Proposed Plan

Two Areas of Concern (AOCs) Requiring Land Use Controls (LUCs), SWMUs SEAD-121C, the Defense Reutilization and Marketing Office (DRMO) Yard, and SEAD-121I, the Rumored Cosmoline Oil Disposal Area at the SENECA ARMY DEPOT ACTIVITY (SEDA) Romulus, New York

January 2008

PURPOSE OF THE PROPOSED PLAN

This Proposed Plan describes the remedial alternative selected for two areas of concern (AOCs), SEAD-121C (the former Defense Reutilization and Marketing Office [DRMO] Yard) and SEAD-121I (the Rumored Cosmoline Oil Disposal Area) at the Seneca Army Depot Activity (SEDA or Depot) Superfund Site, located in Seneca County, New York. This Proposed Plan was developed by the U.S. Army (Army) in consultation with the U.S. Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (NYSDEC). The Army is issuing this Proposed Plan as part of their public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, and Sections 300.430(f) and 300.435(c) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The nature and extent of the contamination at the two AOCs is described in the April 2006 Remedial Investigation (RI) Report and the November 2007 Construction Completion Report (CCR). The Army, EPA, and NYSDEC encourage the public to review these documents to gain a more comprehensive understanding of the AOCs, the site and the Superfund activities that have been completed.

This Proposed Plan is being provided as a supplement to the RI and CCR Reports to inform the public of the Army's preferred remedies for the AOCs and to solicit public comments pertinent to the selected remedies. The preferred remedy for both AOCs includes provisions to formally impose and implement Land Use Controls (LUCs) that prohibit the use of the designated land for residential activities, and to prohibit access to and use of groundwater.

The identified LUCs were previously established for three other AOCs (i.e., SEADs 27, 64A, and 66) that are located in proximity to SEADs 121C and 121I. At the time of the final determination for the other three SEADs, all parties agreed that the identified LUCs should be imposed on all land within the Planned Industrial / Office-Development and Warehousing (PID) Area at the former Depot due to the anticipated future use of the land and the similarity of its known past uses by the Army.

The remedies described in this Proposed Plan are the preferred remedy for each of the AOCs. Changes to the preferred remedy, or a change from the preferred remedy to another remedy, may be made if public comments or additional data indicate that such a change will result in a more appropriate remedial action. The final decision regarding the selected remedies will be made after the Army and the EPA have taken all public comments into consideration. The Army is soliciting comments because the Army and EPA may select a remedy other that the preferred remedy for either or both of the AOCs.

MARK YOUR CALENDAR

January 24, 2008 – February 22, 2008:
Public comment period related to this Proposed Plan.

January 29, 2008 at **7:00 P.M.**: Public meeting at the Seneca County Office Building, Village of Waterloo New York, Heroes Conference Room.

COMMUNITY ROLE IN SELECTION PROCESS

The Army, EPA, and NYSDEC rely on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, the RI and CCR Reports and this proposed plan have been made available to the public for a public comment period which begins on January 24, 2008 and concludes on February 22, 2008.

A public meeting will be held during the public comment period at the Seneca County Office Building, Heroes Conference Room on January 29, 2008 at 7:00 p.m. to present the conclusions of the RI and the construction activities performed, to elaborate further on the reasons for selecting the preferred remedies, and to receive public comments.

Comments received at the public meeting, as well as written comments, will be documented in the Responsiveness Summary Section of the Record of Decision (ROD), the document that formalizes the selection of the remedy for the AOCs.

Written comments on the Proposed Plan should be addressed to:

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BRAC Environmental Coordinator
Seneca Army Depot Activity
Building 123, P.O. Box 9
5786 State Route 96
Romulus, NY 14541-0009

SCOPE AND ROLE OF ACTION

The primary goal of these actions is to enable the Army to transfer or lease the land occupied by the identified AOCs to other private or public parties for beneficial reuse. The historic use of this land was industrial and warehousing. The planned future use for the land in these AOCs is Planned Industrial/Office-Development/Warehousing, and these uses are consistent with the Town of Romulus' current zoning of the land within the PID Area.

Prior to transfer or lease of any property at the SEDA, the Army is required to ensure that the property is suitable for reuse. Information exists for SEADs 121C and 121I that indicates that hazardous substances are still present at these AOCs at concentrations that potentially pose risks to selected populations. At SEAD-121C, a risk assessment based on exposure scenarios that are consistent with the planned future use of the land in the AOC indicates that such uses are possible and appropriate given the residual levels of hazardous substances that remain at the AOC. At SEAD-121I, a risk assessment indicates that an elevated level of non-cancer risk exists due to the presence of metals in the soil. The primary metals responsible for the identified risk were associated with strategic stockpiles of ore that were previously staged within the AOC.

Although risks estimated for SEAD-121C are acceptable for industrial occupants, the EPA requested that lead contaminated soil at levels exceeding 1,500 mg/Kg be removed to enhance the overall acceptability of the area. The lead cleanup objectives that were established for SEAD-121C were that the 95th upper confidence limit (95th UCL) of the mean for samples collected from the area of the excavation would not exceed 1,250 mg/Kg, and that no individual sample would contain a lead concentration of more than 1,500 mg/Kg.

Once the Government's strategic stockpile mission was terminated at SEAD-121I, the Army also performed a mission termination cleanup action in the areas where the stockpiles were previously located. The cleanup objectives established for this work were that the 95th

UCL of the mean for manganese in the area of the former stockpiles of ore would not exceed 10,000 mg/Kg, and that no individual sample would contain manganese at a level greater than 19,500 mg/Kg. Additionally, the 95th UCL of the mean for iron would not exceed 100,000 mg/Kg at the former stockpile locations.

Based on these findings and actions, it was determined that formally imposing LUCs already established for the greater PID Area, which prohibit residential activities, and prohibit access to and use of groundwater, is an appropriate measure to minimize any potential future health and environmental impacts at both AOCs.

SITE BACKGROUND

Site and AOC Descriptions

The SEDA previously occupied approximately 10,600 acres of land located in the Towns of Varick and Romulus in Seneca County, New York. The former military facility was owned by the U.S. Government and operated by the Army between 1941 and approximately 2000, when SEDA's military mission ceased. Prior to the Army's occupation of the land, this land was used for farming, agricultural and residential purposes. The SEDA's historic military mission included receipt, storage, distribution, maintenance, and demilitarization of general supplies, conventional ammunition, explosives and special weapons.

SEDA is located in an uplands area, which forms a divide that separates 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 1929 [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). Given this topographic profile, the primary direction of surface water flow throughout the SEDA is to the west towards Seneca Lake. Isolated portions of the Depot drain to the northeast (Seneca-Cayuga Canal) and east (Cayuga Lake). Primary surface water flow conduits to Seneca Lake are Reeder, Kendaia, Indian, and Silver Creeks, while Kendig Creek flows to the northeast and an unnamed creek flows away from the southeast corner of the Depot towards Cayuga Lake in the east. Comparably, the predominant groundwater flow direction is to the west and southwest, although local variations exist at specific locations throughout the Depot.

SEAD-121C and SEAD-121I are both located in the east-central portion of the former SEDA. Both AOCs are within the greater PID and Warehousing Area. Both AOCs are located at elevations greater than 720 ft (NGVD 1929). The location of SEAD-121C and SEAD-121I within the Depot are shown on **Figure 1**.

SEAD-121C, the former DRMO Yard

SEAD-121C is a triangularly-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; an elongated, segmented, rectangular-shaped, open concrete storage structure immediately adjacent to, and located halfway along the northwest perimeter fence of the AOC; and a multi-chambered, open storage cell adjacent to the east

perimeter fence, near the northern-most point of the DRMO Yard. This latter storage area sits between railroad tracks and is located in an area where broken asphalt pavement is present and intermixed with the earth.

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 activity 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

SEAD-121I consists of four rectangular-shaped, open grass and dirt covered areas that are bounded by 3rd and 7th 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 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 of this land was previously used for the staging of strategic stockpiles of ferro-manganese 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 3rd St., 4th St., 5th St., 6th St., and 7th 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 3rd 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 indicates 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 historically staged strategic stockpiles of ferro-manganese ore in portions of SEAD-121I, and these stockpiles were present during the EBS and RI sampling events and into the early part of 2007. 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. The stockpile mission at SEAD-121I terminated in 2007 when the stockpiles were sold and removed, and the historic staging areas have had all ore residual removed.

Parallel rows of warehouses border the eastern and western sides of the AOC, across the bounding north-south running Avenue C and Avenue D.

Seneca Army Depot History

The U.S. Government purchased land for the Seneca Army Depot in Varick and Romulus, New York from approximately 150 families during June 1941. This land previously was used primarily for family homesteads, farming and agriculture. Once land was obtained, a work force numbering more than 7,000 at the peak of construction built the infrastructure of the Depot which included roads and rail lines; storage igloos; numerous buildings and structures that were used for administrative, maintenance, recreational, training, living, and support functions; and surrounded the entire facility with more than 20 miles of perimeter security fence, much of which was completed prior to the US's entry into World War II (WWII). The Depot began its primary mission of receipt, maintenance and supply of ammunition in 1943. After the end of WWII, the Depot's mission shifted from supply to storage, maintenance and disposal of ammunition.

On July 14, 1989, the EPA proposed the SEDA for inclusion on the National Priorities List (NPL). The EPA

recommendation was approved and finalized on August 30, 1990, when the SEDA was listed in Group 14 of the Federal Facilities portion of the NPL.

Once listed on the NPL, the Army, EPA, and NYSDEC identified 57 solid waste management units (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. Each of these sites was identified in the *Federal Facilities Agreement under CERCLA Section 120; Docket Number: II-CERCLA-FFA-00202* (FFA) signed by the three parties in 1993. The number of SWMUs was subsequently expanded to include 72 AOCs once the Army completed the required *SWMU Classification Report* 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 Areas of Concern (AOCs). SWMUs listed as AOCs were scheduled for investigations based upon data and potential risks to the environment.

In 1995, the SEDA was designated for closure under the Department of Defense's (DoD's) 1995 Base Realignment and Closure (BRAC) process. In accordance with requirements of BRAC, the Army prepared an Environmental Baseline Survey (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 various portions of the SEDA has been modified by Seneca County Industrial Development Agency (SCIDA) since 1996.

Since 1995, approximately 8,000 acres of the former Depot has been released to the SCIDA. An additional 250 acres of land at the Depot has been transferred to the U.S. Coast Guard for continued operation of a LORAN[1] Station. Finally, other property still owned by the federal government has been leased to private parties for beneficial reuse.

PREVIOUS INVESTIGATIONS AND ACTIVITIES

Two environmental investigations were conducted at SEAD-121C and SEAD-121I to characterize conditions present. In addition, soil removal actions were performed at both of the AOCs during the summer of 2007.

The Army conducted a limited Environmental Baseline Survey (EBS) in 1998 and 1999 at each AOC to assess if hazardous substances were likely to be present. This work is summarized in the report *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)].* Based on the results of the EBS, the Army subsequently conducted RIs at both AOCs during 2002 and 2003. The results of the RI are summarized in the report *Remedial Investigation Report for Two EBS Sites*

[1] LORAN – long range navigation

in the Planned Industrial Development Area (SEAD-121C and SEAD-121I. During these investigations, samples of soil (surface, subsurface, and ditch), surface water and groundwater were collected from one or both of the AOCs and analyzed for the full suite of Target Compound and Target Analyte List (TCL and TAL, respectively) parameters.

During the investigations, analytical data collected were compared to the prevailing state and federal standards and reference values. Cleanup levels and standards considered included New York's: Technical and Guidance Memorandum (TAGM) No. 94-HRW-4046 soil cleanup objectives; Class GA Groundwater Quality Standards; and, Class C Surface Water Ambient Water Quality Standards (AWQSs). Federal reference values considered included EPA Region IX Preliminary Remediation Goals (PRGs) for residential soils and PRGs for Tap Water, and Maximum Contaminant Limits (MCLs) for Drinking Water. The state's TAGM #4046 values for soil have recently been superseded by a new set of soil cleanup values including: protection of groundwater; protection of ecological resources; unrestricted use; and four levels of restricted use (i.e., residential, restricted residential, commercial, and industrial). State guidance for hazardous waste sites requires that response actions evaluated for possible implementation include the no action alternative, one that focuses on returning the location to pre-use conditions (i.e., unrestricted use), and others as may be appropriate.

During the prior investigations, it was determined that metals in the soil are the primary hazardous substances present at both of the AOCs. Concentrations identified for specific metals were shown to exceed identified cleanup objectives and reference values. Additionally, other selected organic chemicals have also been found at both AOCs at lower frequency, but at concentrations that exceed defined cleanup objectives and reference values. Finally, groundwater at SEAD-121C, and episodic surface water flows at both SEAD-121C and SEAD-121I have been shown to contain hazardous substances at concentrations that exceed state standards and federal reference values.

Specific hazardous substances of concern at SEAD-121C include benzene; the seven carcinogenic polycyclic aromatic hydrocarbons (cPAHs); dieldrin; three Aroclor congeners (1242, 1254, and 1260); and the metals arsenic, copper, lead, and iron. Hazardous substances identified at SEAD-121I include the seven cPAHs; dieldrin and heptachlor epoxide; and the metals arsenic, chromium, iron, manganese, and thallium.

During the summer of 2007, removal actions were performed at both SEAD-121C and SEAD-121. As is indicated above, the focus of the removal action at SEAD-121C was to eliminate samples containing lead concentrations in excess of 1,500 mg/Kg and to achieve an excavation area wide 95th UCL of the mean of 1,250 mg/Kg. At SEAD-121I, the goal of the ore pile cleanup was to remove residual ore and achieve a 95th UCL residual manganese concentration in soil of less than 10,000 mg/Kg for the excavation areas with no individual sample exceeding a value of 19,500 mg/Kg, and a 95th UCL residual iron concentration in soil of less than 100,000 mg/Kg. Confirmatory soil samples were collected at each area during the removal actions, and they were analyzed only for the metals of specific interest. The results of the confirmatory sampling and analysis are provided in **Table 2** and **6**, below.

SEAD-121C, the DRMO Yard

Soil Investigations

Hazardous substances found in the soil at SEAD-121C, the DRMO Yard after the EBS and RI are listed and compared to applicable state and federal cleanup objectives in **Table 1**. This table also identifies the 95th UCL of the mean value computed for the soil data set based on EPA's ProUCL methodologies.

Table 1
Comparison of Measured Soil Concentrations at SEAD-121C to Soil Cleanup Objective Criteria

Hazardous Substance	95th UCL of the Mean (mg/Kg)*	NYSDEC Industrial Use (mg/Kg)*	Region IX Industrial Soil PRGs (mg/Kg)*
Benzene	0.18	89	1.4
Ethylbenzene	2.44	780	400
Benzo(a)anthracene	1.91	11	2.1
Benzo(a)pyrene	1.99	1.1	0.21
Benzo(b)fluoranthene	2.64	11	2.1
Benzo(k)fluoranthene	1.38	110	21
Chrysene	1.83	110	210
Dibenz(ah)anthracene	0.31	1.1	0.21
B(a)P Toxicity Equiv.	2.66	NA	NA
4,4`-DDD	0.006	180	10
4,4`-DDE	0.015	120	7
4,4`-DDT	0.015	94	7
Aldrin	0.004	1.4	0.1
Aroclor-1254	0.13	25	21
Aroclor-1260	0.03	25	21
Dieldrin	0.007	2.8	0.11
Endrin	0.004	410	1800
Arsenic	5.69	16	1.6
Barium	400	10000	67000
Cadmium	9.9	60	450
Chromium	27.0	6800	100000
Copper	1575	10000	41000
Lead	2278	3900	800
Mercury	0.11	5.7	NA
Nickel	44.3	10000	20000
Silver	3.6	6800	5100
Zinc	800	10000	100000

Key: * mg/Kg = milligrams per Kilogram; NA = Not Available

Forty-eight (48) surface soil (0 – 0.2 ft), 10 ditch soil (0 – 2 ft.) and 20 subsurface soils (> 2 ft.) were collected and analyzed as part of the investigation of soil at SEAD-121C. Soil samples showed levels of two volatiles organic compounds, six cPAHs, six pesticides, two PCBs, and 14 metals that exceeded various Federal or State comparative values.

Generally, only trace levels of volatile organic compounds were found in soil samples at SEAD-121C. Concentrations noted for several of the identified compounds were consistent with laboratory contaminant levels. Benzene and ethylbenzene were both found in a single subsurface sample at elevated concentrations.

The cPAHs were found in all soils evaluated (i.e., surface, subsurface, and ditch), but the higher concentrations were generally detected in the surface soils. The highest concentrations of cPAH compounds, including predominantly benzo(a)pyrene were found in three portions of the site: at one location north of Building 316 immediately next to the southern end of the earthen bottom storage cell that are located in this portion of the AOC; at three locations exterior to the yard along the southern edge of 1st Street in close proximity to the southern man-made drainage culvert; and, at one surface soil location halfway along the northwestern boundary fence that separates the DRMO Yard from the abutting drainage ditch. The concentration of benzo(a)pyrene measured in each of these samples exceeded its Industrial Use reference value, while the concentration of benzo(b)fluoranthene found in the sample along the northwestern boundary fence was also above its Industrial Use reference value. A visual inspection of the location north of Building 316 indicates that there are pieces of broken up asphalt intermixed with the soil at the southern end of the storage cells north of Building 316. This sample location is also between two railroad tracks. The three locations located along 1st Street are outside and upgradient of the DRMO Yard and its activities. The elevated results found in these samples are reflective of background concentrations that result from stormwater runoff from the upgradient PID and Warehousing area, and the adjacent road. A visual inspection of the sample location along the northwestern boundary fence suggests that the data is anomalous, as there is no difference in any of the soil noted in this area versus others collected in the DRMO Yard that show lower concentrations.

The highest concentrations of metals were generally collocated in surface soil samples collected from locations in the northern-most and southwestern corners of the former yard, where scrap metal collection areas were previously located. Metal species identified at the yard that could pose potential risks to human health included arsenic, copper, iron, and lead; subsequent risk

assessments indicated that potential risks were within EPA's acceptable range.

During the summer of 2007, a soil removal action was performed to remove lead contaminated soil that had been identified in the northern end of the DRMO Yard. Locations where elevated cPAH compound concentrations were not addressed for the reasons noted above. Confirmatory samples were collected and analyzed for total lead only. The results of the confirmatory analyses indicate that the remaining soils at SEAD-121C achieved the defined cleanup objectives (i.e., for lead, 95th UCL less than 1,250 mg/Kg, with no individual sample concentration in excess of 1,500 mg/Kg). **Table 2** below summarizes the residual levels of lead that now remains at SEAD-121C versus comparative cleanup objectives.

Table 2
Comparison of Measured Soil Concentrations at SEAD-121C to Soil Cleanup Objective Criteria

Hazardous Substance	95th UCL of the Mean (mg/Kg)*	NYSDEC Industrial Use (mg/Kg)*	Region IX Industrial Soil PRGs (mg/Kg)*
Pre-Removal Action (see Table 1)			
Lead (complete AOC)	2278	3900	800
Post Removal Action			
Lead (complete AOC)	430.4	3900	800

Key: * mg/Kg = milligrams per Kilogram; NA = Not Available

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. 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 during the RI. 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 found to be dry. Data collected during the EBS is considered suspect because bailers were used. Sampling with bailers is a more aggressive technique that stirs up silt and soil that is commonly found in wells, and which can lead to false positive results for many compounds, especially metals..

Groundwater data developed for SEAD-121C was compared to Federal and State criteria including New York State Class GA Groundwater Standards, Federal Maximum Contaminant Levels (MCLs), and EPA Region IX PRGs for Tap Water. The Federal MCLs 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. The results of the groundwater sampling at SEAD-121C are presented in **Table 3**, below.

Table 3
Comparison of Measured Groundwater Concentrations at SEAD-121C and Cleanup Objectives

Hazardous Substance	EBS Maximum Groundwater Concentration (µg/L)*	RI Maximum Groundwater Concentration (µg/L)*	NYSDEC GA Groundwater Standard (µg/L)*	Federal MCL Standard (µg/L)	EPA Region IX PRG for Tap Water (µg/L)*	Maximum Seneca Background Concentration (µg/L)*
1,2-Dichloro-Benzene	36	ND	3	0.6	370	NA
4,4'-DDD	0.81	ND	0.3	NA	0.28	NA
4,4'-DDE	0.3	ND	0.2	NA	0.2	NA
4,4'-DDT	0.56	ND	0.2	NA	0.2	NA
Alpha-BHC	0.059	ND	0.1	NA	0.011	NA
Beta-BHC	0.33	ND	0.04	NA	0.037	NA
Delta-BHC	0.16	ND	0.04	NA	NA	NA
Dieldrin	0.2	ND	0.004	NA	0.0042	NA
Heptachlor	0.14	ND	0.04	0.4	0.015	NA
Heptachlor epoxide	0.11	ND	0.03	0.2	0.0074	NA
Aluminum	5350	588	NA	NA	36000	42400
Antimony	NA	8.4	3	6	15	52.7
Iron	5620	869	300	NA	11000	69400
Manganese	1365	297	300	NA	880	1120
Sodium	95200	58400	20000	NA	1200000	59400

Key: µg/L = micrograms per Liter; NA = Not Available; ND = Not Detected.

Volatile organic compounds (VOCs), pesticides and polychlorinated biphenyls (PCBs) were not detected in groundwater samples characterized during the RI

sampling program. Two semivolatile organic compounds (SVOCs) were detected in groundwater samples collected during the RI, but neither was found at a concentration above any comparative criteria.

Nineteen (19) metals were detected in samples collected from the permanent wells at SEAD-121C during the RI. Aluminum, antimony, iron, manganese, and sodium exceeded their respective comparative criteria in at least two of the six groundwater samples characterized during the RI sampling events.

Surface Water Investigation

No permanent surface water body is located within the bounds of SEAD-121C. Drainage ditches are located exterior to the AOC, along its southern and northwestern bounds. The man-made drainage ditches 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. Surface water flow in the abutting drainage ditches is an episodic event; thus, there is no NYSDEC designation assigned to surface water (i.e., runoff) found in the channels. For comparative purposes, analytical results compiled for surface water samples were compared to New York State's Class C AWQSs and to the EPA's Region IX PRGs for Tap Water. The results of this comparison are shown in **Table 4**.

Table 4
Comparison of Measured Surface Water Concentrations at SEAD-121C and Cleanup Objectives

Hazardous Substance	Maximum Surface Water Concentration (µg/L)*	NYSDEC Class C Surface Water Standard (µg/L)*	EPA Region IX PRG for Tap Water (µg/L)*
Bis(2-ethylhexyl)phthalate	4.2	0.6	4.8
Aluminum	8760	100	36000
Arsenic	50.3	150	0.045
Barium	423	NA	2600
Beryllium	0.86	1100	73
Cadmium	19.5	3.84	18
Calcium	166000	NA	25000
Chromium	129	139.45	110
Cobalt	47	5	730
Copper	1160	17.32	1500
Iron	110000	300	11000
Lead	839	1.46	15
Magnesium	26200	NA	40000
Manganese	2380	NA	880
Mercury	2.1	0.0007	11
Nickel	154	99.92	730
Potassium	5350	NA	700000
Selenium	4.6	4.6	180
Silver	8	0.1	182
Sodium	123000	NA	1200000
Thallium	6.3	8	2.4
Vanadium	233	14	36
Zinc	6910	159.25	11000

Key: µg/L = micrograms per liter; NA = Not Available; ND = Not Detected.

Surface water samples were collected from 10 locations during the SEAD-121C RI; nine of these samples were collected exterior to SEAD-121C, while the last was collected from a puddle within the AOC that accumulated after a storm event.

Neither VOCs nor pesticides/PCBs were detected in any of the surface water samples collected in or near SEAD-121C. The SVOC bis(2-ethylhexyl)phthalate was detected in one sample collected from a location that is upgradient of, exterior to, and southwest of the AOC. The reported concentration of 4.2 µg/L exceeds New York's Class C AWQS, but is less than Region IX's PRG for Tap Water.

Twenty-two metals were detected in surface water samples collected from the vicinity of the DRMO Yard. Of the 22 metals detected, 10 were detected in every sample analyzed, while two others (i.e., arsenic and selenium) were only observed in one sample each. Antimony was not detected in any surface water sample. Eleven of the detected metals exceeded their respective Class C AWQS for surface water. Eight metals exceeded their respective Region IX PRGs for Tap Water.

SEAD-121I, 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 2002 and 2003; 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).* The combined analytical results of the EBS and the RI are summarized and discussed below.

Soil Investigations

Fifty-one (51) soil samples, including 12 ditch soil samples, 34 surface soil samples (i.e., 0 – 2 inches bgs) and five soil samples collected from soil borings, but from depths of less than 2 ft. bgs, were collected and analyzed as part of the investigation of soil at SEAD-121I. A summary of the soil data for SEAD-121I compared to pertinent criteria is provided in **Table 5**.

Table 5
Comparison of Measured Soil Concentrations at SEAD-121I to Soil Cleanup Objective Criteria

Hazardous Substance	95th UCL of the Mean (mg/Kg)*	NYSDEC Restricted Commercial Use (mg/Kg)*	NYSDEC Restricted Industrial Use (mg/Kg)*	Region IX Industrial Soil PRGs (mg/Kg)*
Acetone	0.061	500	1000	54000
Benzo(a)anthracene	9.25	5.6	11	2.1
Benzo(a)pyrene	8.42	1	1.1	0.21
Benzo(b)fluoranthene	10.43	5.6	11	2.1
Benzo(k)fluoranthene	9.40	56	110	21
Chrysene	12.00	56	110	210
Dibenz(ah)anthracene	1.26	0.56	1.1	0.21
Indeno(123-cd)pyrene	4.47	5.6	11	2.1
B(a)P Toxicity Equiv.	13	NA	NA	NA
4,4`-DDE	0.014	62	120	7
4,4`-DDT	0.013	47	94	7
Aldrin	0.0059	0.68	1.4	0.1
Dieldrin	0.011	1.4	2.8	0.11
Endrin	0.0048	89	410	1800
Heptachlor epoxide		NA	NA	0.19
Antimony	3.3	NA	NA	410
Arsenic	26	16	16	1.6
Cadmium	2.5	9.3	60	450
Chromium	73	1500	6800	10000
Copper	65	270	10000	41000
Iron	21111	NA	NA	100000
Lead	54	1000	3900	800
Magnesium	11000	NA	NA	NA
Manganese	89533	10000	10000	19000
Mercury	0.039	2.8	5.7	NA
Nickel	96	310	10000	20000
Selenium	41	1500	6800	5100
Silver	2.4	1500	6800	5100
Thallium	45	NA	NA	67
Zinc	163	10000	10000	100000

Key: * mg/Kg = milligrams per Kilogram; NA = Not Available

Eight VOCs, including acetone, benzene, ethyl benzene, meta/para xylene, methyl ethyl ketone, methylene chloride, ortho xylene, and toluene, were detected in the 45 surface soil samples collected and analyzed from SEAD-121I. Acetone was the only VOC found at concentrations that are above normal laboratory contaminant levels.

Twenty-eight SVOCs, including mainly PAHs, cPAHs, and mixed phthalates were detected in the soil samples collected from SEAD-121I. Generally, the seven cPAH compounds were found most frequently. The seven cPAH compounds were also the only substances

observed to exceed State or Federal comparative values. Three samples exhibited benzo(a)pyrene toxicity equivalent (BTE) concentrations in excess of NYSDEC's historic reference value of 10 mg/Kg.

Seven pesticides and two PCBs were detected in the soils at SEAD-121I. Five pesticides (i.e., 4,4`-DDE, 4,4`-DDT, aldrin, dieldrin and endrin) were found at concentrations that exceeded one of their respective comparative cleanup objectives.

Twenty-three metals were detected in the 45 soil samples collected in or around SEAD-121I. Thirteen metals (arsenic, antimony, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc) were found at concentrations that exceeded one of their respective comparative cleanup criteria.

The metals exhibiting concentrations above comparative cleanup objective levels were generally located in close proximity to the historic ore piles. As such, the stockpiles are presumed to be the source of the elevated levels of these metals in the AOC soils.

Once the strategic stockpile mission was terminated at SEAD-121I, the Army cleaned up the former stockpile areas. During this effort, the former asphalt pads upon which the ore piles sat were excavated, as was an additional 6 to 12 inches of soil beneath and around the footprints of the piles. Confirmatory soil samples were collected and analyzed for iron and manganese only. The results of the confirmatory analyses indicate that the remaining soils at the stockpile locations achieved the defined cleanup objectives (i.e., for iron, 95th UCL less than 100,000 mg/Kg; for manganese, 95th UCL less than 10,000 mg/Kg, and no individual sample concentration above 19,500 mg/Kg). **Table 6** below summarizes the residual levels of iron and manganese that now remain at SEAD-121I.

Table 6
Comparison of Measured Soil Concentrations at SEAD-121I to Soil Cleanup Objective Criteria

Hazardous Substance	95th UCL of the Mean (mg/Kg)*	NYSDEC Restricted Commercial Use (mg/Kg)*	NYSDEC Restricted Industrial Use (mg/Kg)*	Region IX Industrial Soil PRGs (mg/Kg)*
Pre-Removal Action				
Iron	21111	NA	NA	100000
Manganese	89533	10000	10000	19000
Post Removal Action				
Iron (entire AOC)	18021	NA	NA	100000
Manganese (entire AOC)	2438	10000	10000	19000

Groundwater Investigation

Groundwater was not encountered in any of the soil borings advanced at SEAD-121I. Each of these borings was terminated once the underlying bedrock surface was encountered. Therefore, groundwater was not evaluated as a media of concern at SEAD-121I.

Surface Water Investigation

Seven (7) surface water samples were collected and analyzed as part of the investigation of SEAD-121I.

Table 7
Comparison of Measured Surface Water Concentrations at SEAD-121I and Cleanup Objectives

Hazardous Substance	Maximum Surface Water Concentration (µg/L)*	NYSDEC Class C Surface Water Standard (µg/L)*	EPA Region IX PRG for Tap Water (µg/L)*
Aluminum	2050	100	36000
Iron	3410	300	11000
Lead	26.3	1.46	15
Zinc	190	159.25	11000

Key: µg/l = micrograms per liter; NA = Not Available; ND = Not Detected.

No VOCs or pesticide/PCB compounds were detected in the surface water samples collected for SEAD-121I. Two SVOCs (butylbenzylphthalate and fluoranthene) were detected in one surface water sample each at

SEAD-121I. Neither of these values exceeded their respective cleanup objective levels (i.e., NYS Class C AWQS or Region IX PRGs for Tap Water).

Eighteen metals were detected in the surface water at SEAD-121I, of these 18, seven (i.e., aluminum, calcium, magnesium, manganese, potassium, sodium, and zinc) were found in every sample. 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; however, only lead was found at a concentration that exceeded its Region IX tap water cleanup objective.

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.

Risk Assessment Methodology

Risk assessments are performed at sites where hazardous substances have been detected to identify if the concentrations of the species found will pose potential adverse threats to current or future human or ecological receptors if they are allowed to remain at the site. Risk assessments are inherently conservative, purposely biased to prompt an action if potential risk is identified.

Human health risk assessments follow a four-step process, which includes hazard identification, exposure assessment, toxicity assessment and risk characterization. These four steps are used to assess potential site-related human health risk for reasonable maximum exposure scenarios that do or could exist at the site if no action were taken to eliminate or mitigate them.

Hazard Identification: Chemicals of Concern (COCs) in the various media at the site are identified and selected based on factors such as their toxicity, concentrations detected relative to regulatory standards and guidelines, frequency of occurrence, fate and transport in the environment, mobility, persistence and bioaccumulation.

Exposure Assessment: Different exposure pathways through which existing or future receptors might be exposed to the COCs are evaluated. Possible exposure pathways include ingestion, dermal contact, or inhalation. Factors relating to the exposure assessment include concentrations that receptors may encounter, and the duration and frequency of the potential exposure. The reasonable maximum exposure scenario is calculated to estimate the highest level that could be expected to occur at the site.

Toxicity Assessment: The types of adverse effects associated with exposure to COCs, and the relationship between the magnitude of the exposure and the severity of potential effects are determined. Potential effects are COC-specific and may include risks of developing cancer or other changes in normal functions of organs (non-carcinogenic effects).

Risk Characterization: The level of potential risk present is assessed by combining the outputs of the exposure and toxicity assessment components. Carcinogenic risks and non-carcinogenic hazards are estimated. Current guidelines for acceptable individual lifetime excess cancer risk are established as 1 in 10,000 to 1 in 100,000 or less (10^{-4} to 10^{-6}, or less). The non-cancer hazard, expressed as a "hazard index" (HI), represents the sum of individual exposure levels to corresponding reference doses. A non-cancer HI threshold level of less than 1 is set as the reference point.

Screening-Level Ecological Risk Assessments (SLERAs) are conservative assessments that provide a high level of confidence in determining a low probability of adverse risk, and they incorporate uncertainty in a precautionary manner. The purpose of the SLERA is to assess the need, and if necessary, the level of effort necessary to conduct a detailed, baseline ecological risk assessment for a site. Principal components of the SLERA are the Screening-Level Problem Formulation and Ecological Effects Evaluation, Screening-Level Exposure Estimate and Risk Calculation, and the Scientific Management Decision Point (SMDP) with four possible decisions:

- 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.

Site Risks

Human health (HHRA) and ecological risk assessments were performed for both SEAD-121C and SEAD-121I to assess potential effects that could result due to the human or ecological species exposure to hazardous substances identified at the AOCs. The baseline HHRAs were conducted in accordance with the USEPA's *Risk Assessment Guidance for Superfund* (RAGS) and the supplemental guidance and updates to the RAGS. Technical judgment, consultation with EPA staff, and recent publications were used in the development of the risk assessment. The overall objective of the HHRAs were 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 reasonable maximum exposure (RME) was evaluated during the HHRAs.

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.

Human Health Risk Assessment

The land at SEAD-121C previously was used as the Defense Reutilization and Marketing Office Yard where scrap, hazardous materials and substances, excess and retired equipment, and other materials were staged pending sale or recycle. SEAD-121I was used as an equipment and material receiving and shipping area, where transported materials were brought into or dispatched from the Depot. The future use of both of these sites has been defined as planned industrial / office development.

The HHRA began by identifying contaminants of concern (COCs) for the various media found in the AOCs. The COCs identified for SEAD-121C included:

- Benzene (soil)
- PAHs (soil)
- Pesticides/PCBs (soil)
- Metals (soil and surface water)

The COCs identified for SEAD-121I included:

- PAHs (soil)
- Pesticides/PCBs (soil)
- Metals (soil and surface water)

Both AOCs are in an area that is serviced by municipal water; therefore it is unlikely that groundwater underlying the AOCs will be used for potable purposes in the future. However, New York views all groundwater as a potential drinking water source, so potential exposure to groundwater was evaluated for SEAD-121C, where groundwater was found and samples were characterized. COCs identified for SEAD-121C groundwater included 1,2-dichlrobenzene, pesticides and metals which were found at concentrations above New York AWQSs. Groundwater was not considered at SEAD-121I where it was not identified or sampled.

Receptors considered in the HHRA included industrial workers, construction workers and adolescent trespassers. Exposure pathways considered included inhalation of dusts, dermal contact with and ingestion of soil, and dermal contact with surface water.

SEAD-121C Risk Results

A review of the carcinogenic risks for reasonable maximum exposures (RMEs) to the soils and surface water at SEAD-121C showed that all levels were within EPA's acceptable range (i.e., 10^{-4} to 10^{-6} or less). The industrial worker exhibited the highest potential risk at 3 $x10^{-5}$, with all other potential risk levels found at 2 x 10^{-6} or less. This analysis includes the cPAH data collected from the four highest locations identified inside between railroad tracks, and outside of SEAD-121C upgradient of the site. Therefore, the Army concludes that there is no reason to remove the soil around these isolated and background locations.

Non-cancer hazard levels (HIs) for all exposure scenarios evaluated were less than EPA's threshold of one (1). The largest HI found was 0.8 for the construction worker.

Lead was identified as a COC in soil and surface water at SEAD-121C. The lead risk for industrial workers and adolescent trespassers for heterogeneous and homogeneous populations were all below EPA's target PbB level of 10 µg/dL.

SEAD-121I Risk Results

A review of the carcinogenic risks for RMEs to the soils and surface water at SEAD-121I showed that all levels were within EPA's acceptable range (i.e., 10^{-4} to 10^{-6} or less). The industrial worker exhibited the highest potential risk at 7 $x10^{-5}$, with all other potential risk levels found at levels of 2 x 10^{-5} or less.

RME HIs calculated for the construction worker and industrial worker at SEAD-121I are all above 1. The significant contributing COC for both receptors and exposure pathways is manganese. Arsenic and iron also contribute to the elevated HI noted for the construction worker. Locations identified at SEAD-121I with the most significant concentrations of each of these dominant COCs were in the immediate vicinity of the strategic stockpiles of ferro-manganese ore, where visual evidence existed to indicate that fines and dusts from the ore were present. The HI identified for the adolescent trespasser was less than 1.

Lead was identified as a COC in surface water at SEAD-121I; however, there is no reliable model for quantifying risk from lead due to dermal contact to surface water.

As is discussed earlier, the Army conducted a removal action at the former stockpile locations within SEAD-121I The results of confirmatory sampling indicate that the iron and manganese 95th UCL concentrations in the immediate area of the excavations (i.e., 22,116 mg/Kg and 3,550 mg/Kg, respectively) are below the established cleanup objectives (i.e., 100,000 mg/Kg iron, and 10,000 mg/Kg manganese with no individual sample exceeding 19,500 mg/Kg). Further, the AOC-wide 95th UCL for iron and manganese are even lower than the excavation only values (18,021 mg/Kg iron, and 2,438 mg/Kg manganese).

Ecological Risk Assessment

AOC-specific ecological evaluations were not conducted at SEADs 121C and 121I. Both AOCs are generally void of characteristics and attributes that would make them attractive habitats for ecological receptors. As is indicated, the DRMO Yard is a gravel-covered lot 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 weeds are present at numerous locations immediately along the fence line and randomly at other locations within the Yard. Similarly, SEAD-121I is a relatively flat, open area that is located between parallel strips of bordering warehouses, roads, and railroad lines. There are intermixed areas of dirt and grass/weed vegetative growths within each block of the AOC, and evidence of wear due to vehicular traffic.

Animals that have been identified within the greater Depot during various other ecological surveys include the beaver, eastern coyote, deer, red and gray fox, eastern cottontail rabbit, muskrat, raccoon, gray squirrel, striped skunk, and the woodchuck. Other smaller mammals (mice, shrews, voles, etc) are also likely. Bird species 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 or underlie the AOCs; thus, it does not directly support aquatic life.

No known occurrences of Federal- or State-designated threatened or endangered plant or animal species within a 2-mile radius of the AOCs are identified in NYSDEC's Natural Heritage Program Biological and Conservation Data System. No species of special concern are documented within the Depot property.

The results of the SLERA indicated that there are potential ecological risks associated with the hazardous substances that are present at SEAD-121C and SEAD-121I. Potential ecological risks were found for a variety of avian and mammalian receptors that could be periodically found in and around the AOCs.

Subsequently, as a result of the refinement of ecological COC analysis in which factors such as bioavailability, bioaccumulation, size of foraging area, the use of NOAEL/LOAEL multiplier, and the use of the maximum site concentration as the exposure point concentration are considered, all preliminary COCs identified were eliminated from further analysis. Some of the COCs identified as contributing to the ecological risk are present at levels consistent with background concentrations found throughout the Depot. Finally, both AOCs are in an area where the planned future land use is industrial/warehousing/office development, and therefore is not expected to be an attractive wildlife habitat. Given these additional considerations and information, it is unlikely that the conditions identified at the AOCs will significantly impact ecological receptors and no further action is warranted for either SEAD-121C or SEAD-121I based on the ecological risk assessment.

Summary of Human Health and Ecological Risks

The results of the HHRA completed for SEAD-121C indicate that there is no unacceptable human health non-cancer hazard or carcinogenic risk present at the AOC. Data is available to indicate that potential risk may exist due to hazardous substances contained in the groundwater, but this risk is mitigated because there is an alternative source of potable water present. The SLERA indicates that potential risks are possible to wildlife; however the allowed refinement of chemical of concern process suggests that the SLERA results are overly conservative. Furthermore, this AOC is an area previously and currently designated for industrial/warehousing/office development usage, and thus this AOC is not likely to be an attractive ecological habitat.

The results of the HHRA completed for SEAD-121I indicate that there were unacceptable non-cancer hazard to potential industrial and construction workers at the AOC. These hazards arose due to concentrations of manganese, iron and arsenic found in soil and dusts at the AOC. These hazardous substances were found at locations associated with the former strategic stockpile mission at the Depot. Non-cancer hazards are not found for the adolescent trespasser. Additionally, no carcinogenic risk is identified for any human receptor at the AOC. The SLERA indicates that potential risks are possible to wildlife; however again the SLERA is shown to be overly conservative, and this AOC is not an area that is likely to be an attractive ecological habitat.

Based on the results of the site investigations and risk assessments completed, the Army has determined that actual or threatened releases of hazardous substances from SEAD-121C do not pose a risk to human or ecological receptors.

A potential risk to human health was noted at SEAD-121I for future industrial and construction workers due to materials that were associated with the strategic stockpiles of ore at the AOC. No undo risk was identified for ecological receptors.

Although no risk was identified at SEAD-121C, the EPA requested that a hot-spot removal action be performed in a portion of the AOC where elevated levels (i.e., concentrations greater than 1,500 mg/Kg) of lead in soil were identified. Similarly, due to the presence of a potential human health risk at SEAD-121I due to metals associated with the strategic ore stockpiles, the EPA requested that existing engineering controls (i.e., locked security fences and warning signs) be maintained until such time as the stockpile mission was terminated and residues were eliminated.

The U.S. Government terminated the strategic stockpile mission at SEAD-121I in 2007. As is noted earlier in this proposed plan, residues associated with the strategic stockpile mission were cleaned up in July and August of 2007. Once the stockpiles were removed and their former locations were cleaned, requirements for prior engineering controls were eliminated.

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, including consideration of applicable or relevant and appropriate requirements (ARARs), TBC reference values and site-specific risk-based levels.

The following remedial action objectives were established for SEAD-121C and SEAD-121I:

- 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.

Tables 1 – 4 identify soil, groundwater, and surface water cleanup objectives and standards, respectively.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA § 121(b)(1), 42 U.S.C. §9621(b)(1) mandates that remedial actions must be protective of human health and the environment, cost effective, comply with ARARs, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable.

Remedial Alternatives

Alternative 1: No Action

The Superfund program requires that the "no-action" alternative be considered and serve as the baseline by which other alternatives evaluated are compared. 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.

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. If justified by the periodic reviews, subsequent remedial actions may be implemented to remove, treat, or contain the contaminated soils.

A municipal, potable water distribution system, which derives its raw water from a non-groundwater source, is present within the PID Area. The presence of this alternative supply of water system eliminates any reason to consider use of groundwater for domestic purposes. Groundwater was not encountered in the vicinity of SEAD-121I. A poor yielding supply of groundwater does exist beneath SEAD-121C, and it is known to contain chemical contaminants at concentrations in excess of New York GA standards for groundwater quality. However, these concentrations are consistent with the background water quality found to exist at the Depot. Additionally, during one of the historic sampling events, contaminants associated with historic releases from SEAD-27 were identified within a well that is located within SEAD-121C. These chemicals were not found during the RI sampling events completed at this AOC.

Given these facts, the Army has decided to formally impose the groundwater access and use restriction that was previously implemented for the greater PID Area under the Record of Decision for SEADs 27, 64A, and 66 in 2004 on all groundwater that is located in the PID Area. The no action alternative for groundwater will apply to all remedial action alternatives considered within this propose plan.

SEAD-121C and SEAD-121I, Alternative 1 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

Alternative 2: Excavation of Contaminated Soil to Achieve Unrestricted Use Cleanup Objectives, Off-Site 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 clean-up objective levels (see Title 6 New York Code of Rules and Regulations, Part 375-6). 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 8**.

TABLE 8
Comparison of Hazardous Substance Concentrations found in SEAD-121C Soil Versus NYSDEC's Unrestricted Use Soil Cleanup Objectives

Hazardous Substance	Units	95th UCL of the Mean Concentrations	NYSDEC 's Unrestricted Use Cleanup Objective	Number of Concentrations Above Cleanup	Is the 95th UCL Above Cleanup Objective (Y/N)?
Benzene	µg/Kg	181	60	1	Y
Ethylbenzene	µg/Kg	2444	1000	2	Y
Benzo(a)anthracene	µg/Kg	1908	1000	6	Y
Benzo(a)pyrene	µg/Kg	1986	1000	7	Y
Benzo(b)fluoranthene	µg/Kg	2640	1000	9	Y
Benzo(k)fluoranthene	µg/Kg	1379	800	7	Y
Chrysene	µg/Kg	1834	1000	6	Y
Dibenz(ah)anthracene	µg/Kg	312	330	3	N
Indeno(1,2,3-cd)pyrene	µg/Kg	319	500	5	N
B(a)P Equivalents	µg/Kg	2659	10000	2	N
4,4`-DDD	µg/Kg	6.4	3.3	5	Y
4,4`-DDE	µg/Kg	14.8	3.3	19	Y
4,4`-DDT	µg/Kg	15.7	3.3	15	Y
Aldrin	µg/Kg	3.6	5	4	N
Aroclor-1254	µg/Kg	134	100	5	Y
Aroclor-1260	µg/Kg	32.5	100	1	N
Dieldrin	µg/Kg	6.9	5	2	Y
Endrin	µg/Kg	4.1	14	3	N
Barium	mg/Kg	400	350	7	Y
Cadmium	mg/Kg	9.9	2.5	16	Y
Chromium	mg/Kg	27	30	15	N
Copper	mg/Kg	1575	50	21	Y
Lead	mg/Kg	430.4	63	48	Y
Mercury	mg/Kg	0.11	0.18	4	N
Nickel	mg/Kg	44	30	51	Y
Silver	mg/Kg	3.6	2	9	Y
Zinc	mg/Kg	800	109	39	Y

Analysis of the available analytical data indicates that hazardous substances are found at concentrations exceeding NYSDEC's Unrestricted Use cleanup objective in most surface soil samples collected from SEAD-121C. Further, hazardous substances at concentrations that exceed the Unrestricted Use cleanup levels are present in many samples collected from the 2 to 6 foot depth range. Given this distribution of contaminants in the soil, the Army anticipates that six feet of soil would need to be excavated throughout the DRMO Yard to achieve Unrestricted Use clean-up objective levels. Based on this expanse of excavation, the estimated volume of contaminated soil requiring removal from the DRMO Yard is 173,600 cubic yards (CY).

As part of the construction work, the soil exterior to three permanent buildings (Buildings 316, 360 and 355) would need to 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.

All excavated soil and demolition debris would be characterized and transported for disposal at off-site landfills. Water generated from the collection of storm event water in the open excavations would be captured and treated on site, as necessary. It would be discharged to the Seneca County Wastewater Treatment Facility in conformance with their requirements.

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

Once this action was completed, the land 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 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 essentially 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 clean-up objective levels. A summary listing of the hazardous substances found in surface and ditch soils at SEAD-121I where measured concentrations exceed NYSDEC's Unrestricted Use soil cleanup objectives is provided in **Table 9**.

TABLE 9
Comparison of Hazardous Substance Concentrations found in SEAD-121I Soil Versus NYSDEC's Unrestricted Use Soil Clean Up Objectives

Hazardous Substance	Units	95th UCL of the Mean Concentrations	NYSDEC 's Unrestricted Use Cleanup Objective	Number of Concentrations Above Cleanup Objectives	Is the 95th UCL Above Cleanup Objectives (Y/N)?
Acetone	µg/Kg	61	50	3	Y
Benzo(a)anthracene	µg/Kg	9252	1000	14	Y
Benzo(a)pyrene	µg/Kg	8419	1000	16	Y
Benzo(b)fluoranthene	µg/Kg	10431	1000	16	Y
Benzo(k)fluoranthene	µg/Kg	9405	800	17	Y
Chrysene	µg/Kg	11998	1000	17	Y
Dibenz(ah)anthracene	µg/Kg	1263	330	10	Y
Indeno(1,2,3-cd)pyrene	µg/Kg	4468	500	14	Y
Phenol	µg/Kg	759	330	1	Y
B(a)P Equivalents	µg/Kg	13000	10000	2	Y
DDE	µg/Kg	14	3.3	5	Y
DDT	µg/Kg	13	3.3	2	Y
Aldrin	µg/Kg	5.9	5	3	Y
Dieldrin	µg/Kg	11	5	2	Y
Endrin	µg/Kg	4.8	14	1	N
Arsenic	mg/Kg	26	13	6	Y
Cadmium	mg/Kg	2.5	2.5	4	Y
Chromium	mg/Kg	73	30	7	Y
Copper	mg/Kg	65	50	5	Y
Lead	mg/Kg	54	63	8	N
Manganese	mg/Kg	2438	1600	12	Y
Nickel	mg/Kg	96	30	19	Y
Selenium	mg/Kg	41	3.9	7	Y
Silver	mg/Kg	2.4	2	3	Y
Zinc	mg/Kg	163	109	14	Y

Review of available analytical data indicates that one or more of the identified hazardous 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 hazardous substances identified were found in shallow soils (0 to 2 feet)

because only a thin layer of soil exists above the underlying bedrock in this portion of the Depot.

Based on this distribution of hazardous substances, most of the four blocks that define the Rumored Cosmoline Oil Disposal Area would require excavation to an average depth of 2 feet. The area across the bounding road surfaces to the front face of the parallel, north-south oriented rows of facing warehouses that constrict the extent of this AOC would not be excavated. The Army believes that the roads are a physical barrier that bound the limit of the AOC and limit the extent of excavation. The area surrounding the Rumored Cosmoline Oil Disposal Area and not associated with a release of hazardous 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 soil cleanup objective, the Army believes that the entire warehouse 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 CY of soil and roadway would need to be excavated, characterized, treated (as necessary), transported and disposed 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 may 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 Wastewater Authority 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 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

Alternative 3: Excavation of Contaminated Soil to Achieve Industrial Use Cleanup Objectives, Off-site Treatment/Disposal and Soil Backfill.

SEAD-121C, the DRMO Yard

This alternative involves the excavation of soil containing hazardous substances at levels that exceed the NYSDEC's Industrial Use soil cleanup objective levels. A summary listing of hazardous substances found in surface, subsurface and ditch soils at SEAD-121C at concentrations exceeding NYSDEC's Industrial Use soil cleanup objectives is provided in **Table 10**.

TABLE 10
Comparison of Hazardous Substance Concentrations found in SEAD-121C Soil Versus NYSDEC's Industrial Use Soil Clean Up Objectives

Hazardous Substance	Units	95th UCL of the Mean Concentrations	NYSDEC 's Restricted Industrial Use Cleanup Objective	Number of Concentrations Above Cleanup Objective	Is the 95th UCL Above Cleanup Objective (Y/N)?
Benzo(a)pyrene	µg/Kg	1986.1	11000	7	Y
Benzo(b)fluoranthene	µg/Kg	2640.2	1100	1	N
B(a)P Equivalents	µg/Kg	2658.9	11000	2	N

Three separate areas of the former DRMO Yard would be excavated to remove soil containing hazardous

substances above Industrial Use cleanup objective levels under this alternative. The first area centers around an isolated, surficial (approximately 1 foot) detection of benzo(a)pyrene exceeding the Industrial Use cleanup objective that is located partway along the northwest facing fence line that separates the yard from the abutting drainage ditch. Approximately 1,315 cubic yards 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. This area overlies historic railroad tracks, and is within an area where there is visual evidence of broken up asphalt paving. Approximately 1,620 cubic yards of soil and debris would be excavated from this location. The last excavation area would be located to the east and entirely outside the former DRMO Yard where soil samples indicate that levels of benzo(a)pyrene exceeding Industrial Use cleanup objectives are present in soils to a depth of at least two feet. This area is outside and upgradient of the actual DRMO Yard, and located along the edge of an asphalt roadway. This area is approximated by results from three samples along the southern edge 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 CY of soil would be excavated from this area. These excavations are all driven by the presence of cPAHs in shallow soils, which do not indicate that there is a site risk to future industrial occupants.

The total excavation volume for this alternative is approximately 14,900 CY.

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. 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 and treated on site, as necessary. It would be discharged to the Seneca County Wastewater Treatment Facility 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 activity purposes.

Because this alternative would result in hazardous 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 hazardous substances at levels in excess of the Commercial Use soil cleanup 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 found in surface and ditch soils at SEAD-121I at concentrations in excess of NYSDEC's Commercial Use soil cleanup objectives is provided in **Table 11**.

TABLE 11
Comparison of Hazardous Substance Concentrations found in SEAD-121I Soil Versus NYSDEC's Commercial Use Soil Clean Up Objectives

Hazardous Substance	Units	95th UCL of the Mean Concentrations	NYSDEC 's Restricted Commercial Use Cleanup Objective	Number of Concentrations Above Cleanup Objective	Is the 95th UCL Above Cleanup Objective (Y/N)?
Benzo(a)anthracene	µg/Kg	9252	5600	6	Y
Benzo(a)pyrene	µg/Kg	8419	1000	16	Y
Benzo(b)fluoranthene	µg/Kg	10431	5600	8	Y
Dibenz(ah)anthracene	µg/Kg	1263	560	6	Y
Indeno(1,2,3-cd)pyrene	µg/Kg	4468	5600	3	N
B(a)P Equivalents	µg/Kg	13000	10000	3	Y
Arsenic	mg/Kg	26	16	5	Y
Manganese	mg/Kg	2438	10000	1	N
Nickel	mg/Kg	96	310	2	N

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

Approximately 21,630 CY 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 Wastewater Authority for final treatment and discharge. All excavated soil and associated demolition debris would be characterized and transported for disposal at off-site landfills. Water generated from the collection of runoff would be captured and treated on site, as necessary.

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 hazardous 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

Alternative 4: Land Use Control Alternative

SEAD-121C, the DRMO Yard

The Army conducted 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 this risk assessment indicate that SEAD-121C is suitable for the continued use as an industrial area. Although the risk assessment indicates that the land at SEAD-121C is suitable for industrial use, elevated concentrations of lead were found in the shallow soil in the northernmost corner of SEAD-121C. The EPA asked that the elevated lead

concentrations be removed to enhance the overall acceptability of the area, and the Army agreed to EPA's request. The soil excavation was completed in an area in the northern corner of the AOC where three surface soil samples showed lead concentrations in excess of NYSDEC's Industrial Use soil cleanup objective. **Figure 2** shows the extent of the excavation completed in SEAD-121C. The depth of the completed excavation varied based on the results of the confirmatory samples. The majority of the excavation extended roughly 1 foot below grade, while small segments were advanced approximately 2 and 4 feet beneath grade until soil cleanup objectives (i.e., no individual sample exhibited a lead concentration in excess of 1,500 mg/Kg and 95th UCL lead concentration of excavation data set was less than 1,250 mg/Kg) were achieved. At completion, approximately 775 CY of soil were excavated and disposed off-site at a non-hazardous solid waste landfill facility. The final extent and depth of the excavation and volume of soil removed was confirmed by the collection and analysis of soil samples for lead from the base (1 per 2,500 ft^2) and perimeter (1 per 50 linear ft.) of the excavation. As a result of the interim soil removal action, the Army demonstrated that the 95th UCL concentration of lead remaining in the soil in the immediate area of the excavation was 599 mg/Kg, with no individual sample exhibiting a concentration in excess of 1,500 mg/Kg.

All excavated soil and debris was characterized and transported off-site for disposal at a non-hazardous landfill. No soil pre-treatment was required prior to transport to the off-site landfill. No water was generated from the collection of stormwater in the excavations at SEAD-121C, so no water was treated and discharged.

The area of the excavation was regraded to enhance surface water drainage and vehicular and pedestrian access/egress. As a result of this action, local and overall AOC-wide 95th UCL lead concentration was reduced from 2,278 mg/Kg to a final level of 430.4 mg/Kg.

Even though the lead concentration at the AOC has been reduced, other hazardous constituents remain at levels that prevent unrestricted use and unrestricted exposures. Therefore, institutional controls in the form of land use restrictions that prohibit the use of the site for any purpose other than industrial activities must still be implemented.

Now that the interim removal action has been completed, it is estimated that this alternative will require approximately six months to implement. This alternative will allow hazardous 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	$350,000
Annual OM&M Cost (soil)	$3,000
Annual OM&M Cost (groundwater)	$3,000
Present Worth Cost	$424,460
Construction time	0 Month
Completion Time	6 Months

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

The Army excavated soil, asphalt, and residual ferro-manganese ore debris from the location of the former strategic stockpiles in SEAD-121I after the Government mission was terminated in 2007. The extent of the soil and debris excavations completed at SEAD-121I is shown in **Figure 3**. The depth of the completed excavations varied based on the results of the confirmatory samples. The majority of the excavation extended roughly 1 foot below grade, while the excavation completed in one part of northern ore pile and one portion of the former southern ore pile extended to bedrock (approximately 2 feet below grade), The deeper excavations were required when preliminary confirmatory sample results indicated that residual levels of manganese were above established site cleanup goals. At completion of the two excavations in SEAD-121I, approximately 1,545 CY of soil were excavated and disposed off-site at a non-hazardous solid waste landfill facility.

All excavated soil and debris was characterized and transported off-site for disposal at a non-hazardous landfill. No soil pre-treatment was required prior to transport of the soil or debris to the off-site landfill. No water was generated from the collection of stormwater in the excavations at SEAD-121I, so no water was treated and discharged.

The areas of the ore pile excavations were regraded to enhance surface water drainage and vehicular and pedestrian access/egress. As a result of this action, the overall AOC-wide 95th UCL manganese and iron concentrations were reduced from 89,533 mg/Kg and 21,111 mg/Kg, respectively to final levels of 2,438 mg/Kg and 18,021 mg/Kg, respectively.

Even though the soil in the vicinity of the former stockpiles staging sites meets the cleanup goals established for this action, hazardous substances remain at the AOC at levels in excess of Industrial Use cleanup objectives. Therefore, the Army will impose institutional controls in the form of land use restrictions that prohibit the use of the site for any purpose other than industrial activities at the AOC. It is estimated that this alternative would take approximately six months to implement.

Furthermore, as this alternative allows 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	$375,000
Annual OM&M Cost (soil)	$3,000
Annual OM&M Cost (groundwater)	$3,000
Present Worth Cost	$449,460
Construction time	1 Month
Completion Time	6 Month

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 operations, monitoring and maintenance (OM&M) costs and net present-worth costs.

- State acceptance indicates if, based on tits 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.

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 remove 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 affected by hazardous substances. Alternative 4 for SEAD-121C only removes soil containing elevated levels of lead, while at SEAD-121I, only that soil and debris associated with the historic stockpile mission is removed.

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. The state law also allows site owners or occupants to propose alternative cleanup objectives for their properties. Given this flexibility, the Army views the New York cleanup objectives as "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 (i.e., Unrestricted, Commercial or Industrial). Although Alternative 4 for SEAD-121C does not comply with NYSDEC's Industrial Use cleanup objectives for all compounds (i.e., cPAHs), risk assessments performed using USEPA's risk assessment guidance demonstrate that no human health risk exists for the future use of the site. LUCs will be implemented to maintain the planned future (i.e., industrial) use at SEAD-121C. Comparably, while other hazardous substances remain at SEAD-121I subsequent to the strategic stockpile cleanup action that was performed, the levels of iron and manganese which were the principal risk drivers for this AOC have been reduced to levels that are lower than New York's Commercial and Industrial Use soil cleanup objectives. Therefore, LUCs will be implemented at SEAD-121I to maintain the planned future use of this AOC.

EPA 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.

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 and manganese and iron contaminated soil and debris at SEAD-121I (Alternative 4) provides some reduction in the toxicity and mobility of hazardous substances, but less than achieved by Alternative 3 at the same AOCs as other contaminants are not considered.

Short-Term Effectiveness

Alternatives 1 and 4 would not pose any additional short term hazards to workers at the AOCs or the community as additional physical construction is not included in either of these remedies. Alternatives 2 and 3 could 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 and 3 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 and 3 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.

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.

The excavation; stabilization, as necessary; characterization; transport; and disposal of soil and debris excavated under either Alternatives 2 or 3 at both AOCs 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.

Cost

The present-worth cost associated with Alternatives 1, 2, 3, and 4 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 12** below.

TABLE 12

Remedial Alternative Comparative Cost Summary

Alternative	Capital Cost	Annual OM&M Costs	Total Present-Worth Costs
SEAD-121C, the DRMO Yard			
1	$0	$6,000	$74,460
2	$17,600,000	$3,000	$17,637,230
3	$1,490,000	$6,000	$1,564,460
4	$350,000	$6,000	$424,460
SEAD-121I, the Rumored Cosmoline Oil Disposal Area			
1	$0	$6,000	$74,460
2	$4,542,500	$3,000	4,579,730
3	$2,163,000	$6,000	$2,237,460
4	$375,000	$6,000	$449,460

Alternative 1 is 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.

State Acceptance

NYSDEC has provided a letter that indicates that it concurs with the preferred remedial soil and groundwater alternatives.

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.

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 and EPA have selected Soil

Alternatives 4 and Groundwater Alternative 1 for SEAD-121C and SEAD-121I.

At SEAD-121C, the Army has excavated soil that contained concentrations of lead in excess of 1,500 mg/Kg to reduce potential human health risks that may be associated with the identified contamination. The successful completion of the SEAD-121C removal action is based on a determination that the 95th upper confidence limit (95th UCL) of the mean for soil in the immediate area of the excavation achieves a post-excavation level of 1,250 mg/Kg or less. Confirmatory sampling and analysis results substantiating the level of cleanup achieved are provided in **Table 2**. This remedy does not include the excavation of the anomalous levels of cPAH compounds found at SEAD-121C because they have been determined to reflect background contamination from the greater industrialized area of the former Depot, broken up pieces of asphalt, and an anomalous result that does not result in unacceptable risks for the planned future industrial occupant.

At SEAD-121I, the Army cleaned up the areas where the former strategic stockpiles were located and demonstrated that residual levels of manganese were below cleanup goals that were established for the action. The residual level of iron (reported as the 95th UCL of the excavation dataset only) in the vicinity of the excavations was 22,116 mg/Kg versus a cleanup objective of 100,000 mg/Kg; while the residual level of manganese was 3,550 mg/Kg as opposed to a cleanup goal of 10,000 mg/Kg. The AOC-wide residual levels for these two metals are even lower (see **Table 6**).

The Army 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 New York reference 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.

At SEAD-121C (DRMO Yard) levels of residual hazardous substances, including cPAH compounds, 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. Further, while hazardous substances were identified in the groundwater at concentrations above New York AWQSs, 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 manganese found in the soil in proximity to the former strategic stockpiles have been reduced to levels that are consistent with Federal and State cleanup objectives for soil at industrial sites. 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 New York AWQSs could 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 sites has a land use control all ready existing on it, the sites 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 EPA throughout the PID Area. These LUCs result from conditions found at other AOCs (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 Proposed Plan 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; periodic certifications that the institutional engineering controls are in-place and being maintained by the owner or persons implementing the remedy; and, Reporting/Notification requirements. In addition, the Army will prepare an environmental easement for the AOCs, 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.

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GLOSSARY

Administrative Record
The body of documents that were considered or relied on which form the basis for the selection of a response action.

Ambient Water Quality Standards (AWQS)
Standards and guidance values developed by New York State for specific classes of fresh and saline surface waters and fresh groundwaters for protection of the best uses assigned to each class.

Applicable or Relevant and Appropriate Requirements (ARARs)
As defined under CERCLA, ARARs are cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limits set forth under federal or state law that specifically address problems or situations present at a CERCLA site. ARARs are major considerations in setting cleanup goals, selecting a remedy, and determining how to implement that remedy at a CERCLA site. ARARs must be attained at all CERCLA sites unless a waiver is attained. ARARs are not national cleanup standards for the Superfund program. *See also Comprehensive Environmental Response, Compensation, and Liability Act and Superfund.*

Area(s) of Concern (AOC(s))
Areas of Concern (AOCs) include both solid waste management units where releases of hazardous substances may have occurred and locations where there has been a release or threat of a release in the environment of a hazardous substance, pollutant or contaminant (including radionuclides) under CERCLA.

Army Corps of Engineer (USACE)
The engineering organization of the U.S. Army. The districts involved in the Seneca Army Depot Activity project include the New York District (CENAN), the New England District (CENED), and the Engineering and Support Center, Huntsville (CEHNC).

Base Realignment and Closure (BRAC)
A congressionally mandated process that involves closure of military bases. The goal of BRAC is to transition the former bases from military uses to civilian reuse, with the intent of minimizing the negative effects of base closure by spurring economic development and growth. The SEDA was listed as a base to be closed in October 1995. Base closure is in the process of being performed.

Baseline Risk Assessment (BRA)
A baseline risk assessment is an assessment conducted before cleanup activities begin at a site to identify and evaluate the threat to human health and the environment. After remediation has been completed, the information obtained during a baseline risk assessment can be used to determine whether the cleanup levels were reached.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, was enacted by Congress on December 11, 1980. This law created a tax on the chemical and petroleum industries and provided broad Federal authority to respond directly to releases or

threatened releases of hazardous substances that may endanger public health or the environment. CERCLA:

> Established prohibitions and requirements concerning closed and abandoned hazardous waste sites;
>
> Provided for liability of persons responsible for releases of hazardous waste at these sites; and
>
> Established a trust fund to provide for cleanup when no responsible party could be identified.

The law authorizes two kinds of response actions:

> Short-term removals, where actions may be taken to address releases or threatened releases requiring prompt response.
>
> Long-term remedial response actions, that permanently and significantly reduce the dangers associated with releases or threats of releases of hazardous substances that are serious, but not immediately life threatening. These actions can be conducted only at sites listed on USEPA's National Priorities List (NPL).

CERCLA also enabled the revision of the National Contingency Plan (NCP). The NCP provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The NCP also established the NPL.

CERCLA was amended by the Superfund Amendments and Reauthorization Act (SARA) on October 17, 1986.

Cleanup

Cleanup is the term used for actions taken to deal with a release or threat of release of a hazardous substance that could affect humans and or the environment. The term sometimes is used interchangeably with the terms remedial action, removal action, response action, or corrective action.

Closure (Department of Defense)

Under the Department of Defense's definition, closure means that all missions of the base will cease or be relocated. All personnel (military, civilian, and contractor) will either be eliminated or relocated. The entire base will be excessed and the property disposed.
(Reference: http://www.hqda.army.mil/acsimweb/brac/braco.htm)

Community Environmental Response Facilitation Act (CERFA – Public Law 102-426)

The Community Environmental Response Facilitation Act (CERFA) was passed by Congress in 1992, and amended Section 9620(h) of CERCLA, which addresses Federal real property transfers. In enacting the legislation Congress stated that the closure of Federal facilities has an adverse impact on local economies and that delays in remediating contaminated real property add to this burden by delaying the conversion of such property to productive uses. The statute applies to real property owned by the Department of Defense and on which the U.S. plans to terminate Federal government operations, as well as to real property that has been used as a military installation and which is being closed or realigned pursuant to base closure. Federal entities with control over such properties must identify those upon

which no hazardous substances or petroleum products/derivatives were stored for more than one year, released, or disposed of by examining relevant sources of data such as property deeds, aerial photographs, or other similar documents. Subsequent transfers or sales of the identified properties by the limited states must contain assurances that the U.S. will assume full responsibility for any response or corrective action that may become necessary after the transfer of property is completed. Where hazardous substances or petroleum products/derivatives were stored for more than one year, released, or disposed of on the U.S.-owned real property, the Federal entity with control of the property must notify the state of any lease entered into by the controlling Federal entity that will remain in effect after operations cease. The notification must be sent to the state prior to the signing of the lease, and must inform the state of the name of the lessee, and a description of the uses permitted under the condition of the lease. (Reference: http://www.ntc.blm.gov/learningplace/res_CERFA.html)

Completion Report
A report that documents and certifies that conditions found at an Area of Concern (AOC) do not constitute a threat to public health, welfare or the environment and that further remedial measures are not necessary. Such documentation shall meet, to the extent practicable and as necessary under the specific facts pertaining to the AOC, the requirements of USEPA's RCRA Facility Investigation Guidance, USEPA's Guidance for Conducting RI/FSs under CERCLA, and any subsequent amendments to these documents and all other applicable federal or state guidance.

Contaminant
A contaminant is any physical, chemical, biological, or radiological substance or matter present in any media at concentrations that may result in adverse effects on air, water, or soil.

Contract Laboratory Program (CLP)
The USEPA's program that approves laboratories that provide chemical testing services of known quality using a wide range of standard methods and maintaining consistent quality control.

Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)
A group of seven semivolatile organic compounds including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene and indeno(1,2,3-cd)pyrene that are suspected carcinogens for humans.

Detection Limit
The lowest concentration of a chemical that can be distinguished reliably from a zero concentration.

Disposal
Disposal is the final placement or destruction of toxic, radioactive or other wastes; surplus or banned pesticides or other chemicals; polluted soils; and drums containing hazardous substances from removal actions or accidental release. Disposal may be accomplished through the use of approved secure landfills, surface impoundments, land farming, deep well injection, or ocean dumping.

Environmental Protection Agency (USEPA)
The Federal regulatory agency responsible for enforcing the environmental rules and regulations of the United States. Representatives from the USEPA Region 2, which includes New York State, are involved

in the review and oversight of the environmental work being conducted at the Seneca Army Depot Activity.

Expanded Site Investigation (ESI)
An expanded investigation that typically includes media sampling and analyses. An ESI is performed following a Preliminary Site Investigation to obtain more information regarding the concentrations of pollutants at a site.

Exposure Pathway
An exposure pathway is the route of contaminants from the source of contamination to potential contact with a medium (air, soil, surface water, or groundwater) that represents a potential threat to human health or the environment. Determining whether exposure pathways exist is an essential step in conducting a baseline risk assessment. *See also Baseline risk Assessment.*

Federal Facilities Agreement (FFA) also known as the Interagency Agreement (IAG)
An agreement signed between USEPA, NYSDEC and the Army that describes the process for identifying, investigating and remediating sites at the Seneca Army Depot Activity.

GA Groundwater Standard
A water quality standard promulgated by the NYSDEC that establishes a minimum quality of a groundwater supply that could be used as a source of drinking water.

Groundwater
Groundwater is the water that flows beneath the earth's surface that fills pores between such materials as sand, soil, or gravel and that often supplies wells and springs.

Hazard Index (HI)
The unit used to assess the overall potential for non-carcinogenic effects posed by a chemical. It is expressed as the ratio of the exposure level or intake of a chemical to the chemical's reference dose.

Hazard Quotient (HQ)
The hazard quotient is used to present the ecological risk posed by a chemical. It is the ratio of the expected exposure point concentration to an appropriate toxicity reference value.

Hazardous Substance
A hazardous substance defined by CERCLA section 101(14) references the following environmental statues: CWA sections 311 and 307(a), CAA section 112, RCRA section 3001, and TSCA section 7.

Heavy Metal
The term heavy metal refers to a group of toxic metals including arsenic, chromium, copper, lead, mercury, silver, and zinc. Heavy metals often are present at industrial sites at which operations have included battery recycling and metal plating.

Inorganic Compounds

An inorganic compound is a compound that generally does not contain carbon atoms (although carbonate and bicarbonate compounds are notable exceptions). Examples of inorganic compounds include various metals.

Land Use Controls

Environmental land use controls (LUCs), also known as institutional controls (ICs), activity and use limitations (AULs), and environmental use restrictions (EURs), are legal and administrative measures to protect human health and environment from risk based cleanups in which residual contamination is contained on site. LUCs limit human exposure by restricting activity, use, and access to properties with residual contamination. Source: http://www.lucs.org/

Maximum Contaminant Level (MCL)

Established under the Safe Drinking Water Act as concentrations of pollutants considered protective for drinking water.

Mean Sea Level (MSL)

The average height of the sea surface, based upon hourly observation of the tide height on the open coast or in adjacent waters that have free access to the sea. In the United States, it is defined as the average height of the sea surface for all stages of the tide over a nineteen year period. Mean sea level, commonly abbreviated as MSL and referred to simply as 'sea level,' serves as the reference surface for all altitudes in upper atmospheric studies.
(Reference: http://earthobservatory.nasa.gov:81/Library/glossary.php3?xref = mean%20sea%20level)

Monitoring Well

A monitoring well is a well drilled at a specific location on or off a hazardous waste site at which groundwater can be sampled at selected depths and studied to determine the direction of groundwater flow and the types and quantities of contaminants present in the groundwater.

National Contingency Plan (NCP)

The NCP, formally the National Oil and Hazardous Substances Contingency Plan, is the major regulatory framework that guides the Superfund response effort. The NCP is a comprehensive body of regulations that outlines a step-by-step process for implementing Superfund responses and defines the roles and responsibilities of USEPA, other federal agencies, states, private parties, and the communities in response to situations in which hazardous substances are released into the environment. *See also Superfund.*

National Priorities List (NPL)

The NPL is USEPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial response under Superfund. Inclusion of a site on the list is based primarily on the score the site receives under the HRS. Money from Superfund can be used for cleanup only at sites that are on the NPL. EP A is required to update the NPL at least once a year. *See also Hazard Ranking System and Superfund.*

Nephelometric Turbidity Unit (NTU)

A measurement unit of turbidity in water. Small particles of soil particles, such as clay or silt, become suspended with a water sample and increase the turbidity of the sample. This increase in turbidity has been identified as a source of increased metals concentration in samples. This effect is especially noticeable for groundwater samples collected within the clay-rich glacial till at the SEDA.

New York State Department of Environmental Conservation (NYSDEC)

NYSDEC's missions include detecting and controlling sources of pollution, protecting and managing New York's natural resources, informing and educating the public about environment, natural resources, and government's actions to protect them.

95th Upper Confidence Limit of the Mean (95th UCL)

A statistical value computed for a specific set of data that represents the upper value, based on a ninety-five percent confidence, of the data sets true mean (average). There is a five percent chance or less that the average from all samples from the data set will be higher than this value.

No Action (NA)

A NA site has had no historic remedial action, such as a former tank removal, spill cleanup operation, or limited excavation, has ever been performed at the site. Sampling, chemical analyses, and risk assessments may have been completed for a NA site.

NYCRR

The New York State compilation of Codes, Rules, and Regulations.

Operation and Maintenance (O&M)

O&M refers to the activities conducted at a site, following remedial actions, to ensure that the cleanup methods are working properly. O&M activities are conducted to maintain the effectiveness of the remedy and to ensure that no new threat to human health or the environment arises. Under the Superfund program, the state or PRP assumes responsibility for O&M, which may include such activities as groundwater and air monitoring, inspection and maintenance of the treatment equipment remaining on-site, and maintenance of any security measures or institutional controls.

Organic Chemical or Compound

An organic chemical or compound is a substance produced by animals or plants that contains mainly carbon, hydrogen, and oxygen.

Parsons or Parsons Corporation

Parsons has performed environmental investigative and remedial action work at the Seneca Army Depot Activity since approximately 1990. Work has been performed by a number of Parsons' successor operating businesses that have offered environmental consulting and remediation services including C.T. Main, Inc. (~ 1990 – 1995), Engineering Science, Inc. (~ 1995 – 1998), Parsons Engineering Science, Inc. (~ 1999 – 2003), and most recently, Parsons Infrastructure & Technology Group, Inc. (~ 2003 -). Parsons is a leader in many diverse markets such as infrastructure, transportation, water, telecommunications, aviation, commercial, environmental, planning, industrial manufacturing, education, healthcare, life sciences and homeland security. Parsons provides technical and management solutions

to federal, regional and local government agencies as well as private industries worldwide. http://www.parsons.com

Pesticide

A pesticide is a substance or mixture of substances intended to prevent or mitigate infestation by, or destroy or repel, any pest. Pesticides can accumulate in the food chain and or contaminate the environment if misused.

Polychlorinated Biphenyl (PCB)

PCBs are a group of toxic, persistent chemicals, produced by chlorination of biphenyl, that once were used in high voltage electrical transformers because they conducted heat well while being fire resistant and good electrical insulators. These contaminants typically are generated from metal degreasing, printed circuit board cleaning, gasoline, and wood preserving processes. Further sale or use of PCBs in the United States was banned in 1979.

Polycyclic Aromatic Hydrocarbon (PAH)

A PAH is a chemical compound that contains more than one fused benzene ring. They are commonly found in petroleum fuels, coal products, and tar.

Present Worth Cost Analysis

The equivalent future worth of money at the present time. By discounting all costs to a common base year, the costs for different remedial action alternatives can to be compared on the basis of a single figure for each alternative. This is a calculated value that requires the length of time that an activity would be performed and the interest rate. For example, the cost of the long-term operation and maintenance of a remedy is provided in terms of the present worth. Typically, a 30-year cost is required and an interest rate of 7%.

Proposed Plan

The Proposed Plan is the first step in the remedy selection process. The Proposed Plan provides information supporting the decisions of how the preferred alternative was selected. It summarizes the site information and how the alternatives comply with the requirements of the NCP and CERCLA. The Proposed Plan is provided to the public for comment. The responses to the Proposed Plan comments are provided in the ROD.

Record of Decision (ROD)

A ROD is a legal, technical, and public document that explains which cleanup alternative will be used at a Superfund NPL site. The ROD is based on information and technical analysis generated during the remedial investigation and feasibility study (RI/FS) and consideration of public comments and community concerns. *See also Preliminary Assessment and Site Investigation and Remedial Investigation and Feasibility Study.*

Release

A release is any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, leaching, dumping, or disposing into the environment of a hazardous or toxic chemical or extremely hazardous substance, as defined under RCRA. *See also Resource Conservation and Recovery Act.*

Remedial Action (RA)
A RA is the actual construction or implementation of a remedy at a site or portion thereof.

Remedial Investigation and Feasibility Study (RI/FS)
The RI/FS is the step in the Superfund cleanup process that is conducted to gather sufficient information to support the selection of a site remedy that will reduce or eliminate the risks associated with contamination at the site. The RI involves site characterization through collection of data and information necessary to characterize the nature and extent of contamination at the site. The RI also determines whether the contamination presents a significant risk to human health or the environment. The FS focuses on the development of specific response alternatives for addressing contamination at a site.

Resource Conservation and Recovery Act (RCRA)
RCRA is a federal law enacted in 1976 that established a regulatory system to track hazardous substances from their generation to their disposal. The law requires the use of safe and secure procedures in treating, transporting, storing, and disposing of hazardous substances. RCRA is designed to prevent the creation of new, uncontrolled hazardous waste sites.

Responsiveness Summary
The Responsiveness Summary summarizes information about the views of the public and support agency regarding both the remedial alternatives and general concerns about the site submitted during the public during the public comment period. It also documents in the record of decision how public comments were integrated into the decision making process. Source: (USEPA, 1999).

Risk Assessment
The process of assessing and analyzing threats that contaminants found at a site pose to surrounding populations and the environment. The resulting analysis is used as a preliminary, conservative estimate of the potential level of threat that is posed so that appropriate and cost-effective countermeasures can be identified and implemented.

Semivolatile Organic Compound (SVOC)
SVOCs, composed primarily of carbon and hydrogen atoms, have boiling points greater than 200°C. Common SVOCs include PCBs and phenol. *See also Phenol and Polychlorinated Biphenyl.*

Seneca Army Depot Activity (SEDA)
A 10,634-acre military facility, constructed in 1941, located in central New York responsible for storage and management of military commodities, including munitions. The depot ceased military operations in 2000. Environmental cleanup activities will continue until all sites have been addressed.

Seneca County Board of Supervisors
The board that oversees Seneca County's governmental affairs.

Seneca County Industrial Development Agency
The Seneca County Industrial Development Agency (SCIDA) is a public benefit corporation created in 1973 by an act of the New York State Legislature. The agency's primary purpose is to promote private

sector commercial and industrial development, and advance the job opportunities and economic welfare of the people of Seneca County.

Significant Threat
The term refers to the level of contamination that a state would consider significant enough to warrant an action. The thresholds vary from state to state.

Soil Boring
Soil boring is a process by which a soil sample is extracted from the ground for chemical, biological, and analytical testing to determine the level of contamination present.

Solid Waste Management Unit (SWMU)
A SWMU is a RCRA term used to describe a contiguous area of land on or in which where solid waste, including hazardous waste, was managed. This includes landfills, tanks, land treatment areas, spills and other areas where waste materials were handled. Identification of all SWMUs at SEDA was performed as part of the RCRA Part B Permit Application process.

Subsurface
Underground, or beneath the surface.

Surface Water
Surface water is all water naturally open to the atmosphere, such as rivers, lakes, reservoirs, streams, and seas.

Superfund
Superfund is the trust fund that provides for the cleanup of hazardous substances released into the environment, regardless of fault. The Superfund was established under CERCLA and subsequent amendments to CERCLA. The term Superfund also is used to refer to cleanup programs designed and conducted under CERCLA and its subsequent amendments. *See also Comprehensive Environmental Response, Compensation, and Liability Act.*

Target Analyte List (TAL)
The Target Analyte List is a list of inorganic compounds that are required to be analyzed when performing analytical procedures under CERCLA. The list includes metals and cyanide.

Target Compound List (TCL)
The Target Compound List is a list of organic compounds that are required to be analyzed when performing analytical procedures. The list includes volatile organic compounds, semivolatile organic compounds, pesticides, and PCBs.

Technical Administrative Guidance Memorandum (TAGM)

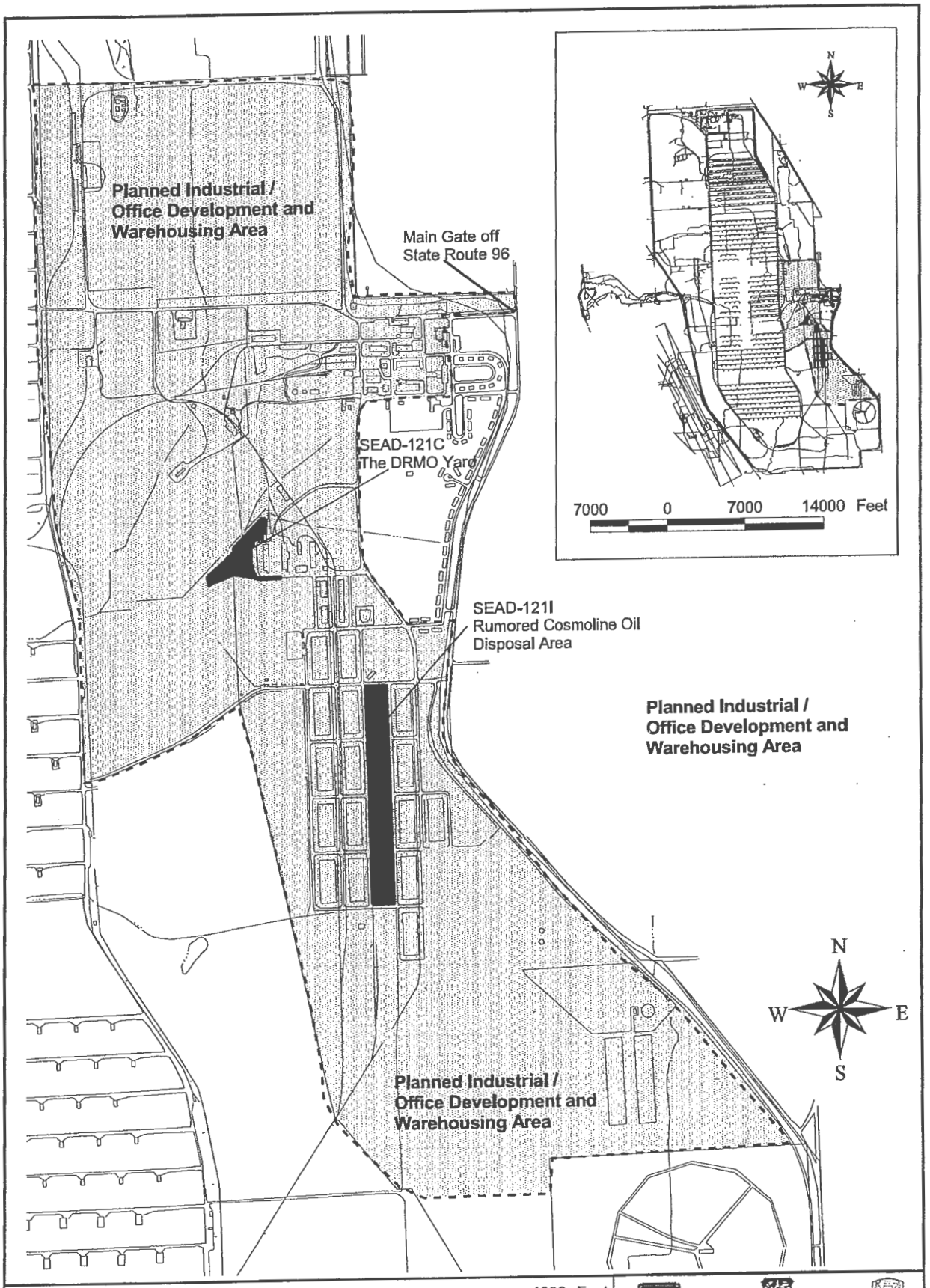
TAGMs are technical guidance publications provided by NYSDEC that describes various processes and procedures recommended by NYSDEC for the investigation and remediation of hazardous waste sites. One TAGM, No. 4046, provides guideline values for recommended soil cleanup levels at waste sites.

Trophic Level

A group of organisms that occupy the same position in a food chain. Source (*The American Heritage® Dictionary of the English Language*, Fourth Edition. Retrieved November 30, 2006, from Dictionary.com website: http://www.dictionary.com

Volatile Organic Compound (VOC)

A VOC is one of a group of carbon-containing compounds that evaporate readily at room temperature. Examples of VOCs include trichloroethane; trichloroethylene; and BTEX. These contaminants typically are generated from metal degreasing, printed circuit board cleaning, gasoline, and wood preserving processes.



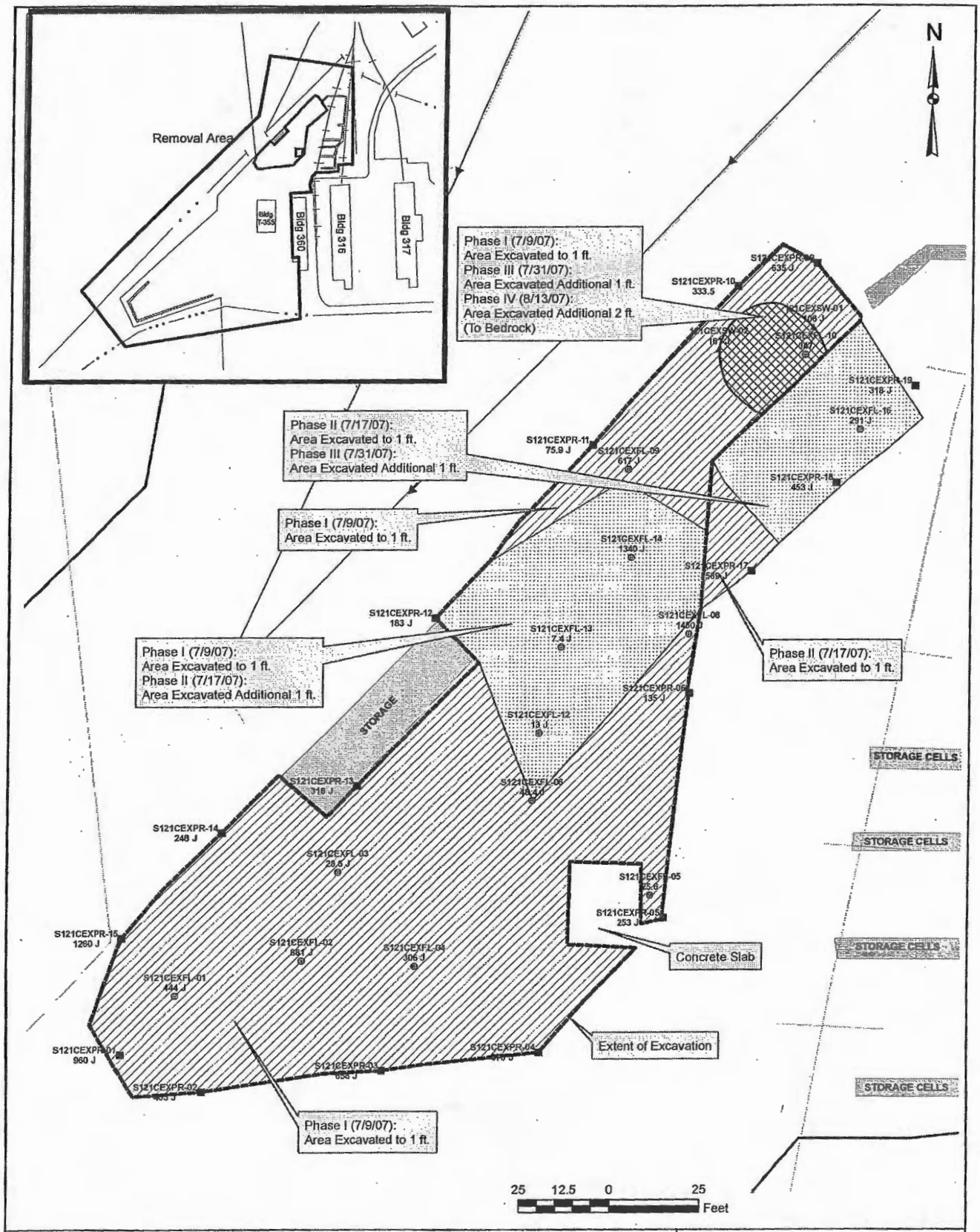
PARSONS

SENECA ARMY DEPOT ACTIVITY
PROPOSED PLAN - SEADs 121C & 121I

FIGURE 1
SEDA SITE MAP and
LOCATION OF SEADs 121C &121I

November 2007

O:\Seneca\3 Sites Requiring ICs\3 sites requiring ics feb 2007.apr\SEADD-121C_I Proposed Plan Figure 1



LEGEND:

- Railroad Tracks
- Site Boundary
- Surface Water
- Surface Water Flow Direction
- Final Excavation Depth = 1 FT
- Final Excavation Depth = 2 FT
- Final Excavation Depth = 4 FT
- Confirmatory Sidewall Sample Approximate Location with Lead Result in mg/Kg
- Confirmatory Floor Sample Approximate Location with Lead Result in mg/Kg
- Confirmatory Perimeter Sample Approximate Location with Lead Result in mg/Kg
- Limits of Initial Phase I Excavation

NOTE: When a field duplicate was collected, the concentration presented is an average of the results from the sample and its associated duplicate.

O:\arcview\Seneca\PIDarea\Proposed Plan\Figure 2.mxd

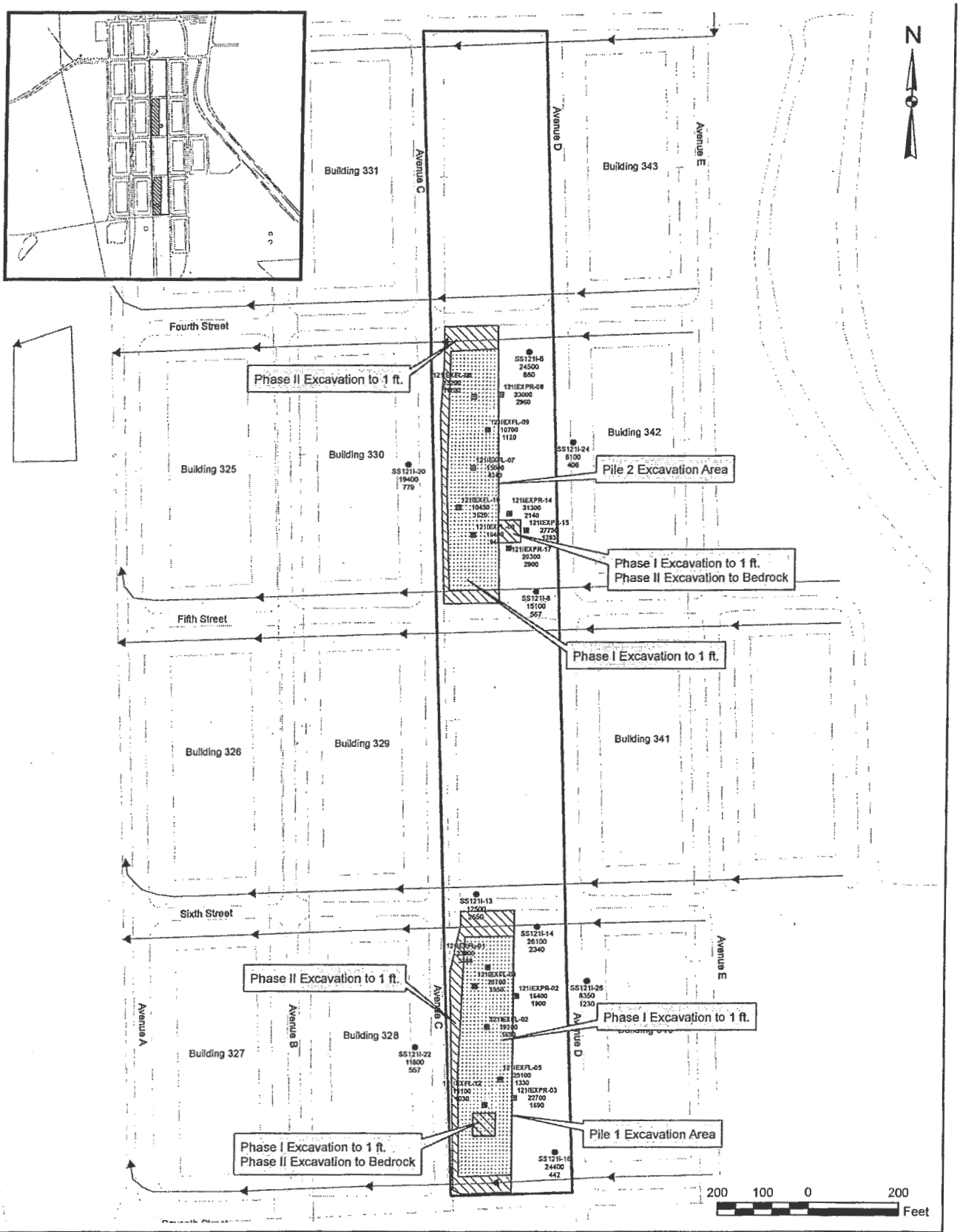
PARSONS

SENECA ARMY DEPOT ACTIVITY

SEAD-121C & 121I Proposed Plan

FIGURE 2
SEAD-121C
EXCAVATION AREA & FINAL
CONFIRMATORY SAMPLE LOCATIONS

Job #: 741172-02300 | Date: OCTOBER 2007



LEGEND:

- Railroad Tracks
- Site Boundary
- Surface Water
- Surface Water Flow Direction
- Phase I Excavation Area
- Phase II excavation Area
- RI Surface Soil Location with Iron and Manganese Concentrations (mg/Kg)
- Approximate Final Confirmatory Sample Location with Iron and Manganese Concentrations (mg/Kg)

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SENECA ARMY DEPOT ACTIVITY

SEAD-121C & 121I Proposed Plan

FIGURE 3
SEAD-121I
EXCAVATION AREA & FINAL CONFIRMATORY SAMPLE LOCATIONS

Job #: 741172-02300 | Date: OCTOBER 2007

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

Seneca Army Depot Activity (SEDA)

Public Presentation

January 29, 2008

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History/Background of SEAD-121C and SEAD-121I

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Insert Portrait Site Map Here

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SEDA History

- SEDA was owned by U.S. Government and operated by Army between 1941 and approximately 2000, when SEDA's military mission ceased.
- SEDA's historic military mission included receipt, storage, distribution, maintenance, and demilitarization of conventional ammunition, explosives, and special weapons.

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SEAD-121C Description

- SEAD-121C is a triangularly-shaped gravel lot, approximately 8.75 acres in size.
- Bordered on two sides (northwest and south) by man-made drainage ditches.
- SEAD-27 (Bldg 360, Steam Cleaning Waste Tank) abuts immediately to east.
- Surface water drains towards ditches and then flows to west towards Kendaia Creek.

SEAD-121C Description (Cont'd)

- Noticeable features include one storage building, an open storage cell (southwest corner), an open concrete storage structure (northwest side), and a multi-chambered open storage cell (east side).
- Broken asphalt pavement and railroad tracks are present along east side.

SEAD-121C History

- SEAD-121C was used to store material/equipment no longer needed for national defense, or that did not comply with legislative or regulatory requirements.
- Material/equipment was sold, recycled, or sent off-site for disposal at licensed facilities.

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SEAD-121I Description

- Prior to 2007, strategic stockpiles of ore were staged in two areas of SEAD-121I.
- SEAD-121I is approximately 16.8 acres in size.
- Area consists of four separate, open, grass and dirt covered areas bounded by 3rd and 7th St. (north and south ends, respectively) and Avenues C and D (west and east sides, respectively).

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SEAD-121I Description (Cont'd)

- Buried reinforced concrete storm drains convey runoff water east to west along 3rd St., 4th St., 5th St., 6th St., and 7th St.
- Railroad lines and concrete loading docks are located along west side (Avenue C).

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SEAD-121I History

- Area was used for shipment / delivery / packaging / unpacking of equipment, some coated with Cosmoline oil (corrosion and rust inhibitor).
- Cosmoline oil may have been deposited on ground during delivery/shipping /packing / unpacking.

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SEAD-121I History (Cont'd)

- Stockpiles of ferro-manganese ore were previously located on asphalt pads sited between 3rd and 4th St. and 5th and 6th St. along Avenue C.
- Stockpile mission terminated in 2007 when stockpiled ore was sold and removed.
- All ore, ore residuals, former staging pads, and some surrounding soil have been removed.

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Investigations and Activities at SEAD-121C and SEAD-121I

- 98 – 99: Limited Environmental Baseline Surveys (EBS).
- 02 – 03: Remedial Investigations (RIs)
- 07: SEAD-121C Removal Action
- 07: SEAD-121I Ore Pile Removal and Cleanup

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Summary of Impacts at SEAD-121C and SEAD-121I

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Sampling and Analysis Activities at SEAD-121C and SEAD-121I

- Soil and Ditch Soil
- Surface Water
- Overburden Groundwater at SEAD-121C
- Confirmatory Sampling for SEAD-121C Removal Action
- Cleanup Verification after ore pile removals (SEAD-121I).

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Impacts to SEAD-121C Soil

- Soil was impacted primarily by carcinogenic polycyclic aromatic hydrocarbons (cPAHs) and lead. After a hot spot removal action, residual lead levels action are below NYSDEC Industrial Use soil cleanup objective value.

Compound	Maximum Detect (ppm)	95th UCL [1] (ppm)	Industrial Soil Cleanup Objective (ppm)
Benzo(a)pyrene [2]	8.7	1.99	1.1
Benzo(b)fluoranthene [2]	12	2.64	11
Lead - before removal	18,900	2,278	3,900
current levels	1,450	430.4	

1. Appropriate upper confidence limit of the arithmetic mean, as recommended by the EPA Version 4.0 ProUCL program to represent site condition.
2. All data from EBS and RI were used.

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Impacts to SEAD-121C Soil (Cont'd)

- 95th upper confidence limit (UCL) of the arithmetic mean is a statistical estimate of the likely level of exposure that may exist over the entire site.

Impacts to SEAD-121C Soil (Cont'd)

- Elevated cPAH concentrations in soil are associated with stormwater runoff from the upgradient area and adjacent roads. Asphalt pieces were intermixed with soil at one location where an elevated benzo(a)pyrene concentration was detected.

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Impacts Found at SEAD-121C Groundwater

- Groundwater contains metal concentrations that are generally consistent with SEDA background groundwater quality.

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Impacts in SEAD-121C
Surface Water

- No permanent surface water body is located at SEAD-121C, samples were collected from drainage ditches outside of site.
- No impacts to surface water identified.

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Impacts in SEAD-121I Soil

- Soil inside SEAD-121I was impacted primarily by metals (manganese and iron) associated with the former stockpiles of ore. They were removed.

Compound	Maximum Detect (ppm)	95th UCL [1] (ppm)	Industrial Soil Cleanup Objective (ppm)
Iron – before ore removal	58,400	21,111	NA
current levels	31,300	18,021	
Manganese – before ore removal	310,500	89,533	10,000
current levels	11,100	2,438	

1. Appropriate upper confidence limit of the arithmetic mean, as recommended by the EPA version 4.0 ProUCL program to represent site conditions.
2. All data from EBS and RI were used.

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Impacts in SEAD-121I Groundwater

- Groundwater was not encountered in any of the soil borings advanced at SEAD-121I. Therefore, groundwater was not a media of concern.

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Impacts in SEAD-121I
Surface Water

- No impacts to surface water identified at SEAD-121I.

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Human Health Risk Evaluation
SEAD-121C/121I

- Assessed for planned future use – industrial/office development.
- Receptors include construction worker, industrial worker, and adolescent trespasser.
- Potential exposure pathways include inhalation of ambient dusts caused by soil resuspension, ingestion of soil, dermal contact with soil, and dermal contact with surface water.

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SEAD-121C Human Health Risk Results

Receptor	Hazard Index (HI) EPA recommends < 1	Cancer Risk EPA recommends 10^{-4} – 10^{-6} or lower
Industrial Worker (Soil and Surface Water Exposure)	0.4	3E-5
Industrial Worker (Ditch Soil and Surface Water Exposure)	0.02	1E-6
Construction Worker (Soil and Surface Water Exposure)	0.8	2E-6
Construction Worker (Ditch Soil and Surface Water Exposure)	0.3	7E-7
Adolescent Trespasser (Soil and Surface Water Exposure)	0.03	3E-7
Adolescent Trespasser (Ditch Soil and Surface Water Exposure)	0.03	1E-7

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SEAD-121C Human Health Risk Results (Cont'd)

- Cancer risks for all receptors with exposure to SEAD-121C soil and surface water, or ditch soil and surface water are below EPA's limit of $1x10^{-4}$.
- Non-cancer hazard indices (HIs) for all receptors with exposures to SEAD-121C soil and surface water, or ditch soil and surface water are below EPA's limit of 1.

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SEAD-121C Human Health Risk Assessment Conclusion

- Contaminants in the SEAD-121C impacted mediums (soil, ditch soil, and surface water) do not pose significant risks to current or future receptors under industrial use scenario.

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SEAD-121I Human Health Risk Results

- Cancer risks for all receptors with exposure to SEAD-121I soil and surface water, or ditch soil and surface water are below EPA's limit of $1x10^{-4}$.
- Non-cancer HI for adolescent trespasser with exposure to SEAD-121I soil and surface water, or ditch soil and surface water is below EPA's limit of 1.

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SEAD-121I Human Health Risk Results (Cont'd)

- Non-cancer HIs for construction worker and industrial worker with exposures to SEAD-121I soil/ditch soil and surface water were above EPA's limit of 1.
- The most significant contributing COC for elevated HIs is manganese. Arsenic and iron also contribute to elevated HI for construction worker.

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SEAD-121I Human Health Risk Results (Cont'd)

- Highest concentrations of metals were in the immediate vicinity of the strategic stockpiles of ferro-manganese ore.
- Removal/cleanup action removed ore piles, ore residuals, and former staging pads.

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SEAD-121I Human Health Risk Assessment Conclusion

- Residual contaminants in the SEAD-121I impacted mediums (soil, ditch soil, and surface water) no longer pose significant risks to current / future industrial receptors due to completion of cleanup action of the ore piles.

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Ecological Risk Evaluation
SEAD-121C/121I

- No COCs were identified for SEAD-121C or SEAD-121I soil /ditch soil /surface for ecological receptors.
- Location of both areas not attractive habitat for ecological receptors (Industrial area)
- Soil, ditch soil, and surface water at SEAD-121C and SEAD-121I do not significantly impact ecological receptors in the areas.

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Recommended Action at SEAD-121C and SEAD-121I

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Purpose of Action at SEAD-121C/121I

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

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Alternatives Considered for SEAD-121C/121I

- Alternative 1 — No Action
- Alternative 2 — Excavation of Soil to Achieve Unrestricted Use Cleanup Objectives and Off-Site Disposal
- Alternative 3 (implemented) (at sites in 2007) — Excavation of Soil to Achieve Industrial Use Cleanup Objectives and Off-Site Disposal
- Alternative 4 — Land Use Control (LUC)

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Selected Remedy at SEAD-121C/121I

- Removal /Cleanup Actions implemented at both sites during summer 2007 to reduce elevated contaminant levels to acceptable levels.
- Adopt existing PID-wide LUCs that prohibit:
  - access to and use of groundwater; and,
  - prohibit the future use of the land for residential purposes (e.g., housing, schools, child care facilities, and playgrounds).

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Basis of Proposing Alternative 4

- Necessary removal / cleanup actions complete.
- Equivalent LUCs have been imposed on other portions of the PID Area that are not retained by the Army.
- If the LUCs are adopted, human health risk would be acceptable to all receptors considered (including residential receptors).
- Ecological risk would be acceptable to all receptors considered with the LUCs.

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Schedule to Implement Remedy at SEAD-121C/121I

- Formal application of the LUCs should take approximately 1~2 months to complete.

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