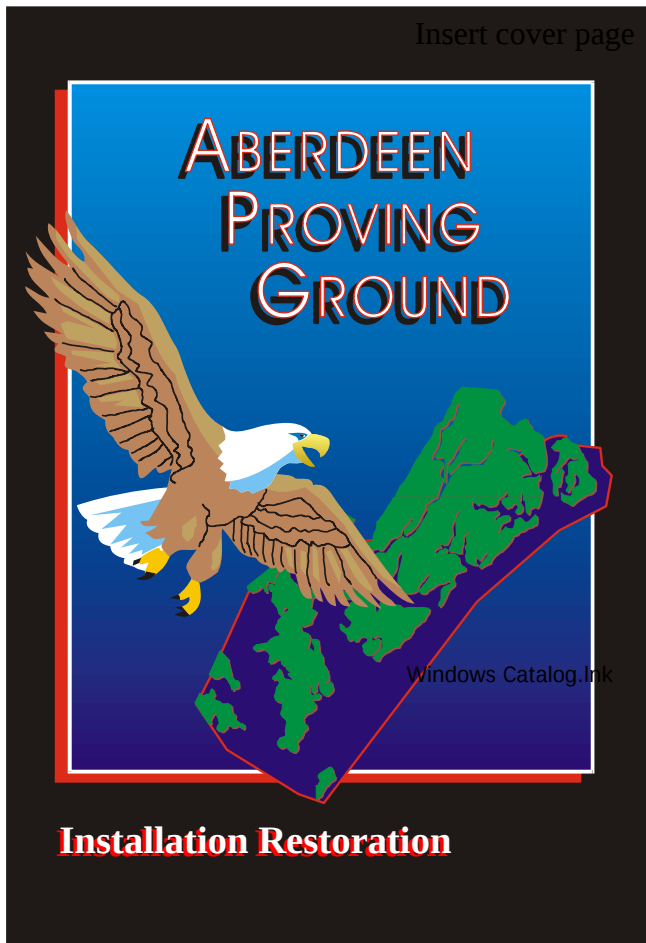


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RECORD of DECISION

**Remedial Action at
Main Industrial Area – Northwest
Canal Creek Study Area
(Sites EACC1E, EACC1J & EACC2D)**

**Final
September 2009
U.S. Army Garrison
Aberdeen Proving Ground, MD**

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RECORD OF DECISION

REMEDIAL ACTION AT MAIN INDUSTRIAL AREA - NORTHWEST CANAL CREEK STUDY AREA (Sites EACC1E, EACC1J, and EACC2D)

ABERDEEN PROVING GROUND, MARYLAND

SUBMITTED BY:

**ENVIRONMENTAL MANAGEMENT DIVISION
U.S. ARMY GARRISON ABERDEEN PROVING GROUND
ABERDEEN PROVING GROUND, MARYLAND 21010**

FINAL, SEPTEMBER 2009

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Attachment B – Conceptual Site Model

ACRONYMS AND ABBREVIATIONS

AEDB-R	Army Environmental Database – Restoration
APG	Aberdeen Proving Ground
ARARs	Applicable or Relevant and Appropriate Requirements
CC2	Mixture of trichlorophenyl urea and paraffin
CCA	Canal Creek Aquifer
CCSA	Canal Creek Study Area
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COCs	Contaminants of Concern
COPC	Contaminants of Potential Concern
CSM	Conceptual Site Model
4,4'-DDD	4,4'-Dichlorodiphenyldichloroethane
4,4'-DDE	4,4'-Dichlorodiphenyldichloroethylene
4,4'-DDT	4,4'-Dichlorodiphenyltrichloroethane
DDTr	Mixture of 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT
DSERTS	Defense Site Environmental Restoration Tracking System
EA	Edgewood Area
EOD	Explosive Ordnance Disposal
ERA	Ecological Risk Assessment
ER-L	Effects Range-Low
FFA	Federal Facility Agreement
FS	Feasibility Study
GA	Tabun
GB	Sarin
GIS	Geographical Information System
GP	General Physics Corporation
HEAST	Health Effects Assessment Summary Tables
HHRA	Human Health Risk Assessment
HI	Hazard Index
HQ	Hazard Quotient
IRIS	Integrated Risk Information System
IRP	Installation Restoration Program
LUC	Land Use Controls
MDE	Maryland Department of the Environment
MIA-NW	Main Industrial Area - Northwest
msl	mean sea level
µg/kg	micrograms per kilogram

mg/kg	milligrams per kilogram
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
PCB	Polychlorinated biphenyl
R&D	Research and Development
RAB	Restoration Advisory Board
RAO	Remedial Action Objective
RBC	Risk-Based Concentration
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
SWMU	Solid Waste Management Unit
TEL	Threshold Effects Level
TRV	Toxicity Reference Value
TWDP	Toxic Waste Disposal Pit
USAEHA	U.S. Army Environmental Hygiene Agency
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
UXO	Unexploded ordnance
VX	o-Ethyl-s-diisopropylaminoethylmethylphosphonothiolate
WWI	World War I
WP	White Phosphorus

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**RECORD OF DECISION
REMEDIAL ACTION AT MAIN INDUSTRIAL AREA – NORTHWEST SOIL SITES
IN THE CANAL CREEK STUDY AREA
ABERDEEN PROVING GROUND, MARYLAND
EDGEWOOD AREA NATIONAL PRIORITIES LIST (NPL) SITE
SEPTEMBER 2009**

PART 1: DECLARATION

1 SITE NAME AND LOCATION

The Main Industrial Area – Northwest (MIA-NW) Soil Sites within the Canal Creek Study Area (CCSA) are located in the Edgewood Area (EA) of Aberdeen Proving Ground (APG), Maryland. Pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), this Record of Decision (ROD) selects a remedial action for three sites. The Army Environmental Database – Restoration (AEDB-R) numbers, formerly referred to as Defense Site Environmental Restoration Tracking System (DSERTS) numbers, for these three sites are as follows:

EACC1E	Building 87 Complex
EACC1J	Building 30 Toxic Waste Disposal Pits
EACC2D	Laboratory Toxic Waste Disposal Pit

The location of these sites is shown on Figure 2 in the Decision Summary (Part 2) of this ROD.

The United States Environmental Protection Agency (USEPA) Superfund Site Identification number for APG-EA is MD 2210020036. This ROD will be listed as MIA-NW Soil Sites in the CCSA in the USEPA's Comprehensive Environmental Response, Compensation and Liability Information System database. The site owner and lead agency is the United States Department of the Army, the USEPA is the lead regulatory agency, and the Maryland Department of the Environment (MDE) is the supporting regulatory agency. APG is located on the northwestern shore of the Chesapeake Bay in southern Harford County and eastern Baltimore County.

Future RODs will be developed to address the remaining soil sites at CCSA, groundwater contamination in the Canal Creek Aquifer (CCA) in the West Canal Creek Area and the

Surficial Aquifer in the Kings Creek Area, vapor intrusion, sediment and marshes associated with Canal Creek and Kings Creek, and potential radioactive areas. Groundwater contamination within the CCA in the East Canal Creek Area is currently being captured and treated at the Canal Creek Groundwater Treatment Plant, in accordance with the ROD signed in July 2000.

2 STATEMENT OF BASIS AND PURPOSE

This ROD presents the remedy selected by the Army and the USEPA Region III for the MIA-NW Soil Sites in the CCSA. Land Use Controls (LUCs) have been chosen as the Selected Remedy for these sites. This remedy was chosen in accordance with CERCLA, as amended by the Superfund Amendments and Reauthorization Act, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The Selected Remedy also satisfies Resource Conservation and Recovery Act (RCRA) corrective action requirements. The decision is based on the Administrative Record for these sites.

The Army and USEPA, with support from MDE, developed remedial alternatives to achieve the performance objective of a completed response action. These sites pose no potential unacceptable risks to human health under an industrial land-use scenario (i.e., foreseeable future use); however, there is potential for risk to hypothetical future residents, resulting in the need for LUCs. The results of the Ecological Risk Assessments (ERAs) suggest no unacceptable risk to ecological receptors at these sites.

USEPA and MDE support the Selected Remedy outlined in this ROD as necessary to adequately and cost-effectively protect human health and the environment.

3 ASSESSMENT OF THE SITE

Remedial Investigation (RI) and risk assessments for the MIA–NW Soil Sites revealed that no additional investigation was warranted for Sites EACC1E – Building 87 Complex and EAC1J- Building 30 Toxic Waste Disposal Pits (TWDPs), because no unacceptable human health or ecological risks were identified under current or likely future land use scenarios. Results of the RI and risk assessments for Site EACC2D – Laboratory TWDP indicated that no unacceptable risks were identified for human health under current or likely future land use scenarios. The identified potential ecological risk is limited because the habitat area contained within the site is small (approximately a 17-foot radius circle) when compared to the overall available habitat of the EA. Additionally, for all three sites, there is a potential for exposure to unexploded ordnance (UXO) white phosphorus (WP), buried waste, and lead was not sampled at a frequency appropriate to evaluate risk associated with residential land use. Therefore, LUCs are needed to prevent future residential land use, elementary and secondary schools, child care facilities, and playgrounds.

The response actions selected in this ROD are necessary to protect the public health and the environment from actual or threatened releases of hazardous substances into the environment.

4 DESCRIPTION OF THE SELECTED REMEDY

The Selected Remedy for the MIA-NW Soil Sites is LUCs. This remedy includes the following elements:

- Existing LUCs at APG would continue. These measures include engineering controls, boating access restrictions, and restrictions on subsurface access by site workers. These three sites are located in a restricted portion of the Installation. Access to the restricted area is limited to properly cleared personnel or individuals in an escorted capacity. A wide variety of physical security countermeasures including barrier systems, sensors, and random patrols by law enforcement personnel are in place to prevent unauthorized access.
- Modifications will be made to the Installation Master Plan and Geographical Information System (GIS) Overlay Maps in order to prevent future residential land use, elementary and secondary schools, child care facilities, and playgrounds until risks presented by contaminant levels at the site allow for unlimited use and unrestricted exposure. These modifications for sites EACC1J and EACC2D would also include

language indicating the potential for encountering waste material during authorized excavation activities. Excavation warning signs would also be maintained to advise personnel authorized access to adjacent areas of the potential hazards

A Remedial Design (RD) will be submitted consistent with the RD schedule provisions of the Federal Facility Agreement (FFA) to outline the LUC implementation. The Army shall be responsible for implementation, maintenance, periodic reporting, and enforcement of LUCs in accordance with the RD. As part of the Army's inspection and reporting responsibilities, periodic reviews will be undertaken and review reports will be submitted at a frequency determined by site-specific conditions (as specified in the USEPA-approved RD). The LUCs will include implementation through the APG Master Planning system with geographic information support.

Although the Army may transfer these responsibilities to another party by contract, property transfer agreement, or through other means, the Army shall ultimately be responsible for remedy integrity and shall: i) perform CERCLA 121(c) five-year reviews; ii) notify the appropriate regulators and/or local government representatives of any known LUC deficiencies or violations; iii) provide access to the property to conduct any necessary response; iv) retain the ability to change, modify or terminate LUCs and any related deed or lease provisions; and, v) ensure that the LUC objective is met to maintain remedy protectiveness.

At the earliest possible time, but no less than 60 days prior to leasing or transferring any portion of the Army-owned property to another agency, person, or entity, (including Federal-to-Federal transfers) the Army shall provide notice to EPA and MDE of such intended lease or transfer. As a condition of property transfer or lease, the Army may require the transferee or lessee, in cooperation with other stakeholders, to assume responsibility for various implementation actions. Third party LUC responsibility will be incorporated into pertinent contractual, property, and remedial documentation, such as a purchase agreement, deed, lease, and RD addendum. To the extent permitted by law, a transfer deed shall require the LUCs imposed as part of a CERCLA remedy to run with the land and bind all property owners and users. If the Army intends to transfer ownership of any site, if allowed by Federal and/or State law (upon transfer of fee title), the Army may grant the State an

environmental covenant or easement that would allow the State to enforce LUC terms and conditions against the transferee(s), as well as subsequent property owner(s) or user(s) or their contractors, tenants, lessees or other parties. This covenant will be incorporated by reference in the transfer deed and will run with the land in accordance with State realty law. This state enforcement right would supplement, not replace, the Army's right and responsibility to enforce the LUCs.

The Selected Remedy for these sites is protective of human and ecological receptors. The present worth cost of the Selected Remedy is \$126,000.

5 STATUTORY DETERMINATIONS

This remedy meets the requirements of CERCLA Section 121 and, to the extent practicable, the NCP. The Selected Remedy for the MIA-NW Soil Sites in the CCSA is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate, is cost-effective, and utilizes permanent solutions to the maximum extent practicable.

The Selected Remedy does not employ treatment to reduce toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants. Therefore, the Selected Remedy does not satisfy the statutory preference for remedies that employ treatment as a principal element.

Because the Selected Remedy will result in hazardous substances, pollutants, or contaminants remaining on site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

6 DATA CERTIFICATION CHECKLIST

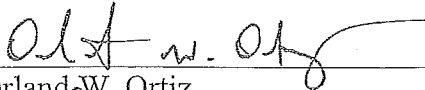
The following information is included in the Decision Summary section of this ROD. Additional information is located in the Administrative Record file for the CCSA.

- Baseline risk calculation (Section 7);
- Current and reasonably anticipated future land use assumptions and potential land use that will be available as a result of the Selected Remedy (Section 6);

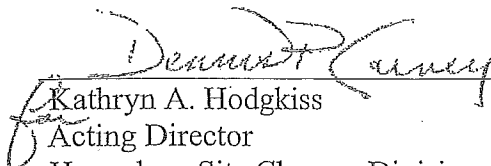
- Estimated capital, Operations & Maintenance (O&M), and total present worth costs, and the number of years the remedy cost estimates are projected (Section 12.4);
- Key factor(s) that led to selecting the remedy (i.e., description of how the Selected Remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision) (Section 10);
- Groundwater (including vapor intrusion) for the West Canal Creek and Kings Creek Areas is not included in this ROD but will be considered in a future ROD (Section 4); and
- There are no principal threat wastes for these sites under the current and likely future military/industrial land use scenario for these sites (Section 11).

7 AUTHORIZING SIGNATURES

The approval authority for the Army for this action is the APG Installation Commander.


Orlando W. Ortiz
Colonel, U.S. Army
Deputy Installation Commander

24 Sep 09
Date


Kathryn A. Hodgkiss
Acting Director
Hazardous Site Cleanup Division
U.S. Environmental Protection Agency, Region III

9/24/09
Date

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PART 2: DECISION SUMMARY

1 SITE NAME, LOCATION, AND DESCRIPTION

The MIA-NW Soil Sites within the CCSA are located in the Gunpowder Peninsula portion of APG, Maryland. The USEPA Superfund Site Identification Number for APG-EA is MD 2210020036. Pursuant to CERCLA, this ROD selects a remedial action for the MIA-NW Soil Sites. The Army is the lead agency for site remediation, USEPA is the lead regulatory agency, and MDE is the support regulatory agency.

APG is a 72,500-acre Army installation located on the northwestern shore of the Chesapeake Bay in southern Harford County and eastern Baltimore County, Maryland (Figure 1). The installation is bordered to the east and south by the Chesapeake Bay; to the west by Gunpowder Falls State Park, the Crane Point Power Plant, and residential areas; and to the north by the towns of Edgewood, Joppa, Magnolia, and Aberdeen. The Bush River divides the installation into two main areas. The northeastern area is referred to as the Aberdeen Area, and the southwestern area is referred to as the Edgewood Area.

Established as the Ordnance Proving Ground in 1917, the Aberdeen Area of the installation became a formal military post, designated as APG, in 1919. Traditionally, APG's primary mission involved the testing and development of weapon systems, munitions, vehicles, and a wide variety of military support material. The EA (formerly Edgewood Arsenal) was appropriated by presidential proclamation in 1917 and has since been a center for research, development, testing, and manufacturing of military-related chemicals and chemical agents (U.S. Army Toxic and Hazardous Materials Agency, 1983).

The CCSA encompasses more than 700 acres in the northern portion of the APG-EA, and is bordered by the Westwood Study Area to the west, Bush River and Lauderick Creek Study Areas to the east, and other EAs to the south (Figure 1). The CCSA has been used since World War I (WWI) for the development, testing, and manufacturing of military-related chemicals and agents. Since the end of WWI, the chemical manufacturing activities were scaled down and many of the plants were abandoned or converted to pilot-scale chemical manufacturing facilities. Until the 1970s, most of the buildings in the CCSA discharged

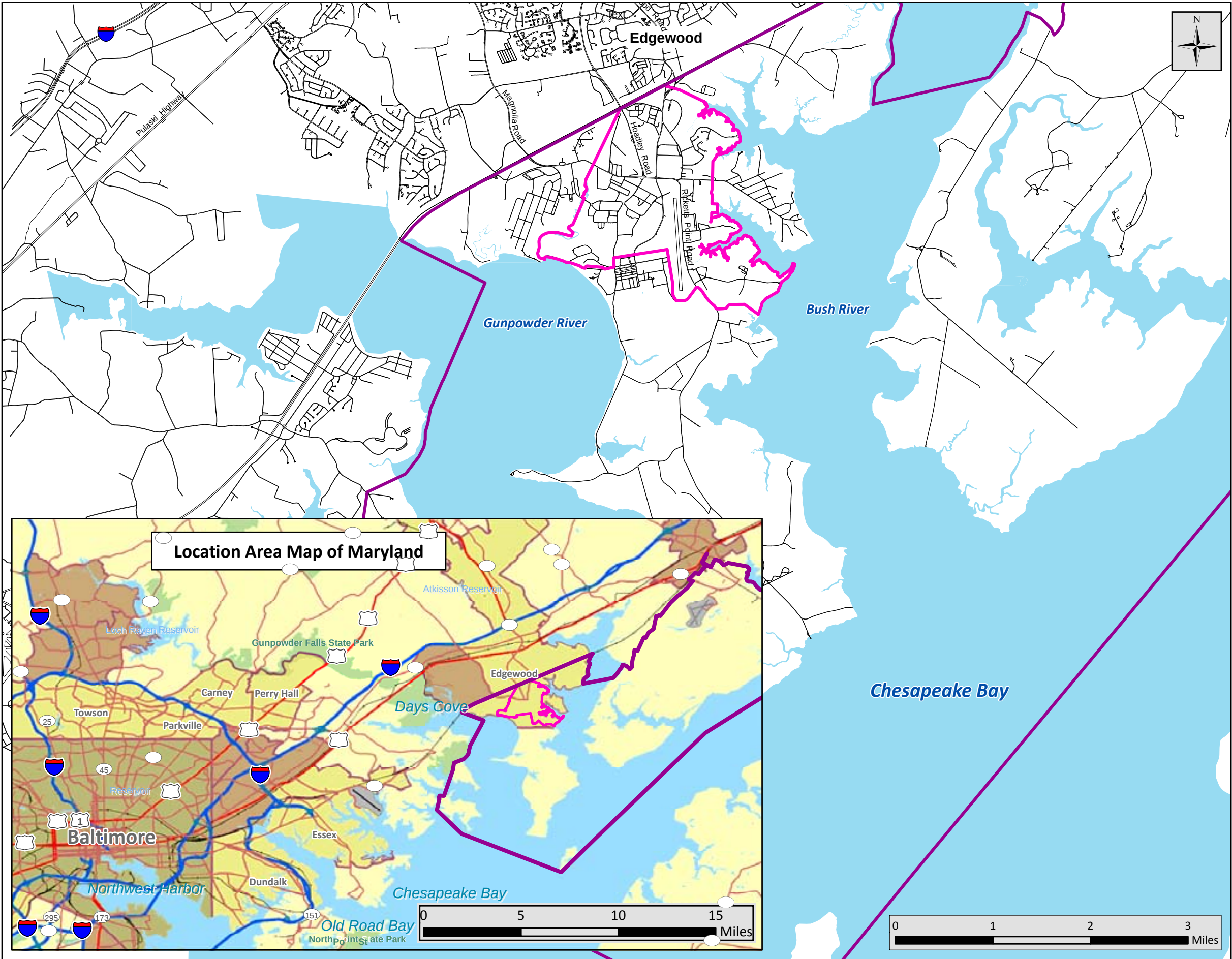
liquid wastes to the West or East Branches of Canal Creek. The CCSA contains more than 50 AEDB-R sites, including the following three sites addressed by this ROD (Figure 2):

- EACC1E—Building 87 Complex
- EACC1J—Building 30 Toxic Waste Disposal Pits
- EACC2D—Laboratory Toxic Waste Disposal Pit

2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

In September 1986, USEPA issued a RCRA Part B permit to APG. This permit required the assessment of Solid Waste Management Units (SWMUs) at APG due to their potential for release of contaminants to the environment. Studies performed within the guidelines of the RCRA permit identified the CCSA as one of the four areas containing SWMUs. These studies included the Hydrogeologic Assessment (U.S. Geological Survey [USGS], 1989) and the RCRA Facility Assessment (U.S. Army Environmental Hygiene Agency [USAEHA], 1989).

Based on findings from these studies, APG-EA was placed on the NPL in February 1990. The Department of the Army and USEPA Region III entered into an FFA on March 27, 1990 that subjected APG to RCRA corrective action and CERCLA remedial action requirements for the contaminated sites (USEPA Region III and U.S. Army, 1990). The APG Directorate of Public Works – Environmental Management Division, formerly known as the Directorate of Safety, Health and Environment, implements the Installation Restoration Program (IRP) to fulfill the FFA requirements. The designations for sites under the purview of CERCLA and the IRP were later changed from SWMUs to DSERTs sites, and are now referred to as AEDB-R sites.



Map Key

- Aberdeen Proving Ground
- Army Base Area Boundary Line
- Canal Creek Study Area
- Surface Water Body
- Roads

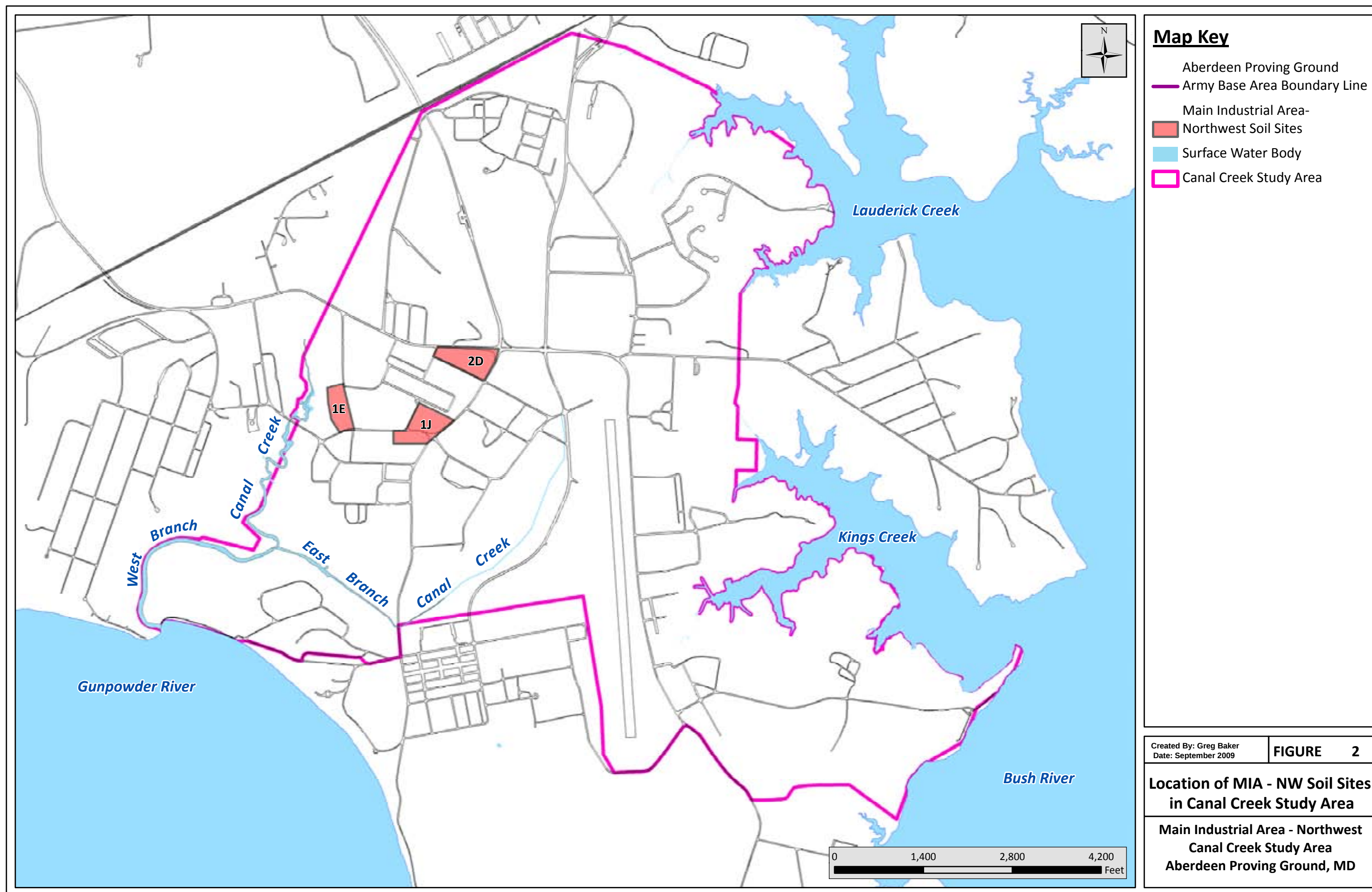
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Date: July 2009

FIGURE 1

**Location of
Aberdeen Proving Ground**

**Main Industrial Area - Northwest
Canal Creek Study Area
Aberdeen Proving Ground, MD**

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RI activities at the MIA-NW Soil Sites addressed by this ROD were initiated in 1993 and conducted in three major phases: Phase I (1993-1995), Phase II (at selected sites from 1996-2002), and Phase III (2004). Additional sampling was also conducted in 2003-2004 in support of the ERA. The following risk assessments, RI report, and FS report were used to support the Selected Remedies in this ROD:

- *Feasibility Study for Volume 1: Canal Creek Main Industrial Area – Northwest Region (Plexus, 2009)*
- *Remedial Investigation Report for Thirty-Five Remaining Soils Sites, Volume I: Canal Creek Main Industrial Area – Northwest Region (General Physics [GP], 2008)*
- *Data Evaluations and Risk Characterizations for DSERTS Sites in the Canal Creek Study Area, Volume I: Northwest Industrial Area (EA, 2008)*
- *Baseline Human Health Risk Assessment for DSERTS Sites in the Canal Creek Study Area, Volume I: Northwest Industrial Area (EA, 2007)*

Individual site histories and descriptions are provided in Section 5.

3 PUBLIC/COMMUNITY INVOLVEMENT

CERCLA Sections 113(k)(2)(B) and 117, Department of Defense, and Army policy require the involvement of the local community as early as possible in the IRP process. To accomplish this, APG is conducting monthly Restoration Advisory Board (RAB) meetings and periodic public meetings at each decision point in the CERCLA remedial process. The RAB membership is comprised of both Army and local community members. Information about the MIA-NW Soil Sites was briefed to the RAB several times.

The Proposed Plan was made available to the public on July 16, 2009. The Administrative Record, which contains the information used to select the remedy, is available at the Aberdeen and Edgewood Branch of the Harford County Public Library and at the Miller Library at Washington College. The notice of the availability of these documents was published in *The Aegis*, *Cecil Whig*, *Kent County News*, *The Avenue*, and *East County Times*. A copy of the newspaper ad is provided in the Responsiveness Summary (Part 3) of this ROD. The public meeting was held on August 13, 2009, and the public comment period was held from July 30 to August 29, 2009. Responses to the public comments received during this period are provided in the Responsiveness Summary (Part 3) of this ROD.

4 SCOPE AND ROLE OF RESPONSE ACTION

The CCSA contains more than 50 AEDB-R sites, including the three sites addressed in this ROD. Separate RODs have been issued for sites in the CCSA, as shown in Table 1:

Table 1
Canal Creek Study Area Records of Decision

Site Name	Date	AEDB-R Designation
Building 103 Dump	February 1995	EACC1H-E
Building 503 Smoke Mixture Burning Sites	April 1995	EACC1L-A
Beach Point Test Site Groundwater	September 1997	EACC3N
East Canal Creek Aquifer	July 2000	EACC4A
13 Select Sites in the CCSA	September 2006	EACC1A-A, EACC1D, EACC2F, EACC1G-B, EACC2A, EACC2B, EACC2C, EACC2G, EACC2H-A, EACC2I-A, EACC2I-B, EACC3B, EACC3H
G-Street Salvage Yard	September 2007	EACC1A-B
10 Soil Sites in the CCSA	September 2008	EACC1F-A, EACC1F-B, EACC1G-A, EACC1H-D, EACC1I-B, EACC3E, EACC3F, EACC3I, EACC3O, EACC3P

Future RODs will be developed to address the remaining soil sites at the CCSA, groundwater contamination in the Canal Creek Aquifer (CCA) in the West Canal Creek Area and the Surficial Aquifer in the Kings Creek Area, vapor intrusion, sediment and marshes associated with Canal Creek and Kings Creek, and potential radioactive areas. This ROD addresses the final response action for the MIA-NW Soil sites in the CCSA.

RI sampling was conducted at these three sites. The results of the RIs and risk assessments for two sites—EACC1E – Building 87 Complex and EACC1J – Building 30 TWDPs—did not indicate the need for any further investigation since there were no unacceptable risks identified for human or ecological receptors under current or likely future land use scenarios. The results of the RI and risk assessments for site EACC2D – Laboratory TWDP indicated no unacceptable risks were identified for human health under current or likely future land use scenarios. The Contaminants of Concern (COCs) DDT_r (a combination of the pesticides 4,4'-dichloro-diphenyltrichloroethane [4,4'-DDT], 4,4'-dichlorodiphenyldichloroethane [4,4'-DDD], and 4,4'-dichlorodiphenyldichloroethylene [4,4'-DDE]) and arsenic were identified as potential ecological risks. However, this ecological risk is limited because the habitat area contained within the site is small (approximately a 17-foot radius circle) when compared to the overall available habitat of the EA. Levels of lead must be further assessed if future residential land use is considered for any of the MIA-NW Soil Sites since sampling was conducted at a frequency appropriate for current and likely future military/industrial use. Additionally, for all three MIA-NW Soil Sites, there is a potential for exposure to UXO, WP, and buried waste. Therefore, without further investigation, LUCs preventing future residential land use (i.e., future residential land use, elementary and secondary schools, child care facilities, and playgrounds) are needed for all three sites. Hazardous substances, pollutants, or contaminants will remain on site above levels that allow for unlimited use and unrestricted exposure. Therefore, CERCLA 121(c) five-year reviews will be performed for the MIA-NW Soil Sites.

The Selected Remedy for these sites will prevent residential exposure to hazardous substances in soil that may pose unacceptable risk. Groundwater (including vapor intrusion) is not included in this ROD, but will be considered in a future ROD.

5 SITE CHARACTERISTICS

The CCSA was named after Canal Creek, which drains an area comprised of more than 3,000 acres. The East and West Branches of Canal Creek flow southward to the Gunpowder River. In the eastern portion of the CCSA, surface water drains into Lauderick Creek and Kings Creek. Both of these creeks drain into Bush River (USGS, 1996). The general land cover for the CCSA includes grassy areas, wooded areas with low shrubs, wetlands, and buildings and paved areas. Land surface is characterized by low, gently rolling terrain. Elevations range from approximately 40 feet above mean sea level (msl) at several locations near the northern APG-EA boundary, to about 10 feet above msl near the West Branch of Canal Creek.

Wetlands within the CCSA receive surface water runoff and drainage by overland flow, culverts, and stormwater sewer systems. Surface water runoff within the CCSA flows to both the East and West Branches of Canal Creek, which eventually discharge to the Gunpowder River.

The CCSA is located within the Atlantic Coastal Plain Physiographic Province. Underlying the area of investigation are predominantly fine-grained unconsolidated sediments, consisting of clay, silt, sand, and gravel deposited by streams, rivers, and seas, which form a wedge-shaped body that dips southeastward. Alluvial deposits occur adjacent to and within drainage ways and topographic lows.

The forest, field, and wetland habitats at the CCSA support a wide variety of wildlife and vegetation. Currently, there are no known occurrences of endangered flora or fauna species in the CCSA. Bald eagles, listed under Federal protection status as threatened, are known to forage in and around the CCSA. However, the closest known active bald eagle nesting areas are located in the Westwood Study Area and at the Reardon Inlet.

RI activities were initiated in 1993 and conducted in three major phases: Phase I (1993-1995), Phase II (at selected sites from 1996-2002), and Phase III (2004). Numerous constituents were detected across the CCSA in surface/subsurface soil, sediment, and surface water during these field efforts, including volatile organic compounds, semi-volatile organic compounds, pesticides, herbicides, polychlorinated biphenyls (PCBs), metals, explosives, and radionuclides. Throughout the CCSA, there is a potential for exposure to UXO and WP.

The results of the RI sampling efforts for each of the three MIA-NW sites, along with brief site descriptions and histories, are provided below.

EACC1E, Building 87 Complex – Site EACC1E covers approximately 4.8 acres in the northwest portion of the Canal Creek Industrial Area, west of Alley Road, north of Fleming Road, and adjacent to West Branch Canal Creek (Figure 3). The Complex (also referred to as Plant #87, DuPont Plant, and Pilot Plant) was constructed in 1941 as a chemical manufacturing plant for a mixture of trichlorophenyl urea and paraffin (CC2), which was used to impregnate clothing for protection against chemical warfare agent exposure.

Beginning in 1944 or 1945, the Complex was used for chemical warfare agent manufacturing research and development (R&D) operations, including R&D of the nerve agents Tabun (GA), Sarin (GB), and o-ethyl-s-diisopropylaminoethylmethylphosphonothiolate (VX). Additional historic site uses included filling of chemical munitions, storage of bulk chemicals, small-scale laboratory work, and chemical incineration; all of these activities were also part of R&D processes. The Building 87 Complex had a sewer system for transport and discharge of wastewater generated by its operations. Wastewater drained into four sumps on the first floor of the building, and then discharged to the West Branch Canal Creek Marsh. The wastewater was treated with a caustic agent prior to discharge to the marsh. The caustic agent commonly used at APG was sodium hydroxide, which acted as a decontaminant by increasing the hydrolysis rate. The sewer lines were connected to the sanitary sewer in the early 1980s, and discharge to the West Branch Canal Creek Marsh was subsequently discontinued (USAEHA, 1989). Sump contents were removed in the mid-1990s, and the sumps in Buildings E5625 and E5633 were filled with a material similar to concrete (Foster Wheeler, 1995).

Bulk storage of chemicals used in operations at the EACC1E – Building 87 Complex occurred primarily inside Building 87A (E5625). A railroad loading dock was located on the west side of Building 87A, where large quantities of raw materials and manufactured products were handled. Building 87K (E5633) was also used for chemical storage, both inside and outside in an open-sided drum rack. Dieldrin was detected at a maximum concentration of 34.1 micrograms per kilogram ($\mu\text{g/kg}$) and mercury was detected up to 14.3 milligrams per kilogram (mg/kg). The ERA specified dieldrin and mercury as COCs at

EACC1E – Building 87 Complex, but also identified uncertainties (biased sample design, non-quality habitat, differences in 1995 and 2003 data, and the mercury Toxicity Reference Value), which indicate that the risk is overstated (EA, 2008). Therefore, these COCs were not retained in the FFS and the site does not pose an unacceptable ecological risk. Furthermore, the site does not pose an unacceptable human health risk under current and likely future military/industrial land use scenarios. However, lead “hot spots” at EACC1E must be further evaluated before this site can be considered for residential purposes. Lead was detected in surface soil during the Phase I RI at levels between 2.55 and 2,780 mg/kg, while levels detected during the Phase II and III RIs were significantly lower.

EACC1J, Building 30 TWDPs – Site EACC1J covers approximately 7.5 acres in the northwest portion of the Canal Creek Industrial Area, at the intersection of Fleming and Hoadley Roads (Figure 4). The disposal pits were reportedly used from WWI to the late-1940s as burial sites for toxic wastes generated by the former Building 30 Laboratory located south of Fleming Road. Information from the RCRA Facility Assessment (RFA; USAEHA, 1989) indicated that a large disposal pit may have been located where Building E5101 currently stands, a second pit may have been located between the Building E5101 parking lot and 32nd Street, and two additional small pits may have existed west of the former Building 30 Laboratory. Historic disposal practices consisted of hand-digging a hole, placing the waste into the hole, and replacing the soil to cover the disposed material. Chlorinated lime (e.g., decontaminating agent) was then spread over the disposal area to prevent toxic vapors (Jacobs Engineering Group, 1995). Suspected wastes included chemical warfare agents and contaminated items associated with laboratory operations, including glassware, equipment, packaging materials, gloves, and aprons. The former Building 30 was used after WWI and into the early 1920s. The last usage of the TWDP was reported to have occurred in the late 1940s. The building was abandoned and finally demolished in the early 1970s (USAEHA, 1989).

During the Phase I RI, vanadium was detected at a maximum of 63 mg/kg, which exceeds both the ecological screening and APG background values. Based on factors such as site relatedness, mechanisms of contaminant release, and environmental fate processes, the ERA determined that vanadium is not a COC. The ERA did not identify any unacceptable ecological risk at this site.

Twenty-five test excavations were performed at EACC1J during the Phase III RI. Debris encountered included ash, burn slag, glass and metal fragments, and large pieces of concrete, terracotta fragments, and a half-inch metal pipe.

EACC1J – Building 30 TWDPs has no identified COCs and, therefore, does not pose any unacceptable human health risk under current and likely future military/industrial land use scenarios. However, unrestricted land use risks associated with lead have not been quantified. Additionally, the potential for UXO, WP, and buried waste exists at these sites.

EACC2D, Laboratory TWDP – Site EACC2D covers approximately 7.6 acres north of Blackhawk Road and west of Hoadley Road in the northwest portion of the Canal Creek Industrial Area (Figure 5). The small (17-foot radius circle) disposal pit was the burial site of toxic wastes generated by several nearby laboratories from the 1920s to the 1940s. Laboratory wastes included chemical warfare agents and contaminated items associated with laboratory operations (e.g., glassware, packaging materials, gloves, aprons, mask canisters, and laboratory benches [USAEHA, 1989]). Historic disposal practices consisted of hand-digging a hole, placing the wastes into the hole, and replacing the soil to cover the disposed material. Chlorinated lime (a decontaminating agent) was spread over the disposed material to prevent toxic vapors.

In surface soil samples collected during the Phase I RI, the pesticides 4,4'-DDT, 4,4'-DDD, and 4,4'-DDE were detected at maximum concentrations of 5,690 µg/kg, 1,690 µg/kg, and 1,300 µg/kg, respectively. Levels detected during the Phase II and III RIs were significantly lower. The presence of the pesticides is likely due to insect control practices rather than any manufacturing or testing activities. These pesticides are found in relatively uniform concentrations in sediments throughout the CCSA, indicating they are probably residual from past mosquito control activities. Arsenic was detected at a maximum of 29 mg/kg. Fourteen

test digs were conducted at EACC2D during the Phase III RI. No debris was encountered; however, historical records indicate there was disposal in this area.

EACC2D – Laboratory TWDP poses no unacceptable human health risk under current and likely future military/industrial land use scenarios. However, further sampling for lead would be needed to fully assess the risk to hypothetical future residents. The ERA identified an ecological risk for DDT and arsenic. This ecological risk is limited because the habitat area contained within the site is small (approximately a 17-foot radius circle) when compared to the overall available habitat of the EA.

5.1 Conceptual Site Model

A conceptual site model (CSM) was developed during the risk assessment process for the MIA-NW Soil Sites to identify the primary sources, primary contaminated media, migration pathways, exposure pathways, and potential human receptors. The CSM is based on the data presented in the RI documentation. The CSM is provided in Attachment B of this ROD.

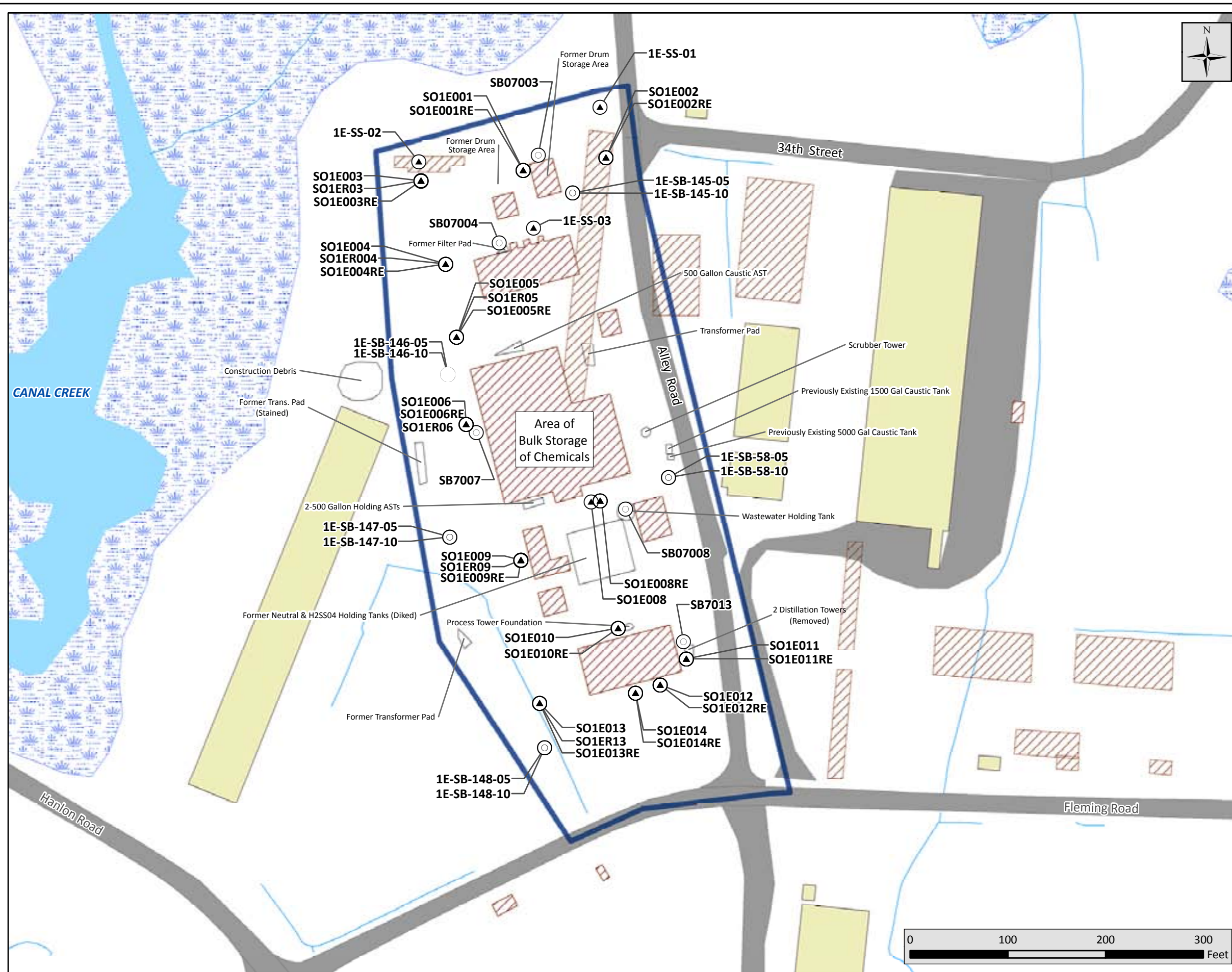
5.1.1 Primary Sources and Release Mechanisms

The primary sources suspected and evaluated in the RIs for the CCSA included spillage and/or deposition for the historical above-ground sources, leakage from the underground sources, and leakage and infiltration from the former sumps and open sewer lines.

5.1.2 Secondary Sources and Release Mechanisms

Secondary sources include leaching to groundwater, dust generation and volatilization to air, erosion and runoff to surface water and sediment, and biotic uptake.

Groundwater underlying the sites in the CCA is not addressed in this ROD—it is being addressed under RODs for AEDB-R sites EACC4A (East Canal Creek Area) and EACC4A-B (West Canal Creek Area).



Map Key

Sample Locations:

Media

- Soil Boring
- Sediment Sample
- ▲ Surface Soil
- ▭ Site/LUC Boundary
- Existing Structure (*1)
- ▨ Former Structure (*1)
- Special Structures
- Roads & Paved Surfaces
- Streams and Ditches
- Surface Water Body
- Wetlands

(*1) - Note: Additional Existing and Former Structures May Be Present But Not Shown Outside the Site Boundary.

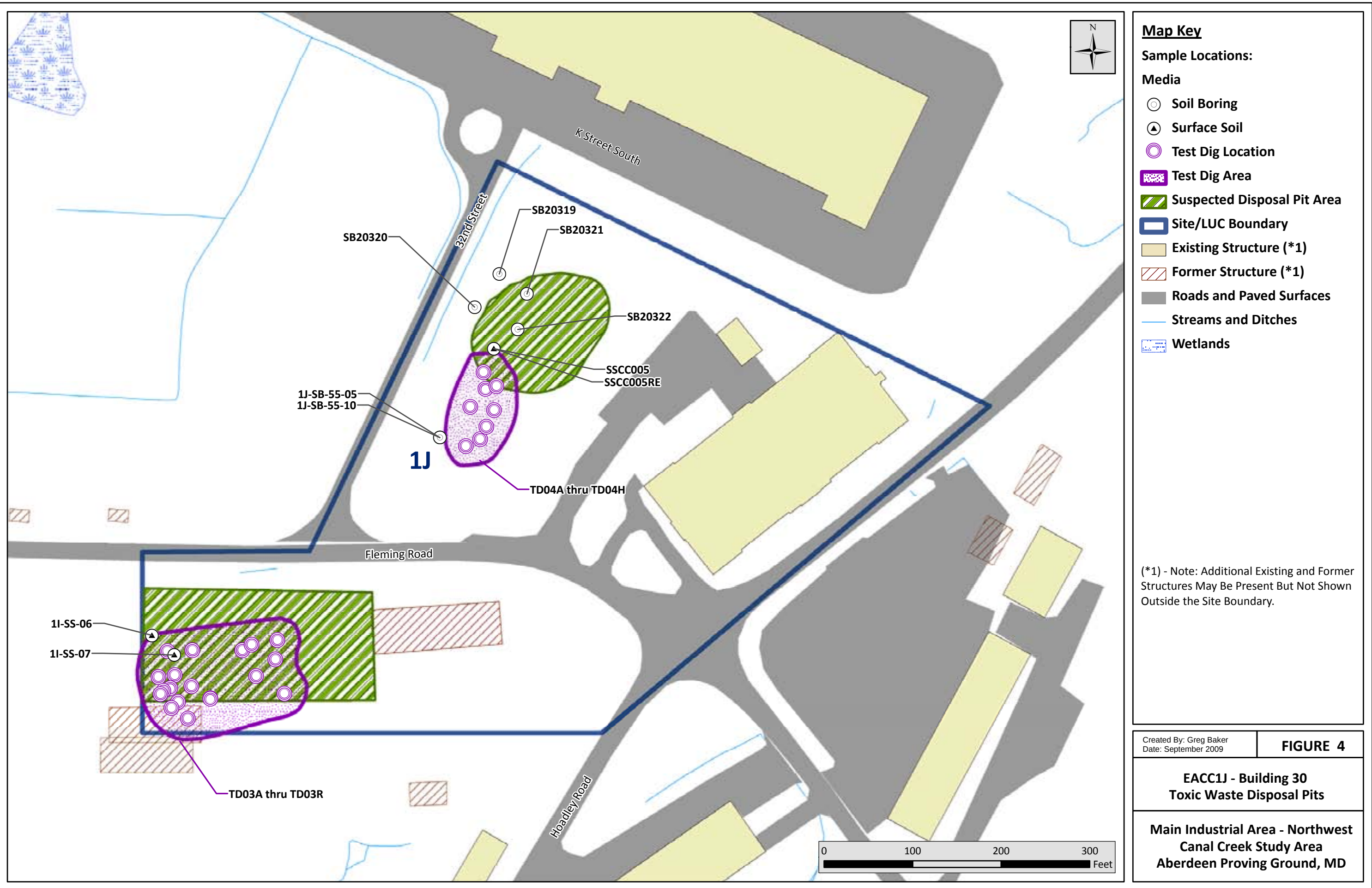
Created By: Greg Baker
Date: September 2009

FIGURE 3

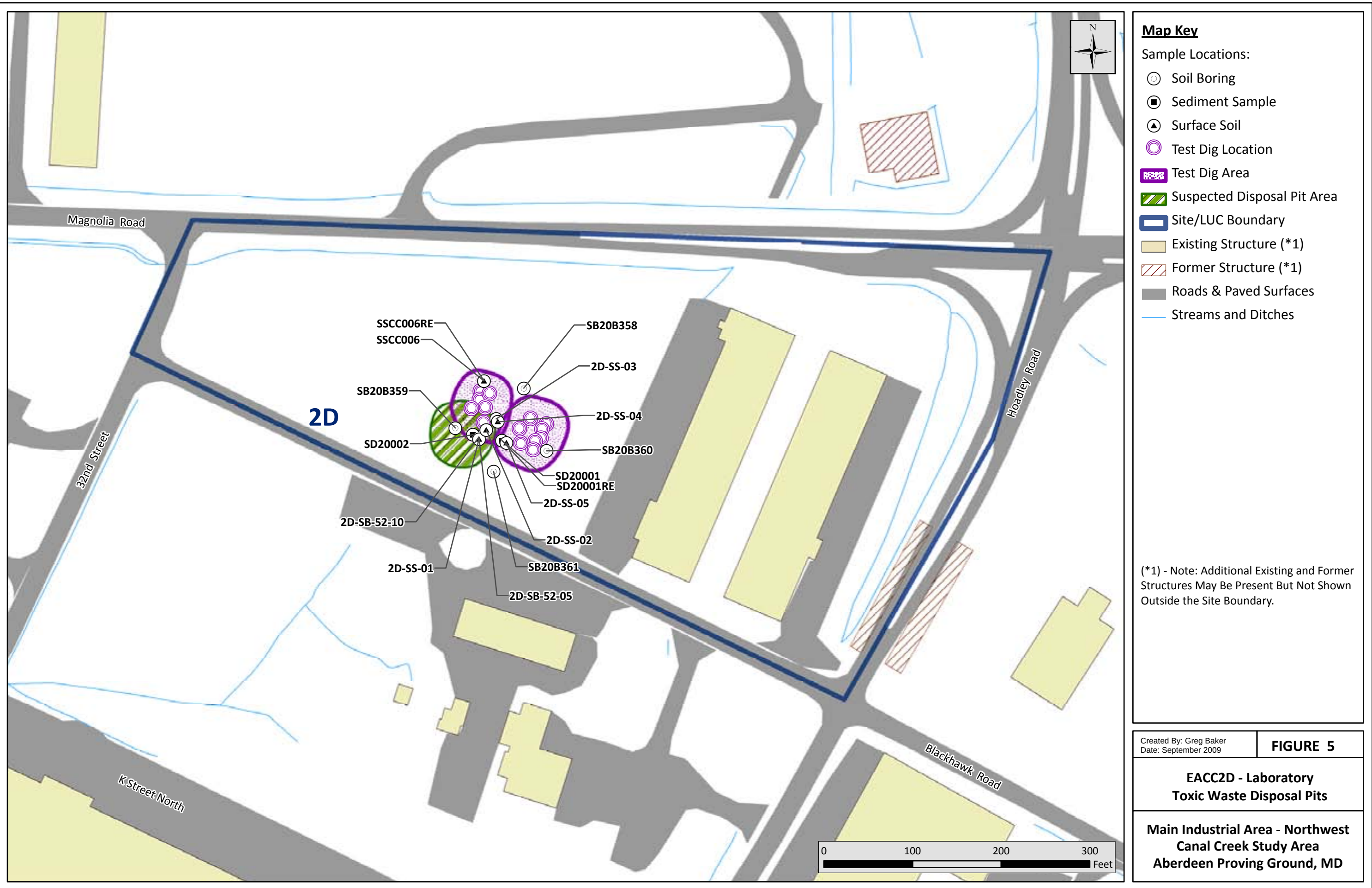
EACC1E - Building 87 Complex

**Main Industrial Area - Northwest
Canal Creek Study Area
Aberdeen Proving Ground, MD**

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6 CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

According to the APG Land Use Assessment (Michael Baker Corporation, 1998), current land use within the CCSA includes R&D, supply/storage, open space, outdoor recreation, administration, airfield, and industrial. Buildings are used for warehousing, as offices, and for R&D activities. Several buildings within CCSA were also used historically for pilot-scale filling of chemical ordnance. With the exception of Weide Army Airfield (which may be subdivided into R&D, airfield, and open space), future land use within the CCSA is not expected to change substantially.

The closest residential housing for military personnel and their dependents is located on Clearview Drive, east of the airfield. Off-post residential housing is approximately 4,000 feet north of the CCSA.

7 SUMMARY OF SITE RISKS

As a component of the RI process, risk assessments were performed for the CCSA sites associated with this ROD. The following summaries of the Human Health Risk Assessment (HHRA) and ERA were derived from the risk assessment documents cited in Section 2.

7.1 Summary of Human Health Risk Assessment

7.1.1 Identification of Contaminants of Potential Concern

The risk assessment screening criteria identified contaminants of potential concern (COPCs) for selection and quantitative evaluation in the HHRA, based on a review of the data and comparison to appropriate screening levels. Maximum concentrations of detected chemicals in environmental media were compared to Risk-Based Concentrations (RBCs) where available, in accordance with USEPA Region III guidance. The RBCs are back-calculated using conservative exposure parameters. RBCs back-calculated from carcinogenic toxicity criteria were used directly as screening criteria; RBCs back-calculated from non-carcinogenic toxicity criteria were adjusted downward by a factor of 10 for use as screening criteria.

Polycyclic aromatic hydrocarbons, metals, and PCBs were identified as COPCs in the *Baseline Human Health Risk Assessment for DSERTS Sites in the Canal Creek Study Area, Volume I: Northwest Industrial Area (EA, 2007)*. Surface soil COPCs included arsenic, iron,

lead, mercury, benzo[a]pyrene, and Aroclor 1248. Subsurface soil COPCs included arsenic, iron, and vanadium.

7.1.2 Exposure Assessment

Current land use for the CCSA is primarily military/industrial. Potentially affected receptors under current/future land use conditions include site workers (i.e., industrial and construction), adolescent trespassers, and hypothetical future residents.

Potential exposure pathways were evaluated for both current and future land use conditions. The following exposure pathways were quantitatively evaluated under current/future land use conditions:

- Adolescent trespasser exposure from inhalation of fugitive dust from surface soil, dermal contact with surface soil, and incidental ingestion of surface soil
- Maintenance worker exposure from inhalation of particulates from surface soil, dermal contact with surface soil, and incidental ingestion of surface soil
- Commercial worker exposure through incidental ingestion of total soil, dermal contact with total soil, and inhalation of fugitive dust from total soil

Under future land-use conditions, the CCSA will likely continue to be used for military/industrial purposes, although commercial or residential development in this area may occur. Under future land use conditions, the following potential exposure pathways were quantitatively evaluated, excluding future use of groundwater:

- Construction worker exposure from inhalation of fugitive dust from total soil, dermal contact with total soil, and incidental ingestion of total soil
- Hypothetical adult and child resident exposure from inhalation of fugitive dust from total soil, dermal contact with total soil, and incidental ingestion of total soil

Exposure point concentrations for the COPCs in each medium and timeframe were based on the 95 percent upper confidence limit on the arithmetic mean concentration or the maximum detected concentration, using the lower concentration. In cases where fewer than five samples were available, the maximum detected value was used as the exposure point concentration. Average daily doses and other exposure parameters are addressed in detail in the HHRA.

7.1.3 Toxicity Assessment

Chronic toxicity criteria and quantitative dose-response data were obtained from the Integrated Risk Information System (IRIS; USEPA, 1996b), Health Effects Assessment Summary Tables (HEAST; USEPA, 1997), and the National Center for Environmental Assessment for COPCs. Potential risks for some chemicals and essential human nutrients could not be quantitatively evaluated in the risk assessment because toxicity data are not available for these constituents. However, exclusion of these chemicals is not anticipated to result in significant underestimate of risk. Available data concludes that these chemicals are moderately toxic, and relatively as toxic (or less toxic) than the COPCs for which health effects criteria are available. Toxicity data in the HHRA are presented by carcinogenic and non-carcinogenic data of each COPC for the oral, dermal, and inhalation exposure routes.

7.1.4 Risk Characterization

The human health risk characterizations combine the average daily doses calculated in the exposure section with the health effects criteria presented in the toxicity section in order to calculate potential human health risks. The estimated upper-bound excess lifetime cancer risks for these sites were compared to USEPA's acceptable risk levels of 1×10^{-6} to 1×10^{-4} for health protectiveness at CERCLA sites. Lifetime cancer risk levels of 1×10^{-6} and 1×10^{-4} represent the probability of one in one million and one in ten thousand, respectively, that an individual could contract cancer as a result of site-specific exposure.

Hazard quotients (HQs) are calculated for individual chemicals based on a ratio of the estimated site-specific exposure to a single chemical over a specified period to the estimated daily exposure level at which no adverse health effects are likely to occur (USEPA, 2005). The effects from simultaneous exposure to multiple chemicals are determined by summing the individual HQs within each exposure pathway (USEPA, 1989). This sum is referred to as the Hazard Index (HI). In general, HIs greater than 1.0 are indicative of a potential for adverse health effects.

For the purposes of the HHRA, sites throughout the CCSA were grouped geographically for assessment. Sites EACC1E, EACC1J, and EACC2D were evaluated together as part of the Northwest Region HHRA (EA, 2007).

Carcinogenic risks for all receptors evaluated are within or below the USEPA's acceptable risk range. With the exception of the hypothetical future child resident, all the total non-carcinogenic HIs are below the acceptable threshold of 1.0. Results for the hypothetical future child resident revealed an HI of 2.6, which exceeds the acceptable 1.0 threshold. However, no target organ-specific HI exceeds 1.0; therefore, there are no unacceptable non-carcinogenic risks. The carcinogenic and non-carcinogenic risks for all receptors are summarized in Table 3.

Table 3
Human Health Risk Sites EACC1E, EACC1J, and EACC2D

Receptor	Cumulative Carcinogenic Risk	Non-carcinogenic Risk
Adolescent Trespasser	2.2×10^{-6}	0.09
Maintenance Worker	1.2×10^{-6}	0.01
Commercial Worker	2.0×10^{-5}	0.08
Construction Worker	2.8×10^{-6}	0.7
Adult Resident*	9.3×10^{-5}	0.28
Child Resident*	9.3×10^{-5}	2.6

*Adult and child resident scenarios combined for carcinogenic risk evaluation

Blood-level modeling conducted at EACC1E also revealed no concerns for lead exposure at the site. Risks associated with vapor intrusion emanating from contaminated groundwater will be evaluated and presented in the final Vapor Intrusion Study.

7.1.5 Uncertainty

All risk assessments require the use of assumptions, judgments, and incomplete data to varying degrees that contribute to the uncertainty of the final estimates of risk. Uncertainties result both from the use of assumptions or models in lieu of actual data and from the error inherent in the estimation of risk-related parameters, and may cause risk to be overestimated or underestimated. Therefore, the results of these risk assessments should not be construed as presenting an absolute estimate of risk to persons potentially exposed to chemicals at the sites addressed in this ROD.

The primary source of uncertainty for these sites is the lack of screening values for detected compounds aluminum, cobalt, and dibenzofuran. However, the lack of screening values is not anticipated to significantly impact the HHRA results.

7.2 Summary of Ecological Risk Assessment

7.2.1 Identification of Contaminants of Potential Concern

Chemicals were selected for evaluation in the ERA if: i) the chemicals were presumed to be present because of past activities at the CCSA sites and ii) the chemicals posed potential risks to ecological receptors. COPCs were selected if their maximum concentrations exceeded the screening level concentrations for ecological receptors provided by USEPA Region III's Biological Technical Assistance Group. Chemicals with maximum concentrations below the screening levels were eliminated from further consideration. All other chemicals were retained as COPCs, including those chemicals lacking screening levels.

7.2.2 Exposure Assessment

Potential exposure pathways and assessment endpoints for ecological receptors were identified based on: i) the likely presence of ecological resources; ii) the nature and extent of chemical contamination; iii) the source/mechanism of chemical release; iv) the medium (or media) of chemical transport; v) the point of potential contact by potential receptor groups; and, vi) the route of exposure at the contact point.

The following potential receptors were identified for surface soil, sediment, and surface water at the three MIA-NW Soil Sites:

- Terrestrial plants
- Soil invertebrates
- Herbivorous mammals
- Vermivorous mammals
- Vermivorous birds
- Predatory mammals
- Predatory birds

7.2.3 Ecological Effects Assessment

The majority of plant toxicity information available from scientific literature is for inorganic COPCs and has been based on the evaluation of potential adverse effects to agricultural crops from the presence of inorganic chemicals in surface soil.

Toxicity reference values (TRVs) were also used when available to assess the potential for chemicals to adversely affect terrestrial plants and earthworms. TRVs used for terrestrial

wildlife were based on widely accepted sources, as documented in the ERA, to evaluate the potential for adverse effects to the receptors of concern. Avian TRVs were then derived applying total uncertainty factors to daily doses reported in various references. Federal Ambient Water Quality Criteria developed by USEPA (1999) for the protection of aquatic life were used to assess potential impacts to aquatic species. Several sources of toxicity data were used to identify the potential for chemicals in sediment to cause adverse effects to benthic communities. Sources include threshold effects levels (TELs) and, in the absence of TEL values, Effects Range-Low (ER-L) values or lowest-effect level values.

7.2.4 Ecological Risk Characterization

No significant risk to ecological receptors was identified for the MIA-NW Soil Site EACC1J. The ERA for Site EACC1E determined dieldrin and mercury to be COCs, but also identified uncertainties (biased sample design, non-quality habitat, differences in 1995 and 2003 data, and the uncertainty of the mercury TRV) that indicate the risk is overstated. The ERA for Site EACC2D concluded there is potential risk to vermivorous birds from DDT in surface soil, and a potential risk to terrestrial plants and vermivorous mammals from arsenic in surface soil (EA, 2008). However, this ecological risk is limited because the habitat area contained within the site is small (approximately a 17-foot radius circle) when compared to the overall available habitat of the EA. In addition, higher quality and preferred habitat exists adjacent to and outside of the evaluated parcel.

7.3 Risk Summary

7.3.1 Human Health

For the three MIA–NW Soil Sites, carcinogenic risks for all receptors evaluated are within or below the USEPA’s acceptable risk range. With the exception of the hypothetical future child resident, all the total non-carcinogenic HIs are below the acceptable threshold of 1.0. Results for the hypothetical future child resident revealed an HI of 2.6 , which exceeds the acceptable 1.0 threshold. However, no target organ-specific HI exceeds 1.0; therefore, there are no unacceptable non-carcinogenic risks.

7.3.2 Ecological

An eight-step USEPA ERA process was completed for the three MIA–NW Soil Sites to determine whether there was potential for ecological receptors to be adversely affected by the presence of contaminants. During the assessment, chemical concentrations were first compared to literature-based screening values. Site-specific chemical doses were then modeled for selected ecological receptors. No unacceptable risks to ecological receptors were identified.

8 REMEDIAL ACTION OBJECTIVE

Remedial Action Objectives (RAOs) are goals developed for the protection of human health and the environment. These objectives can be achieved by reducing exposure (e.g., capping an area or limiting access) and reducing the level of contamination. The RAOs for the MIA–NW Soil Sites are to prevent unacceptable exposure to contaminants in soil and to minimize risk presented by potential buried UXO, WP, and buried waste at the sites. The planned future use of the MIA–NW Soil Sites is for military/industrial activities. The response action selected in this ROD is necessary to protect the public health and the environment from actual or threatened releases of hazardous substances into the environment.

9 DESCRIPTION OF ALTERNATIVES

For sites EACC1E and EACC1J, only two alternatives were considered in the Proposed Plan given the limited risk posed by each of these two sites, the well-defined future use of the sites, and the ability of the lead agency (the Army) to control access to the sites. For all three sites, No Action and LUCs have been evaluated. A third alternative, excavation, was also evaluated for site EACC2D due to the potential human health and ecological risks posed by the elevated concentrations of DDTr.

9.1 Alternative 1—No Action

The NCP requires consideration of “No Action” as a baseline from which to compare other alternatives. Under this alternative, no active remedial measures would be taken to control risks to human or ecological receptors, treat or remove wastes, or reduce the toxicity, mobility, or volume of contaminated media. LUCs would not be implemented. The Army would conduct five-year reviews because contamination would be left in place for sites

exhibiting risk under a residential scenario above levels allowing for unlimited use and unrestricted exposure.

Cost Summary

Capital Cost	\$0
Five-Year Review	\$15,000
Present Worth Cost (30 years)	\$46,000

Estimated Construction Timeframe:

No construction

Estimated Time to Achieve RAOs:

Will not achieve RAOs

9.2 Alternative 2—Institutional Controls

The LUC alternative would be used to limit exposure to those areas where contaminant levels would not allow for unrestricted use. These controls include the following:

- Existing LUCs at APG would continue. These measures include engineering controls, boating access restrictions, and restrictions on subsurface access by site workers. These three sites are located in a restricted portion of the Installation. Access to the restricted area is limited to properly cleared personnel or individuals in an escorted capacity. A wide variety of physical security countermeasures including barrier systems, sensors, and random patrols by law enforcement personnel are in place to prevent unauthorized access.
- Modifications will be made to the Installation Master Plan and Geographical Information System (GIS) Overlay Maps in order to prevent future residential land use, elementary and secondary schools, child care facilities, and playgrounds until risks presented by contaminant levels at the site allow for unlimited use and unrestricted exposure. These modifications for sites EACC1J and EACC2D would also include language indicating the potential for encountering waste material during authorized excavation activities. Excavation warning signs would also be maintained to advise personnel authorized access to adjacent areas of the potential hazards.
- If this site is subsequently remediated to allow for unlimited use and unrestricted exposure, LUCs will no longer be required

CERCLA 121(c) Five-year reviews would be conducted to assess the long-term effectiveness of the LUCs.

Cost Summary

Capital Cost	\$31,000
Annual Operation and Maintenance (O&M) Cost	\$ 2,000
CERCLA 5-Year Review	\$15,000
Present Worth Cost (30 years)	\$126,000

Estimated Construction Timeframe:

No construction

Estimated Time to Achieve RAOs:

6 months

9.3 Alternative 3—Soil Excavation, Off-Site Disposal, and LUCs (Site EACC2D only)

The excavation and off-site disposal alternative would be used to remove contaminants from the site. The soil removal area would be delineated, and approximately 21 cubic yards of material would be excavated and disposed of off-site. Prior to excavation of contaminated soil, Explosive Ordnance Disposal (EOD) technicians would be employed to perform a UXO clearance in the excavation footprint, and clearing and grubbing would occur. Following excavation and disposal, clean fill would be used to backfill the excavated area, and the area would be restored.

LUCs would be the same as defined in Alternative 2 (Section 9.2).

CERCLA 121(c) Five-year reviews would be conducted to assess the long-term effectiveness of the LUCs.

Cost Summary

Capital Cost	\$325,000
Annual O&M Cost	\$ 2,000
CERCLA Five-Year Review	\$ 15,000
Present Worth Cost (30 years)	\$325,000

Estimated Construction Timeframe: 6 months

Estimated Time to Achieve RAOs: 8 months

10 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

This section provides a comparative analysis of the alternatives considered for remediating the MIA-NW Soil Sites. The alternatives are evaluated against the NCP threshold and primary balancing criteria. The analysis identifies trade-offs between alternatives.

10.1 Overall Protection of Human Health and the Environment

LUCs are sufficient to prevent an unplanned hypothetical future residential use of the three sites. Implementation of excavation, off-site disposal, and LUCs at Site EACC2D would increase overall protection of human health and the environment, since the DDT- and arsenic-impacted soil would be removed. Implementation of the No Action alternative would not prevent potential unacceptable exposure to site contaminants. Therefore, the No Action alternative will not be evaluated further.

10.2 Compliance with Applicable or Relevant and Appropriate Requirements

CERCLA, as amended, requires that remedial actions at NPL sites meet the requirements of other Federal and state environmental laws and regulations applicable to the site or that address situations sufficiently similar to the site to be considered relevant and appropriate. These other laws and regulations, termed Applicable or Relevant and Appropriate Requirements (ARARs), include the following:

- Chemical-specific (requirements related to site contaminants)
- Location-specific (requirements related to site location)
- Action-specific (requirements related to the specific remedial actions being considered)

There are no chemical-specific ARARs for any of the alternatives evaluated. Alternative 2 (Institutional Controls) does not require any active remedy on-site; therefore, no action- or location-specific ARARs would apply. Alternative 3 would comply with all location-specific and action-specific ARARs for this site.

10.3 Long-Term Effectiveness and Permanence

The long-term effectiveness and permanence criterion considers the amount of risk that would remain after the alternative has been implemented. It also considers whether the alternative is adequate and reliable.

LUCs would be effective in preventing unacceptable exposure to site contaminants. Implementation of the proposed LUCs would prohibit future residential use of the site and would be reasonably permanent (e.g., routinely verified to be functional over the course of time).

The soil excavation, off-site disposal, and LUCs alternative would prevent human and ecological contact with contaminated soil by eliminating the risk from exposure and providing greater long-term effectiveness and permanence.

10.4 Reduction of Toxicity, Mobility, or Volume Through Treatment

This criterion evaluates how effectively treatment is being employed in the remedial alternative to reduce the toxicity, mobility, and volume of contaminants at the site. Since treatment would not be a component of Alternatives 1, 2, or 3, this criterion is not satisfied.

10.5 Short-Term Effectiveness

Short-term effectiveness takes into account protection of remedial workers, members of the community, and the environment during implementation of the remedial action and the time required to achieve RAOs.

The LUCs alternative can be readily implemented in approximately six months, and the RAOs would be achieved during that time. No risks would be presented to the public through its implementation.

During implementation of the soil excavation, off-site disposal, and LUCs alternative, personnel would be equipped with personal protective equipment and monitoring equipment

would be used to minimize potential exposure during the implementation of the remedial action. This alternative poses greater short-term risk due to the excavation and off-site disposal of contaminated soil. This alternative would require eight months for implementation.

10.6 Implementability

Three factors are considered for implementability: whether the alternative is technically feasible, whether it is administratively feasible, and whether the required services and materials are available. The LUCs alternative would be readily implementable.

Due to the potential presence of UXO at the site, EOD technicians would be employed to perform a UXO clearance prior to and during implementation of the soil excavation, off-site disposal, and LUCs alternative. A substantial presence of UXO, WP, and/or buried metallic objects at the site would impact this alternative—the cost would increase and it would be difficult to implement. Additional actions (including maintaining erosion controls and periodic maintenance of the vegetative cover) would be implementable with minimal effort. Implementation of this alternative is estimated to require eight months for planning, design, site preparation, and construction.

10.7 Cost

The costs considered in this analysis include total capital cost, annual O&M costs, and present worth. The present worth cost is the amount of money in current dollars necessary to cover the total cost of remediation (i.e., for sites with long-term activities, the present worth assumes a five percent interest rate over a 30-year period).

Alternative	Present Worth Cost
2	\$126,000
3	\$325,000

10.8 State Acceptance

State representatives have reviewed the remedial alternatives and provided preliminary comments that were addressed in the RI and FS Reports and Proposed Plan. Based on a

thorough review of the remedial alternatives and response to public comments, MDE concurs with the Selected Remedy

10.9 Community Acceptance

Responses to comments made by members of the community at the Public Meeting and during the Public Comment Period are presented in the Responsiveness Summary, Part 3, of this ROD.

11 PRINCIPAL THREAT WASTES

The COCs present at the three MIA-NW Soil Sites addressed by this ROD are considered non-principal threat wastes (i.e., source materials that present only a low risk in current and likely future land use scenarios).

12 SELECTED REMEDY

12.1 Description of the Selected Remedy

The Selected Remedy for the MIA-NW Soil Sites is Alternative 2 – LUCs. The estimated total present worth cost of the remedy is \$126,000. The Selected Remedy includes the following elements:

- **LUCs.**
 - Existing LUCs at APG would continue. These measures include engineering controls, boating access restrictions, and restrictions on subsurface access by site workers. These three sites are located in a restricted portion of the Installation. Access to the restricted area is limited to properly cleared personnel or individuals in an escorted capacity. A wide variety of physical security countermeasures including barrier systems, sensors, and random patrols by law enforcement personnel are in place to prevent unauthorized access.
 - Modifications will be made to the Installation Master Plan and Geographical Information System (GIS) Overlay Maps in order to prevent future residential land use, elementary and secondary schools, child care facilities, and playgrounds until risks presented by contaminant levels at the site allow for unlimited use and unrestricted exposure. These modifications for sites EACC1J and EACC2D would also include language indicating the potential for encountering waste material during authorized excavation activities. Excavation warning signs would also be maintained to advise personnel authorized access to adjacent areas of the potential hazards.

- o Boundaries for LUC implementation are delineated in Figures 3, 4, and 5.
 - o If this site is subsequently remediated to allow for unlimited use and unrestricted exposure, LUCs will no longer be required.
- **CERCLA 121(c) five-year reviews.** Five-year reviews will be conducted to assess the long-term effectiveness of the LUCs.

The Selected Remedy is protective of human and ecological receptors.

12.2 LUC Remedial Design

LUCs will be implemented for the three MIA-NW Soil Sites. CERCLA 121(c) five-year reviews will also be conducted for these sites (in conjunction with the periodic APG-EA NPL site review) to assess the long-term effectiveness of the LUCs.

The Army shall be responsible for implementation, maintenance, periodic reporting, and enforcement of LUCs. The Army will specify the details of the LUCs to be implemented in an LUC RD document. The Design document will be submitted to USEPA and MDE in accordance with the provisions outlined in the FFA. As part of the Army's inspection and reporting responsibilities, periodic reviews of the restrictions and objectives outlined above will be undertaken and review reports will be submitted at a frequency determined by site-specific conditions (as specified in the USEPA-approved RD). The LUCs will include implementation through the APG Master Planning System with GIS support.

Although the Army may transfer these responsibilities to another party by contract, property transfer agreement, or through other means, the Army shall remain ultimately responsible for remedy integrity and shall: i) perform CERCLA 121(c) five-year reviews; ii) notify the appropriate regulators and/or local government representatives of any known LUC deficiencies or violations; iii) provide access to the property to conduct any necessary response; iv) retain the ability to change, modify or terminate LUCs and any related deed or lease provisions; and, v) ensure that the LUC objective is met to maintain remedy protectiveness.

As a condition of property transfer or lease, the Army may require the transferee or lessee, in cooperation with other stakeholders, to assume responsibility for various implementation actions. Third party LUC responsibility will be incorporated into pertinent contractual, property and remedial documentation, such as a purchase agreement, deed, lease, and RD

addendum. To the extent permitted by law, a transfer deed shall require the LUCs imposed as part of a CERCLA remedy to run with the land and bind all property owners and users. If the Army intends to transfer ownership of any site, if allowed by Federal and/or state law (upon transfer of fee title) the Army may grant the State an environmental covenant or easement that would allow the State to enforce LUC terms and conditions against the transferee(s), as well as subsequent property owner(s) or user(s) or their contractors, tenants, lessees or other parties. This covenant will be incorporated by reference in the transfer deed and will run with the land in accordance with State realty law. This state enforcement right would supplement, not replace, the Army's right and responsibility to enforce the LUCs.

12.3 Summary of the Rationale for the Selected Remedy

The Selected Remedy (LUCs) for the three MIA-NW Soil Sites is protective of human health through the prevention of future residential land use, elementary and secondary schools, child care facilities, and playgrounds. Although there may be limited risk to ecological receptors at site EACC2D, the impacted area is small and does not pose a significant risk to ecological receptors due to the limited area in comparison with the overall habitat at APG-EA. This remedy is dependent on LUCs to provide long-term effectiveness and permanence. It would not result in reduction of toxicity, mobility, or volume of contaminants through treatment. Hazardous substances, pollutants, or contaminants will remain on site above levels that allow for unlimited use and unrestricted exposure. Therefore, these areas will be included in the CERCLA 121(c) five-year review for the APG-EA NPL site.

12.4 Summary of Estimated Remedy Costs

The information in the cost estimate summary is based on the best available information on the anticipated scope of the remedial alternative. Changes in the cost elements are likely to occur as a result of new information and data collected during the LUC design. This is an engineering cost estimate that is expected to be within -30 to +50 percent of the actual project cost (USEPA, 1999 and USEPA, 2000).

The estimated cost for the Selected Remedy includes total capital cost, annual O&M costs, five-year review costs, and present worth over a 30-year period. The estimated cost for the MIA-NW Soil Sites Selected Remedy is \$126,000.

12.5 Expected Outcomes of Selected Remedy

LUCs will be implemented at the MIA NW Soil Sites to prevent future residential land use, elementary and secondary schools, child care facilities, and playgrounds.

12.6 Performance Standards for the Selected Remedy

The following performance standard has been developed for the Selected Remedy:

Establish a restriction in the Installation Master Plan prohibiting development and use of the property for future residential land use, elementary and secondary schools, child care facilities, and playgrounds until risks presented by contaminant levels at the site allow for unlimited use and unrestricted exposure. Modifications to the *Installation Master Plan* would also include language for sites EACC1J and EACC2D indicating the potential for encountering waste material during authorized excavation activities. Excavation warning signs would also be maintained to advise personnel authorized access to adjacent areas of the potential hazards.

13 STATUTORY DETERMINATIONS

13.1 Protection of Human Health and the Environment

USEPA and MDE support the Selected Remedy for the MIA-NW Soil Sites as necessary to adequately and cost-effectively protect human health and the environment through the prevention of future residential land use, elementary and secondary schools, child care facilities, and playgrounds on these sites. Constituents in surface media do not pose unacceptable risk to ecological receptors at the site. Through implementation of LUCs, residential land use will be prevented. RAOs will be achieved upon implementation of LUCs.

13.2 Compliance with Applicable or Relevant and Appropriate Requirements

There are no chemical-, action-, or location-specific ARARs for the Selected Remedy.

13.3 Cost-Effectiveness

The Selected Remedy is considered to be cost-effective because costs are proportional to overall effectiveness.

13.4 Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

The Selected Remedy utilizes permanent solutions to protect future residents from exposure to contaminants through implementation and continued enforcement of LUCs, which are permanent to the extent the LUCs are maintained. LUCs would not be considered to be as permanent as removal or treatment of contaminants. The Army will enforce the LUCs described in Section 4 of this document. In the unlikely event of land transfer, deed restrictions will be imposed.

13.5 Preference for Treatment as a Principal Element

The Selected Remedy does not utilize treatment technologies to reduce the toxicity, mobility, and volume of the contaminated soil because of high costs and lack of performance advantages. The Selected Remedy does not satisfy the statutory preference for treatment as a principal element.

13.6 Five-Year Review Requirement

Hazardous substances, pollutants, or contaminants will remain on site above levels that allow for unlimited use and unrestricted exposure. Therefore, CERCLA 121(c) five-year reviews will be performed for the three MIA-NW Soil Sites.

14 DOCUMENTATION OF SIGNIFICANT CHANGES

There are no significant changes from the Proposed Plan.

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PART 3: RESPONSIVENESS SUMMARY

Comments raised during the public comment period, provided by the Army (Figure 6), are summarized below. As part of its fact sheet on the Proposed Plan, APG included a questionnaire that residents could return with their comments. A total of 2,143 questionnaires were distributed to citizens currently on the Restoration Advisory Board (RAB) mailing list. The public comment period extended from July 30 to August 29, 2009. APG received 10 completed forms. Two response forms indicated Alternative 3, but did not supply additional written comment. Two additional forms were returned with a request to be removed from the mailing list, but no alternative selection nor comments were included. The alternatives preferred by individuals returning comment forms were:

- 1 - Alternative 1 – No Action
- 3 - Alternative 2 – LUCs
- 6 - Alternative 3 – Excavation and Off-Site Disposal

The Army selected Alternative 2, with concurrence from the USEPA. MDE also agreed with the selected remedy. Written comments included on the forms are summarized below:

Comment 1:

How much money (too much!) is being wasted to “clean up” this toxic land? Money that should be going to education. No one should live on APG for hundreds of years to come. And we want to put our military there? Instant karma. Please STOP this absurd project. More people are not needed in Maryland. Is anyone with any conscience or brain power pushing this forward?

Response 1:

The Department of the Army and USEPA Region III entered into a Federal Facility Agreement (FFA) on March 27, 1990 that subjected APG to remedial action requirements for the contaminated sites. These remedial actions are implemented under the Installation Restoration Program (IRP). The IRP is committed to protecting human health and the environment at APG. For each contaminated site listed in the FFA, IRP personnel and

stakeholders carefully evaluate alternatives to find the best solution for that site. The IRP stakeholders include active participation of technical experts from EPA, MDE, and the Biological Technical Assistance Group (BTAG) as well as citizen and community input through monthly citizens meetings. After remedies are chosen and implemented, if contamination is left in place such that unrestricted use of the land is not possible, the site is evaluated every five years to make sure that the remedy is still protective of human health and the environment.

Comment 2:

I am not a scientist. However, given the potential of the hazardous material to leach into any underground water source the cost to eliminate this possibility is quite modest.

Response 2:

The IRP welcomes input from all interested parties, including “non-scientists”. Input from the public is an important part of the remedy decision making process and each comment is valued without regard to the background of the author. Input from a variety of perspectives is important to reach the best solution for each site.

APG recognizes the importance of groundwater as a resource and is actively engaged in conducting studies to determine how to quantify any risks. The groundwater under the sites discussed in this ROD is being studied separately from this effort. There will be an additional Proposed Plan, with opportunity for public input, specifically for groundwater. Any potential risks associated with the groundwater and alternatives to address those risks will be evaluated. The IRP continues to be committed to protecting human health and the environment at APG.

Figure 6 Newspaper Ad

U.S. ARMY INVITES PUBLIC COMMENT ON PROPOSED PLAN FOR MAIN INDUSTRIAL AREA – NORTHWEST SOIL SITES, CANAL CREEK STUDY AREA	
<i>The U.S. Army at Aberdeen Proving Ground (APG) invites the public to comment on its Proposed Plan for the Main Industrial Area – Northwest Soil Sites, Canal Creek Study Area.</i> OPSEC Distribution Restriction Statement: Approved for Public Release. Distribution is Unlimited. OPSEC No. 9778-A-1	
FACT SHEET APG has prepared a fact sheet on the Proposed Plan which includes a comment form that can be returned to APG. If you are not on APG's mailing list, you can request a copy of the fact sheet by calling APG's 24-hour Environmental Information Line at (410) 272-8842 or (800) APG-9998.	WEB SITE You can request a copy of the Proposed Plan and provide comments through the APG Web Site at www.apg.army.mil.
PUBLIC MEETING APG invites the public to attend a meeting on: DATE: August 13, 2009 TIME: 6:30 p.m. – informal poster/information session 7:15 p.m. – presentation PLACE: Richlin Ballroom 1700 Van Bibber Rd Edgewood, MD 21040 The meeting location is wheelchair accessible, and an interpreter for the hearing impaired is available with 72-hours advance notice (call 800-APG-9998).	WRITTEN COMMENTS The 30-day public comment period on the proposed action extends from July 30 through August 29, 2009. Written comments, postmarked by August 29, 2009, should be sent to: Mr. Ken Stachiw Directorate of Public Works, Environmental Management Division ATTN: IMNE-APG-PWE Building E5771 Magnolia Road Aberdeen Proving Ground, MD 21010; or Ms. Yazmine Yap-Deffler U.S. Environmental Protection Agency Region III, 1650 Arch Street Philadelphia, PA 19103-2029; or Ms. Heather Njo Maryland Department of the Environment Federal Facilities Division Hazardous Waste Program 1800 Washington Boulevard, Suite 645 Baltimore, MD 21230-1719
PROPOSED ACTION APG is proposing to take action at Main Industrial Area – Northwest Soil Sites within the Canal Creek Study Area. The Preferred Alternative is Land Use Controls (LUCs) for sites EACC1E, EACC1J, and EACC2D including prohibition of future residential use and modifications to the Installation Master Plan and GIS System. No Action and LUCs were considered for all 3 sites. Alternative 3 (Soil Excavation, Off-Site Disposal, and LUCs) was also considered for site EACC2D.	
ALTERNATIVES EVALUATED FOR THE THREE SOIL SITES Alternative 1, No Action: The law requires APG evaluate taking no action to establish a baseline for comparison with other alternatives. Reviews would be conducted every five years. Cost: \$46,117 Alternative 2, LUCs: APG would implement LUCs to prevent future residential land use. Five year reviews would be completed and updating of the Installation Master Plan and GIS System would be required. Cost: \$126,115 Alternative 3, Soil Excavation, Off-Site Disposal, and LUCs (Evaluated for EACC2D only): APG would excavate soil to remove contaminants from the site, followed by LUCs to prevent future residential use. Five year reviews would be completed and updating of the Installation Master Plans and GIS System would be required. Cost: \$381,490 Based on an analysis of the alternatives, APG prefers Alternative 2, LUCs for sites EACC1E, EACC1J, and EACC2D. The preferred alternative may be modified or new alternatives may be developed based on public input. The final alternative selected will be documented in a Record of Decision that summarizes the decision-making process. APG will summarize and respond to comments received during the comment period as part of the Record of Decision. Copies of the Remedial Investigation, Feasibility Study, and the Proposed Plan are available for review at the APG information repositories. The repositories are located at the Edgewood (410-612-1600) and Aberdeen (410-273-5608) branches of Harford County Library and Miller Library at Washington College in Kent County (410-778-7292).	

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Comment 3:

This is the first time I have totally disagreed with the U.S. Army's choice re: APG. "Gone for good" is the only acceptable alternative. \$255k more is not a big deal to completely remove the contaminants. I wonder if the committee making these decisions lives in this area, or plans to stay in this area long-term or watch and their children and grandchildren grow up here – I'm thinking not.

Response 3:

The sites included in this ROD have been carefully evaluated to make sure that the alternatives selected are protective of human health and the environment for the current and planned future land uses. To insure that this remedy remains protective of human health and the environment for future generations, these sites will be evaluated every five years for protectiveness

Comment 4:

Your many communications re: Installation Restoration Program are appreciated. Sincerely believe alternatives presented have been thoroughly thought through. Congrats on your outstanding efforts. Outstanding!

Response 4:

Thanks you for your feedback. We appreciate your participation in the IRP process.

Comment 5:

Alternative 2 is reasonable if there are no plans presently to use the site for residential land use.

Response 5:

The sites included in this ROD are not currently used for residential purposes and there are no plans for residential use in the future. These sites will be evaluated every five years to insure that the remedy chosen is still protective of human health and the environment.

Comment 6:

To conduct a study and determine risk (unacceptable or significant) then not respond is negligent. Therefore, Alternative 2 is the only other option that addresses all 3 sites. I would also like to see Alternative 3 implemented to allow all 3 sites to be unrestricted and used safely in the near future. Thank you for the opportunity.

Response 6:

Before choosing the selected remedy, alternatives were evaluated against evaluation criteria as defined by CERCLA Guidance. CERCLA Guidance requires that Alternative 1 (No Action) be evaluated to serve as a baseline for comparison with all other developed alternatives. Alternative 3 (Excavation, Off-Site Disposal, and Land Use Controls), while removing contaminants, would still not allow for unrestricted land use because some contamination would be left in place above action levels. Therefore, Land Use Controls would still be implemented. Alternative 2 (Land Use Controls) was selected because it: (i) is protective of human health and the environment; (ii) is the preferred alternative selected by USEPA and MDE; (iii) best satisfies the required CERCLA criteria used for evaluation; (iv) will be evaluated every 5 years to insure that it remains protective of human health and the environment.

Comment 7:

Where will the offsite disposal be located? How will the soil be transported? Will all people who have residence in this area be notified of any action?

Response 7:

If Alternative 3 had been chosen, a Remedial Design would have been prepared that would have included details regarding off-site transportation and disposal. That document would have been available in the Administrative Record. All off-site transportation would have been conducted in accordance with U.S. Department of Transportation requirements. However, these requirements do not include public notifications. The Selected Remedy, LUCs, does not require off-site transportation and disposal.

Comment 8:

This seems the best option at present with future potential for safe excavation and disposal since the groundwater and aquifer for several highly populated counties is within the site. Would recommend water testing for Howard, Cecil, and Kent Counties for ordnance chemical infusions on an every-other-year basis as part of program.

Response 8:

The groundwater under the sites discussed in this ROD is being studied separately from this effort. There will be an additional Proposed Plan, with opportunity for public input, specifically for groundwater. Any potential risks associated with the groundwater and alternatives to address those risks will be evaluated. The IRP continues to be committed to protecting human health and the environment at APG.

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PART 4: REFERENCES

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ATTACHMENT A
PUBLIC MEETING SUMMARY

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SUMMARY
MAIN INDUSTRIAL AREA – NORTHWEST SOIL SITES
CANAL CREEK STUDY AREA
PROPOSED PLAN PUBLIC MEETING
13 August 2008, 6:30 PM
Richlin Ballroom, 1700 Van Bibber Road
Edgewood, Maryland

Attendees:

Community Members: Herb Jonas, Wink Jonas

Harford County Health Department: Rich Gordon

Maryland Department of the Environment (MDE): Heather Njo, John Fairbank

Restoration Advisory Board (RAB) Members: Ruth Ann Young

USACHPPM: Keith Hoddinott

US Army Aberdeen Proving Ground (APG) Directorate of Safety, Health and the Environment (DSHE) Environmental Conservation and Restoration Division (ECD): John Wrobel, Ken Stachiw

USAPG Public Affairs Office (PAO): Pat McClung

US Army Environmental Command (AEC): Douglas Scarborough

Plexus Scientific: Pat Reilley, Sarah Forman

** Prior to the start of the meeting, an informal information poster session was held to provide an opportunity for community members to ask questions about the sites included in the Canal Creek Study Area (CCSA) Three Soil Sites Proposed Plan. No significant questions or concerns were expressed by the meeting attendees during the poster session.*

1.0 Welcome & Introductions

Ms. Pat McClung (APG PAO) welcomed all attendees to the Proposed Plan (PP) for CCSA Three Soil Sites Public Meeting. Ms. McClung emphasized that public participation is extremely important. Ms. McClung encouraged attendees to raise any questions during the meeting. Ms. McClung added that attendees also have the option of submitting written comments instead of the recording.

Mr. John Wrobel thanked all attendees, and explained that he is employed as a project officer, engineer at Aberdeen Proving Ground. Mr. Wrobel stated that he manages the CCSA, including the Three Soil Sites that will be addressed during the meeting. Mr. Wrobel encouraged attendees to ask questions at any point during the meeting.

Mr. Wrobel stated that the purpose of this public meeting was to present and discuss the Three Soil Sites Proposed Plan for CCSA. The CCSA was originally part of the proving ground and is approximately 700 acres. Activities from WWI, WWII and the Korean War produced a lot of waste material, including waste handling and disposal activities. Studies included background for each site, chemicals of concern, risks, and preferred remedial action. The process began with remedial investigation activities in the 1990s, to evaluate chemicals in the environment and risks posed. Feasibility Studies would be conducted to evaluate how

to reduce these risks if present. CCSA was divided into four different areas, such as the southwest and northeast areas. The three soil sites are located in the northwest area. Monthly RAB meetings are conducted to discuss the different study areas and different restoration activities within APG.

Within the Edgewood Area (EA), where the CCSA is located, it is a National Priority List site and EPA has determined the area is a high priority site for study. APG has an agreement with the EPA Region II to investigate the site.

Purpose of this meeting is to discuss the three soil sites in the northwest area of the CCSA. Public participation is encouraged. Documents are available at the public library and at this meeting, and comment sheets are also available. The numerical score put CCSA on the NPL and Remedial Investigations were conducted to evaluate chemicals, risks and impacts to receptors. Feasibility Studies were conducted and a preferred alternative was selected. The public comment period extends to August 29 on the Proposed Plan. Comments on the Proposed Plan will be incorporated into the Record of Decision (ROD), which is agreed upon by the USEPA, MDE, and APG. Comments must be responded to and they aid in the evaluation of the preferred remedy. Actions would be implemented next and a Completion Report would be generated.

2.0 MIA-NW Soil Sites

Mr. Wrobel displayed a map showing the MIA-NW Soil Sites that were evaluated in the Proposed Plan.

Building 87 Complex (EACC1E)

The Building 87 Complex was used for chemical manufacturing and research and development from 1941 through 1985. The complex was demolished in 1999. Sewer systems from the complex discharged neutralized wastes to West Canal Creek. There were no unacceptable cancer or non-cancer risks under the military/industrial land use scenario and no unacceptable ecological risks. Two remedial alternatives, No Action and Land Use Controls, were evaluated.

Building 30 Toxic Waste Disposal Pits (EACC1J)

The toxic waste disposal pits are reportedly located adjacent to Hoadley Road. The pits received wastes generated by nearby laboratories from World War I until the 1940s. There is significant uncertainty regarding the types of wastes placed in the pits as well as the pit location.

Geophysical surveys, soil borings, and 25 test digs at two locations were conducted. Analytical results from the test digs found debris, but contaminants were below risk based concentrations. There were no unacceptable cancer or non-cancer risks under the military/industrial land use scenario and no unacceptable ecological risks. Two remedial alternatives, No Action and Land Use Controls, were evaluated.

Laboratory Toxic Waste Disposal Pits (EACC2D)

Mr. Wrobel stated that small disposal pits were located at this site. The pits received waste from several nearby laboratories from the early 1920s to the 1940s. Wastes disposed

included chemical agents and contaminated items. There were no unacceptable cancer or non-cancer risks under the military/industrial land use scenario. The ecological risk assessment indicated that there is a risk to vermivorous birds from DDT and risk to terrestrial plants and vermivorous mammals from arsenic. A small area is impacted compared to the overall ecological habitat. Three remedial alternatives, No Action; Land Use Controls; and Excavation, Off-Site Disposal, and LUCs were evaluated.

Summary of Remedial Alternatives

Mr. Wrobel discussed the remedial alternatives for the MIA-NW Soil Sites [No Action; LUCs; and Excavation, Off-Site Disposal, and LUCs (EACC2D only)]. The land use must remain military/industrial to limit exposure to contaminants. It is required by CERCLA that No Action be considered as a baseline for use as a comparison with all alternatives. LUCs limit exposure to areas, prohibit development as residential, and involve excavation restrictions. All excavation activities must be approved through APG. For the LUCs alternative, restrictions would be entered into the Installation's Geographical Information System (GIS). The 30 year cost of the No Action alternative is \$46,000, which includes a five-year review.

Mr. Wrobel discussed that the alternatives must be evaluated in terms of the nine evaluation criteria, which are protection of human health and the environment; compliance with applicable regulations; long-term effectiveness; short-term effectiveness; implementability; cost; reduction of toxicity, mobility, or volume; and state and community acceptance. For the ROD, the Army will be held accountable and five-year reviews will be required. LUCs is the preferred alternative for the three MIA-NW Soil Sites. This alternative will prevent residential use/exposure to contaminants, will be protective of human health, and ecological risks will be acceptable. The 30 year cost of the LUCs alternative is \$126,000.

3.0 General Questions and Discussion

Mr. Wrobel stated that public comments on the Proposed Plan will be incorporated into the ROD. The comment period extends until August 29, 2009.

Mr. John Fairbanks of MDE asked whether residential risk is the driver for this site. Mr. Wrobel responded that there is a residential risk, but LUCs will also be needed because of UXO that may be present at these locations and in many areas across the Edgewood Area. Mr. Fairbanks asked whether the \$378,000 cost associated with excavation includes the costs for incorporating these sites in the 5-year review process. Mr. Wrobel confirmed that 5-year review costs are included.

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ATTACHMENT B
CONCEPTUAL SITE MODEL

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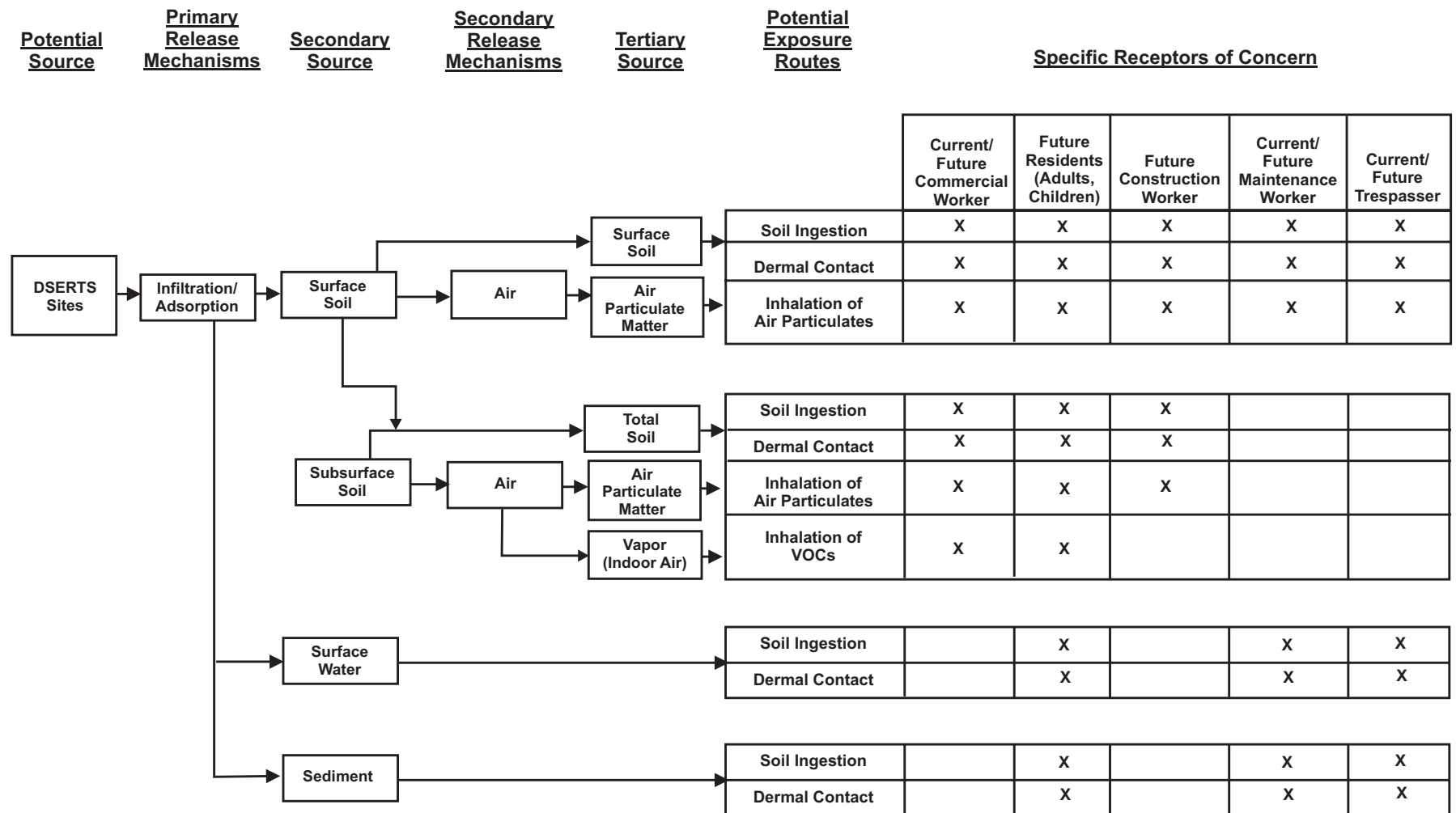


Figure 3-4. Human Health Conceptual Site Model: Canal Creek Study Area.