAP. Both radiological and non-radiological contamination attributable to former AEC operations will be addressed by FUSRAP for soil. FUSRAP will complete a supplemental RI for this site. The ER,A program will be responsible for GW contamination; it is anticipated that in situ bioremediation and MNA will be the remedy.

BUILDING 600-86 SEPTIC SYSTEM IAAP-038

SITE DESCRIPTION

This site consists of the contamination from past activities. Any contamination from current and future activities will be addressed with non-ER,A funding.

Building 600-86 is located in the north-central portion of the installation. This building has served in several roles since its construction in 1941. It was an analytical laboratory from 1941 to 1953. In 1985, two rooms in the building are used to store RCRA hazardous wastes. Room A is used to store spent solvents with a permitted capacity of 2640 gallons. Room B is used to store waste liquids containing cyanide salts. Both rooms have concrete curbing around the perimeter. Small amounts of solvents that may be contaminated with explosives are accumulated in Room C, then filtered through a carbon filter column before being taken off-site.

The function of the laboratory was to perform drinking water and wastewater analyses, as well as analysis of primer mixes containing lead azide in quantities of 10 to 20 milligrams. The waste from

STATUS

RRSE RATING: Medium CONTAMINANTS: Explosives, Metals, VOCs, SVOCs MEDIA OF CONCERN: Soil, Groundwater, Sediment, Surface Water COMPLETED IRP PHASE: PA/SI, RI/FS CURRENT IRP PHASE: RC - 1996

the primer tests was deactivated with ceric ammonium nitrate and the resultant waste solution was disposed of in the Explosive Disposal Area (IAAP-012).

The laboratory building was constructed with its own septic tank and drain. Sometime after 1983, sludge was removed from the septic tank and the tank was filled with sand.

The PA/SI was completed in 1991, the RI was completed in May 1996; sampling found metals below action levels in soil and groundwater.

No further action at this site is required. USACHPPM Phase II Complete.



ABANDONED COAL STORAGE YARD **IAAP-042**

SITE DESCRIPTION

During the operation of the Steam Generating Plant Line 1, coal was the primary fuel used. The Coal Pile is bounded on the north and east by railroad tracks and on the southeast by the head of Brush Creek. The coal is now scattered around an area about 4 acres. Runoff from the coal pile, augmented by water brought into the area by the three culverts below the rail tracks could have caused the widespread dispersal of the coal pile.

The coal pile was established in 1950 and used through 1968. Currently, it is not in use, because the fuel for the heating plant was changed to No. 2 Oil. When the use of coal for heating plant was discontinued in 1968, the stockpiled coal was left in place. There was no cover for the pile to reduce infiltration of precipitation therefore it can be expected that leaching and runoff have occurred since 1950.

Although, the coal pile covers an area of approximately 3 to 4 acres,

runoff may have spread to a greater area. There has been severe erosion of the pile resulting in furrows several feet deep as evidenced by vegetation stress observed on the adjacent storage yards.

The SI sampling was completed in 1991 and no significant contamination was found.

Site IAAP-042, Abandoned Coal Storage Yard was eliminated from RI consideration because the installation completed a State of Iowa Department of Natural Resources Removal Activity. This excavation was summarized in a Finding of No Significant Impact dated 26 October 1992. The RCRA Branch of Region VII EPA have agreed to this removal action. The removal was completed in late 1993, and the area was covered with clean soil and re-vegetated with native grasses.

This site requires no further action under the IRP.





RRSE RATING: I ow **CONTAMINANTS:** Metals, Nitrates, Sulfates **MEDIA OF CONCERN:** Soil COMPLETED IRP PHASE: PA/SI, RI/FS, RD, RA(C) **CURRENT IRP PHASE:** RC - 1993

FLY ASH DISPOSAL AREA IAAP-043

SITE DESCRIPTION

In operation from the 1940s to the 1950s, this area was used for disposal of fly ash, residual coal, clinkers, and other residue from the coal-fired power plant and is nearly 5 acres in size. The site is abandoned and covered with natural vegetation, but has no soil or clay cover.

The PA/SI was completed in 1991, the RI was completed in May 1996; sampling found no significant contamination.

No further action is required at this site. USACHPPM Phase II complete.



RRSE RATING: Medium CONTAMINANTS: Metals, Nitrates, Sulfates MEDIA OF CONCERN: Soil, Surface Water, Sediment COMPLETED IRP PHASE: PA/SI, RI/FS CURRENT IRP PHASE: RC - 2000



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FORMER FUEL STATION USTs IAAP-045

SITE DESCRIPTION

The Fuel Station was located directly east of Texas Ave. north of the Fire Station. The station was used from 1941 until 1997. In 1988, three leaking USTs were removed and replaced, some contaminated soil was left in place. This site consists of the contaminated soil and groundwater from the leaking tanks. The new tanks were active from 1988 to 1997. The newer tanks were removed in 1999.

Annual groundwater sampling began in 1990.

A Risk-Based Corrective Action (RBCA), Tier II report was prepared in accordance with Iowa State Code.

Approximately 520 cy of contaminated soil has been removed. A Corrective Action Report was submitted in Aug 2002.

A No Further Action certificate has been received from the State of Iowa.

STATUS

RRSE RATING: High CONTAMINANTS: POL MEDIA OF CONCERN: Soil, Groundwater COMPLETED IRP PHASE: PA, RI/FS, RD, RA(C) CURRENT IRP PHASE: RC - 2004





Iowa Army Ammunition Plant

Military Munitions Response Program Sites

IAAP-001-R-01 IAAP-001-R-02 IAAP-001-R-03 Central Test Area Line 6 Ammo Production West Burn Pads