

**US Army Corps of Engineers**



**Air Force Center for  
Engineering and the Environment**



**Seneca Army Depot Activity  
Romulus, New York**



**DRAFT  
RECORD OF DECISION**

THE DEFENSE REUTILIZATION AND MARKETING OFFICE YARD (SEAD-121C)  
AND THE RUMORED COSMOLINE OIL DISPOSAL AREA (SEAD-121I)  
SENECA ARMY DEPOT ACTIVITY

AFCEE CONTRACT NO. FA8903-04-D-8675  
TASK ORDER NO. 0031  
CDRL A001C

EPA SITE ID# NY0213820830  
NY SITE ID# 8-50-006

**PARSONS**  
SEPTEMBER 2007

**DRAFT  
RECORD OF DECISION**

**FOR**

**THE DEFENSE REUTILIZATION AND MARKETING OFFICE (DRMO) YARD (SEAD-121C)  
AND  
THE RUMORED COSMOLINE OIL DISPOSAL AREA (SEAD-121I)**

**SENECA ARMY DEPOT ACTIVITY  
ROMULUS, NEW YORK**

**Prepared for:**

**SENECA ARMY DEPOT ACTIVITY  
ROMULUS, NEW YORK**

**and**

**UNITED STATES AIR FORCE CENTER FOR ENGINEERING AND THE ENVIRONMENT  
3300 SYDNEY BROOKS  
BROOKS CITY-BASE, TEXAS 78235**

**Prepared By:**

**Parsons  
150 Federal Street, 4<sup>th</sup> Floor  
Boston, Massachusetts**

**Contract Number: FA8903-04-D-8675**

**Task Order: 0031**

**CDRL: A001C**

**USEPA Site ID: NY0213820830; NY Site ID: 8-50-006**

**September 2007**

**TABLE OF CONTENTS**

<b><u>Section Description</u></b>	<b><u>Page</u></b>
Table of Contents .....	i
List of Tables .....	iv
List of Figures .....	v
List of Appendices .....	vi
1     DECLARATION OF THE RECORD OF DECISION .....	1-1
2     SITE NAME, LOCATION AND DESCRIPTION .....	2-1
3     SITE HISTORY AND ENFORCEMENT ACTIONS .....	3-1
3.1     Land Use .....	3-1
3.2     Response and Enforcement History.....	3-1
4     COMMUNITY PARTICIPATION .....	4-1
5     SCOPE AND ROLE .....	5-1
6     SITE CHARACTERISTICS.....	6-1
6.1     SEAD-121C, the DRMO Yard .....	6-2
6.1.1     Soil Investigation .....	6-2
6.1.2     Groundwater Investigation .....	6-5
6.1.3     Surface Water Investigation.....	6-8
6.2     SEAD-121I, the Rumored Cosmoline Oil Disposal Area.....	6-9
6.2.1     Soil Investigation .....	6-10
6.2.2     Surface Water Investigation.....	6-13
7     SUMMARY OF HUMAN HEALTH AND ECOLOGICAL RISKS .....	7-1
7.1     Methodology .....	7-1
7.1.1     Human Health Risk Assessment.....	7-1
7.1.1.1     Carcinogenic and Non-Carcinogenic Effects.....	7-2
7.1.1.2     Evaluation of Lead Exposure.....	7-2
7.1.2     Screening Level Ecological Risk Assessment (SLERA).....	7-3
7.1.2.1     Ecological Conceptual Model.....	7-4
7.1.2.2     Identification of Ecological COPCs .....	7-5
7.1.2.3     Receptors .....	7-5
7.1.2.4     Screening-Level Effects Evaluation .....	7-6
7.1.2.5     Screening-Level Exposure Estimate .....	7-6

**TABLE OF CONTENTS**  
**(continued)**

<u>Section Description</u>	<u>Page</u>
7.1.2.6 Screening-Level Risk Calculation .....	7-7
7.1.2.7 Further Refinement of Chemicals of Concern .....	7-7
7.2 Risk Assessment for SEAD-121C, the DRMO Yard .....	7-9
7.2.1 Human Health .....	7-9
7.2.1.1 Conceptual Site Model .....	7-9
7.2.1.2 Human Receptors and Exposure Pathways.....	7-9
7.2.1.3 Constituents of Concern .....	7-9
7.2.1.4 Non-Carcinogenic and Carcinogenic Risk Results.....	7-10
7.2.1.5 Lead Risk Characterizations Results .....	7-10
7.2.2 Ecological Risk Assessment, SEAD-121C.....	7-10
7.2.2.1 Preliminary Ecological Conceptual Site Model.....	7-10
7.2.2.2 Identification of Ecological COPCs .....	7-10
7.2.2.3 Receptors .....	7-11
7.2.2.4 Summary of Risk Results and Preliminary Contaminant of Concern Identification .....	7-11
7.2.2.5 Summary of Ecological Risks.....	7-11
7.3 Risk Assessment for SEAD-121I, the Rumored Cosmoline Oil Disposal Area.....	7-12
7.3.1 Human Health .....	7-12
7.3.1.1 Conceptual Site Model .....	7-12
7.3.1.2 Human Receptors and Exposure Pathways.....	7-12
7.3.1.3 Constituents of Concern .....	7-12
7.3.1.4 Non-Carcinogenic and Carcinogenic Risk Results.....	7-13
7.3.1.5 Lead Risk Characterizations Results .....	7-13
7.3.2 Ecological Risk Assessment, SEAD-121I.....	7-13
7.3.2.1 Preliminary Ecological Conceptual Site Model.....	7-13
7.3.2.2 Identification of Ecological COPCs .....	7-13
7.3.2.3 Receptors .....	7-14
7.3.2.4 Summary of Risk Results and Preliminary Contaminant of Concern Identification .....	7-14
7.3.2.5 Summary of Ecological Risks.....	7-14
8 REMEDIAL ACTION OBJECTIVES .....	8-1

**TABLE OF CONTENTS**  
**(continued)**

<b><u>Section Description</u></b>	<b><u>Page</u></b>
9 DESCRIPTION OF ALTERNATIVES.....	9-1
9.1 Groundwater Remedial Action Alternative 1 .....	9-2
9.2 Soil Remedial Action Alternatives .....	9-2
9.2.1 Soil Alternative 1 – No Action .....	9-2
9.2.2 Soil Alternative 2 – Excavation of Contaminated Soil to Achieve Unrestricted Use Cleanup Objectives, Off-Site Treatment/Disposal and Soil Backfill .....	9-3
9.2.3 Soil Alternative 3 – Excavation of Contaminated Soil to Achieve Industrial Use Cleanup Objectives, Off Site Treatment/Disposal and Soil Backfill .....	9-6
9.2.4 Soil Alternative 4 – Land Use Controls .....	9-8
10 COMPARATIVE ANALYSIS OF ALTERNATIVES .....	10-1
10.1 Overall Protectiveness of Human Health and the Environment .....	10-2
10.2 Compliance with ARARs .....	10-2
10.3 Long-Term Effectiveness .....	10-3
10.4 Reduction in Toxicity, Mobility, or Volume through Treatment .....	10-4
10.5 Short-Term Effectiveness .....	10-4
10.6 Implementability .....	10-5
10.7 Cost .....	10-5
10.8 State Acceptance.....	10-6
10.9 Community Acceptance.....	10-6
11 SELECTED REMEDY .....	11-1
12 DOCUMENTATION OF SIGNIFICANT CHANGES .....	12-1
13 STATE ROLE.....	13-1

**LIST OF TABLES**

<b><u>NUMBER</u></b>	<b><u>TITLE</u></b>
3-1	Confirmatory Sample Lead Results – SEAD-121C
3-2	Confirmatory Sample Iron and Manganese Results – SEAD-121I
6-1	Summary Results SEAD-121C – Surface Soil, Subsurface Soil and Ditch Soil vs. NYSDEC Unrestricted Use Criteria
6-2	Summary Results SEAD-121C – Surface Soil, Subsurface Soil and Ditch Soil vs. NYSDEC Restricted Industrial Criteria
6-3	Summary Results SEAD-121C – Surface Soil, Subsurface Soil and Ditch Soil vs. USEPA Region IX Industrial PRGs
6-4	Summary of SEAD-121C Groundwater Compared to Regulatory Criteria - EBS Investigation
6-5	Summary of SEAD-121C Groundwater Compared to Regulatory Criteria - Remedial Investigation
6-6	Summary Results SEAD-121I – Soil, Ditch Soil and Sediment vs. Comparative Criteria
6-7	Summary Results SEAD-121I – Surface Water Samples Compared to Regulatory Criteria
7-1	Contaminants of Concern By Media – SEAD-121C
7-2	Calculation of Total Noncarcinogenic And Carcinogenic Risks – SEAD-121C
7-3	Calculation of Blood Lead Concentration – Industrial Worker Exposed to Surface Soil SEAD-121C
7-4	Calculation of Blood Lead Concentration – Residential Child Exposed to Surface Soil SEAD-121C
7-5	Calculation of Blood Lead Concentration – Industrial Worker Exposed to Ditch Soil SEAD-121C
7-6	Calculation of Blood Lead Concentration – Residential Child Exposed to Ditch Soil SEAD-121C
7-7a	Receptor NOAEL Hazard Quotients for Soil Exposure – SEAD-121C Soil
7-7b	Receptor NOAEL Hazard Quotients for Ditch Soil Exposure – SEAD-121C Ditch Soil
7-8	Contaminants of Concern by Media – SEAD-121I
7-9	Calculation of Total Noncarcinogenic and Carcinogenic Risks – SEAD-121I
7-10	Contributing COPCs to Human Health Risk at SEAD-121I
7-11a	Receptor NOAEL Hazard Quotients for Soil Exposure – SEAD-121I Soil
7-11b	Receptor NOAEL Hazard Quotients for Ditch Soil Exposure – SEAD-121I Ditch Soil
10-1	Summary of Remedial Alternative Costs

**LIST OF FIGURES**

<b><u>NUMBER</u></b>	<b><u>TITLE</u></b>
1-1	Location of SEAD-121C and SEAD-121I
2-1	Seneca Army Depot Activity Location Map
3-1	Planned Land Use
3-2	Results of Confirmatory Samples
3-3	Confirmatory Sample Locations and Results, SEAD-121I
6-1	DRMO Yard – SEAD-121C, EBS and RI Sampling Locations
6-2	DRMO Yard – SEAD-121C, Metal Exceedances at Permanent RI Wells
6-3	DRMO Yard – SEAD-121C, Exceedances in Surface Water
6-4	Rumored Cosmoline Oil Disposal Area – SEAD-121I, EBS and RI Sampling Locations
6-5	Rumored Cosmoline Oil Disposal Area – SEAD-121I, Distribution of Iron and Manganese Concentrations in Soil and Ditch Soil
6-6	Rumored Cosmoline Oil Disposal Area – SEAD-121I, Chromium and Zinc Concentrations in Soil and Ditch Soil
6-7	Rumored Cosmoline Oil Disposal Area – SEAD-121I, Arsenic and Thallium Concentrations in Soil and Ditch Soil
6-8	Rumored Cosmoline Oil Disposal Area – SEAD-121I, Metal Exceedances in Surface Water
7-1	Human Health Risk Assessment Methodology
7-2	Exposure Assessment Process
7-3	Conceptual Site Model for SEAD-121C
7-4	Conceptual Site Model for SEAD-121C and SEAD-121I
7-5	Conceptual Site Model for SEAD-121I
9-1	DRMO Yard – SEAD-121C, Planned Excavations and Sample Exceedances
9-2	SEAD-121I, Unrestricted Use Exceedances and Extent of Anticipated Excavation
9-3	DRMO Yard – SEAD-121C, Planned Excavations and Sample Exceedances
9-4	SEAD-121I, Commercial Use Exceedances and Extent of Anticipated Excavations

**LIST OF APPENDICES**

<b><u>APPENDIX</u></b>	<b><u>TITLE</u></b>
A	Administrative Record
B	Letter of Concurrence
C	Public Comments and Responsiveness Summary
D	Analytical Data
E	ARARs



## **1 DECLARATION OF THE RECORD OF DECISION**

### **Site Name and Location**

The Defense Reutilization and Market Office (DRMO) Yard (SEAD-121C) and the Rumored Cosmoline Oil Disposal Area (SEAD-121I)  
Seneca Army Depot Activity  
CERCLIS ID# NY0213820830  
Romulus, Seneca County, New York

### **Statement of Basis and Purpose**

This decision document presents the U.S. Army's (Army's) and the U.S. Environmental Protection Agency's (USEPA's) selected remedy for two areas of concern (AOCs), SEAD-121C and SEAD-121I located at the Seneca Army Depot Activity (SEDA or the Depot) in the Towns of Varick and Romulus, Seneca County, New York. The decision was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended, 42 U.S.C. §9601 et seq., and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300. The Base Realignment and Closure (BRAC) Environmental Coordinator, the Chief, Alpha Branch, Army BRAC Division, and the USEPA Region II have been delegated the authority to approve this Record of Decision (ROD).

This ROD is based on the Administrative Record that has been developed in accordance with Section 113(k) of CERCLA. The Administrative Record is available for public review at the Seneca Army Depot Activity, 5786 State Route 96, Building 123, Romulus, NY 14541. The Administrative Record Index identifies each of the items considered during the selection of the remedial action. This index is included in **Appendix A**.

The State of New York, through the New York State Department of Environmental Conservation (NYSDEC), has concurred with the selected remedy. The NYSDEC Declaration of Concurrence is provided in **Appendix B** of this ROD.

### **Site Assessment**

The response actions selected in this ROD are necessary to protect human health or the environment from actual or threatened releases of hazardous substances into the environment or from actual or threatened releases of pollutants or contaminants from SEAD-121C and SEAD-121I, which may present an imminent and substantial endangerment to public health or welfare.

### **Description of the Selected Remedy**

The selected remedies for SEAD-121C and SEAD-121I address contaminated soil and groundwater. The selected remedies will result in the removal of soil and groundwater as a pathway for potential receptors.

The elements that compose the selected remedies at SEAD-121C and SEAD-121I include:

- Establish and maintain land use controls (LUCs) to prevent access to or use of the groundwater and to prevent residential activities until unrestricted use and unlimited exposure criteria are attained at the two AOCs; and,
- Complete a review of the selected remedies every 5 years (at minimum), in accordance with Section 121(c) of the CERCLA.

### **SEAD-121C and SEAD-121I Land Use Control (LUC) Performance Objectives**

The LUC performance objectives for SEAD-121C and SEAD-121I are to:

- Prohibit access to or use of the groundwater until New York State's GA groundwater standards are achieved; and,
- Prohibit residential housing, elementary and secondary schools, childcare facilities and playgrounds activities.

The LUCs would be implemented over the land within the boundary of SEAD-121C and SEAD-121I. It should be noted that all land within the Planned Industrial/Office Development and Warehousing (PID) area, which includes the land comprising SEAD-121C and SEAD-121I, is also subject to a separate Proposed Plan and ROD that include institutional controls (ICs) ["Final ROD for Sites Requiring Institutional Controls in the Planned Industrial/Office Development or Warehousing Areas" (Parsons, 2004)]. The location of SEAD-121C, SEAD-121I, and the land that is subject to institutional controls in the PID Area are shown in **Figure 1-1**. Under the previous ROD, LUCs will continue until soil and groundwater constituent concentrations have been reduced to levels that allow for unlimited exposure and unrestricted use. The LUCs may be eliminated if data is provided to and approved by the Army, USEPA, and the NYSDEC to indicate that groundwater quality achieves NYSDEC's GA standards and that soil data allow for unrestricted use.

To implement the Army's remedy, which includes the imposition of LUCs, a LUC Remedial Design for SEAD-121C and SEAD-121I will be prepared which is consistent with Paragraphs (a) and (c) of the New York State Environmental Conservation Law (ECL) Article 27, Section 1318: Institutional and Engineering Controls. In addition, the Army will prepare an environmental easement for SEAD-121C and SEAD-121I, consistent with Section 27-1318(b) and Article 71, Title 36 of ECL, in favor of the State of New York and the Army, which will be recorded at the time of the property's transfer from federal ownership and which will require the owner and/or any person responsible for implementing the LUCs set forth in this ROD to periodically certify that such institutional controls are in place. A schedule for completion of the draft SEAD-121C and SEAD-121I LUC Remedial Design Plan (LUC RD) will be completed within 21 days of the ROD signature, consistent with Section 14.4 of the Federal Facilities Agreement (FFA).

The Army shall implement, inspect, report, and enforce the LUCs described in this ROD in accordance with the approved LUC RD. Although the Army may later transfer these responsibilities to another party by contract, property transfer agreement, or through other means, the Army shall retain ultimate responsibility for remedy integrity.

### **State Concurrence**

NYSDEC forwarded to USEPA a letter of concurrence regarding the selection of a remedial action in the future. This letter of concurrence has been placed in **Appendix B**.

### **Declaration**

CERCLA and the NCP require each selected remedy to be protective of human health, public welfare, and the environment; be cost effective, comply with other statutory laws; and use permanent solutions, alternative treatment technologies, and resource recovery options to the maximum extent possible. CERCLA and the NCP also state a preference for treatment as a principal element for the reduction of toxicity, mobility, or volume of the hazardous substances.

The selected remedies for SEAD121C and SEAD-121I are consistent with CERCLA and the NCP and are protective of human health and the environment, comply with Federal and State requirements that are applicable or relevant and appropriate to the remedial action, are cost-effective, and utilize permanent solutions. The remedies also reduce the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants.

The remedies identified may result in hazardous substances and pollutants or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure for an indeterminate period. A review will be conducted within five years after initiation of the remedial action at each AOC to ensure that the remedy is, or will be, protective of human health and the environment, with consideration given to each AOC's continuing and planned future use.

The estimated cost for implementing, monitoring, assessing and reporting on the continued suitability of the recommended land use restrictions at SEAD-121C, the DRMO Yard, and SEAD-121I, the Rumored Cosmoline Oil Disposal Area, are each \$74,460 over a 30-year period. The total combined estimated cost of the recommended remedial actions at both areas of concern included in this ROD is \$148,920.

The foregoing represents the selection of a remedial action by the U.S. Department of the Army and the U.S. Environmental Protection Agency, with the concurrence of the New York State Department of Environmental Conservation.

Concur and recommend for immediate implementation:

---

STEPHEN M. ABSOLOM  
BRAC Environmental Coordinator

---

Date

PAGE INTENTIONALLY LEFT BLANK

The foregoing represents the selection of a remedial action by the U.S. Department of the Army and the U.S. Environmental Protection Agency, with the concurrence of the New York State Department of Environmental Conservation.

Concur and recommend for immediate implementation:

---

THOMAS E. LEDERLE  
Chief, Alpha Branch, Base Realignment & Closure  
Hampton Field Office

---

Date

PAGE INTENTIONALLY LEFT BLANK

The foregoing represents the selection of a remedial action by the U.S. Department of the Army and the U.S. Environmental Protection Agency, with the concurrence of the New York State Department of Environmental Conservation.

Concur and recommend for immediate implementation:

---

GEORGE PAVLOU  
Director, Emergency and Remedial Response Division  
U.S. Environmental Protection Agency, Region II

---

Date



PAGE INTENTIONALLY LEFT BLANK

## **2 SITE NAME, LOCATION, AND DESCRIPTION**

The Seneca Army Depot previously occupied approximately 10,600 acres of land in Seneca County in the Towns of Romulus and Varick, New York. The property was acquired by the United States Government in 1941, and was operated by the Department of the Army from that time until approximately September 2000 when the installation closed. Prior to the acquisition of the land and the construction of the Depot, the land was used for agriculture and farming.

A location map for SEDA is provided as **Figure 2-1**. **Figure 2-1** also shows that SEDA is bordered by New York State Highway 96 on the east and New York State Highway 96A on the west. SEDA is located in an uplands area, which forms a divide separating two of New York's Finger Lakes; Cayuga Lake on the east and Seneca Lake on the west. Ground surface elevations are generally higher along the eastern and southern borders of the Depot, and lower along the northern and western borders. The approximate elevation at the southeastern corner of the SEDA site is 740 feet (ft., National Geodetic Vertical Datum [NGVD] 1929), while the approximate elevation at the southwestern and northeastern corners is 650 ft. (NGVD, 1929). The approximate elevation at the southwestern corner of the Depot is 590 ft. (NGVD, 1929). Much of the land surrounding the Depot is sparsely populated farmland.

SEAD-121C, the DRMO Yard, is a triangular-shaped gravel lot, approximately 8.75 acres in size, located roughly 4,000 ft. southwest of the former Depot's main entrance off State Route 96. The DRMO Yard is surrounded by a chain-linked fence and access into the AOC is controlled through a single, normally locked gate located at its southeast corner. The surface of the DRMO Yard is graded to allow surface water to drain towards the man-made ditches that bound the AOC on its northwest and south sides. The major pathway of surface water flow is to these drainage ditches, which then flow to the west towards a wetland area and the headwaters of Kendaia Creek.

Several other man-made features are prominent within the DRMO Yard; these include: one storage building; an earthen-bottomed, open storage cell in the southwest corner of the AOC; a rectangular-shaped, earthen-bottomed open, storage cell immediately adjacent to, and located halfway along the northwest perimeter fence of the AOC; and a multi-chambered, concrete slab, storage cell adjacent to the east perimeter fence, near the northern-most point of the DRMO Yard.

The DRMO Yard was used by the Army to store material that was no longer needed for national defense, or that did not comply with legislative and regulatory requirements. The group using the yard was responsible for property reuse (including resale), hazardous property disposal (off-site, at licensed/permitted facilities), precious metals recovery and recycling program support.

SEAD-121I, the Rumored Cosmoline Oil Disposal Area, encompasses four rectangular-shaped, open grass and dirt covered areas that are bounded by 3<sup>rd</sup> and 7<sup>th</sup> Streets (north and south ends, respectively) and Avenues C and D (west and east sides, respectively). The northern end of SEAD-121I is located roughly 4,500 ft. south-southwest of the Depot's main entry off State Route 96. The AOC extends roughly 2,600 ft. further to the south from this point, and the AOC measures approximately 300 ft. in

width throughout its length; the overall size of the AOC is approximately 16.8 acres. Approximately 1.2 acres are used for the staging of strategic stockpiles of metal ore. This AOC is located 2,000 to 4,000 ft. northwest of the topographic high point within the Depot.

Buried reinforced concrete storm drains convey runoff storm water from east to west through the AOC along 3<sup>rd</sup> St., 4<sup>th</sup> St., 5<sup>th</sup> St., 6<sup>th</sup> St., and 7<sup>th</sup> St.

A railroad spur line enters SEAD-121I from the south and extends to the northern end of the AOC where it terminates near the intersection of 3<sup>rd</sup> St. and Avenue C. Two sidings branch off the main spur line; one terminates in the first (north to south) block and the other terminates in the third (north to south) block. There are concrete loading docks located in the first and third blocks next to the railroad lines.

The Army indicated that the rail spur and sidings were used for delivery of equipment and machinery that was frequently packed in Cosmoline (oil). Cosmoline oil is a commonly used substance that prevents corrosion on metal parts and components. During delivery and unpacking of the equipment and machinery, oil from the packing may have been deposited on the ground.

The U.S. Government has historically staged strategic stockpiles of ferro-manganese ore in portions of SEAD-121I, and these stockpiles were present during the Environmental Baseline Survey (EBS) and Remedial Investigation (RI) sampling events. The Government recently sold these stockpiles and they have been removed from SEDA. These strategic stockpiles were located in the second and fourth blocks (north to south) of the AOC, along the western edge of the AOC close to Avenue C. Parallel rows of warehouses border the eastern and western sides of the AOC, across the bounding north-south running Avenue C and Avenue D.

### **Habitat and Ecological Community Characterization**

AOC-specific ecological evaluations of the plant and animal habitats and communities located at SEAD-121C and SEAD-121I were not conducted. The AOCs are generally void of characteristics and attributes that would make it an attractive habitat for most ecological receptors. As is indicated above, the DRMO Yard (SEAD-121C) is a gravel-covered, triangular lot located where historic short- to long-term storage of materials occurred. It is surrounded by a chain-linked fence with a single access gate to control vehicular and human traffic. Isolated growths of weed plants are currently observed at numerous locations immediately along the fence line and randomly at other locations within the Yard. No deciduous or coniferous trees or shrubs are located in the Yard, but they do exist at varying distances exterior of the Yard along the northwestern, western and southern borders of the AOC. Man-made drainage ditches that carry episodic flows of storm- and snow-melt waters are located along the northwest and south edges of the AOC. The Rumored Cosmoline Oil Disposal Area (SEAD-121I) is a four block expanse of open land, that is a surrounded by roads and by two opposing banks of warehouses.

Characterizations of the habitat and ecological communities present near, but exterior of, SEAD-121C and SEAD-121I are based on general observations made during the 1998 EBS and the 2002 RI, and on

the results of the ecological evaluations and assessment that have been conducted at other solid waste management units (SWMUs) at the SEDA [e.g., SEADs 4, 12, 16, 17, 25 and 26, and the Open Burning (OB) Grounds] as part of remedial investigations. Key aspects of these characterizations relevant to this risk assessment are presented below.

The methods used to characterize the ecological resources included AOC- and area-walkovers for the evaluation of existing wildlife and vegetative communities; interviews with local, state, and SEDA resource personnel; and review of environmental data obtained from previous Army reports. SEDA has a strong wildlife management program that is reviewed and approved by the New York Fish and Game Agency. The Depot manages an annual white-tailed deer (*Odocoileus virginiana*) harvest and has constructed a large wetland called the "Duck Pond" in the northeastern portion of the facility to provide a habitat for migrating waterfowl.

The NYSDEC Natural Heritage Program Biological and Conservation Data System identifies no known occurrences of federal- or state-designated threatened or endangered plant or animal species within a 2-mile radius of SEAD-121C. No species of special concern are documented within the Depot property.

The only significant terrestrial resource known to occur at SEDA is the population of white-pelaged white-tailed deer, which inhabits the fenced portion of the Depot, west of the PID area. Annual deer counting conducted at the Depot indicates that the size of the deer herd is approximately 600 animals of which approximately one-third (i.e., 200) are white-pelaged. Since the perimeter of the Depot is totally enclosed by fence, the white-pelaged deer is thought to result from inbreeding within the herd. The Depot maintains the herd through an annual hunting season to prevent overgrazing and starvation of the deer. The management plan of the herd is conducted by the New York State Division of Fish and Wildlife (DFW). The normal brown-pelaged deer are also common. White-tailed deer are not listed as a rare or endangered species.

Agricultural crops and deciduous forests comprise the vegetative resources used by humans near SEDA. Although no crops are grown at the Depot, farmland is the predominant land use of the surrounding private lands. Crops including corn, wheat, oats, beans and hay mixtures, are grown primarily for livestock feed. Deciduous forestland on the Depot and surrounding private lands is under active forest management. Timber and firewood are harvested from private woodlots that surround the Depot, but timber harvesting does not occur on the Depot.

Vegetation across the SEDA consists of successional old field, successional shrub, and successional hardwoods. The NYSDEC Natural Heritage Program Biological and Conservation Data System identifies no known occurrences of federal- or state-designated threatened or endangered plant. No species of special concern are documented within the Depot property. No rare or endangered species were observed during the site assessment.

Several wildlife species are hunted and trapped on private lands near SEDA. Game species hunted include the eastern cottontail, white-tailed deer, ruffed grouse, ring-necked pheasant, and various

waterfowl. Gray squirrel and wild turkey are hunted to a lesser extent. At the Depot, deer, waterfowl, and small game hunting are allowed. Trapping is also permitted on the Depot.

Animals that have been identified at the Depot during various ecological surveys include the beaver, eastern coyote, deer, red and gray fox, eastern cottontail rabbit, muskrat, raccoon, gray squirrel, striped skunk, and the woodchuck. Bird species that have been identified include the blue jay, black-capped chickadee, American crow, mourning dove, northern flicker, ruffed grouse, ring-billed gull, red-tailed hawk, northern junco, American kestrel, white breasted nuthatch, ring-necked pheasant, American robin, eastern starling, turkey vulture, and pileated woodpecker.

There are no permanent lakes, ponds, streams or wetlands in SEAD-121C or SEAD-121I. Surface water only exists intermittently in man-made drainage ditches that abut the AOCs; thus, it does not directly support aquatic life.

There are signs of stressed vegetation in both area resulting from the historic storage activities and vehicular movements through both of the areas.

### **3 SITE HISTORY AND ENFORCEMENT ACTIVITIES**

#### **3.1 LAND USE**

Prior to the acquisition of the land and construction of SEDA in 1941, the property was privately owned and was used principally as homesteads and for agriculture. Between 1941 and 2000, SEDA was owned by the United States Government and operated by the Department of the Army. The Depot began its primary mission of receipt, maintenance and supply of ammunition in 1943. After the end of World War II, the Depot's mission shifted from supply to storage, maintenance and disposal of ammunition. SEDA was selected for closure by the Department of Defense (DoD) in 1995, and SEDA's military mission terminated in September 1999 and the installation was closed in September 2000.

To address employment and economic impacts associated with the SEDA's closure, the Seneca County Board of Supervisors established the Seneca Army Depot Local Redevelopment Authority (LRA) in October 1995. The primary responsibility assigned to the LRA was to prepare a plan for redevelopment of the SEDA property. Following a comprehensive planning process, a *Reuse Plan and Implementation Strategy for Seneca Army Depot* was completed and adopted by the LRA on October 8, 1996. The Seneca County Board of Supervisors subsequently approved this *Reuse Plan* on October 22, 1996. After it had acquired land at the former Depot from the Army, the Seneca County Industrial Development Authority (SCIDA) changed the planned use of land in 2005. **Figure 3-1** depicts the intended future land uses for SEDA, as modified by the SCIDA. As indicated on **Figure 3-1**, the proposed future land use for SEAD-121C and SEAD-121I is for Planned Industrial/Office Development or Warehousing.

Land within the Planned Industrial/Office-Development and Warehousing (PID) area is subject to LUCs that prohibit the use of the land for residential activities and that prohibit the access to and use of groundwater. These LUCs were implemented on the PID Area via a separate Proposed Plan and ROD, which included ICs ["Final ROD for Sites Requiring Institutional Controls in the Planned Industrial/Office Development or Warehousing Areas" (Parsons, 2004) signed on September 30, 2004].

#### **3.2 RESPONSE AND ENFORCEMENT HISTORY**

SEDA was proposed for the National Priorities List (NPL) in July 1989. In August 1990, SEDA was finalized and listed in Group 14 on the Federal Section of the NPL. After SEDA was listed on the NPL, the Army, USEPA, and NYSDEC identified 57 SWMUs where data or information suggested, or evidence existed to support, that hazardous substances or hazardous wastes had been handled and where releases to the environment may have occurred. Additionally, the USEPA, NYSDEC, and the Army negotiated and finalized a Federal Facilities Agreement (FFA) for the Site in 1993. The general purposes of the Agreement were to:

- "Ensure that the environmental impacts associated with past and present activities at the Site are thoroughly investigated and that appropriate remedial action is taken as necessary to protect human health and the environment;

- Establish a procedural framework and schedule for developing, implementing and monitoring appropriate response actions at the Site in accordance with CERCLA, the NCP, Superfund guidance and policy, RCRA, RCRA guidance and policy and applicable State law; and
- Facilitate cooperation, exchange of information and participation of the Parties in such actions.”<sup>1</sup>

The number of SWMUs was subsequently expanded to include 72 AOCs once the Army finalized the *SWMU Classification Report* (Parsons, 1994) for the Depot in 1994.

The SEDA was a generator and treatment, storage and disposal facility (TSDF) for hazardous wastes and thus, subject to regulation under the Resource Conservation and Recovery Act (RCRA). Under the RCRA permit system, corrective action is required at all SWMUs, as needed. Remedial goals are the same for CERCLA and RCRA; thus, once the 72 SWMUs were listed, the Army recommended that they be identified as either areas requiring No Action or as AOCs, where additional; investigation, study, or actions were needed. SWMUs listed as AOCs were then scheduled for investigations based upon data and potential risks to the environment.

In October 1995, the SEDA was designated for closure under the DoD’s 1995 Base Realignment and Closure (BRAC) process. In accordance with requirements of BRAC, the Army prepared an EBS for SEDA. Under the EBS, all areas at the Depot were evaluated and subdivided into one of seven standard environmental categories consistent with the Community Environmental Response Facilitation Act (CERFA – Public Law 102-426) guidance and the DoD’s *BRAC Cleanup Plan Guidebook* (DoD, 1993). Based on the findings and conclusions of the EBS, SEAD-121C and SEAD-121I were both designated as AOCs where additional information and data were required before the land could be offered for transfer and reuse.

Once SEDA was added to the 1995 BRAC list, the Army’s primary objective expanded from performing remedial investigations and completing necessary remedial actions to include the release of non-affected portions of the Depot to the surrounding community for their reuse for other, non-military purposes (i.e., industrial, municipal, and residential). The designated future use of land within the SEDA was first defined and approved by the Seneca County Local Redevelopment Authority in 1996. The planned use for portions of the SEDA has been modified by Seneca County Industrial Development Agency (SCIDA) since 1996.

As required for sites on the NPL, an RI was completed for SEAD-121C and SEAD-121I. The Final RI was completed and submitted to USEPA and NYSDEC in May 2006.

Subsequent to their review of the RI report, the USEPA requested that soil containing elevated concentrations of metals above NYSDEC soil cleanup objectives located in SEAD-121C and around the staging areas of the historic strategic ore piles be addressed. Specifically, at SEAD-121C, the USEPA’s

---

<sup>1</sup> Federal Facility Agreement under CERCLA Section 120 in the Matter of Seneca Army Depot, Romulus, New York, Docket Number: II-CERCLA-FFA-00202, Section 3, Page 4, January 1993.

focus was on soil that contained elevated levels of lead in excess of NYSDEC's Industrial Use criteria levels, while at SEAD-121I the USEPA's focus was related to elevated concentrations of manganese in excess of the state's Commercial and Industrial Use criteria level.

At SEAD-121C, the DRMO Yard, the objective of the removal action was to excavate soil containing levels of lead in excess of 1,500 milligrams per Kilogram (mg/Kg), and to achieve an excavation-wide concentration for lead of 1,250 mg/Kg or less. The excavation-wide cleanup objective was set as the 95<sup>th</sup> upper confidence limit (95<sup>th</sup> UCL) of the mean<sup>2</sup> of the confirmatory samples collected from the excavation alone. Full details of the removal action are presented in the Completion Report prepared for the action (pending).

Approximately ### cubic yards (yd<sup>3</sup>) of soil were excavated from the area shown in **Figure 3-2**. The location of all confirmatory soil samples is also shown on this figure. The lead results for samples collected from the SEAD-121C excavation area are presented and summarized in **Table 3-1**.

At SEAD-121I, after the ferro-manganese ore was removed, the cleanup objective was to have the remaining soil concentration (determined as the 95<sup>th</sup> UCL of the mean) for manganese of 10,000 mg/Kg or less within the areas of the former stockpiles. Full details of the site activity are presented in the Completion Report prepared for the action (pending).

The area of the ore piles is shown in **Figure 3-3**. The location of all confirmatory soil samples is also shown on this figure. The manganese and iron results for samples collected from the SEAD-121I excavation area are presented and summarized in **Table 3-2**.

The cleanup objectives established for both of the removal actions was achieved, as is summarized above.

---

<sup>2</sup> Confidence limits for the mean ([Snedecor and Cochran, 1989](#)) are an interval estimate for the mean. Interval estimates are often desirable because the estimate of the mean varies from sample to sample. Instead of a single estimate for the mean, a confidence interval generates a lower and upper limit for the mean. The interval estimate gives an indication of how much uncertainty there is in our estimate of the true mean. The narrower the interval, the more precise is our estimate. The 95<sup>th</sup> upper confidence limit is the highest estimate for the mean that is expected to exist with 95 percent confidence for a particular set of data.



#### **4 COMMUNITY PARTICIPATION**

The U.S. Army relies on public input to ensure that community concerns are considered in selecting an effective remedy for each Superfund site. To this end, the RI/FS report, the Proposed Plan and the supporting documentation have been made available to the public for a public comment period, which began on **Date 1** and concluded on **Date 2**. Copies of the RI report, the Proposed Plan, the Record of Decision, and supporting documentation are available at the following repository:

Seneca Army Depot Activity  
Building 123  
Romulus, NY 14541  
(607) 869-1309  
Hours are Mon-Thurs 8:30 am to 4:30 pm

A public meeting was held during the public comment period at the Seneca County Office Building on **Date 3** at 7 pm to present the conclusions of the RI, to elaborate further on the reasons for recommending the preferred remedial option, and to receive public comments. Comments received at the public meeting, as well as written comments, are documented in the Responsiveness Summary Section of the ROD, **Appendix C**.

The primary responsibility assigned to the LRA was the preparation of a plan for the redevelopment of the Depot. During the BRAC process, monthly presentations have been given to the LRA. In addition, the SEDA Restoration Advisory Board (RAB) was established to facilitate the exchange of information between SEDA and the community. RAB members include the representatives from the Army, USEPA, NYSDEC, NYSDOH, and the community. After a comprehensive planning process, a Reuse Plan and Implementation Strategy for Seneca Army Depot was completed and adopted by the LRA on October 8, 1996. The Reuse Plan was subsequently approved by the Seneca County Board of Supervisors on October 22, 1996.

During the BRAC process there have been, and continue to be, monthly presentations to the RAB regarding the progress of SEAD-121C and SEAD-121I and other investigations related to the closure of SEDA.

## **5**      **SCOPE AND ROLE**

The Army's ultimate goal for SEDA is to transfer or lease the entire site to other private or public parties for beneficial reuse. Prior to the transfer or lease of any property at the site, the Army is required to ensure that the property is suitable for release and reuse. If information or evidence exists to indicate that hazardous substances may be present at any location slated for transfer, the Army is obligated to conduct investigations needed to verify the presence/absence of hazardous substances, and assess the potential risks that may exist due to the presence of hazardous substances at the site. These investigations and assessments are conducted under the oversight of, and subject to the review and approval of the USEPA and the NYSDEC. The findings, results, and the conclusions of the investigations and assessments, and the subsequent land use decisions that are made based on the Army's investigations and assessments are also made available to the public for review and comment.

If the results and conclusions of the investigations and assessments of property at the SEDA indicate that risks to human health or the environment exist due to the continuing presence of hazardous substances, the Army is obligated to propose, design, implement, monitor, inspect and report on the remedial actions used to eliminate, mitigate or control the threat. The remedial actions are also subject to review and approval by all parties.

SEAD-121C, the DRMO Yard, and SEAD-121I are designated AOCs that are located in the PID Area of the former SEDA. The Army is currently leasing other property located in the PID Area to outside parties for reuse as warehousing and light industrial property. It is the Army's goal to demonstrate that SEAD-121C and SEAD-121I are available for reuse, either via lease or transfer to another public or private party.

Conditions identified in SEAD-121C indicate that carcinogenic and non-carcinogenic risks for future industrial receptors are within or below USEPA's acceptable limits (i.e.,  $10^{-4}$  to  $10^{-6}$  carcinogenic; hazard index [HI] of 1, non-carcinogenic). However, concentrations of selected chemicals have been identified in the soil at levels that exceed the NYSDEC's Restricted Industrial Use cleanup objectives. Of these chemicals, lead is the one observed most frequently at elevated concentrations and is found concentrated in one portion of the AOC.

Conditions identified in SEAD-121I indicate that carcinogenic risks for future industrial receptors are within or below USEPA's acceptable limits (i.e.,  $10^{-4}$  to  $10^{-6}$ ). However, non-carcinogenic risks determined for selected receptors are above USEPA's acceptable limit of 1. The principal contaminant identified that drives the non-carcinogenic risk is manganese, which is concentrated in soil at two portions of the AOC where the Government has historically stored strategic stockpiles of ferro-manganese ore. Further, concentrations measured for other chemicals in soil at SEAD-121I are present at concentrations in excess of the NYSDEC's Restricted Industrial Use cleanup objectives.

Exposure to lead contaminated soils at SEAD-121C has been addressed via a removal action under the selected remedy for this AOC. Exposure to manganese and iron contaminated soil found at SEAD-121I has

been addressed by completion of a soil removal action in the vicinity of the former stockpiles to mitigate any residual risks that remain at the AOC and that are associated with the stockpiles. To further limit potential risks at both of the AOCs, the Army recommends that the PID Area-wide LUCs that prohibit the use of the land for residential activities and that prohibit access to and use of groundwater be formally imposed at both SEAD-121C and SEAD-121I to control future uses of the property.

The selected remedies are cost-effective, readily available alternatives that will provide effective and efficient solutions to environmental concerns identified at both AOCs. The selected remedies are discussed in greater detail in **Section 9**.

## 6 SITE CHARACTERISTICS

Two environmental investigations were conducted to document the environmental conditions present at SEAD-121C, the DRMO Yard, and at SEAD-121I, the Rumored Cosmoline Oil Disposal Area. Initially, a limited EBS was performed to determine if hazardous substances were present in select environmental media at the two AOCs. The EBS work was limited to the collection and analysis of surface and subsurface soil and groundwater samples at SEAD-121C, and the collection of surface soil and sediment samples at SEAD-121I. This work was performed in 1998 – 1999 and is reported in the document *Final Investigation of Environmental Baseline Survey Non-Evaluated Sites [SEAD-119A, SEAD-122 (A, B, C, D, E), SEAD-123 (A, B, C, D, E, F), SEAD-46, SEAD-68, SEAD-120 (A, B, C, D, E, F, G, H, I, J), and SEAD-121 (A, B, C, D, E, F, G, H, I)]* (Parsons, 1999). In the conclusions of this effort, the Army recommended “that additional soil and groundwater sampling be performed to determine the extent of the impacts from semivolatiles, pesticides, and metals at SEAD-121C. At this time, there are an insufficient number of data points to perform a Mini Risk Assessment.”<sup>3</sup> Comparably for SEAD-121I, the Army recommended “that additional soil sampling be performed to determine the extent of the impacts from semivolatiles. At this time there are an insufficient number of data points to perform a Mini Risk Assessment”<sup>4</sup>

Conditions present at both AOCs were more thoroughly investigated during a multimedia RI at both AOCs in 2002 and 2003. Samples of surface and subsurface soil, groundwater (SEAD-121C only), surface water and “ditch soil” found in man-made culverts adjacent to the AOCs were collected and analyzed for Target Compound and Target Analyte List (TCL/TAL) compounds. The results of this effort were reported in the *Remedial Investigation Report for Two EBS Sites in the Planned Industrial Development Area (SEAD-121C and SEAD-121I)* Final (Parsons, 2006).

Analytical data collected during the site investigations were compared to prevailing state and federal standards and guidance criteria. State guidance criteria and standards considered included New York’s Technical and Guidance Memorandum (TAGM) No. 94-HRW-4046 soil cleanup objectives and Title 6 New York Code of Rules and Regulations (6NYCRR) Subpart 375-6.8 Remedial Program Soil Cleanup Objectives for soil; and New York’s Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (Technical and Operation Guidance Series [TOG] 1.1.1) for groundwater and surface water. The TAGM soil guidance values were recently replaced by New York’s Subpart 375-6.8 regulations, and data comparisons previously made to the TAGM values have been eliminated from all material presented in this ROD.

Federal guidance criteria considered during the evaluation of analytical data included USEPA Region IX Preliminary Remediation Goals (PRGs) for residential and industrial soils and PRGs for tap water, as well as Maximum Contaminant Limits (MCLs) and Secondary Drinking Water Standards for Drinking Water.

---

<sup>3</sup> Parsons, May 1999, pg. 38

<sup>4</sup> Parsons, May 1999, pg. 48

Results obtained from the analysis of all of the samples and sample duplicates are provided in the appendices of this ROD. Summary tables presenting results obtained by comparing sample data to regulatory cleanup criteria merges sample and its associated sample-duplicate results into a single value for each compound that is reflective of the average condition found at a sampling location. The combined analytical results of the EBS and the RI are summarized and discussed below.

## 6.1 SEAD-121C, THE DRMO YARD

### 6.1.1 Soil Investigations

The investigation of soil at SEAD-121C included the collection and analysis of samples from 48 surface soil, 10 ditch soil and 20 subsurface soil locations. A total of 53 surface soil samples and duplicates, 20 subsurface soil samples, and 11 ditch soil and duplicates were collected and characterized. Eight surface soil samples and four subsurface soil samples were collected during the EBS. Forty surface soil samples, 10 ditch soil samples, and 16 subsurface soils were collected during the RI. **Figure 6-1** shows the locations where the soil and ditch soil samples were collected. A compilation of all the sample and sample duplicate results for surface, subsurface, and ditch soil samples is provided in **Appendix D, Table 1**.

**Tables 6-1, 6-2, and 6-3** provide the summary soil results for SEAD-121C compared to three sets of regulatory criteria, NYSDEC's Unrestricted Use and Industrial Use criteria, and USEPA Region IX Industrial Soil PRGs. Each of the listed tables identifies the compounds that were detected in total soil, surface soil only, subsurface soil only, and ditch soil only; identifies the number of times the detected compounds were found in one of the categories of soil; and, identifies how many samples contained a concentration in excess of the referenced regulatory criteria. In addition, the 95<sup>th</sup> UCL of the mean is computed for the total soil data set developed, and this value is compared directly with each regulatory criteria value.

#### *Volatile Organic Compounds (VOCs)*

Eleven volatile organic compounds (VOCs) were detected at the 78 total soil locations characterized during the EBS and the RI at SEAD-121C. The identified VOCs included acetone, benzene, carbon disulfide, chloroform, ethyl benzene, meta/para xylene, methyl ethyl ketone, methylene chloride, ortho xylene, styrene, and toluene. Acetone and toluene were the two VOCs most frequently detected, present in 37% and 17% of the total soil samples, respectively. Acetone was found in all types of soil analyzed (i.e., surface, subsurface, and ditch soil), while toluene was only found in surface and subsurface soils characterized. Five VOCs (acetone, benzene, ethyl benzene, meta/para xylene, and methyl ethyl ketone) were detected in one or more samples each at concentrations in excess of the NYSDEC Unrestricted Use criteria values. Three of these compounds (benzene, ethyl benzene, and meta/para xylene) had 95<sup>th</sup> UCL values that exceeded their respective Unrestricted Use criteria value, but in each case the elevated UCL value was driven by one or two sample concentrations that were above the criteria value.

Ethyl benzene and meta/para xylene were found collocated in one surface soil sample collected from location SBDRMO-9, which is located in the southeastern corner of the DRMO yard at concentrations of 3,300 “J”<sup>5</sup> µg/Kg for ethyl benzene, and 4,400 J µg/Kg for meta/para xylenes. Benzene, ethyl benzene, and meta/para xylenes also were observed to exceed NYSDEC’s Unrestricted Use criteria once each in subsurface soil, and each of the elevated concentrations were found collocated in a sample collected at SBDRMO-9, which is near the southeastern corner of the DRMO Yard.

Benzene was the only VOC that was observed to exceed its USEPA PRGs for industrial soil, with an exceedance in the subsurface soil collected from location SBDRMO-9.

None of the detected VOCs were found in any sample at concentrations that exceeded either NYSDEC’s Industrial Use criteria values.

#### *Semivolatile Organic Compounds (SVOCs)*

Twenty-seven semivolatile organic compounds (SVOCs), including most of the polycyclic aromatic hydrocarbons (PAHs), some phthalates, and other compounds were detected in the 78 soil sample locations characterized at SEAD-121C. **Tables 6-1, 6-2, and 6-3** present summary statistics and results of the comparison of sample concentrations to the various comparative regulatory cleanup objectives.

Seven of the detected PAHs [i.e., benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene] are known as carcinogenic PAHs (cPAHs). Generally, the PAHs and the cPAHs were the most frequently detected SVOCs, the analytes found at the highest concentrations, and the analytes most frequently found at levels above the various cleanup criteria. Pyrene was the PAH found at the highest overall concentration (34,000 µg/Kg); Fluoranthene was the PAH found most frequently, present in 45 of the 78 soil sample locations analyzed; while benzo(a)pyrene and benzo(b)fluoranthene, both cPAHs, were the two compounds found to exceed their comparative cleanup criteria most frequently. Benzo(a)pyrene concentrations detected were above NYSDEC’s Industrial Use and USEPA’s Industrial Soil PRGs most frequently, while measured concentrations of benzo(b)fluoranthene were most frequently above NYSDEC’s Unrestricted Use comparative criteria.

The seven cPAHs and 3 or 4-methylphenol were the only SVOCs that were found at levels above any of their respective soil cleanup objective levels. Each of the eight SVOCs was detected in at least one sample at a concentration above its NYSDEC’s Unrestricted Use criteria value. Benzo(b)fluoranthene exceeded its Unrestricted Use criteria value in eight samples. Benzo(a)pyrene and benzo(b)fluoranthene were the only two compounds to exceed NYSDEC’s Industrial Use values in any soil samples, while four of the cPAHs were detected at concentration above their respected Industrial Soil PRG levels in one or more samples.

---

<sup>5</sup> The “J” is a data qualifier that indicates that the concentration is estimated.

The 95<sup>th</sup> UCL computed for five of the cPAHs [i.e., benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene] were higher than NYSDEC's Unrestricted Use criteria value, while three surpassed USEPA's Industrial Soil PRGs, and only benzo(a)pyrene was higher than its NYSDEC Industrial Use criteria level.

Further review of the data indicates that the semivolatile organic compounds are generally found most frequently and at higher concentrations in the shallower soil samples. Based on the ditch soil sample results, it appears that higher concentrations are found exterior to the DRMO yard at locations that are upgradient of the AOC.

#### *Pesticides and Polychlorinated Biphenyls (PCBs)*

Fourteen pesticides and three polychlorinated biphenyls (PCBs) were found in one or more of the soil samples collected from SEAD-121C. The most frequently detected pesticide was endosulfan I, which is an insecticide and an acaricide<sup>6</sup> that is used extensively on crops and as a wood preserver. This analyte was found in 19 of the 78 sample locations characterized at SEAD-121C, with a maximum concentration of 185 µg/Kg. Other frequently detected pesticides included 4,4'-DDE, and 4,4'-DDT, present in 18, and 16 samples, respectively.

The most frequently detected PCB was aroclor-1254, which was found nine times; this analyte also exhibited the maximum concentration for PCBs in SEAD-121C, with a concentration of 930 µg/Kg. Aroclor-1260 was found in eight of the samples characterized.

Six pesticides (4,4'-DDD, 4,4'-DDE, 4,4'-DDT, aldrin, dieldrin and endrin) and aroclor-1254 and aroclor-1260 were found at concentrations that exceeded NYSDEC's Unrestricted Use cleanup criteria. The pesticides 4,4'-DDE (15 times) and 4,4'-DDT (11 times) were the pesticides most frequently found at concentrations above their respective Unrestricted Use values. Aroclor-1254 ranked third in the number of times it was detected in soil samples at concentrations above its Unrestricted Use cleanup objective. Aroclor-1254 was also the only pesticide or PCB compound that was detected above its Industrial Soil PRG value. None of the pesticides or PCBs were detected in soil samples at concentrations that exceeded their respective Industrial Use criteria values.

Review of the data also indicates that the pesticides and PCB compounds are found most frequently and at higher concentrations in the shallower soil samples. All but three (endrin, endrin ketone, and aroclor-1260) of the maximum concentrations detected for pesticides and PCBs in soils at SEAD-121C were found in the surface soil samples. The highest levels of the other three compounds were found in subsurface soil samples.

---

<sup>6</sup> Acaricide: a chemical agent used to kill mites, a pesticide.

*Metals and Cyanide (CN)*

Twenty-three metals were detected in one or more of the 78 soil sample locations collected from SEAD-121C. **Tables 6-1, 6-2, and 6-3** provide summary statistics and a summary of comparison of soil sample data to the three comparative cleanup criteria.

Fourteen metals (aluminum, arsenic, barium, calcium, chromium, copper, iron, lead, magnesium, manganese, nickel, potassium, vanadium, and zinc) were detected in every soil sample analyzed. The frequency of detection in samples for the remaining eight metals ranged from a low of 15% for thallium to a high of 97% for beryllium. A majority (14) of the maximum concentrations measured for the individual metals were found in shallow soil samples, while five maximum concentrations were found in the ditch soil samples, and four were found in subsurface soils.

Nine metals were found in one or more soil samples at concentrations that exceeded NYSDEC's Unrestricted Use comparative values. Of these metals, nickel was most frequently (52 times) found at concentrations above the Unrestricted Use criteria. Zinc was found at concentrations above the Unrestricted Use criteria second most frequently, followed by lead at third. All nine of the metals that surpassed NYSDEC's Unrestricted Use levels were found in surface soils; seven of the nine metals observed to surpass the Unrestricted Use criteria were observed at elevated concentrations in subsurface soil and ditch soil samples.

Two metals, arsenic and lead, were observed to exceed USEPA Industrial Soil PRG levels in soil samples, and only lead was observed to surpass NYSDEC's Industrial Use criteria value in soil samples collected from SEAD-1211C. Arsenic surpassed the Industrial Soil criteria value (1.59 mg/Kg) in 76 of the 78 sample locations characterized. Lead exceeded the USEPA's Industrial Soil PRG in five samples and NYSDEC's Industrial Use level in two samples.

**6.1.2 Groundwater Investigation**

Two temporary groundwater monitoring wells (i.e., MW121C-1 and MW121C-2) were installed and sampled using bailers during the EBS in 1998. During the RI, four permanent monitoring wells were installed, and two rounds (i.e., February and May of 2003) of groundwater samples were collected and analyzed at three of the permanent wells (MW121C-3, MW121C-4, and MW121C-6) using low flow sampling techniques. Samples could not be collected from the fourth permanent monitoring well (i.e., MW121C-5) during either of the 2003 sampling events because the well was dry. The locations of the monitoring wells are shown on **Figure 6-1**.

Analytical results collected during the EBS sampling event are not considered representative of the conditions that exist at the AOC because both wells were temporary installations, the wells were not fully developed and stabilized before sampling, and samples were collected using bailers. The collection of samples using bailers is likely to introduce silt and sediment into the samples analyzed, which can lead to exaggerated analyte concentrations due to the presence of materials sorbed onto the surface of the



entrained silt and sediment. The results of the EBS groundwater sampling did provide the basis for the installation of the permanent monitoring wells, and the use of the USEPA's recommended low-flow, purge and pump sampling process. Nevertheless, brief summaries of the EBS and RI sampling events are provided below. The RI results are discussed first, due to their higher degree of credibility.

**Appendix D Table 2** presents all of the groundwater data collected at SEAD-121C. **Table 6-4** summarizes the results for the 1998 EBS groundwater sampling event; **Table 6-5** provides a similar summary of results for the 2003 RI sampling events. Groundwater data developed for SEAD-121C were compared to federal and state criteria including New York State Class GA Groundwater Standards, federal Maximum Contaminant Levels (MCLs), federal Secondary Drinking Water Standards (SEC), and USEPA Region IX PRGs for tap water. The federal MCLs, SECs and the Region IX PRGs are considered TBC criteria because they pertain specifically to drinking water, and the groundwater at SEAD-121C is not used as a source of drinking water at the Depot. There is a separate municipal water distribution system within the PID area

#### *VOCs*

VOCs were not detected in groundwater samples characterized during the 2003 RI sampling program.

Seven VOCs (i.e., 1,4-dichlorobenzene, acetone, bromochloromethane, bromoform, carbon disulfide, chlorobenzene, and vinyl chloride) were detected in the groundwater samples collected during the EBS. All of the noted VOCs were each detected once. Summary statistics for the identified VOCs found in EBS groundwater samples are shown in **Table 6-4**.

The compound 1,4-dichlorobenzene, which was detected once at 36 µg/L at sample location MW121C-2 was the only VOC observed to exceed a promulgated standard (i.e., GA standard of 3 µg/L. Monitoring well MW121C-2 is located within the AOC and situated near the southwestern corner of the AOC. Four other VOCs (bromochloromethane, bromoform, chlorobenzene, and vinyl chloride) were also detected once in the sample collected from MW121C-2, but each of these analytes was present at a concentration less than any identified standard.

#### *SVOCs*

Two SVOCs, bis(2-ethylhexyl)phthalate and di-n-butylphthalate were each detected once during the 2003 RI groundwater sampling events. Neither SVOC exceeded its respective GA standard or USEPA's Region IX PRGs for tap water. Both of the concentrations measured for these compounds were detected at levels slightly above their respective detection limits.

Eight SVOCs [i.e., bis(2-ethylhexyl)phthalate, butylbenzylphthalate, diethylphthalate, di-n-butylphthalate, fluorene, hexachlorobutadiene, phenanthrene, and pyrene] were detected in the groundwater samples collected during the EBS at SEAD-121C. None of the compounds identified exceeded state or federal standards.

### *Pesticides and PCBs*

No pesticides or PCBs were detected in groundwater samples collected from the permanent wells during the RI (**Table 6-5**).

Nineteen pesticides were detected in one or two of the groundwater samples collected during the EBS; PCB congeners were not identified in any groundwater sample collected during the EBS. Summary statistics for the identified pesticides and PCBs found during the EBS groundwater sampling event are shown in **Table 6-4**.

Seven pesticides (i.e., 4,4'-DDD, 4,4'-DDT, alpha-BHC, beta-BHC, delta-BHC, dieldrin, and heptachlor epoxide) were found at concentrations exceeding their respective GA standard in both of the EBS groundwater samples collected. Two other pesticides (i.e., 4,4'-DDE and heptachlor) were found at concentrations exceeding their respective GA standard once each. The exceedance of heptachlor was detected in monitoring well MW121C-1, while the exceedance of the GA standard for 4,4'-DDE was observed in the groundwater sample collected from well MW121C-2. The maximum concentration of dieldrin (0.2 J µg/L) was 50 times its GA standard (0.004 µg/L); the maximum concentration of beta-BHC (0.33 J µg/L) was eight times greater than its GA standard (0.04 µg/L); the maximum concentration of delta-BHC (0.16 J µg/L) was four times its GA standard (0.04 µg/L); the maximum concentrations of heptachlor (0.14 J µg/L) and 4,4'-DDD (0.81 J µg/L) were approximately three times their respective GA standard (0.04 µg/L and 0.3 µg/L, respectively).

### *Metals and Cyanide*

Nineteen metals (identified below) were detected in samples collected from the permanent wells at the DRMO Yard during the RI. Summary statistics for the identified metals found during the RI groundwater sampling events are shown in **Table 6-5**.

Aluminum, antimony, iron, manganese, and sodium exceeded their respective groundwater standard in two or more of the groundwater samples characterized during the RI sampling events. None of the groundwater concentrations measured for metals exceeded USEPA's Region IX PRGs for tap water.

**Figure 6-2** graphically summarizes where, and during which sampling event, the noted exceedances of groundwater standards for metals occurred. Aluminum exceeded the secondary standard (SEC) of 50 µg/L in four samples; three of these occurred during the February 2003 sampling event, with the fourth occurring during the May 2003 sampling event. Antimony exceeded the GA standard twice during the February 2003 sampling round. Iron exceeded its GA standard three times; twice during the February 2003 sampling event, and once in May 2003. Sodium exceeded its GA standard in three samples; twice in February and once in May 2003. Manganese exceeded its GA standard once during the February 2003 sampling event, in one member of a sample-duplicate pair; the average for the two samples was less than the GA standard (i.e., 286 µg/L). Sample results reported for samples collected in February 2003 were

higher than the results from the round conducted in May 2003, which is likely due to more complete stabilization of the water in the wells and seasonal variation.

### 6.1.3 Surface Water Investigation

No permanent surface water body is located within the bounds of the DRMO Yard. Drainage ditches are located exterior of SEAD-121C, along the southern and northwestern bounds. The man-made drainage culverts convey storm and snow-melt runoff waters away from land located within the SEDA's former administrative, maintenance and warehousing areas, which are located to the north-northeast, east, and south-southeast, of SEAD-121C to Kendaia Creek that is located to the west. Land within the DRMO Yard is sloped towards the bordering drainage ditches so runoff from the site flows into these ditches as well. Surface water flow in the abutting drainage ditches is an episodic event, and thus, there is no NYSDEC designation assigned to surface water (i.e., runoff) found in the channels.

Surface water samples were collected from 10 locations during the SEAD-121C RI; nine of these samples were collected exterior to the DRMO Yard, while the last was collected from a puddle that accumulated after a storm event. Summary statistics for the surface water analyses are shown in **Table 6-6**. Surface water data were compared to New York State's Class C Ambient Water Quality Standards (AWQS) and to the USEPA's Region IX PRGs for tap water for comparative purposes. All analytical results for surface water samples collected from SEAD-121C are presented in **Appendix D Table 3**.

#### *VOCs*

VOCs were not detected in any of the surface water samples collected and characterized from the vicinity of the DRMO Yard.

#### *SVOCs*

Bis(2-ethylhexyl)phthalate was detected in one sample collected from location, SWDRMO-2, at a concentration of 4.2 J  $\mu\text{g/L}$ . SWDRMO-2 is located upgradient of, exterior to, and southwest of the AOC in drainage ditch #2. Surface water found at this location originates from locations to the east and southeast of SEAD-121C, the DRMO Yard. This value exceeds the NYSDEC Class C AWQS (i.e., 0.6  $\mu\text{g/L}$ ), but is below USEPA's Region IX PRG for tap water.

#### *Pesticides and PCBs*

Pesticides and PCBs were not detected in the surface water collected from locations in the vicinity of the DRMO Yard.

### *Metals and Cyanide*

Twenty-two metals were detected in surface water samples collected from the vicinity of the DRMO Yard. Summary statistics for the identified metals found during the RI surface water sampling event are shown in **Table 6-5**.

Ten metals (i.e., aluminum, barium, calcium, copper, iron, lead, magnesium, potassium, sodium, and zinc) were detected in every sample analyzed; two others (i.e., arsenic and selenium) were observed in one sample each. Eleven metals (aluminum, cadmium, cobalt, copper, iron, lead, manganese, mercury, nickel, silver, vanadium, and zinc) exceeded their respective Class C AWQS for surface water. Lead exceeded its Class C criteria in every sample analyzed, while aluminum and iron was found above their respective Class C criteria value in five samples each. All the other metals listed were found at concentrations above their respective Class C criteria value in two samples, apiece. Six metals (arsenic, cadmium, iron, manganese, thallium, and vanadium) exceeded their respective Region IX PRGs for tap water. Iron and thallium concentrations exceeded the Tap Water criteria values in two samples each, while the other four metals were observed at concentrations above their respective Tap Water PRG values in one sample each.

Locations where metal exceedances of NYSDEC's Class C AWQSs or Region IX PRGs are observed are shown on **Figure 6-3**.

The surface water sample collected from location SWDRMO-2 contained the maximum concentration recorded for metals in surface water for 18 of the 22 metals detected in samples. Location SWDRMO-2 is upgradient of, exterior to, and southwest of the AOC. Surface water concentrations found for 13 metals in this sample also exceeded their respective Class C AWQSs, Regions IX PRGs for Tap Water or both criteria. The location immediately downstream of SWDRMO-2 (i.e., SWDRMO-3) contained the next highest number of metal exceedances of the Class C AWQSs and Region IX PRGs for tap water for 11 metals, and the second highest measured concentrations found in surface water samples for 16 metals; it also contained the highest reported concentrations of calcium and potassium reported in surface water for the AOC. These results suggest that the source of most of the metals observed in the bordering southern drainage culvert originate upgradient and decrease as they move past the AOC, probably due to dilution effects.

Only aluminum, iron, lead, and thallium were detected in samples from locations other than SWDRMO-2 and SWDRMO-3 at levels greater than Class C or Region IX PRGs.

## **6.2 SEAD-121I, THE RUMORED COSMOLINE OIL DISPOSAL AREA**

Samples of surface soil, ditch soil and surface water were collected and analyzed as part of the EBS and RI at SEAD-121I, the Rumored Cosmoline Oil Disposal Area. The sampling and analyses were performed in 1998 (EBS) and between 2002 and 2003 (RI); the results of this effort were reported in the

RI Report (Parsons, 2006). The combined analytical results of the EBS and the RI are summarized and discussed below.

### 6.2.1 Soil Investigation

Fifty-five samples and duplicates were collected from 5 soil boring, 34 surface soil, and 12 ditch soil locations and analyzed as part of the investigation of soil at SEAD-121I. As the exact operating practices used at the Rumored Cosmoline Oil Disposal Area are unknown, the implemented soil investigation included the collection and analysis of soil samples from within the AOC and beyond the defined bounds of the AOC to identify areas of impacted soil. Four surface soil samples and two ditch soil samples were collected during the EBS. Thirty surface soil samples, 10 ditch soil samples, and five shallow soil samples from soil borings were collected during the RI. **Figure 6-4** shows the locations where the soil and ditch soil samples were collected. The results for all 51 of the soil sample locations are discussed together as field observations indicate that all of these environmental “media” are equivalent in characteristic and nature. Generally, the ditch soil samples were collected from locations on the AOCs surface where erosion channels were observed due to surface water flow off the AOC’s surface to the underlying storm sewer locations. Similarly, the soil boring sampling was terminated at relatively shallow depths because bedrock was encountered very close to the grounds surface throughout the AOC.

**Table 6-6** presents a summary of all of the samples results compared versus USEPA Region IX Industrial Soil PRGs and New York’s Unrestricted, Commercial, and Industrial Use Soil Cleanup objectives. The full results for soil samples are provided in **Appendix D Table 4**.

#### *Volatile Organic Compounds (VOCs)*

Eight VOCs were detected in the soil samples analyzed. The eight VOCs detected included: acetone, benzene, ethyl benzene, meta/para xylene, methyl ethyl ketone, methylene chloride, ortho xylene, and toluene. **Table 6-6** presents summary statistics for the soil samples and compares the results to four different cleanup criteria.

Acetone was the VOC most frequently detected, present in 36 of the samples characterized. The highest reported concentration for acetone was 150 µg/Kg. Acetone was the only VOC that was observed to exceed any of the comparative cleanup criteria evaluated; it was found at concentrations in excess of NYSDEC’s Unrestricted Use cleanup level in three of the samples characterized. The 95<sup>th</sup> UCL computed for acetone also exceeded NYSDEC’s Unrestricted Use criteria value for soil. Acetone is a common laboratory contaminant and the level found in most of the soil samples characterized are within the range that is considered to be associated with laboratory contamination. It is also noted that acetone is an artifact of the soil sample collection, preservation, and preparation procedure used for these samples.

Each of the remaining VOCs was observed in fewer than 25 percent of the samples and at relatively low concentrations. None of the measured concentrations exceeded any of NYSDEC’s or USEPA’s comparative criteria. The maximum concentration measured for benzene was 41 µg/Kg. The maximum

concentration measured for toluene was 31 µg/Kg, and the maximum concentration measured for all other VOCs was below 10 µg/Kg.

#### *Semivolatile Organic Compounds (SVOCs)*

Twenty-eight semivolatile organic compounds (SVOCs), including PAHs, the cPAHs, and mixed phthalates, were detected in the surface soil samples collected from SEAD-121I. **Table 6-7** presents summary statistics developed for the SVOCs found in surface soil samples, as well as results for the comparison of sample data to cleanup criteria.

Four of the SVOCs (benzo(b)fluoranthene, fluoranthene, phenanthrene and pyrene) were each found in 48 of the 51 samples analyzed. Conversely, five SVOCs (3,3-dichlorobenzidine, di-n-octylphthalate, isophorone, nitrobenzene, and phenol) were only found once, each collocated in the sample collected from location SD121I-7. Generally, the seven cPAH compounds were found most frequently in the soil samples, while the phthalates were generally detected least frequently.

The seven cPAHs [i.e., benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene] were the only SVOCs observed to exceed their respective state and federal cleanup criteria levels. Generally, benzo(a)pyrene exceeded its comparative criteria most frequently, found at concentrations above USEPA's Industrial Soil PRG 30 times, NYSDEC's Unrestricted and Commercial Use criteria 15 times, and NYSDEC's Industrial Use Criteria 14 times.

Each of the cPAHs was found at a concentration that exceeded NYSDEC's Unrestricted Use criteria in at least nine of the 51 sample locations characterized, and concentrations reported for benzo(k)fluoranthene and chrysene were found at levels above their respective Unrestricted Use criteria values 16 times. The 95<sup>th</sup> UCL values computed for each of the seven cPAH compounds based on the collected soil samples from SEAD-121I also surpassed their respective Unrestricted Use cleanup criteria values. Five of the cPAHs were also observed to exceed NYSDEC's Commercial and Industrial Use criteria in at least one of the samples characterized, while six (all but chrysene) were found at concentrations above USEPA's Industrial Soil PRGs. Four of the computed 95<sup>th</sup> UCL values [i.e., benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene] computed based on the collected data surpassed their respective Commercial Use cleanup objectives, and the 95<sup>th</sup> UCL values computed for benzo(a)pyrene and dibenz(a,h)anthracene also surpassed NYSDEC's Industrial Use values. Five of the 95<sup>th</sup> UCL concentrations computed for cPAHs [i.e., benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene] surpassed their respective Industrial Soil PRG values.

#### *Pesticides and PCBs*

Seven pesticides and two PCBs were detected in the soils at SEAD-121I (see **Table 6-6**). Frequency of detection for pesticides ranged from a low of 4% for dieldrin and endrin to a high of 53% for

endosulfan I. Most of pesticides detected were found at locations along the edge of Avenue C and Avenue D at low concentrations. Pesticides and PCBs were not detected in the downgradient ditch soil locations. Endosulfan I was the pesticide compound found most frequently, present in 24 of the 45 samples characterized. All of the other pesticides and PCBs were found in fewer than nine samples analyzed.

None of the pesticides or PCBs detected in the soil samples from SEAD-121I were found at concentrations that exceeded their respective Industrial Soil PRG value or their respective Commercial or Industrial Use cleanup objectives. Five of the pesticides were detected at concentrations in one or more samples that exceeded their respective Unrestricted Use cleanup criteria. 4,4'-DDE was found at concentrations above NYSDEC's Unrestricted Use criteria in five samples, followed by aldrin in three samples, 4,4'-DDT and dieldrin in two samples and endrin in one sample. The 95<sup>th</sup> UCL value computed for four of the pesticides (all except endrin) that showed individual sample exceedances for samples also surpassed their respective Unrestricted Use criteria levels.

#### *Metals and Cyanide*

Twenty-three metals plus cyanide were detected in the soil samples collected at or around SEAD-121I. **Table 6-6** presents summary statistics developed for the soil samples.

Thirteen metals (aluminum, arsenic, calcium, chromium, cobalt, iron, lead, magnesium, manganese, nickel, potassium, vanadium, and zinc) were detected in all samples. The frequency of detection for the remaining ten detected metals ranged from a low of 14% for silver to a high of 96% for beryllium and mercury. Cyanide was detected with a frequency of 8%.

Ten metals (arsenic, cadmium, chromium, copper, lead, manganese, nickel, selenium, silver, and zinc) found in soils at SEAD-121I were found at concentrations that exceeded their respective NYSDEC Unrestricted Use in at least three samples each. Nickel (17 times) was the metal observed to exceed its Unrestricted Use cleanup objective most frequently, followed by zinc (14 times) and manganese (11 times). The 95<sup>th</sup> UCL values computed for eight of the ten metals (all except cadmium and lead) observed to be present in individual samples within the AOC also exceeded their respective Industrial Soil PRG criteria levels.

Three metals (arsenic, manganese and thallium) were detected at concentrations that exceeded EPA PRGs for Industrial soil in at least one sample. Of these metals, arsenic was found at concentrations above its Industrial Soil PRG in 34 samples while the other two metals were found at elevated concentration in four or fewer samples, each. The 95<sup>th</sup> UCL of the mean computed for arsenic and manganese exceeded their respective Industrial Soil PRGs. Similarly, three metals (arsenic, manganese and nickel) were also detected at concentrations that exceeded NYSDEC's Commercial Use in one or more samples. Manganese exceeded its commercial Use criteria value most frequently (6 times). Arsenic and manganese were also detected in some samples at levels that exceeded NYSDEC's Industrial Use cleanup objectives. Manganese was again found at concentrations above its Industrial Use cleanup criteria value

in six samples. The 95<sup>th</sup> UCL computed for arsenic and manganese also exceeded their respective Commercial and Industrial Use cleanup criteria.

Manganese (310,000 mg/Kg), calcium (298,000 mg/Kg) and iron (58,400 mg/Kg), respectively, were the metals that exhibited the highest single sample concentrations in soil samples collected at SEAD-121I. Most of the higher concentrations observed for iron and manganese were found collocated in samples collected in the immediate vicinity of the two strategic ferro-manganese ore piles, while most of the higher concentrations of calcium were observed in samples at locations away from the two ore piles. **Figure 6-5** presents the distribution of iron and manganese found in soils at SEAD-121I.

Site observations and historic records note the long-term staging of a strategic stockpile of ferrous-manganese ore in the second and fourth blocks at SEAD-121I, in close proximity of where the elevated iron and manganese concentrations are found. As such, the stockpiles are presumed to be the source of the elevated levels of these metals in the AOC soils. **Figures 6-6** and **6-7** also show that many of the elevated concentrations of arsenic, chromium, thallium and zinc that are observed at SEAD-121I, are also located in close proximity to the ore piles.

### 6.2.2 Surface Water Investigation

Seven surface water samples were collected and analyzed as part of the investigation of SEAD-121I. Results of the surface water analyses were compared to State of New York ambient water quality standards for Class C surface waters and USEPA's Region IX PRGs for tap water. **Table 6-7** presents summary statistics developed for the surface water samples and compares the results to regulatory criteria values. The full data for surface water samples collected from SEAD-121I are provided in **Appendix D Table 5**.

#### *VOCs*

VOCs were not detected in the surface water at SEAD-121I.

#### *SVOCs*

Two SVOCs were detected in the surface water at SEAD-121I. Butylbenzylphthalate was detected in one sample at the northwestern corner of SEAD-121I, SW121I-10, at a maximum concentration of 1.1 J µg/L. Fluoranthene was also detected at a maximum concentration of 1.1 J µg/L in one sample, SW121I-6, located inside SEAD-121I. Neither of these values exceeded their respective Tap Water PRG value. There are no Class C surface water criteria for these compounds.

#### *Pesticides and PCBs*

Pesticides and PCBs were not detected in the surface water samples collected from SEAD-121I.



*Metals*

Eighteen metals were detected in the surface water at SEAD-121I; of the 18 metals, seven (i.e., aluminum, calcium, magnesium, manganese, potassium, sodium, and zinc) were found in every sample (see **Table 6-7**). Four of the identified metals [aluminum (3 times), iron (2 times), lead (4 times), and zinc (1 time)] exceeded their respective AWQS Class C standards. None of the surface water concentrations measured exceeded the USEPA's Region IX PRG for tap water. Aluminum and zinc were detected in all seven samples, iron was detected in five samples, and lead was detected in four samples. The maximum detections of aluminum, iron, lead, and zinc (2,050 µg/L, 3,410 µg/L, 26.3 µg/L, and 190 µg/L, respectively) were collocated at SW121I-6, which is located immediately north of the southern ore pile inside SEAD-121I. The second highest concentrations of aluminum, iron, and lead (1,490 µg/L, 3,080 µg/L, and 21 µg/L, respectively) were found at SW121I-10, which is located north of the northern ore pile within the boundary of SEAD-121I. The locations where metals exceeded their respective AWQS are shown on **Figure 6-8**.

Based on the data, the Army has concluded that hazardous substances do exist at both of the AOCs at concentrations above defined cleanup objectives and occasionally standards. There is no strong and direct correlation between the hazardous substances found in AOC-specific soils and groundwater as no definitive plumes have been identified at SEAD 121C, and no groundwater was encountered at SEAD-121I. There is some evidence that identified hazardous substances have been mobilized by overland flow of storm-event water.

## 7 SUMMARY OF HUMAN HEALTH AND ECOLOGICAL RISKS

Human health and ecological risk assessments were performed for SEAD-121C and SEAD-121I using the analytical data developed during the EBS and the RI of the AOCs, summarized above, and fully reported in the RI Report (Parsons, 2006).

### 7.1 **METHODOLOGY**

#### 7.1.1 **Human Health Risk Assessment**

The baseline human health risk assessments were conducted in accordance with the USEPA's *Risk Assessment Guidance for Superfund (RAGS)* (USEPA, 1989) and the supplemental guidance and updates to the RAGS. Technical judgment, consultation with USEPA staff, and recent publications were used in the development of the risk assessment. The overall objective of the baseline human health risk assessment was to assess potential risks to current and reasonably anticipated future human receptors resulting from the release of, and exposure to, hazardous substances at SEAD-121C and SEAD-121I. The results of the risk assessment were used to identify whether a corrective action may be warranted at the AOCs.

The reasonable maximum exposure (RME) was evaluated during the human health risk assessment. The human health risk assessment methodology is shown in **Figure 7-1**. A four-step process was used for assessing site-related human health risks for RME and CT exposure scenarios:

- *Hazard Identification* – identified the contaminants of concern based on several factors such as toxicity, frequency of occurrence, and concentration;
- *Exposure Assessment* – estimated the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways by which humans are potentially exposed;
- *Toxicity Assessment* – determined the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response); and
- *Risk Characterization* – summarized and combined the outputs of the exposure and toxicity assessments to provide a quantitative assessment of site-related risks (for example, one-in-a-million excess cancer risk).

As part of the Exposure Assessment component of the risk assessment, conceptual site models were developed for both AOCs which considered the COCs identified at the AOC, the media affected, the most probable future receptors, and the duration each receptor would be exposed to hazardous substances identified in the area.

### 7.1.1.1 Carcinogenic and Non-Carcinogenic Effects

Under current USEPA guidelines, the likelihood of carcinogenic and non-carcinogenic effects due to exposure to site-related chemicals is considered separately. Non-carcinogenic risks were assessed by the calculation of a Hazard Index (HI), which is an expression of the chronic daily intake of a chemical divided by its safe or Reference Dose (RfD). An HI that exceeds 1.0 indicates the potential for non-carcinogenic effects to occur. Carcinogenic risks were evaluated using a cancer Slope Factor (SF), which is a measure of the cancer-causing potential of a chemical. Slope Factors are multiplied by daily intake estimates to generate an upper-bound estimate of excess lifetime cancer risk. For known or suspected carcinogens, USEPA has defined an acceptable cancer risk range of  $10^{-4}$  to  $10^{-6}$  (one-in-ten thousand to one-in-one million) or less.

### 7.1.1.2 Evaluation of Lead Exposure

Lead was identified as a COC in surface soil, subsurface soil, ditch soil, and surface water at SEAD-121C, and from ditch soil, surface soil and surface water at SEAD-121I.

Surface water has elevated levels of lead; however quantification of dermal exposure to lead in surface water could not be completed since a model is not currently available to quantify such risk and exposure. Due to the episodic nature of surface water flow through the drainage ditches that are exterior to SEAD-121C and SEAD-121I, human exposure to surface water is expected to be infrequent and therefore potential risks are expected to be minor.

Risk associated with lead in surface and ditch soils were evaluated using the *Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil* (USEPA, 2003b) for the industrial worker. The central tendency exposure factors for industrial workers were used to evaluate potential risks associated with lead in soil. The industrial worker was assumed to accidentally intake 50 mg of soil each day while working at the SWMU for 219 days each year. This assumption is consistent with the default assumptions used in the adult lead model (USEPA, 2003b).

This model provides an assessment of non-residential exposure by relating soil lead intake to blood lead concentrations in women of childbearing age. The methodology focuses on estimating fetal blood lead levels in women exposed to site soils. It should be noted that the adult lead model is based on the assumption of continuing long-term exposure. As construction workers are expected to work at the site for only a short-term (i.e., approximately 1 year), risk associated with lead exposure is expected to be minor and therefore it was not evaluated in the risk assessment.

For an adolescent trespasser, the Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK) developed by USEPA was used to evaluate receptor lead level via exposure to surface soil and ditch soil at SEAD-121C. The IEUBK model results, based on residential exposure assumptions, can only be used as a screening tool as the exposure frequency for the adolescent trespasser is much less than

the residential child. In addition, a child receptor is considered more sensitive than an adolescent receptor. The IEUBK windows version software package was developed based on the IEUBK Guidance Manual (USEPA 1994). The model utilizes four interrelated modules (exposure, uptake, biokinetic, and probability distribution) to estimate blood lead (PbB) levels in children exposed to lead-contaminated media.

For the industrial worker and the adolescent trespasser, the AOC-specific exposure point concentrations (EPCs) and CT exposure factors were used along with the default assumptions presented in the models to derive the lead level estimation for the receptors. Risk characterization for lead exposure was conducted based on a comparison between the estimated blood lead level and the target PbB level of concern. Blood lead level was estimated based on the USEPA IEUBK model or the Adult Lead Model. The target PbB level of concern is 10.0 micrograms per deciliter ( $\mu\text{g/dL}$ ) for a child (USEPA, 1994, 2003b).

### 7.1.2 Screening Level Ecological Risk Assessment (SLERA)

Screening-level ecological risk assessments (SLERAs) were also performed for SEAD-121C and SEAD-121I to evaluate whether hazardous substances found at either of the AOCs have the potential to cause adverse effects to ecological resources. The SLERAs were conducted in accordance with several USEPA and NYSDEC guidance documents including *Ecological Risk Assessment Guidance for Superfund (ERAGS): Process for Designing and Conducting Ecological Risk Assessments* (USEPA, 1997), *Guidelines for Ecological Risk Assessment* (USEPA, 1998), *Fish and Wildlife Impact Analysis* (NYSDEC, 1994b), and *The Role of Screening-Level Risk Assessments and Refining Contaminants of Concern in Baseline Ecological Risk Assessments* (USEPA, 2001).

The current USEPA (1997) ecological risk assessment paradigm includes eight general steps:

1. Screening-Level Problem Formulation and Ecological Effects Evaluation;
2. Screening-Level Exposure Estimate and Risk Calculation;
3. Baseline Risk Assessment Problem Formulation;
4. Study Design and Data Quality Objective (DQO) Process;
5. Field Verification of Sampling Design;
6. Site Investigation and Analysis Phase;
7. Risk Characterization; and
8. Risk Management.

The ecological risk assessments completed for SEAD-121C and SEAD-121I included a screening-level ecological risk assessment (SLERA, Steps 1 and 2) and further refinement of chemicals of concern (COCs) (Step 3.2). Step 3.2, COC refinement, was performed in accordance with the USEPA's ERAGS (1997) and the supplemental guidance of ERAGS (USEPA, 2001). The SLERA process is summarized in **Figure 7-2**.

Upon completion of screening-level Ecological Risk Assessment (ERA) Step 2, there is a Scientific Management Decision Point (SMDP) with four possible decisions according to the ERAGS (USEPA, 1997) and the supplemental guidance (USEPA, 2001):

- There is adequate information to conclude that ecological risks are negligible and therefore there is no need for remediation on the basis of ecological risks;
- The information is not adequate to make a decision at this point and the ERA process should continue to a baseline ERA;
- The information indicates a potential for adverse ecological effects, and a more thorough assessment is warranted; or
- In cases where contamination has sharply defined borders or where the extent of contamination is limited, it may be preferable to cleanup the area to the screening values rather than spending time and resources determining a less conservative cleanup number.

The results of the SLERA indicate which contaminants found at the AOC can be eliminated from further consideration and which should be evaluated further. The refinement of COCs helps streamline the overall ERA process by considering additional components early in the baseline ERA. The results of the ecological risk assessment presented will be used to determine the need for further study. The baseline ERA, if conducted, will further evaluate potential or actual adverse ecological effects associated with site-related contaminants and results will be used to develop appropriate remedial measures, if required.

#### **7.1.2.1 Ecological Conceptual Model**

Preliminary CSMs were developed separately for both AOCs. Each CSM provided an overall assessment of the primary and secondary sources of contamination at the AOCs, and the corresponding release mechanisms and affected media. Potential sources of contamination; potentially complete exposure pathways; and, ecological receptors are depicted in the CSM.

A complete exposure pathway consists of a source and mechanism of contaminant release, a transport mechanism for the released contaminants, a point of contact, and a route of contaminant entry into the receptor. If any of these elements is missing, the pathway is incomplete. In addition, potential receptors were identified to allow evaluation of potentially complete pathways.

For most terrestrial receptors, soil exposure intervals are limited to the upper 2 feet of the soil column. For purposes of this SLERA, surface soil was defined as the 0-2 ft. below ground surface (bgs). Surface and subsurface soil (0-4 ft. bgs, hereafter referred to as total soil) may be uncovered during future excavation activities and therefore, may result in contaminants in the soil becoming available for contact. Therefore, exposure to total soil (0-4 ft. bgs) was also evaluated in the SLERAs.

Ecological receptors are not directly exposed to contaminants in groundwater.

There are no permanent lakes, ponds, streams or wetlands in SEAD-121C or SEAD-121I. Exposure to ditch soil and surface water was evaluated for wildlife receptors identified for the two SLERAs.

### 7.1.2.2 Identification of Ecological COPCs

Chemicals of potential concern (COPCs) were identified by comparing the maximum detected concentrations in each impacted medium at each AOC to ecological risk-based screening values. For each data set selected, the maximum detected concentration was compared to the ecological screening value. For soil, the maximum detected concentration of all results (including surface and subsurface soil results) was used for the screening purposes, and the COPCs identified were used for both the surface soil and the total soil data sets. The ecological screening values are based on conservative (i.e., environmentally protective) generic values derived by various agencies. In brief, the following sources (cited in order of preference) were consulted for screening value selection for soil:

- USEPA (2000a, 2003c, 2005) Ecological Soil Screening Levels;
- USEPA Region III (1995) Biological Technical Assistance Group (BTAG) Screening Levels;
- USEPA Region V (2003) Ecological Screening Levels;
- Oak Ridge National Laboratory (ORNL) Screening Benchmarks for Soil and Litter Invertebrates and Heterotrophic Process (Efroymsen et al., 1997a), and Terrestrial Plants (Efroymsen et al., 1997b);
- Canadian Environmental Quality Guidelines developed by the Canadian Council of Ministers of the Environment (2003); and
- Circular on Target Values and Intervention Values for Soil Remediation developed by the Netherlands (2000).

For surface water, the New York State Ambient Water Quality Standards (NYS AWQS) and Guidance Values for Class C surface water and the National Recommended Water Quality Criteria (USEPA, 2004) (whichever is lower) were used as screening values. If screening values are not provided by either of the above documents, the USEPA Region III (1995) BTAG screening levels were used for the screening.

Constituents with maximum detected concentrations exceeding the corresponding screening values were retained as COPCs. With the exception of the nutrients (i.e., calcium, magnesium, potassium, and sodium), constituents with no screening values available were retained as COPCs. In addition, all bioaccumulative compounds identified in the report *Bioaccumulation Testing and Interpretation for the Purpose of Sediment Quality Assessment* (USEPA, 2000b) as important bioaccumulative compounds were retained as COPCs as a conservative approach, which is consistent with the ecological risk assessment guidance set forth by USEPA for the Mid-Atlantic Hazardous Site Cleanup program.

### 7.1.2.3 Receptors

The following species were selected as ecological receptors for SEAD-121C and SEAD-121I.

- Deer mouse (*Peromyscus maniculatus*);
- Short-tail shrew (*Blarina brevicauda*);

- Meadow vole (*Microtus pennsylvanicus*);
- Red fox (*Vulpes vulpes*);
- American robin (*Turdus migratorius*); and
- Great blue heron (*Ardea herodias*).

#### 7.1.2.4 Screening-Level Effects Evaluation

The SLERA for mammalian and avian receptors was conducted by comparing potential exposures to COPCs to screening ecotoxicity values (SEVs). SEVs for those analytes identified as COPCs were derived from studies reported in the literature, in the absence of site-specific data, by establishing data selection criteria such that SEVs would be as relevant as possible to assessment endpoints at the sites. In accordance with USEPA guidance (1997), the lowest available, appropriate toxicity values were used with modifying factors to ensure a conservative (i.e., health protective) screening-level evaluation.

#### 7.1.2.5 Screening-Level Exposure Estimate

Estimates of contaminant exposures, expressed as daily dose ingested of contaminated food items (i.e., plants, invertebrates, and animals) and media, were calculated to compare potential wildlife exposures to adverse effect levels. COPC daily dose ingested (expressed as the mass of COPC ingested per kilogram body weight per day) depends on the COPC concentration in food items and media, the receptor's trophic level, the trophic level of food items, and the receptor's ingestion rate of each food item and media.

USEPA (1993b, 1999b, and 2005) has provided a variety of exposure information for numerous avian and mammalian species. Data are directly available for body weights of various species. Similarly, information regarding feeding rates, and dietary composition, including incidental soil ingestion, are also available for many species. Such exposure parameters were compiled for the selected receptor species (i.e., deer mouse, short-tailed shrew, meadow vole, red fox, American robin, and great blue heron). Feeding rates for receptors were based upon USEPA (1999b, 2005) or allometric equations presented in Nagy (1999). Literature values for diet fraction and body weights were taken from USEPA (1993b, 1999b, 2005).

For the screening-level exposure estimate, site foraging frequency factors for all receptors were assigned as 1, in accordance with the USEPA (1997) guidance. That is, all receptors were assumed to be exposed 100% of the time to the COPCs at the AOC. This is a very conservative assumption as most receptors will spend at least part of the time outside of the AOC boundaries, either by having a larger home range than the AOC area, seasonal migration patterns, and/or winter dormancy periods. For example, the red fox has a much larger foraging range than the size of either SEAD-121C or SEAD-121I (i.e., over 200 acres vs. approximately 5 and 34 acres, respectively), yet the SLERA assumes that the fox spends all of its time at SEAD-121C or 121I.

The soil-to-plant uptake factors and soil-to-soil invertebrate uptake factors were obtained from the "Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities"

(USEPA 1999b). Small mammal bioaccumulation factors were obtained from published literature or were calculated based on chemical-specific partitioning coefficients provided in the literature.

The exposure point concentration (EPC) evaluated for each soil COPC was determined based on the maximum detected concentration, in accordance with the USEPA (1997) guidance.

#### **7.1.2.6 Screening-Level Risk Calculation**

For wildlife receptors, the risk calculation step uses the results of the wildlife exposure and toxicity effects assessments to calculate a hazard quotient for each COPC. A hazard quotient (HQ) is a ratio of the estimated exposure dose (for mammal and bird receptors) of a contaminant to the SEV. Generally, the greater this ratio or quotient, the greater the likelihood of an effect. A HQ less than 1 indicates that the contaminant alone is unlikely to cause adverse ecological effects. Because conservative (i.e., health protective) estimates of potential chronic exposures and toxicity were used, screening-level HQs tend to overestimate actual risks. Cumulative effects of COPCs were not quantitatively evaluated in this SLERA.

For the screening level ERA, NOAEL toxicity values, the maximum detected COPC concentrations, and conservative exposure assumptions were used to calculate the screening level HQs. Each of these assumptions adds to the conservative nature of the HQ calculated.

#### **7.1.2.7 Further Refinement of Chemicals of Concern**

Due to the conservative nature of the assumptions used in the screening-level ecological risk assessment, additional evaluation was completed to refine the contaminants of concern. The refinement of COCs streamlines the overall ERA process to determine if further evaluation is warranted. Lines of evidence (COC refinement) evaluated include:

- COC detection frequency;
- Risk results based on reasonable site average concentration and/or LOAEL SEVs;
- Size of site relative to foraging area of receptors;
- Site risk relative to background risk;
- Relative uncertainties of SLERA results;
- Sufficiency and quality of literature toxicity data and experimental designs;
- Strength of cause/effect relationships; and
- Quality of habitat for receptors.

Alternative toxicity values and mean exposures based on mean concentrations of contaminants detected in a media at an AOC were considered for the refinement of COCs. Other factors used to compute the screening level HQs (i.e., relative bioavailability, the site foraging frequency factor, and the NOAEL/LOAEL multiplier) were also conservative estimations.



*Relative Bioavailability*

The relative bioavailability of contaminants found at SEAD-121C and SEAD-121I were assumed to be 100% during the SLERA. However, contaminants in environmental media are generally less available to biological organisms compared with the same contaminants in the experimental medium (i.e., diet, water, etc.).

*Site Foraging Frequency Factor*

The site foraging frequency factors (or area-use factors) were assumed to be 1 for the mammalian receptors, and 100% for the avian receptors for the avian receptors at both AOCs. That is, the receptors were assumed to live within each AOC at all times, and not range or forage beyond the boundaries of the AOC being evaluated. Again, this is a very conservative assumption as most ecological receptors will spend at least part of the time outside of the AOC boundaries, either by having a larger home range than the AOC area, seasonal migration patterns, and/or winter dormancy periods.

A site foraging frequency factors of 0.025 would be more appropriate for the red fox for SEAD-121C. Similarly, a site foraging frequency factor of 0.5 would be a more appropriate estimate for the American robin or great blue heron.

*NOAEL/LOAEL Multiplier*

A NOAEL is preferred to a LOAEL as a screening ecotoxicity value to ensure that risk is not underestimated (USEPA, 1997). However, NOAELs currently are not available for many groups of organisms and many chemicals. When a LOAEL value, but not a NOAEL value, is available from the literature, a standard practice is to multiply the LOAEL by a NOAEL/LOAEL multiplier (0.1) and to use the product as the NOAEL for the screening evaluation. Although a NOAEL/LOAEL multiplier of 0.1 was used, the true NOAEL may be only slightly lower than the experimental LOAEL, particularly if the observed effect is of low severity (Sample et al., 1996). The data review referred to in the ERAGS that is used to support the use of 0.1 as the NOAEL/LOAEL multiplier indicates that 96% of chemicals included in the review had a NOAEL/LOAEL multiplier no less than 0.2. Therefore, using a default NOAEL/LOAEL multiplier of 0.1 may result in an overestimation of the HQs. LOAEL values were used in Step 3.2 as alternative SEV values.

*Maximum Detected Concentration*

The use of the maximum detected concentration as the EPC may overestimate risk since the receptor is actually exposed to a broader range of contaminant concentrations rather than the maximum detected concentrations. Exposure would occur throughout the AOC at various levels, including the EPC. Thus, actual risks may be lower than those presented in the assessment.

## 7.2 RISK ASSESSMENT FOR SEAD-121C, THE DRMO YARD

### 7.2.1 Human Health

#### 7.2.1.1 Conceptual Site Model

Potential sources of contamination, exposure pathways, and receptors for SEAD-121C are depicted graphically in the conceptual site model (CSM) shown in **Figure 7-3**. The CSM provides an overall assessment of the primary and secondary sources of contamination found at the AOC, and the corresponding release mechanisms and the affected media. The CSM also identifies the potential human receptors and the associated pathways of exposure to the affected media.

#### 7.2.1.2 Human Receptors and Exposure Pathways

The baseline risk assessment evaluated the potential health effects that may result from hazardous substance exposure for the following three receptor groups:

- Current/Future Construction Worker;
- Current/Future Industrial Worker; and,
- Current/Future Adolescent Trespasser/Visitor.

The following exposure pathways were considered:

1. Inhalation of dust from surface soil and ditch soil in ambient air (construction worker, adolescent trespasser / visitor, industrial worker);
2. Ingestion of surface soil and ditch soil (construction worker, adolescent trespasser / visitor, industrial worker);
3. Dermal contact to surface soil and ditch soils (construction worker, adolescent trespasser / visitor, industrial worker);
4. Ingestion of subsurface soils (construction worker);
5. Dermal contact to subsurface soils (construction worker);
6. Ingestion of groundwater (daily) (construction worker, adolescent trespasser / visitor, industrial worker);
7. Dermal contact to groundwater (construction worker);
8. Dermal contact to surface water (construction worker, adolescent trespasser / visitor).

#### 7.2.1.3 Constituents of Concern

The primary human health constituents of concern (COCs) identified at the DRMO Yard are summarized in **Table 7-1**. These include benzene, the seven cPAHs, dieldrin, three aroclor congeners (i.e., 1242, 1254, and 1260) and several metals (e.g., arsenic, lead, etc.). Several of these compounds, including the cPAHs, dieldrin, the aroclor congeners, and arsenic, are known to cause cancer in laboratory animals and are suspected to be human carcinogens.

#### 7.2.1.4 Non-Carcinogenic and Carcinogenic Risk Results

The non-carcinogenic and carcinogenic risk results for the above scenarios are summarized in **Table 7-2**. Complete details of the human health risk assessment for each exposure route are presented in Appendix E of the Final RI report (Parsons, 2006) for soil, ditch soil, groundwater, and surface water exposure.

RME non-carcinogenic risks calculated for the construction worker, industrial worker, and adolescent trespasser/visitor at SEAD-121C are all below HIs of 1. RME carcinogenic risks calculated for the construction worker, industrial worker, and adolescent trespasser/visitor are all within or below the USEPA's recommended range of  $10^{-4}$  to  $10^{-6}$ .

#### 7.2.1.5 Lead Risk Characterization Results

##### *Soil*

Lead risk characterization results for surface soil exposure for the industrial worker at SEAD-121C are presented in **Table 7-3**. The 95<sup>th</sup> percentile PbB among fetuses of adult industrial workers are 7.8 and 9.8  $\mu\text{g}/\text{dL}$ , for a homogeneous and a heterogeneous population, respectively. Both estimates are below the USEPA target PbB level of concern (i.e., 10  $\mu\text{g}/\text{dL}$ ).

The results are presented in **Table 7-4**. Nevertheless, the 95<sup>th</sup> percentile PbB levels among residential children are below the USEPA target PbB level of concern (i.e., 10  $\mu\text{g}/\text{dL}$ ).

##### *Ditch Soil*

The lead risk characterization results for SEAD-121C ditch soil exposure are presented in **Tables 7-5** for the industrial worker. The 95<sup>th</sup> percentile PbB levels among fetuses of adult industrial worker are 5.2 and 6.8  $\mu\text{g}/\text{dL}$ , assuming a homogeneous and a heterogeneous population, respectively. Both estimates are below the USEPA target PbB level of concern (i.e., 10  $\mu\text{g}/\text{dL}$ ).

The results for the adolescent trespasser are presented in **Table 7-6**. The 95<sup>th</sup> percentile PbB levels among residential children are below the USEPA target PbB level of concern (i.e., 10  $\mu\text{g}/\text{dL}$ ).

### 7.2.2 Ecological Risk Assessment, SEAD-121C

#### 7.2.2.1 Preliminary Ecological Conceptual Site Model

The preliminary ecological CSM developed for SEAD-121C is presented in **Figure 7-4**.

#### 7.2.2.2 Identification of Ecological COPCs

Chemicals of potential concern (COPCs) were identified by comparing the maximum detected concentrations in each impacted medium to ecological risk-based screening values. The following four data sets were used for the screening-level ecological risk assessment at SEAD-121C:

- SEAD-121C surface soil (0-2 ft. bgs.);
- SEAD-121C total soil (0-4 ft. bgs.);
- SEAD-121C ditch soil (0-2 ft. bgs.); and
- SEAD-121C surface water.

### 7.2.2.3 Receptors

The deer mouse, short-tailed shrew, meadow vole, red fox, American robin and great blue heron were selected as ecological receptors for SEAD-121C.

### 7.2.2.4 Summary of Risk Results and Preliminary Contaminant of Concern Identification

HQ results for the identified receptors based on the maximum detected concentrations for the COPCs and the NOAEL SEVs are presented in **Table 7-7A** for SEAD-121C soil and surface water exposure, **Table 7-7B** for SEAD-121C ditch soil and surface water exposure.

Once the screening level HQs were computed, the Army applied the refinement of COC process to the results of the SLERA to determine if evaluation of ecological risks was warranted at SEAD-121C, the DRMO Yard.

### 7.2.2.5 Summary of Ecological Risks

After application of the refinement of COC process, no COCs were identified for SEAD-121C soil, SEAD-121C ditch soil, or SEAD-121C surface water and the rationales are summarized below.

1. Preliminary COCs were identified for SEAD-121C soil, ditch soil, and surface water. However, alternative HQs calculated during the refinement of COCs (Step 3.2), especially the HQs based on the mean concentrations and LOAEL SEVs are either below 1 or close to 1 (with the highest at 5). Therefore, no final COCs were identified for any medium at SEAD-121C.
2. The planned future land use for SEAD-121C is industrial / office development. Thus, the AOC is not expected to support, sustain, or attract ecological receptors and therefore is not expected to be a wildlife habitat. The presence of ecological receptors is expected to be generally curtailed at SEAD-121C where habitat conditions are poor and current and future human activity levels are sufficiently disruptive to discourage wildlife use.
3. The concentrations of several preliminary COPCs identified in Step 2B (chromium and thallium in SEAD-121C soil; and antimony in SEAD-121C ditch soil) are consistent with SEDA background.

Based on the above discussion, it is the Army's position that soil, ditch soil, surface water, and groundwater at SEAD-121C are not expected to significantly impact ecological receptors and no further action is warranted at SEAD-121C based on the ecological risk assessment.

### **7.3 RISK ASSESSMENT FOR SEAD-121I, THE RUMORED COSMOLINE OIL DISPOSAL AREA**

#### **7.3.1 Human Health**

##### **7.3.1.1 Conceptual Site Model**

Potential sources of contamination, exposure pathways, and receptors for SEAD-121I are depicted graphically in the conceptual site model (CSM) shown in **Figure 7-5**. The CSM provides an overall assessment of the primary and secondary sources of contamination found at the AOC, and the corresponding release mechanisms and the affected media. The CSM also identifies the potential human receptors and the associated pathways of exposure to the affected media.

##### **7.3.1.2 Human Receptors and Exposure Pathways**

The baseline risk assessment evaluated the potential health effects that may result from hazardous substance exposure for the following three receptor groups:

- Current/Future Construction Worker;
- Current/Future Industrial Worker; and,
- Current/Future Adolescent Trespasser/Visitor.

The following exposure pathways were considered:

1. Inhalation of dust from surface soil and ditch soil in ambient air (construction worker, adolescent trespasser / visitor, industrial worker);
2. Ingestion of surface soil and ditch soil (construction worker, adolescent trespasser / visitor, industrial worker);
3. Dermal contact to surface soil and ditch soils (construction worker, adolescent trespasser / visitor, industrial worker);
4. Dermal contact to surface water (construction worker, adolescent trespasser / visitor).

##### **7.3.1.3 Constituents of Concern**

The primary human health constituents of concern (COCs) identified at the Rumored Cosmoline Disposal Area are summarized in **Table 7-8**. These include the seven cPAHs, dieldrin, heptachlor epoxide, and six metals (e.g., arsenic, chromium, iron, manganese, thallium, and vanadium). Several of these compounds, including the cPAHs, dieldrin, and arsenic, are known to cause cancer in laboratory animals and are suspected to be human carcinogens.

#### 7.3.1.4 Non-Carcinogenic and Carcinogenic Risk Results

The non-carcinogenic and carcinogenic risk results for the above scenarios are summarized in **Table 7-9**. Complete details of the human health risk assessment for each exposure route are presented in Appendix E of the Final RI report (Parsons, 2006) for soil, ditch soil, groundwater, and surface water exposure.

RME non-carcinogenic risks calculated for the construction worker and the industrial worker at SEAD-121I are all above HIs of 1. RME carcinogenic risks calculated for the construction worker, industrial worker, and adolescent trespasser/visitor are all within or below the USEPA's recommended range of  $10^{-4}$  to  $10^{-6}$ .

The elevated hazard indices for the industrial worker were caused by inhalation of dust in ambient air from soil, ingestion of soil, and inhalation of dust in ambient air from ditch soil. For the construction worker the major pathways contributing to the hazard indices were inhalation of dust in ambient air from soil, ingestion of soil, dermal contact to soil, inhalation of dust in ambient air from ditch soil, and ingestion of ditch soil. The significant contributing COPC to all non-cancer risk for all receptors and exposure pathways is manganese. Arsenic also contributed to 27% of the non-cancer risk to the construction worker from ingestion of ditch soil. **Table 7-10** presents the contribution of major COPCs to hazard indices greater than 1.

#### 7.3.1.5 Lead Risk Characterization Results

Lead was not identified as a COC in soil or ditch soil. Lead was identified as a COC in surface water, but there is no reliable model for quantifying risk from lead due to contact with surface water.

### 7.3.2 Ecological Risk Assessment, SEAD-121I

#### 7.3.2.1 Preliminary Ecological Conceptual Site Model

The preliminary CSM developed for SEAD-121I, the Rumored Cosmoline Oil Disposal Area is presented in **Figure 7-4**.

#### 7.3.2.2 Identification of Ecological COPCs

Chemicals of potential concern (COPCs) were identified by comparing the maximum detected concentrations in each impacted medium to ecological risk-based screening values. The following four data sets were used for the screening-level ecological risk assessment at SEAD-121I:

- SEAD-121C surface soil (0-2 ft. bgs.);
- SEAD-121C ditch soil (0-2 ft. bgs.); and
- SEAD-121C surface water.

### 7.3.2.3 Receptors

The deer mouse, short-tailed shrew, meadow vole, red fox, American robin and great blue heron were selected as ecological receptors for SEAD-121I.

### 7.3.2.4 Summary of Risk Results and Preliminary Contaminant of Concern Identification

HQ results for the identified receptors based on the maximum detected concentrations for the COPCs and the NOAEL SEVs are presented in **Table 7-11A** for SEAD-121I soil and surface water exposure, **Table 7-11B** for SEAD-121I ditch soil and surface water exposure.

Once the screening level HQs were computed, the Army applied the refinement of COC process to the results of the SLERA to determine if evaluation of ecological risks was warranted at SEAD-121I, the Rumored Cosmoline Oil Disposal Area.

### 7.3.2.5 Summary of Ecological Risks

After application of the refinement of COC process, no COCs were identified for SEAD-121I soil, ditch soil, or surface water and the rationales are summarized below.

1. Preliminary COCs were identified for SEAD-121I soil, ditch soil, and surface water. However, alternative HQs calculated during the refinement of COCs (Step 3.2), especially the HQs based on the mean concentrations and LOAEL SEVs are either below 1 or close to 1 (with the highest at 5). Therefore, no final COCs were identified for any medium at SEAD-121I.
2. The planned future land use for SEAD-121I is industrial / office development. Thus, the AOC is not expected to support, sustain, or attract ecological receptors and therefore is not expected to be a wildlife habitat. The presence of ecological receptors is expected to be generally curtailed at SEAD-121I where habitat conditions are poor and current and future human activity levels are sufficiently disruptive to discourage wildlife use.
3. The concentrations of several preliminary COPCs identified in Step 2B (antimony, cadmium, cyanide, lead and vanadium in SEAD-121I soil; and vanadium in SEAD-121I ditch soil) are consistent with SEDA background.
4. The source of the metal contamination at SEAD-121I is the strategic stockpiles of ferrous-manganese ore stored at the AOC. At the time that the strategic piles are removed, residues associated with the historic stockpiling activities will be addressed by the DoD through the authority responsible for management of the piles.

Based on the above discussion, it is the Army's position that soil, ditch soil, and surface water at SEAD-121I are not expected to significantly impact ecological receptors and no further action is warranted at SEAD-121I based on the ecological risk assessment.

## **8 REMEDIAL ACTION OBJECTIVES**

Remedial action objectives are specific goals to protect human health and the environment. These objectives are based on available information and standards such as Applicable or Relevant and Appropriate Requirements (ARARs) and risk-based levels established in the risk assessment. These objectives are also based upon current and intended future land use, which is planned Industrial/Office Development and Warehousing for SEAD-121C and SEAD121I.

Remedial action objectives have been developed that consist of media-specific objectives for protection of human health and the environment. NYSDEC's General Remedial Program goal is to restore a specific site to pre-disposal conditions, to the extent feasible. Unrestricted land use was considered at SEAD-121C and SEAD-121I to compare the cost of remediating the AOCs for this land use versus the costs to implement a more restricted land use. Unrestricted use was also considered to comply with Army guidance, which states that alternatives consistent with property use without any restriction should be considered to compare life-cycle institutional control costs with more conservative cleanup alternatives (DAIM-BO, "Army Guidance for Using Institutional Controls in the CERCLA Process").

Remedial action objectives are specific goals to protect human health and the environment; they specify the contaminant(s) of concern, the exposure route(s), receptor(s), and acceptable contaminant level(s) for each exposure route. These objectives are based on risk levels established in the risk assessment and should comply with ARARs, unless a waiver is necessitated. A list of ARARs is provided in **Appendix E**.

Results of the risk assessment for SEAD-121I indicate that remedial action is required at the AOC due to risk to human health resulting primarily from manganese. Manganese is present at this AOC because of the Government's stockpile of strategic raw materials, which in this case is a ferro-manganese ore. The Government's strategic stockpile mission at the SEDA is continuing, and as such, it is likely that manganese will continue to be found at the AOC at levels that pose potential risks to humans. In order to manage and control the apparent risk posed by the manganese, the Army believes it is prudent to retain the land occupied by the ore piles and maintain, secure and monitor the existing engineering controls (security fences and signs) that are already in place to minimize the likelihood that effected area are accessed by potential future occupants or users of the land surrounding the strategic stockpiles. In addition, the Army has notified the governing authority of the strategic stockpiles of the risk represented by the manganese, and has indicated that appropriate remedial actions are likely to be needed once the strategic stockpile mission is terminated.

Results of the risk assessment for SEAD-121C do not indicate that risks to human health exist at this AOC for future industrial users or occupants. However, there is an area in the northern portion of this AOC where unusually high levels of lead have been identified, and where prudent management decisions indicate that a focused removal action should be performed to lessen future exposures to users or occupants of the land.



Results of the groundwater investigations performed at SEAD-121C indicate that there are metals present in the groundwater at levels that exceed NYSDEC's GA groundwater standards. However, the level of the aluminum, iron and sodium contaminants identified in the groundwater at SEAD-121C are generally consistent with background levels of these found in the groundwater throughout the Depot, and are not reflective of historic actions and operations performed at the DRMO Yard.

Given this information the remedial action objectives for SEAD-121C and SEAD-121I are as follows:

- Reduce or eliminate future user direct contact, ingestion and the inhalation threats to soils containing hazardous substances; and,
- Protect human health by prohibiting exposures of future users to groundwater that may contain hazardous substances.

## **9 DESCRIPTION OF ALTERNATIVES**

CERCLA § 121(b)(1), 42 U.S.C. § 9621 (b)(1) and the NCP require that each selected remedy be protective of human health and the environment, be cost effective, comply with other statutory laws, and use permanent solutions, alternative treatment technologies, and resource recovery options to the maximum extent possible. In addition, there is a statutory preference for the treatment as a principal element for the reduction of toxicity, mobility, or volume of the hazardous substances.

Four remedial alternatives were identified for the soils at SEAD-121C and SEAD-121I. One alternative was considered for the groundwater at both of the AOCs. The soil alternatives, along with the technologies and processes that make up each alternative, considered are:

- Soil Alternative 1: No-Action.
- Soil Alternative 2: Excavate, stabilize (as needed), off-site disposal and backfill of areas where identified soil contamination exceed NYSDEC Unrestricted Use Cleanup Criteria Levels.
- Soil Alternative 3: Excavate, stabilize (as needed), off-site disposal and backfill of areas where identified soil contamination exceed NYSDEC Restricted Industrial Use Cleanup Criteria Levels.
- Soil Alternative 4: Land Use Controls

The single remedial alternative considered for groundwater is:

- Groundwater Alternative 1: No Action

Each of the alternatives was evaluated against the NCP's evaluation criteria including:

- Overall protectiveness of the public health and the environment;
- Standards, criteria and guidance;
- Long-term effectiveness and permanence;
- Reduction in toxicity, mobility or volume of contamination through treatment;
- Short-term impacts and effectiveness;
- Implementability;
- Community acceptance;
- State acceptance; and
- Cost-effectiveness.

In addition, each alternative was also evaluated against NYSDEC's criteria of current, intended, and reasonably anticipated future land use.

Descriptions of each of the soil and the groundwater alternatives considered for SEADs 121C and 121I are provided below. As there is only one alternative considered for groundwater, and it will be applied in

conjunction with each of the soil remedial alternatives, the discussion of the groundwater alternative is presented first.

## **9.1 GROUNDWATER REMEDIAL ACTION ALTERNATIVE 1**

The Superfund program requires that the “no-action” alternative be considered and serve as the baseline to which other alternatives evaluated are compared. The “no action” remedial alternative for groundwater does not include the design or implementation of any physical remedial measures to address types of groundwater contamination identified at the SEAD-121C, nor considered likely to be present at SEAD-121I.

A municipal, potable water distribution system, which derives its raw water from a non-groundwater source, is present within the entire PID Area. The presence of this alternative supply of water eliminates any reason to consider use of groundwater underlying the PID Area for domestic purposes. Groundwater was not encountered in the vicinity of SEAD-121I during the site investigations performed. A poor yielding supply of groundwater does exist in the overburden beneath SEAD-121C, and it is known to contain chemical contaminants at concentrations in excess of New York’s GA groundwater quality standards. However, contaminant concentrations identified at SEAD-121C are consistent with the background water quality found to exist at the Depot. Additionally, the upper groundwater aquifer that does exist beneath the PID Area is subject to marked seasonal variations in elevation, which often result in periods of time when groundwater can not be effectively obtained for any purpose. Given these facts, the Army will take “no action” for groundwater that may exist beneath SEAD-121C and SEAD-121I and will formally impose a groundwater access and use restriction at the AOCs instead. An area-wide groundwater use/access restriction has already been imposed on the PID Area as part of a prior CERCLA determination made for the Depot (See Final Record of Decision (ROD) Sites Requiring Institutional Controls in the Planned Industrial/Office Development and Warehousing Area, Seneca Army Depot Activity [Parsons, 2004]).

The “no action” alternative for groundwater will be applied to all remedial action alternatives considered for soil for the two AOCs discussed in this Record of Decision. The likely costs associated with the application of the “no action” alternative for groundwater is included in each of the cost estimates provided for soil alternatives below.

## **9.2 SOIL REMEDIAL ACTION ALTERNATIVES**

### **9.2.1 Soil Alternative 1 – No Action**

The “no action” remedial alternative for soil does not include the design or implementation of any physical remedial measures to address types of contamination identified at the AOCs. The “no-action” alternative (Alternative 1) is identical for work that might be considered for either SEAD-121C or SEAD-121I. Again, the “no action” alternative must be considered and evaluated for Superfund sites.

Application of this alternative would result in hazardous substances at concentrations above levels that allow for unrestricted use and unlimited exposures remaining in the soils at both AOCs. As such, CERCLA requires that the AOCs be reviewed at least once every five years to assess changes in conditions found at the AOCs. If justified by the periodic reviews, subsequent remedial actions may be implemented to remove, treat or contain the contaminated soils.

*SEAD-121C and SEAD-121I, Alternative 1 (No Action) Costs*

Capital Cost:	\$0
Annual Operation, Maintenance, and Monitoring (OM&M) Costs (soil):	\$3,000
OM&M Costs (groundwater)	\$3,000
Present-Worth Costs:	\$74,460
Construction Time:	0 months
Completion Time	1 month

**9.2.2 Soil Alternative 2 – Excavation of Contaminated Soil to Achieve Unrestricted Use Cleanup Objectives, Treatment/Disposal and Soil Backfill**

SEAD-121C, the DRMO Yard

This alternative involves the excavation of soil containing substances at levels in excess of the NYSDEC's Unrestricted Use Soil Cleanup Objective levels. A summary listing of hazardous substances identified in current surface, subsurface and ditch soils at SEAD-121C at concentrations in excess of NYSDEC's Unrestricted Use Soil Cleanup Objectives is provided in **Table 6-1**. **Figure 9-1** shows the location of soil samples that contain contaminants at concentrations that exceed NYSDEC's Unrestricted Use Criteria.

Further analysis of the available analytical data indicates that substances are found at concentrations exceeding NYSDEC's Unrestricted Use objective in most surface soil samples collected from SEAD-121C. Additionally, hazardous substances at concentrations that exceed the Unrestricted Use criteria levels are present in many samples collected from the 2 to 6 foot depth range at locations around the AOC. Given this distribution of contaminants in the soil, the Army anticipates that six feet of soil will need to be excavated over the entire DRMO Yard surface, as well as into areas beyond the fenced yard to achieve post-action soil concentrations that are consistent with the Unrestricted Use criteria levels. Based on these dimensions, the estimated volume of contaminated soil requiring excavation at the DRMO Yard is 173,600 yd<sup>3</sup>.

As part of the construction work, the soil exterior to three permanent buildings (Buildings 316, 360 and 355) would be excavated, as would soil adjacent to, but not beneath, two railroad tracks that service this portion of the former Depot. Extra care and time would be required during the excavations around these structures to ensure that their structural integrity was not impacted by the work or backfill operations. Local utility lines servicing this portion of the former Depot would need to be diverted or possibly

eliminated during the planned excavation. The temporary storage pads and cells, their surrounding walls or barriers, and the security fence surrounding the yard would be dismantled or demolished, and materials would be decontaminated and disposed, or recycled, as necessary and appropriate. Further, episodic water flow through four drainage ditches surrounding the Yard would need to be diverted during the construction process to preclude inflow of storm-event run-off water into the excavation. Finally, air and fugitive dust monitoring would need to be performed during the active phases of excavation, waste soil and debris loading and transport, and excavation backfill.

Silt fencing would be erected around the excavation site to minimize storm water run-on and runoff and to limit the transport of soil via erosion. Episodic storm water run on flows into excavation areas would be captured, tested, treated as necessary, and then discharged to the Seneca County Sewer District system. All excavated soil and associated demolition debris would be characterized and transported for disposal at off-site landfills.

Once the excavation was completed and its extent confirmed by the collection and analysis of confirmatory samples, the area of the excavation would need to be backfilled, compacted, and graded.

Once this action was completed, the area excavated would be appropriate for unrestricted use and unlimited exposures, and no further land use restriction would be imposed on the soil found in this area.

#### *SEAD-121C Alternative 2 (Unrestricted Use) Costs*

Capital Cost	\$17,600,000
Annual OM&M Cost (soil)	\$0
Annual OM&M Cost (groundwater)	\$3,000
Present-Worth Costs:	\$17,637,230
Construction time	12 Months
Completion Time	24 Months

#### SEAD-121I, the Rumored Cosmoline Oil Disposal Area

Alternative 2 for soil at SEAD-121I is identical to that which is discussed above for SEAD-121C. This alternative involves the excavation of soil containing hazardous substances at levels in excess of the NYSDEC's Unrestricted Use Soil Cleanup Objective levels. A summary listing of hazardous substances identified in current surface, subsurface and ditch soils at SEAD-121I at concentrations in excess of NYSDEC's Unrestricted Use Soil Cleanup Objectives is provided in **Table 6-4**. **Figure 9-2** shows the location of soil samples that contain contaminants that exceed the NYSDEC's Unrestricted Use Criteria at SEAD-121I.

Analysis of available data indicates that one or more of the identified substances are found in most soil samples collected and characterized during the RI at levels that exceed the Unrestricted Use Cleanup Objective levels. The identified substances were found in shallow soils (0 to 2 ft.) because only a thin layer of soil exists above the underlying bedrock in this portion of the Depot.

The Army believes that Avenue C and D and 3<sup>rd</sup> and 7<sup>th</sup> Street physically constrain the area where historic unloading and removal of Cosmoline oil occurred. Based on the distribution of hazardous substances identified and the limits of the AOC, most of the four blocks that define the Rumored Cosmoline Oil Disposal Area will require excavation to an average depth of 2 feet. The area across the bounding road surfaces to the parallel, north-south oriented rows of warehouses that constrict the extent of this AOC would not be excavated. The area surrounding the Rumored Cosmoline Oil Disposal Area and not associated with a release of substances would remain with the existing land use control for industrial use only. Since most soil samples collected from the warehouse area contained one or more contaminants that exceeded an Unrestricted Use Cleanup Objective, the Army believes that the entire Warehousing Area that surrounds the exterior of the Rumored Cosmoline Oil Disposal Area would have the existing LUC remain.

Based on this excavation area, 45,425 yd<sup>3</sup> of soil and roadway would need to be excavated, characterized, treated (as necessary), transported and disposed of off site at a non-hazardous waste landfill.

The area's underlying stormwater collection and conveyance system may be compromised, requiring subsequent repair or replacement. Further, buried utility lines that run through the area (telephone, electricity, gas and water) would possibly need to be addressed. Finally, the railroad line and sidings servicing the warehouse area could also have to be removed, limiting reuse potentials

Silt fencing would be erected around the excavation site to minimize storm water run-on and runoff and to limit the transport of soil via erosion. Episodic storm water run on flows into excavation areas would be captured, tested, treated as necessary, and then discharged to the Seneca County Sewer District system. All excavated soil and associated demolition debris would be characterized and transported for disposal at off-site landfills.

The area of the excavation would need to be backfilled with clean fill, the fill would be compacted, and the site would be regraded. As a result of this action, the land excavated would be appropriate for unrestricted use and unlimited exposures, and no further land use restriction for soil would be imposed on the area.

*SEAD-121I, Alternative 2 (Unrestricted Use) Costs*

Capital Cost	\$4,542,500
Annual OM&M Cost (soil)	\$0
Annual OM&M Cost (groundwater)	\$3,000
Present-Worth Costs	\$4,579,730
Construction Time	15 Months
Completion Time	27 Months

### 9.2.3 Soil Alternative 3 – Excavation of Contaminated Soil to Achieve Industrial Use Cleanup Objectives, Treatment/Disposal and Soil Backfill

#### SEAD-121C, the DRMO Yard

This alternative involves the excavation of soil containing substances at levels that exceed NYSDEC's Industrial Use Soil Cleanup Objective levels. A summary listing of substances identified in current surface, subsurface and ditch soils at SEAD-121C at concentrations in excess of NYSDEC's Industrial Use Soil Cleanup Objectives is provided in **Table 6-1**. **Figure 9-3** shows the location of soil samples that contain contaminants that exceed NYSDEC's Industrial Use Criteria.

Three separate areas of the former DRMO Yard would be excavated to remove soil containing hazardous substances above industrial cleanup objective levels under this alternative. The first area centers around an isolated surficial (approximately 1 foot deep) detection of benzo(a)pyrene exceeding the industrial use standard that is located partway along the northwest facing fence line that separates the Yard from the abutting drainage ditch. Approximately 1,315 yd<sup>3</sup> of soil would be removed from this location.

The second excavation area is defined by three elevated detections of lead that were found in the shallow soil in the northern portion of the DRMO Yard, where the former debris pile, storage pad and storage cells were located. Approximately 1,620 yd<sup>3</sup> of soil would be excavated.

The last excavation area would be located to the east and almost entirely outside the former DRMO Yard where soil samples indicate that levels of benzo(a)pyrene exceeding industrial standards are present in soils to a depth of at least 2 ft. This area is approximated by results from three samples along the southern edge of the investigated area and one near the former storage cells that are located to the north of Building 316 inside the DRMO Yard. Approximately 12,000 yd<sup>3</sup> of soil would be excavated from this area.

The total excavation volume for this alternative is approximately 14,900 yd<sup>3</sup>.

As part of the construction work, the soil exterior to two permanent buildings will be excavated, as will soil in the vicinity of two railroad spur lines that service this portion of the former Depot. A portion of the storage cells and security fence surrounding the yard would be dismantled or demolished, and materials would be decontaminated as necessary. All excavated soil and demolition debris would be characterized and transported for disposal at an off-site non-hazardous landfill.

Silt fencing would be erected around the area of excavation to minimize storm water run-on and runoff and to limit the amount of erosion that would occur. Episodic storm water run on flows into excavation areas would be captured, tested, treated as necessary, and then discharged to the Seneca County Wastewater Authority for final treatment and discharge.

If any of the soil was found to be hazardous, on-site treatment would be used prior to transport to the off-site landfill. Water generated from the collection of runoff would be captured, tested, and treated on-site, as necessary. It would be discharged to the Seneca County Sewer District in conformance with their requirements.

The area of the excavation would need to be backfilled, compacted, and graded. As a result of this action, the land comprising the former DRMO Yard would be appropriate for future industrial use. Institutional controls in the form of an environmental easement would be used to prohibit the use of the property for non-industrial purposes.

Because this alternative would result in substances remaining on site above levels that allow for unrestricted use and unlimited exposure, CERCLA requires that the site be reviewed at least once every five years. If justified by the review, further remedial actions may be implemented to remove or treat the identified wastes.

#### *SEAD-121C, Alternative 3 Costs*

Capital Cost	\$1,490,000
Annual OM&M Cost (soil)	\$3,000
Annual OM&M Cost (groundwater)	\$3,000
Present-Worth Costs	\$1,564,460
Construction Time	9 Months
Completion Time	21 Months

#### SEAD-121I, the Rumored Cosmoline Oil Disposal Area

Soil containing substances at levels in excess of the Commercial Use Soil Objective levels would be excavated from SEAD-121I, characterized, treated on-site, as necessary, and then transported off site for disposal at a licensed landfill. A summary listing of hazardous substances identified in current surface, subsurface and ditch soils at SEAD-121C at concentrations in excess of NYSDEC's Commercial Use Soil Cleanup Objectives is provided in **Table 6-4**. **Figure 9-4** shows the location of soil samples that contain contaminants that exceed the NYSDEC's Commercial Use Criteria.

Based on a review of analytical data collected at SEAD 121I, the Army estimates that approximately 5,500 yd<sup>3</sup> of soil would be excavated from southern most block of the AOC; another 2,850 yd<sup>3</sup> would be excavated from next block; over 8,520 yd<sup>3</sup> would need to be excavated from the third block of the AOC; and, roughly 4,760 yd<sup>3</sup> would be excavated from the northern most block of the AOC. Each excavation would extend to an average depth of 2 ft bgs. The existing roadways would again serve as physical barriers that bound to outward extent of all of the proposed excavations.

Approximately 21,630 yd<sup>3</sup> of soil would be excavated, characterized, treated (as necessary), transported and disposed of off-site at a non-hazardous waste landfill.



During the construction work, uses of the warehouse facilities affected by the excavation would need to be interrupted or terminated. As part of the construction work, many of the adjacent roadways surfaces would be removed, and the integrity of the underlying storm water diversion system may be compromised, requiring subsequent repair or replacement. Further, the railroad line and sidings servicing the warehouse area would also be removed, requiring replacement.

Silt fencing would be erected around the area of excavation to minimize storm water run-on and runoff and to limit the amount of erosion that would occur. Episodic storm water run on flows into excavation areas would be captured, tested, treated as necessary, and then discharged to the Seneca County Sewer District for final treatment and discharge. All excavated soil and associated demolition debris would be characterized and transported for disposal at off-site landfills.

The area of the excavation would need to be backfilled with clean fill and regraded. As a result of this action, the land excavated would be appropriate for commercial use.

Because this alternative would result in substances remaining on site above levels that allow for unrestricted use and unlimited exposure, CERCLA requires that the site be reviewed at least once every five years. If justified by the review, further remedial actions may be implemented to remove or treat the identified wastes.

#### *SEAD-121I, Alternative 3 Costs*

Capital Cost	\$2,163,000
Annual OM&M Cost (soil)	\$3,000
Annual OM&M Cost (groundwater)	\$3,000
Present-Worth Cost	\$2,237,460
Construction Time	12 Months
Completion Time	24 Months

#### **9.2.4 Soil Alternative 4 – Land Use Controls**

##### SEAD-121C, the DRMO Yard

The Army prepared human health and ecological risk assessments based on sampling results for soil and surface water at SEAD-121C, in accordance with Superfund guidance. The results of the risk assessments indicated that SEAD-121C is suitable for the continued use as an industrial area. Nevertheless, soil containing concentrations of lead in excess of 1,500 mg/Kg were removed from the northern portion of the AOC in July and August 2007 to enhance the overall acceptability of the area for future owners or users. The successful completion of the removal action was verified by determining that the 95<sup>th</sup> UCL of the data set was equal to or less than 1,250 mg/Kg and that no individual confirmatory sample exhibited a sample concentration in excess of 1,500 mg/Kg. A figure showing the extent of the excavation completed is presented as **Figure 3-2**. Analytical results confirming the successful completion of the removal action for lead are presented in **Table 3-1**.

Even though the residual concentration of lead found in the soil in the northernmost portion of the former DRMO Yard has been successfully reduced, contaminants still remain in the soil at levels above NYSDEC's Unrestricted, Residential, and Restricted Residential Use levels. However, as is presented above, results of the risk assessment, which included data representing the higher levels of lead previously encountered at the AOC, indicate that continued use of the land for industrial purposes is acceptable. Given these facts, institutional controls in the form of land use restrictions that prohibit the use of the site for any purpose other than industrial activities will be implemented.

Now that the removal action is completed, it is estimated that this alternative will take approximately one month to implement. This alternative allows substances to remain at the site above levels that would allow for unrestricted use and unlimited exposures. Therefore, CERCLA requires that the site be reviewed at least once every five years. If justified by the review, further remedial actions may be implemented to remove or treat the identified wastes.

#### *SEAD-121C, Alternative 4 Costs*

Capital Cost	\$0
Annual OM&M Cost (soil)	\$3,000
Annual OM&M Cost (groundwater)	\$3,000
Present Worth Cost	\$74,460
Construction Time	0 Months
Completion Time	1 Month

#### SEAD-121I, the Rumored Cosmoline Oil Disposal Area.

The Army conducted human health and ecological risk assessments for SEAD-121I. The SLERA indicated that no final ecological COCs were identified and that the area is not an attractive habitat for ecological receptors. The human-health risk assessment indicated that the likely carcinogenic risks associated with the exposure to hazardous substances found in the soils at, and in the vicinity of the AOC, are within the EPA's recommended risk range of  $10^{-4}$  –  $10^{-6}$ . The human-health risk assessment also indicated that residual levels hazardous substances found at the AOC did pose potential non carcinogenic risks to current and future receptors.

Non-carcinogenic health risks were directly associated with manganese residuals of the U.S. Government's strategic stockpiles of ferro-manganese ore that were previously located within the bounds of the Rumored Cosmoline Oil Disposal Area. The Government's stockpile mission is completed at the SEDA. The strategic piles recently were sold and moved out of the SEDA, and a cleanup action of the footprint was performed in August of 2007. The strategic stockpile mission and materials associated with them are not governed by CERCLA.

Summary results from the removal action indicate that residual levels of manganese in the vicinity of the former ore piles are lower than NYSDEC's Commercial and Industrial Use Cleanup Objectives and lower

than USEPA's iron and manganese PRGs for industrial soil. A figure showing the extent of the excavation completed is presented as **Figure 3-3**. The completion of the excavation was confirmed by the collection and analysis of confirmatory soil samples for iron and manganese from the base and perimeter of the excavation. Analytical results from the manganese and iron analyses are presented in **Table 3-2**. The results of the sampling and analysis demonstrate that there is no longer an unacceptable threat to human health or the environment.

However, since other substances remain at the AOC in excess of NYSDEC's Cleanup Objectives, the Army will also impose LUCs that prohibit the use of the land for residential activities. Additionally, in the absence of information for the groundwater quality present beneath the AOC, the LUCs will also prohibit access to and use of groundwater at the AOC for potable purposes.

Furthermore, since this alternative would allow hazardous substances to remain at the site above levels that would allow for unrestricted use and unlimited exposures, CERCLA requires that the site be reviewed at least once every five years. If justified by the review, further remedial actions may be implemented to remove or treat the identified wastes.

*SEAD-121I, Alternative 4 Costs*

Capital Cost	\$0
Annual OM&M Cost (soil)	\$3,000
Annual OM&M Cost (groundwater)	\$3,000
Present Worth Cost	\$74,460
Construction Time	0 Months
Completion Time	1 Month

## 10 COMPARATIVE ANALYSIS OF ALTERNATIVES

The evaluation criteria are described below.

- Overall protection of human health and the environment assesses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced or controlled through treatment, engineering controls or institutional controls.
- Compliance with ARARs addresses whether or not a remedy would meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes and requirements or provide grounds for invoking a waiver.
- Long-Term effectiveness and permanence refers to the ability of a remedy to maintain reliable protections of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.
- Reduction of toxicity, mobility, or volume through treatment is the anticipated performance of the treatment technologies, with respect to these parameters, a remedy may employ.
- Short-Term effectiveness address the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.
- Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.
- Cost includes the estimated capital and OM&M costs and net present-worth costs.
- State acceptance indicates if, based on its review of the RI/FS and Proposed Plan, the state concurs with the preferred remedy at the present time.
- Community acceptance will be assessed in the ROD and refers to the public's general response to the alternatives described in the Proposed Plan and the RI/FS reports.

A comparative analysis of these alternatives based upon the evaluation criteria noted above is presented below. Since the remedial alternatives considered for both sites are identical, the following discussion applies to both AOCs, except where AOC specific variations are noted.

## 10.1 OVERALL PROTECTIVENESS OF HUMAN HEALTH AND THE ENVIRONMENT

Alternative 1 would not be protective of human health or the environment since it would not address the soils that have been found to contain hazardous substances which pose risks to human and ecological receptors for unrestricted use. Alternative 2 is protective of human health and the environment as its objective is to removal all soil that contains hazardous substances in excess of levels that would allow for unrestricted use and unlimited exposures. Alternatives 3 and 4 are protective of future industrial scenario human health for the future site use as an industrial area. Alternative 3 is slightly more protective of human health than Alternative 4 since all of the highest contaminant concentrations are removed and replaced with material that is not yet affected by hazardous substances. Alternative 4 for SEAD-121C only removes soil containing elevated levels of lead, while at SEAD-121I soil containing primarily manganese and iron with other metal co-contaminants are removed.

## 10.2 COMPLIANCE WITH ARARS

There are currently no promulgated federal standards for hazardous substance levels in soils, and risk based decisions are used to determine if cleanup is warranted or necessary. NYSDEC recently issued and enacted into state law cleanup objectives for five categories of future land use (i.e., unrestricted, residential, restricted-residential, commercial, and industrial) at waste sites located within its bounds and these are considered to be “relevant and appropriate” criteria to consider.

Alternative 1 does not comply with the NYSDEC’s soil cleanup objectives. Alternatives 2 and 3 comply with NYSDEC’s soil cleanup objectives for the future use of the site anticipated under each alternative. Under Alternative 4 for SEAD-121C, NYSDEC’s industrial use cleanup objective for lead is achieved, but other contaminants remain at the AOC at concentrations that exceed the state’s industrial cleanup objectives. However, a risk assessments performed using USEPA’s risk assessment guidance demonstrated no human health risk for the planned future use of SEAD-121C. LUCs will be implemented to maintain that future use.

Non-carcinogenic risks were identified at SEAD-121I due to the presence of manganese in the soil at locations around the historic ore stockpiles. While the remedial action has removed soil containing concentrations of manganese in excess of the state’s industrial and commercial cleanup objectives from SEAD-121I, other contaminants still exist at concentrations above NYSDEC’s commercial cleanup objectives. However, a risk assessment indicates that the other contaminants identified at SEAD-121I do not pose a threat to human health at the site for the planned future use. Therefore, the LUCs will be implemented to maintain the future use for SEAd-121I.

USEPA and the New York State Department of Health (NYSDOH) have promulgated health based protective criteria, which are enforceable standards for drinking water contaminants. Hazardous substances have been identified in the groundwater at SEAD-121C. The levels of metals identified are consistent with the Depot’s background groundwater quality. Occasionally, organic contaminants have also been identified in the groundwater at SEAD-121C, but these appear to be associated result with

releases from SEAD-27, which abuts the DRMO Yard. A separate ROD, approved by the Army, EPA, and NYSDEC, imposes a groundwater access and use restriction on all land within the PID area based on the data that is available from SEAD-27. Furthermore, the area of SEAD-121C is serviced by a municipal water supply source that is not directly derived from groundwater. Given these considerations, and the Army's and EPA's prior decision to impose a area wide access and use restriction on groundwater in the PID Area, the current proposed remedy does not consider any form of groundwater treatment.

However, since groundwater was identified at SEAD-121C and since all groundwater within the State of New York is considered a source of drinking water, the federal and state criteria health based criteria are applicable, and none of the proposed remedies proposed for SEAD-121C addresses this criteria.

Groundwater was not encountered in the unconsolidated soils above the shallow bedrock in SEAD-121I. The area of SEAD-121I is also served by a municipal source of potable water that is derived from a non-groundwater source location. Therefore, groundwater criteria are not applicable to the proposed remedy at SEAD-121I.

### 10.3 LONG-TERM EFFECTIVENESS

Alternative 1 (i.e., no action) for groundwater is expected to have minimal long-term effectiveness on groundwater quality since it relies on natural attenuation to restore groundwater quality. However, since an alternative potable water supply that does not rely on local groundwater exists within the PID Area, the restriction of access and use of groundwater within this portion of the Depot will not greatly impact future use and operations. Historic information indicates that the shallow, overburden aquifer throughout the Depot is generally subject to large seasonal variability, both in terms of quantity and quality of yield. Many of the metals identified in historic groundwater samples are indigenous to the native soil found at the depot, which are entrained as final particles in groundwater recovered from monitoring wells at the Depot, and these impact the general usefulness of the upper aquifer as a source of potable groundwater without pre-treatment.

Alternative 1 (i.e., "No Action") for soil at SEAD-121C and SEAD-121I does not involve active remedial measures, and thus both would be ineffective in eliminating receptor's potential exposures to contaminants in the soil. The excavation of soil to NYSDEC's Unrestricted Use Criteria levels Soil Alternative 2 for SEAD-121C and SEAD-121I) would be the most protective alternative for human health as it would allow for unrestricted use of the land at both of the AOCs. Implementation of Alternative 3 (i.e., excavation of soil containing contaminants above Restricted Industrial Use levels) at both sites would be more effective than the no action alternative, but less effective than excavating soils to NYSDEC's Unrestricted Use levels. As a result, the land at both AOCs would be restricted to industrial type activities only. Implementation of Alternative 4 for both AOCs also allows use of the land at both AOCs for industrial operations and is protective of human health at this level of contact. Application of Alternative 4 for SEAD-121C (DRMO Yard) is more protective of human health as the highest concentrations of lead are removed, even though they are not shown to represent risk to future industrial receptors. Alternative 4 for SEAD-121I is also more of human health as the highest concentrations of

manganese that exceed NYSDEC's commercial and industrial use cleanup objectives are removed. The remaining contaminants have been shown not to pose potential risk to future users.

#### **10.4 REDUCTION IN TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT**

Alternatives 1 would provide no reduction in the toxicity, mobility or volume of hazardous substances found in soil at either AOC. Under Alternative 2, soils containing hazardous substances in excess of the state's unrestricted use cleanup objectives would be excavated and transported off site for disposal. This would reduce the toxicity and mobility of hazardous substances left at the AOCs. Comparably, Alternative 3 would also reduce the toxicity and mobility of hazardous substances left at the AOCs, but not to the same extent as would be achieved under Alternative 2. In either case, if excavated soil needed to be stabilized prior to off site disposal, the volume of the material disposed at the off site facility would increase. The removal of lead contaminated soils at SEAD121C (Alternative 4) and the removal of manganese and iron contaminated soil at SEAD-121I provides some reduction in the toxicity and mobility of hazardous substances, but less than achieved by Alternative 3 at the same AOC as other contaminants are not considered.

#### **10.5 SHORT-TERM EFFECTIVENESS**

Alternatives 1 would not pose any additional short term hazards to workers at the AOCs or the community as physical construction is not included in either of these remedies. Alternatives 2, 3, and 4 would all pose some additional short-term hazards to neighboring site workers and the community through dermal contact, ingestion or inhalation of hazardous constituents during the excavation, loading, transporting, and unloading operations that are needed to complete these construction efforts. Further, noise from the heavy equipment used for excavation, loading and hauling could also impact nearby employees of neighboring industries and companies, and local residents. Excavation noise levels at SEAD-121I are expected to be more significant because it is likely that the underlying bedrock will be encountered and repeatedly scraped during the work, and there are more industrial and residential units in close proximity to this AOC than SEAD-121C. In addition, interim and post remediation sampling activities would pose some risk to site workers. Potential risks to nearby employees of local companies and nearby residents could be controlled by developing and implementing sound engineering controls, health and safety procedures, monitoring practices.

Since soil and debris will be transported off site under Alternatives 2, 3, and 4, there will be an increase in traffic on the roads within and surrounding the Depot and the receiving landfills. This could translate into an increased likelihood of vehicular accidents, and potential releases of soil and debris containing hazardous constituents at other locations along the driving routes. Since more material is being excavated and disposed under Alternative 2, there is a greater potential under this option than Alternative 3 and 4. Alternatives 2, 3, and 4 also require varying amounts of soil disturbance that could affect the surface water hydrology in the areas being excavated.

At SEAD-121C, Alternative 2, which involves the excavation of a larger amount of soil overall, and involves the excavation of soil from areas within or very close to four existing drainage ditches that service the greater PID Area, has a greater likelihood of impacting the surface water hydrology than does Alternative 3 or 4. At SEAD-121I, Alternative 2 also involves the excavation of more soil, and this is expected to include more soil to the depth of bedrock, and the exposure of bedrock may significantly impact surface water flow. Alternative 2's disturbance of soil across larger surfaces at both AOCs also increases the likelihood of soil erosion and transport, both via surface water flow and as fugitive dusts. Therefore, appropriate silt and dust containment measures will need to be implemented and monitored during the excavation, loading, and hauling activities. Lesser levels of controls would also need to be implemented, maintained and monitored during the work associated with Alternative 3 and 4.

## 10.6 IMPLEMENTABILITY

Alternative 1, the no-action alternative, would be the easiest alternative to implement, since there are no actions to undertake.

Alternative 4 will be slightly more difficult to implement than Alternative 1 because it requires the implementation, maintenance, oversight and annual reporting of the continuing effectiveness of land use controls and the preparation, submittal and approval of a land use control implementation plan. Additionally, at SEAD-121I, engineering controls (security fences and warning signs) would need to be continued and maintained in the vicinity of the ferro-manganese ore piles until the U.S. Government's continuing strategic stockpile mission was terminated at AOC. The excavation, characterization, stabilization (if needed), transport, and disposal of some soil, and the implementation of site controls and procedures at both SEAD-121C and SEAD-121I in response to the removal of selected metal contaminated soils will further increase the degree of difficulty required to complete these actions.

The excavation; stabilization, as necessary; characterization; transport; and disposal of soil and debris excavated under either Alternatives 2 or 3 are readily available and mature technologies and can be accomplished. The increased volume of soil/debris requiring excavation under Alternative 2 at both AOCs would increase the difficulty of completing this alternative above those anticipated for Alternative 3.

## 10.7 COST

The present-worth cost associated with Alternatives 1, 2, 3, and 4 and G-1 is calculated using a discount rate of seven percent (7%) and a 30-year time interval. The estimated capital, operation, maintenance, and monitoring, and the present worth costs are presented in **Table 10-1**.

Alternative 1 and Alternative 4 are the least expensive remedial action alternative at an estimated cost of \$74,460. Alternative 2 is the most expensive remedial action alternative with respective AOC costs of \$17,637,230 for SEAD-121C and \$4,579,730 for SEAD-121I.



## **10.8 STATE ACCEPTANCE**

NYSDEC concurs with the preferred remedial soil and groundwater alternatives

## **10.9 COMMUNITY ACCEPTANCE**

Community acceptance of the preferred alternative for SEAD-121C and SEAD-121I will be assessed in the ROD following review of the public comments received on the Proposed Plan.

## 11 SELECTED REMEDY

The selected remedy for any site should, at a minimum, eliminate or mitigate all significant threats to the public health or the environment presented by the hazardous substances or waste present at the site. Based on the data presented and summarized earlier within this Proposed Plan, the Army plans to excavate soil at SEAD-121C that contains elevated concentrations of lead to reduce potential human health risks that may be associated with the identified contamination. In addition, the Army has selected to will impose LUCs on land that is designated as SEAD-121C, the DRMO Yard, and SEAD-121I, the Rumored Cosmoline Oil Disposal Area. The Army's recommended LUCs will:

- Prohibit use of the land for residential activities including residential housing, elementary or secondary schools, child care facilities, playgrounds, etc.; and,
- Prohibit access to, and use of groundwater at the AOCs.

Results of the site investigations and risk assessment performed using data developed from SEAD-121C and SEAD-121I indicate that hazardous substances have been identified to exist at, or in the vicinity of, the AOCs. Levels found are higher than NYS guidance values for unrestricted use, and it is likely that the identified concentrations would pose a threat to residential populations. Thus, the levels measured do not allow for unlimited exposure and unrestricted use of the land.

Some individual concentrations of contaminants in the soil do exceed NYSDEC's Industrial Cleanup Objective levels. However, levels of residual hazardous substances found in the soil do not pose a potential risk to the human receptors that are considered most likely to use the land (i.e., industrial worker, construction worker, adolescent trespasser) for the foreseeable future at SEAD-121C. Further, while hazardous substances were identified in the groundwater at concentrations above NYS AWQSSs, an alternative potable water distribution supply exists throughout the PID Area, which minimizes the potential risks represented by contact or ingestion with this media.

At SEAD-121I (Rumored Cosmoline Oil Disposal Area), levels of residual hazardous substances were found in the soil in proximity to the strategic stockpiles when the RI was completed posed a non-cancer risk to the industrial and construction workers. The strategic stockpile mission at the SEDA has now been terminated, and the stockpiles have been sold and move off the SEDA site. Based on RI finding, the Army conducted a removal action of soil at the locations of the former strategic stockpiles once they were removed from the SEDA. The removal action was performed in August of 2007, and the results of confirmatory sampling and analysis indicate that cleanup goals established for the action were achieved. The historic stockpiles of ore have been removed and confirmatory sampling and analysis demonstrates no environmental concerns.

Further, the quality of the groundwater at SEAD-121I, while not found during the investigations completed, is unknown and thus suspect. Groundwater found at other locations within the PID area suggests that there is a regional poor quality of groundwater and the potential to have hazardous

substances at concentrations in excess of NYS AWQs may be present. Therefore, the Army believes it prudent to limit or restrict potential contact with or ingestion of this media until such time as sufficient data is available to clarify if possible risk exists. The presence of a potable water supply in the PID area again minimizes the potential impact of this decision.

Finally, since the area surrounding these AOCs already has land use controls in effect, the AOCs should stay consistent with the surrounding land uses.

The residential use and groundwater access/use LUCs proposed as part of this remedy already have been proposed and implemented by the Army and the USEPA throughout the PID Area. These LUCs result from conditions found at other AOCs (i.e., SEADs 27, 64A, and 66) and were implemented in September 2004. SEAD-27 is immediately adjacent to SEAD-121C. These LUCs may be lifted on a location-by-location basis at some time in the future, with the consent and approval of the Army, the USEPA, and the NYSDEC, if a future owner/user/occupant provides additional data that indicates that the selected location is suitable for unlimited exposure and unrestricted use.

The Army's recommended remedial actions for SEAD-121C, the DRMO Yard, and SEAD-121I, the Rumored Cosmoline Oil Disposal Area discussed in this Record of Decision include LUCs. To implement the Army's recommended remedy at the AOCs, a LUC Remedial Design (RD) will be prepared. The LUC RD Plan will include: a Site Description; the IC Land Use Restrictions; the LUC Mechanism to ensure that the land use restrictions are not violated in the future; implementation and maintenance actions, including periodic inspections; and, Reporting/Notification requirements. In addition, the Army will prepare an environmental easement for the AOC, consistent with Section 27 1318(b) and Article 71, Title 36 of ECL, in favor of the State of New York and the Army, which will be recorded at the time of transfer of the AOCs from federal ownership. A schedule for completion of the draft LUC RD covering the AOC will be completed within 21 days of the ROD signature, consistent with Section 14.4 of the Federal Facilities Agreement (FFA). In accordance with the FFA and CERCLA §121(c), the remedial action (including ICs) will be reviewed no less often than every 5 years. After such reviews, modifications may be implemented to the remedial program, if appropriate.

The Army shall implement, inspect, maintain, report, and enforce the LUCs described in this ROD in accordance with the approved LUC RD. Although the Army may later transfer these responsibilities to another party by contract, property transfer agreement, or through other means, the Army shall retain ultimate responsibility for remedy integrity.

**12     DOCUMENTATION OF SIGNIFICANT CHANGES**

(Reserved)

**13     STATE ROLE**

(Reserved)

**APPENDICES**

<b><u>APPENDIX</u></b>	<b><u>TITLE</u></b>
A	Administrative Record
B	Letter of Concurrence
C	Public Comments and Responsiveness Summary
D	Analytical Data
E	ARARs

**APPENDIX A**

**ADMINISTRATIVE RECORD**

**ADMINISTRATIVE RECORD**

Canadian Council of Ministers of the Environment. 2003. Canadian Environmental Quality Guideline. December 2003.

DOD, 1993. Base Realignment and Closure Cleanup Plan Guidebook, Fall 1993.

Efroymson, R.A. et al. 1997a. Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision. November.

Efroymson, R.A., et al. 1997b. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: November 1997 Revision.

Nagy, et al. 1999. Energetics of Free-ranging Mammals, Reptiles, and Birds. *Ann. Rev. Nutr.* 19: 247-277.

Netherlands Ministry of Housing, Spatial Planning and Environment. 2000 Circular on Target Values and Intervention Values for Soil Remediation.

NYSDEC, 1993. Technical and Administrative Guidance Memorandum #4003, Cleanup Guideline for Soil Contaminated with Radioactive Material, September 1993.

NYSDEC, 1994a. Technical and Administrative Guidance Memorandum #4046, Determination of Soil Cleanup Objectives and Cleanup Levels, January 24, 1994.

NYSDEC, 1994b. Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites, Division of Fish and Wildlife, October 1994.

NYSDEC, 2004 - Division of Water Technical and Operational Guidance Series 1.1.1 (TOGS 1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, June 1998 as amended January 1999, April 2000, and June 2004.

Parsons, 1994. SWMU Classification Report, Seneca Army Depot Activity, Final, Engineering-Science, Inc., June 1994.

Parsons 1999. Final Investigation of Environmental Baseline Survey Non-Evaluated Sites [SEAD-119A, SEAD-122 (A, B, C, D, E), SEAD-123 (A, B, C, D, E, F), SEAD-46, SEAD-68, SEAD-120 (A, B, C, D, E, F, G, H, I, J), and SEAD-121 (A, B, C, D, E, F, G, H, I)], Parsons Engineering Science, Inc., May 1999.

Parsons, 2003. Record of Decision, Twenty No Action SWMUs and Eight No Further Action SWMU, Final, Parsons, September 2003.

Parsons, 2004. Record of Decision, Sites Requiring Institutional Controls in Planned Industrial / Office Development or Warehousing Area, Final, Parsons, September 2004.



Parsons, 2006. Remedial Investigation Report for Two EBS Sites in the Planned Industrial Development Area (SEAD-121C and SEAD-121I), Final, Parsons, April 2006.

Sample et al. 1996. Toxicological Benchmarks for Wildlife: 1996 Revision.

Title 40 Code of Federal Regulations, Part 300, National Oil and Hazardous Substances Pollution Contingency Plan.

Title 40, Code of Federal Regulations, Part 261, Identification and Listing of Hazardous Waste.

Title 42 US Code Chapter 103, Comprehensive Environmental Response, Compensation, and Liability, Section 9620.

Title 42 US Code Chapter 103, The Community Environmental Response Facilitation Act, Section 9620(h)(4),(5).

USEPA, 1989. Risk Assessment Guidance for Superfund (RAGS), Volume 1, Human Health Evaluation Manual (Part A), EPA/540/1-89/002, December 1989.

USEPA, NYSDEC, and Army, 1993. Federal Facilities Agreement under CERCLA Section 120; Docket Number: II-CERCLA-FFA-00202, USEPA, NYSDEC, and the Army, January 1993.

USEPA, 1994. Guidance Manual for the Integrated Exposure Uptake Biokinetic Model for Lead in Children [NTIS #PB93-963510, EPA 9285.7-15-1], February 1994.

USEPA, 1997. Ecological Risk Assessment Guidance for Superfund (ERAGS): Process for Designing and Conducting Ecological Risk Assessments. EPA 540-R-97-006, OSWER Directive # 9285.7-25, June 1997.

USEPA, 1998a. Guidelines for Ecological Risk Assessment, Risk Assessment Forum, Washington, DC, EPA/630/R095/002F, April 1998.

USEPA, 1999a. A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents, USEPA 540-R-98-031, OSWER 9200.1-23P, PB98-963241, July 1999.

USEPA, 1999b. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities. Peer Review Draft. November 1999.

USEPA, 2000a. The Ecological Soil Screening Level (Eco-SSL). Interim.

USEPA, 2000b. Bioaccumulation Testing and Interpretation for the Purpose of Sediment Quality Assessment, Status and Needs. Office of Water and Office of Solid Waste. February 2000.

USEPA, 2001. The role of Screening-Level Risk Assessments and Refining Contaminants of Concern in Baseline Ecological Risk Assessments, OSWER Publication 9345.0-14, EPA 540/F-01/014, June 2001.

USEPA, 2002. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Integrated Manual, NTIS-PB2002105715, USEPA SW-846, 2002.

USEPA, 2003a. National Primary Drinking Water Standards, USEPA 816-F-03-016, USEPA, Office of Ground Water and Drinking Water, June 2003.

USEPA, 2003b. Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, USEPA, Technical Work Group for Lead, EPA-540-R-03-001, January 2003.

USEPA. 2003c. The Ecological Soil Screening Level (Eco-SSL). Interim. Revised in 2003.

USEPA, 2004. Preliminary Remediation Goals (PRGs), USEPA, Region IX, October 2004.

USEPA. 2005. The Ecological Soil Screening Level (Eco-SSL). Interim. Revised in March 2005.

USEPA Region III. 1995. Region III BTAG Screening Levels.

USEPA Region V, 2003. Ecological Screening Levels.

Woodward-Clyde, 1997. U.S. Army Base Realignment and Closure 95 Program, Environmental Baseline Survey Report, Woodward-Clyde Federal Services, March 1997.

**APPENDIX B**

**LETTER OF CONCURRENCE**

**APPENDIX C**

**PUBLIC COMMENT AND RESPONSIVENESS SUMMARY**

## **PUBLIC COMMENTS AND RESPONSIVENESS SUMMARY**

### **The DEFENSE REUTILIZATION AND MARKETING OFFICE YARD (SEAD-121C) AND THE RUMORED COSMOLINE OIL DISPOSAL AREA (SEAD-121I)**

#### **SENECA ARMY DEPOT SUPERFUND SITE**

### **INTRODUCTION**

A responsiveness summary is required by Superfund policy. It provides a summary of citizen's comments and concerns received during the public comment period, and the Army's responses to those comments and concerns.

### **OVERVIEW**

Since the inception of this project, the Army has implemented an active policy of involvement with the local community. This involvement has occurred through the public forum provided by regular meetings of the Base Clean-up Team (BCT). During these meetings, representatives of the community, the Army and the regulators are brought together in a forum where ideas and concerns are voiced and addressed. The BCT has been routinely briefed by the Army in regards to the progress and the results obtained during both the investigation and remedial alternative selection process. In addition to regular project specific briefings, the Army has provided experts in various fields related to the CERCLA program that have provided lectures intended to educate the general public in the various technical aspects of the CERCLA program at SEDA. Lectures have been conducted on risk assessments, both human health and ecological, remedial alternatives, such as bioventing and natural attenuation, institutional controls, and the feasibility study process.

### **BACKGROUND ON COMMUNITY INVOLVEMENT**

Initially, during the years from 1991 through 1995 the Army formed and solicited community involvement through quarterly meetings with the Technical Review Committee (TRC). The TRC was comprised of community leaders with an active interest in the on-goings of the CERCLA process at the depot. These meetings were open to the public and were announced in the local newspaper and the radio. Following inclusion of the depot on the final BRAC closure list in late 1995, the Army transitioned from the TRC and formed the Base Clean-up Team (BCT). The BCT was comprised of several of the TRC members with the addition of additional Army and regulatory representatives. The BCT increased the frequency of the meetings to a monthly basis. Since the formation of the TRC and the BCT, the Army has met with the local community members on a regular basis and has discussed the finding of both the RI and the FS. In addition, the proposed plan has been presented to the BCT.

## **SUMMARY OF COMMUNITY RELATIONS ACTIVITIES**

The EBS report, RI report, and the Proposed Plan for SEAD-121C and SEAD-121I have been released to the public for comment. These documents were made available to the public in the administrative record file at the information repositories at Building 123 within the Seneca Army Depot Activity, 5786 State Route 96, Romulus, New York, 14541-0009. The public comment period on these documents was held from **Date 1 to Date 2**. The notice of availability for the above-referenced documents was published in the Finger Lake Times during this time period.

On Date 3, the Army, the EPA and the NYSDEC conducted a public meeting at the Seneca County Board of Supervisors Room, located at the Seneca County Office Building in Waterloo, NY to inform local officials and interested citizens about the Superfund process, to review current and planned remedial activities at the AOCs, and to respond to any questions from area residents and other attendees. The meeting included poster board presentations and provided an opportunity for the public to speak to Army, EPA and NYSDEC representatives involved in the process. The public was given the opportunity to provide formal comments that would be documented and become part of the official record for the selected remedy.

## **SUMMARY OF COMMENTS AND RESPONSES**

No formal comments were received from the community during the public meeting. There is no official transcript since no comments were provided. In addition, no formal comments were received from the community during the public meeting or the public comment period.

**APPENDIX D**

**ANALYTICAL RESULTS FOR SAMPLES**









