U.S. ARMY ENGINEER DIVISION
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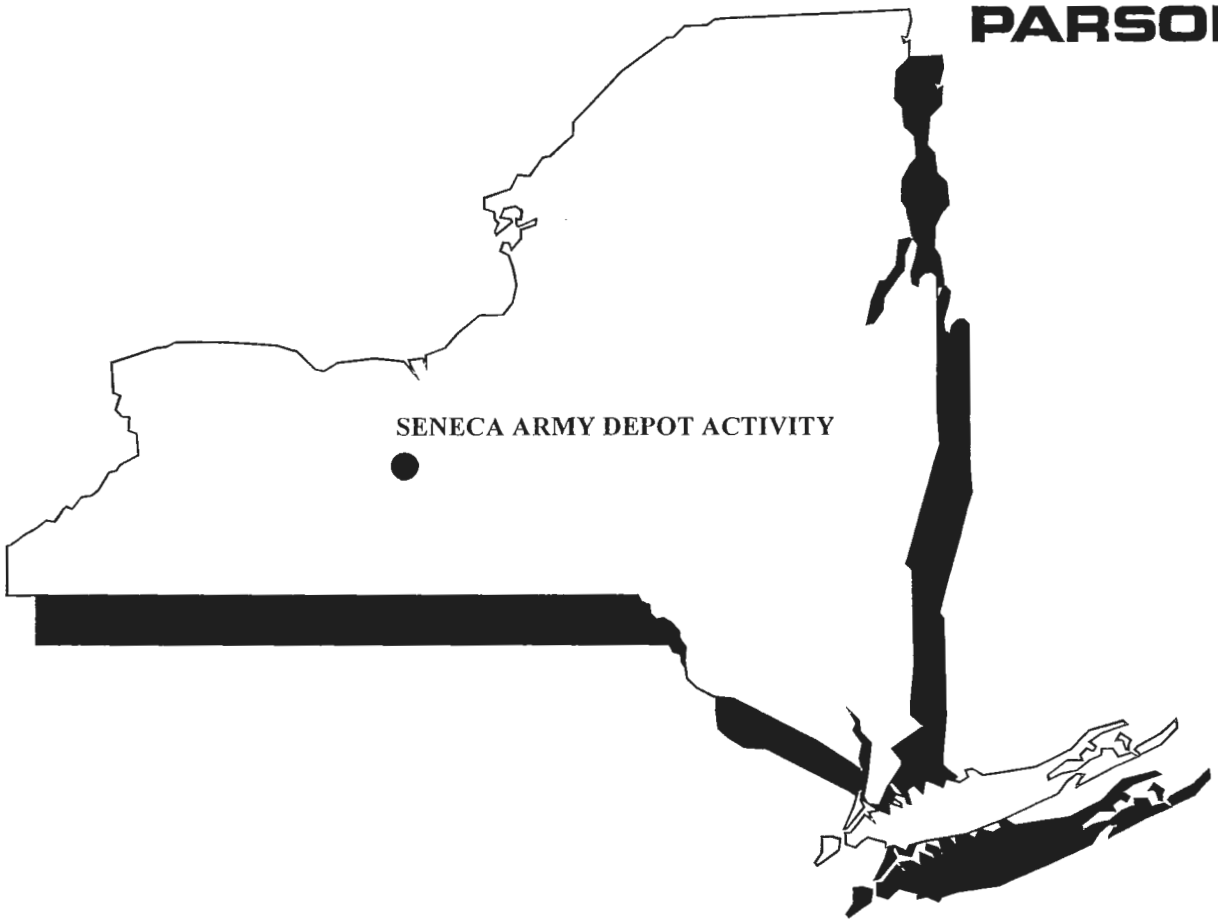

DRAFT

PROPOSED PLAN

SITES REQUIRING INSTITUTIONAL CONTROLS IN THE PLANNED INDUSTRIAL/OFFICE DEVELOPMENT OR WAREHOUSING AREAS

SENECA ARMY DEPOT ACTIVITY (SEDA)

JULY2003

DRAFT

PROPOSED PLAN

FOR

SITES REQURING INSTITUTIONAL CONTROLS IN THE PLANNED INDUSTRIAL/OFFICE DEVELOPMENT OR WAREHOUSING AREAS

SENECA ARMY DEPOT ACTIVITY

ROMULUS, NEW YORK

Prepared for:

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July 2003

DRAFT PROPOSED PLAN
Sites Requiring Institutional Controls in the
Planned Industrial/Office Development or Warehousing Areas
Seneca Army Depot Activity (SEDA)
Romulus, New York

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July 2003

1.0 PURPOSE OF PROPOSED PLAN

This Proposed Plan describes the preferred remedy for Building 360 – Steam Cleaning Waste Tank (SEAD-27), the Garbage Disposal Area (SEAD-64A), and the Pesticide Storage Area Near Building 5 and 6 (SEAD-66), shown in **Figure 1**.

The Proposed Plan identifies the preferred remedial option for each of the three sites with the rationale for its preference. The Proposed Plan was developed by representatives of the U.S. Army Corps of Engineers (Army) in cooperation with the U.S. Environmental Protection Agency (USEPA) and the New York State Department of Environmental Conservation (NYSDEC). The Army is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, and Section 300.430(f) of the National Contingency Plan (NCP). The recommendations summarized here result from findings and conclusions that have been developed for the sites that are documented in several documents (i.e., "Completion Reports," see **Section 8.0 References**) that exist in the Administrative Record for the Depot. Copies of the Completion Reports are available for the publics' review at the Information Repository located at the Seneca Army Depot Activity (SEDA), Building 123. Please contact the office of Mr. Steve Absolom at the address shown below in order to view these documents.

This Proposed Plan is being provided to inform the public of the Army's preferred remedial action for each of the identified areas. This document is intended to solicit public comments pertaining to all the remedial options evaluated, as well as to specify the Army's preferred remedial option.

The remedies described in this Proposed Plan are the preferred remedies for the listed sites. Changes to the preferred remedies, or from the preferred remedies 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 for the site. The Army may select a remedy other than the preferred remedy. The final decision regarding the selected remedy will be made after the Army has taken into consideration all public comments.

Dates to remember:
MARK YOUR CALENDAR

date
Public comment period on completion reports, Proposed Plan, and remedies considered

date
Public meeting at the [enter meeting location] from 7:00 to 8:30 PM

The Army's recommended remedy for SEADs 27, 64A, and 66 is to establish Institutional Controls (ICs) for each site. Land use restrictions would be established prohibiting the sites' future use for residential purposes including housing or establishment of daycare facilities and prohibiting access/use of groundwater without prior Army/USEPA approval. The SEAD 27, 64A, and 66 land use restrictions will be maintained on all the property within the Planned Industrial/Office Development and Warehousing Area (henceforth collectively designated as the "PID Area"). The proposed boundary for the land use restrictions is shown in **Figure 2**. The establishment of the area-wide land use restrictions within the "PID Area" is consistent with the intended reuse of the property identified by the Seneca County Industrial Development Authority (SCIDA) and will simplify IC implementation by having a single set of land use restrictions for the entire "PID Area." In addition, a public water supply is available in the "PID Area" so that an area-wide groundwater restriction will have minimal adverse impact on the future land use.

2.0 COMMUNITY ROLE IN SELECTION PROCESS

The Army relies 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 Completion Reports, the Proposed Plan and supporting documentation have been

made available to the public for a public comment period, which begins on date and concludes on date.

A public meeting will be held during the public comment period at the [meeting location] on date to present the conclusions of the Completion Report, to elaborate further on the reasons for recommending the preferred remedial option, and to receive public comments. Comments received at the public meeting, as well as written comments received from concerned parties, will be documented in the Responsiveness Summary Section of the Record of Decision (ROD)--the document that formalizes the selection of the remedy.

All written comments should be addressed to:

Mr. Stephen Absolom
BRAC Environmental Coordinator
Seneca Army Depot Activity
Building 123, P.O. Box 9
5786 State Route 96

Romulus, NY 14541-0009

Information and data summarized within this Proposed Plan for the three sites is presented and described in greater detail within the "Final Decision Document, Mini Risk Assessment" Report (Parsons, 2002), which should be reviewed and consulted. The Decision Document was submitted to fulfill the Army's obligation to provide a Completion Report that documents the efforts conducted under a CERCLA Remedial Investigation/Feasibility Study (RI/FS) for the identified sites. To better understand the listed sites and the investigations and studies that have been conducted at each location, the public is encouraged to review the project documents at the following repository:

Copies of the Completion Reports, Proposed Plan, and supporting documentation are available at the following repositories:

Seneca Army Depot Activity
Building 123, P.O. Box 9
5786 State Route 96
Romulus, NY 14541-0009
(607) 869-1309
Hours are Mon-Thur 8:30 am to 2:30 pm

3.0 SITE BACKGROUND

SEDA is a 10,634-acre military facility located in Seneca County, Romulus, New York, which has been owned by the United States Government and operated by the Department of the Army since 1941. The facility is located in an uplands area, which forms a divide separating two of the New York Finger Lakes, Cayuga Lake on the east and Seneca Lake on the west. The elevation of the facility is approximately 600 feet Mean Sea Level (MSL).

As part of the requirements of RCRA, the Army identified 72 Solid Waste Management Units (SWMUs). In 1990, the Depot was included in the federal section of the National Priorities List (NPL). As a federal facility listed on the NPL, provisions of CERCLA (42 USC § 9620e) required that the Army investigate the sites known to exist at the Depot and complete all necessary remedial investigations and actions at the facility. In accordance with this stipulation, the Army, USEPA, and NYSDEC negotiated and finalized a Federal Facility Agreement (i.e., the FFA, EPA, et. al., 1993) that outlines the administrative process and the procedures that will be followed to comply with CERCLA.

Following the initial identification of sites, the Army ranked each site for priority of investigation based upon that site's projected risk. The goal of the initial categorization of SWMUs was to prioritize the pending investigations and remedial actions so that those sites with the greatest risk would be addressed first. The Army's rankings divided the 72 identified SWMUs into two major site groups including one where "No Action" was required and a priority grouping where sites were designated as Areas of Concern (AOCs) because additional information or action was deemed necessary. Subsequent to the Army's proposal of the rankings, all parties met to review and discuss the available information for the identified SWMUs, and to finalize ranking assignments. The consensus of all parties was to mount necessary investigations and possible actions at the AOCs and to identify the SWMUs for which no investigations would be required.

In 1995, SEDA was designated for closure under the Department of Defense's (DoD's) Base Realignment and Closure (BRAC) process. With SEDA's inclusion on the BRAC list, the Army's emphasis expanded from expediting necessary investigations and remedial actions at priority AOCs to include the release and reuse of non-affected portions of the Depot to the surrounding community for non-military (i.e., industrial, municipal and residential) purposes. Thus, BRAC sites may be released for non-military use.

As part of the BRAC process, the Army commissioned an Environmental Baseline Survey (EBS) of the Depot. Under the EBS, all of the property identified as subject to transfer or lease at a facility (e.g., SEDA) is classified into one of the seven standard environmental conditions of property area types as defined by the Community Environmental Response Facilitation Act (CERFA) guidance and the Department of Defense (DoD) BRAC Cleanup Plan Guidebook. This is achieved by identifying, characterizing, and documenting the obviousness of the presence or likely presence of a release or a threatened

release of a hazardous substance or petroleum product associated with the historical and current use of Seneca Army Depot Activity. Areas that are designated as Category 1, 2, 3, or 4 under the CERFA process are suitable for transfer or lease, subject to consideration of the qualifiers. Areas that are designated as Category 5, 6, or 7 are not suitable for transfer, pending further investigation and remediation, as may be needed. The complete details of the EBS are summarized in the document "U.S. Army Base Realignment and Closure 95 Program; Environmental Baseline Survey Report", Seneca Army Depot Activity, New York (Woodward-Clyde Federal Services, 1997).

At the completion of the EBS, 113 BRAC parcels of land were identified and classified within the 10,634 acre Depot. Of the total area, approximately 8,690 acres were found to be suitable for lease or transfer (as designated by Categories 1 through 4), while the remaining area (approximately 1,945 acres) were designated as Categories 5 through 7 and were not deemed presently suitable for immediate transfer for reuse.

Data developed under the EBS process were shared with the Seneca Army Depot Local Redevelopment Authority (LRA), and served as part of the basis for their recommendations for the proposed future uses of land within the Depot. As a result of the LRA's efforts, the proposed future uses of various portions of the Depot are shown on **Figure 1**. **Table 1** summarizes the size of the areas proposed for each of the seven categories identified. Details of the LRA's recommended plan are described in full in the document entitled "Reuse Plan and Implementation Strategy for the Seneca Army Depot" (RKG Associates, Inc., 1996).

SEAD-27 and SEAD-66 are located in the area designated by the LRA as Planned Industrial/Office Development, and SEAD-64A is located in the area designated by the LRA as the Warehouse Area, shown in **Figure 1**. A significant factor that contributed to the identification of the border designated by the LRA for these areas was the identification and classification of land within and surrounding these areas as defined under CERFA. Generally, historic land use within each LRA-defined zone was similar, while the land use beyond the defined boundary was different. A list of the 33 SWMUs contained within the "PID Area" (i.e., Planned Industrial/Office Development and the Warehouse Areas) and their assigned designation under the CERFA process are presented in **Table 2**.

It should be noted that at present, some of the historic SWMUs encompassed by the PID Area will be retained by the Army pending the completion of the CERCLA process at the sites ("Retained Areas"). In addition, three new sites, designated as SEAD-120G, SEAD-121C and SEAD-121I, are still the subjects of ongoing site investigations based on the classification assigned under the CERFA process. Furthermore, SEAD-1 and SEAD-2 are currently subject to closure under provisions of RCRA. During the investigation and remediation of the Retained Areas, the Army will provide fencing and/or warning signs as appropriate to prevent unauthorized access to these sites. Thus, the following sites located in the PID Area, shown in **Figure 2**, will be retained by the Army:

SEAD-1	SEAD-2	SEAD-5
SEAD-16	SEAD-17	SEAD-25
SEAD-26	SEAD-39	SEAD-40
SEAD-50	SEAD-54	SEAD-59
SEAD-67	SEAD-71	SEAD-120G
SEAD-121C	SEAD-121I	

The Army will be completing the CERCLA process for the "Retained Areas," and after the investigations or remedial actions are complete, the sites will continue to be subject to the area-wide restrictions. However, upon request by the SCIDA or other future property owner, the Army, USEPA, and NYSDEC will assess and evaluate the needs for land use restrictions in these areas on a site-by-site basis.

The "PID Area" also includes sites that are the subject of a concurrent and parallel No Action/No Further Action (NA/NFA) Proposed Plan and ROD. The Army has recommended "No Action" or "No Further Action" for these sites based on its review of currently available information that is available in the Administrative Record for the Depot. The NA sites in the PID Area include:

SEAD-9	SEAD-10	SEAD-20
SEAD-22	SEAD-33	SEAD-36
SEAD-37	SEAD-42	SEAD-47 (part)
SEAD-49	SEAD-55	SEAD-68

The NFA sites in the PID Area include:

SEAD-28	SEAD-30	SEAD-31
SEAD-34		

The following discussion describes the three sites (i.e., SEAD-27, SEAD-64A, and SEAD-66) considered in this Proposed Plan.

3.1 SEAD-27 – Building 360 – Steam Cleaning Waste Tank

SEAD-27 is located in the eastern-central portion of the Depot (**Figure 1**). The steam cleaning waste tank (also known as the Steam Jenny Accumulation Pit) at Building 360 is an open top indoor concrete tank with a grate over the top. The dimensions are 35 feet long by 12 feet wide, and the deepest part is 4 feet. The capacity is 4,500 gallons when filled to near the top or 1,100 gallons to the 2-foot freeboard mark. This tank is no longer in use.

Building 360 is a building where old equipment was refurbished and reconstructed. Lathes, presses, metal-working machines were degreased with steam, high-pressure water and detergents in the cleaning area. After steam cleaning the equipment was moved to other portions of Building 360 for rehabilitation.

The cleaning area was a 20 foot-6 inch wide by 38 foot-6 inch long portion of Building 360 separated from the rest of Building 360 by a high bay cinder block wall. Track mounted carts carrying the equipment to be refurbished were rolled into the cleaning area, through a roll-up-door, on a permanently installed rail system. Metal grating was placed adjacent to and in the middle of the rail system. The floor slopes to the metal grating.

Under the metal grating is a trench system which slopes from a depth of 2 foot-0 inches on the west end to a depth of 2 foot-10 inches toward the east end. Water and grease flowed through the trench system to a second accumulation pit (the "vapor degreaser pit") at the east end. The vapor degreaser pit is a concrete floor depression that contained a vapor degreaser. This second pit was designed to be able to collect trichloroethene (TCE) if a spill should occur. The vapor degreaser pit is constructed with openings through both rail foundation walls. The pit depth is 3 foot-4 inches under the metal grating, the width of the pit is 10 foot-6 inches, and the pit length is 3 foot-0 inches. The vapor degreaser pit was emptied into approved waste removal vehicles and disposed of as hazardous waste at an approved storage facility.

Use of the Steam Jenny Accumulation Pit began in 1976. Since cleaning operations ceased on January 2, 1990, SEDA has periodically monitored the depth of water in the accumulation pit to determine if water levels in the pit are affected by varying groundwater levels. SEDA has also periodically rinsed the pit and disposed of the rinseate as hazardous waste but has never had the pit tested after rinsing for contamination. An analysis of sludge from the bottom of the pit and water in the pit was completed in 1987. A closure investigation was performed under the RCRA program in July of 1995 and the determination was made that the accumulation pit in Building 360 satisfied the RCRA requirements for clean closure (International Technology Corporation, 1995).

3.2 SEAD-64A – Garbage Disposal Area

SEAD-64A is located in the east-central portion of SEDA. The site is bounded to the north by a square storage pad, to the east by the SEDA railroad tracks beyond which is the elevated fire-training pad (SEAD-26), and to the south and west by undeveloped grassland. This SWMU is located on land that is designated for warehouse use. The approximate location of this SWMU is shown on **Figure 1**.

SEAD-64A was used during the period from 1974 to 1979 when the on-site solid waste incinerator was not in operation. The types of wastes disposed at the site are suspected to be primarily household items, although according to the SWMU Classification Report (Parsons, 1994), metal drums and other industrial items were reportedly disposed at this site. Test pitting was conducted as part of the ESI, and no evidence of metal drums or industrial waste was found. All materials identified in the test pit log were inert construction debris, such as reinforced concrete slabs, asphalt pieces, and Constantine wire, which are exempt from regulation under New York State Hazardous Waste Regulations, 6 NYCRR Section 360-7.1 (b)(i). SEDA personnel also reported the operation of small burning pits within this area when it was being landfilled. Debris (asphalt, wooden boards, concrete slabs, and corrugated drain pipe) was visible on the surface, though the site is mostly covered with dense vegetation.

3.3 SEAD-66 – Pesticide Storage Area Near Buildings 5 and 6

It has been reported that pesticides were stored in a structure located in the vicinity of Buildings 5 and 6. The Pesticide Storage Area near Buildings 5 and 6 is located in the east-central portion of SEDA (**Figure 1**). Building 5 is located approximately 100 feet north of Building 6. Building 5 is an elongated building, approximately 350 feet long and 45 feet wide. It is located on the Bundle Ammunition Pack Road and has three driveway areas between the road and the loading docks.

The exact location of the pesticide storage area is unknown. The metal shed, which is suspected to be the former pesticide storage area, is adjacent to Building 5 on the south side. Building 6 is much smaller, approximately 50 feet by 50 feet. A concrete pad, which may have also been used as a former pesticide storage area, is located adjacent to Building 6 on the south side. Both buildings are located approximately 40 to 50 feet from the road. North-south trending railroad tracks are located approximately 20 feet to the west of the two buildings.

Aside from the paved road and driveways, the ground surrounding the buildings is covered with grass. There is little topographic relief in the area, and no surface water bodies are known to exist at the site.

SEAD-66 is located near the divide between the Reeder Creek watershed and the Kendig Creek watershed. Run-off from the site is directed into the Kendig Creek watershed by roadside drainage ditches. Run-off is directed from SEAD-66 into the feeder creek for the Duck Pond, a large surface water body located approximately 1 mile to the north of SEAD-66.

4.0 SUMMARY OF PREVIOUS INVESTIGATIONS

The three sites (SEADs 27, 64A, and 66) have been described in the following documents: SWMU Classification Report (Parsons, 1994); July 1995 Building 360 Closure Investigation (International Technology Corporation, 1995); Draft Final ESI Report - Eight Moderately Low Priority Areas of Concern (Parsons, 1995); Draft ESI Report - Seven Low Priority Areas of Concern (Parsons, 1996); and Final Decision Document for Various "No Action" Sites – Mini Risk Assessments (Parsons, 2002).

4.1 SEAD-27 – Building 360 – Steam Cleaning Waste Tank

Field activities were performed at SEAD-27 as part of the July 1995 Building 360 Closure Investigation conducted in July 1995. They are as follows:

- Accumulation pit liquid waste characterization;
- Concrete coring and removal;
- Closure sampling (concrete and soil);
- Drilling and surveying;
- Groundwater monitoring and well installation;
- Closure sampling (monitoring wells and T-sump);
- Pressure washing of metal grating and interior building surfaces; and
- Ongoing periodic post-closure groundwater sampling (monitoring wells and T-sump).

More details of these activities can be found in International Technology Corporation's *Final Report – Volume I, Building 360 Closure, Seneca Army Depot, Romulus, New York* (International Technology Corporation, 1995).

The results of the chemical analyses can be found in the Final Decision Document – Mini Risk Assessment (Appendix B, Tables B-1 and B-2) for soil and groundwater, respectively. Although samples of water were collected from the T-sump during the period of February to May 1995 and were presented in the RCRA closure report in 1995, these results were not used within the risk assessment. The conclusion was that contaminants found in the water contained in the T-sump were derived from the DRMO Yard (SEAD-121C), which contained a TCE storage tank. The closure report did not find any contamination under the T-sump, which is a secondary containment device that was located under the historic cleaning operation. Available information indicates that it does not leak, and it is therefore isolated from the surrounding environment. An additional two rounds of groundwater sampling were conducted in 2003 using low flow sampling techniques. The 2003 data are presented in **Table 3**.

The RCRA Closure Workplan required testing of all potential contaminants found at the site during the operation of the Steam Jenny Tank. Therefore, soil and groundwater samples were collected and analyzed for volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), cadmium, chromium, and lead. Groundwater samples were also analyzed for semi-volatile organic compounds (SVOCs).

Soil

The four soil samples collected from SEAD-27 in 1995 were analyzed for VOCs, PCBs, cadmium, chromium, and lead. Of these compounds, only chromium and lead were detected. None of these detections exceeded recommended soil cleanup levels identified by NYSDEC in Technical and Guidance Memorandum (TAGM) #4046 "*Determination of Soil Cleanup Objectives and Cleanup Levels*" (NYSDEC, 1994).

Groundwater

The groundwater samples collected from SEAD-27 in 1995 were analyzed for VOCs, SVOCs, PCBs, cadmium, chromium, and lead. There were three exceedances of NYSDEC's GA groundwater criteria for 1,1-dichloroethane, and one exceedance each for 1,1,2,2-tetrachloroethane and total xylene. All of the observed exceedances occurred in the final round of samples collected (May 1995). 1,1-Dichloroethane was detected in MW-2, the downgradient well, at approximately 7 times the GA standard level, and in the two other wells at levels roughly equivalent to, though higher than, the standard (i.e., 5 µg/L). The concentration of 1,1,2,2-tetrachloroethane measured was slightly greater than NYSDEC's GA standard concentration, while the concentration of total xylene detected was twice NYSDEC's GA criteria level. The sample collected from the upgradient well contained the noted exceedances for total xylene and 1,1,2,2-tetrachloroethane.

The T-sump water samples were not considered to be representative of conditions resulting from the accumulation pit and were therefore, excluded from this analysis.

The analytes that exceeded their groundwater standards during the sampling conducted in 1995 were either not detected during the 2003 sampling rounds or were found at levels below their GA or Maximum Contaminant Level (MCL) standards. Most analytes detected in the groundwater during the 2003 sampling rounds were at, or below, the GA or MCL standard. The maximum concentration detected of vinyl chloride was estimated as 2.4 µg/L in MW-1, which slightly exceeded the standard of 2 µg/L. Aluminum, antimony, iron, lead, manganese, thallium, and zinc exceeded their respective GA or MCL standard; however they are within the range of the site-specific background data.

4.2 SEAD-64A – Garbage Disposal Area

A field investigation was conducted at SEAD-64A beginning in February 1994 as part of the Expanded Site Inspection (ESI) for Seven Low Priority AOCs (Parsons, 1996). A geophysical survey was conducted. Twelve soil samples were collected and submitted for VOC, SVOC, pesticide, and metal analyses. Three groundwater samples were collected from SEAD-64A and were submitted for metal, pH, conductivity, temperature, and turbidity analyses.

Several PAHs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene], phenol, and several metals (aluminum, arsenic, chromium, copper, lead, potassium, and zinc) were detected at levels that exceeded TAGMs in one or more soil samples.

During the ESI sampling, aluminum, iron, manganese, and thallium were detected in groundwater at levels that exceeded their respective comparative criteria levels.

In addition, groundwater samples were collected in June 2003 with low-flow methods and were analyzed for Target Analyte List (TAL) metals. Results are summarized in **Table 4.** Aluminum, antimony, iron, manganese, and thallium were detected in groundwater at levels exceeded their respective comparative criteria levels.

4.3 SEAD-66 – Pesticide Storage Area Near Buildings 5 and 6

A Limited Sampling Program was performed at SEAD-66 in December 1993. Surface soil samples collected from SEAD-66 were analyzed for Target Compound List (TCL) pesticides according to the NYSDEC Contract Laboratory Program (CLP) Statement of Work (SOW). Results of the chemical analyses for soil can be found in the Final Decision Document – Mini Risk Assessment (Appendix Q, Table Q-1) (Parsons, 2002).

Of the nine soil samples taken from SEAD-66, two compounds were detected at levels exceeding TAGMs: 4,4'-DDE and 4,4'-DDT were both detected at elevated levels in sample SS66-8 that was taken from a depth of 0-0.2 ft. No groundwater samples were collected.

5.0 SUMMARY OF SITE RISK

When data was collected in the initial investigation, a mini-risk assessment was conducted for those sites to estimate the risks associated with current and future site conditions. The mini-risk assessment estimated the human health and ecological risk that could result from the site if no remedial action were taken. Maximum site concentrations were used as the exposure point concentrations (EPCs) for each site.

Human Health Risk Assessment

The reasonable maximum human exposure was evaluated. A four-step process was used for assessing site-related human health risks for a reasonable maximum exposure scenario:

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

The receptors used in the risk assessment depended on the intended future use. The potentially exposed populations for the industrial use scenario are as follows:

Planned Industrial Development:

1. Industrial worker,
2. Future on-site construction workers,
3. Future worker at on-site day care center, and
4. Future child at on-site day care center.

Warehouse:

1. Future warehouse worker,
2. Future on-site construction worker, and
3. Future trespasser (adult).

The exposure pathways presented reflect the projected future use of the each area. The following exposure pathways were considered:

1. Inhalation of particulate matter in ambient air (all future receptors),
2. Ingestion and dermal contact to on-site surface soils (all future receptors),
3. Ingestion and dermal contact to on-site surface and subsurface soils (future on-site construction worker), and
4. Ingestion of groundwater (daily) (future industrial worker, day care center worker, and day care center child).

Under current USEPA guidelines, the likelihood of carcinogenic and non-carcinogenic effects due to exposure to site-related chemicals are considered separately. Non-carcinogenic risks were assessed by calculation of a Hazard Index (HI), which is an

expression of the chronic daily intake of a chemical divided by its safe or Reference Dose (RfD). An HI that exceeds 1.0 indicates the potential for non-carcinogenic effects to occur. Carcinogenic risks were evaluated using a cancer Slope Factor (SF), which is a measure of the cancer-causing potential of a chemical. Slope Factors are multiplied by daily intake estimates to generate an upper-bound estimate of excess lifetime cancer risk. For known or suspected carcinogens, USEPA has established an acceptable cancer risk range of 10^{-4} to 10^{-6} (one-in-ten thousand to one-in-one million).

Ecological Risk Assessment

The reasonable maximum environmental exposure was also evaluated. A four-step process was used for assessing site-related ecological risks for a reasonable maximum exposure scenario:

- *Characterization of the Unit and the Ecological Communities it May Affect*—Includes ecological conditions observed at the unit, site habitat characterization, wildlife resources that are present in the area, and ecological resource values to wildlife and to humans;
- *Exposure Assessment*—Discusses chemicals of potential concern (COPC), exposure point concentrations, and it presents exposure assessments. Chemical distribution of COPCs, and their uptake through various pathways are also discussed in this section. And daily intakes of COPCs through environmental media are quantified as well;
- *Toxicity Assessment*—Assesses ecological effects that potentially may result from receptor exposure to COPCs. Evaluates potential toxicity of each COPC in each medium and defines toxicity benchmark values that will be used to calculate the ecological quotient (EQ); and
- *Risk Characterization*—Integrates the results of the preceding elements of the assessment. It estimates risk with respect to the assessment endpoints, based on the predicted exposure to and toxicity of each COPC.

Ecological risk was then presented in terms of an EQ, which is derived from the results of the exposure quantification and the toxicity assessment for each COPC. The EQs are based on relevant measurement endpoints and are indicative of the potential for each chemical to pose an ecological risk to receptors. In general, guidelines suggest that EQs less than or equal to 1 present no probable risk. EQs between 1 and 10 present a small potential for environmental effects, EQs between 10 and 100 present a significant potential that effects could result from greater exposure, and EQs greater than 100 indicate the highest potential for expected effects.

5.1 SEAD-27

The total cancer risk from all exposure routes is within the USEPA target range for all three receptors under the industrial scenario. The total non-cancer HI from all exposure routes exceeds one for day care center child (HI=3), but is less than one for the industrial worker (HI=0.7) and the day care center adult worker (HI=0.7). The elevated HI for the day care center child is due solely to ingestion of groundwater, with naphthalene, acetone and chromium being the significant risk contributors.

A risk assessment was also conducted for a residential scenario. The total cancer risk from all exposure routes is within or below the USEPA target range for both receptors (adult resident and child resident). The total non-cancer HI from all exposure routes exceeds one for the adult resident (HI=2) and the child resident (HI=7). The elevated HI for the adult is due solely to ingestion of groundwater and the elevated HI for the child is due to ingestion of groundwater and dermal contact of groundwater. Naphthalene and acetone are the significant risk contributors.

Significant concentrations of acetone were detected in one well in the second and third rounds of the four-month long groundwater sampling program. The fourth round showed that the acetone concentrations had decreased, though they were still present. Naphthalene was detected in the second well, though it was not detected until the fourth quarter of the sampling program. No additional samples have been collected to confirm the presence of naphthalene at the site. Neither of these two compounds has Class GA groundwater criteria, however, their hazard indices indicate that they contribute to risk due to ingestion of groundwater and to dermal contact of groundwater. Based on the current data, should SEAD-27 be used as a residential area, it would be necessary to place a Land Use Restriction on groundwater use. This would restrict the use of groundwater as a drinking water source, preventing exposure to groundwater. This restriction results in the non-cancer hazard indices being less than 1 for both child and adult receptors.

No compounds of concern were detected in SEAD-27 soils. Therefore, no HQs were calculated for this site.

Based on the data from the 2003 sampling rounds, the risk assessment for ingestion of groundwater was recalculated according to the methodology followed in the initial risk calculations, shown in **Table 5**. There was no risk to any of the receptors. The hazard indices for all receptor are below 1. The cancer risk values were within the acceptable USEPA range.

5.2 SEAD-64A

A mini risk assessment was conducted for SEAD-64A based on the 1994 soil and groundwater data and the results of total cancer risk and total non-cancer hazard index can be found in Table 3.5-10 of the Final Decision Document - Mini Risk Assessment, Seneca Army Depot Activity (Parsons, 2002). The

total cancer risks are below or within the EPA target ranges for all receptors under a warehouse land use scenario (i.e., warehouse worker, child trespasser, and construction worker). The total non-cancer hazard indices from all exposure routes are less than one for all receptors. The non-cancer hazard indices are overstated as the metal concentrations in groundwater were elevated due to the elevated turbidities in the groundwater samples.

In addition, risks to residential receptors (i.e., residential adult and residential child) have been evaluated based on the 1994 soil and groundwater data. The results of total cancer risk and total non-cancer hazard index can be found in Table V-3 of the Final Decision Document – Mini Risk Assessment, Seneca Army Depot Activity (Parsons, 2002). The total cancer risks are below or at the EPA upper target limit for all receptors. The total non-cancer hazard indices from all exposure routes are equal to or greater than one for residential receptors. Groundwater ingestion is the only exposure route that would result in significant risk to residential receptors. The non-cancer hazard indices are overstated as the metal concentrations in groundwater were elevated due to the elevated turbidities in the groundwater samples.

Based on the data from the 2003 sampling round, the risk assessment for ingestion of groundwater was recalculated according to the methodology followed in the initial risk calculations, presented in **Table 6**. The site average value was compared to two times the average background value. The only metal retained in the risk assessment is thallium. Due to the thallium concentration, there are elevated hazard indices for the warehouse worker (HI=1), the resident adult (HI=3), and the resident child (HI=8). During the 2003 sampling, only two wells were sampled and thallium was only detected in one well (9.9 J µg/L). This value is estimated since it is below the Contract Required Detection Limit (CRDL). In addition, elevated levels of thallium are often reported by the lab due to aluminum interference caused by the analytical method. Although the level of thallium is likely overestimated, the Army is proposing that an IC, which would include a groundwater use restriction, be established at SEAD-64A.

A mini risk assessment was also conducted to evaluate potential risks to deer mice, short-tailed shrews, and American robins posed by the COPCs detected in surface soils at SEAD-64A. The HQs for all COPCs found in shallow soil were found less than one with the exception of benzo(a)pyrene, bis(2-ethylhexyl)phthalate, fluoranthene, and lead. The elevated risks driven by the above compounds were associated with one surface soil sample. The HQs based on the average concentrations of the other four samples were less than one or slightly above one (i.e., less than five). In addition, as a planned warehouse development, this site would most likely not support a balanced habitat. Based on the above discussion, it is concluded that SEAD-64A would not pose significant risk to potential ecological receptors. The mini risk assessment is presented and described in greater detail within the Final Decision Document – Mini Risk Assessment, Seneca Army Depot Activity (Parsons, 2002).

5.3 SEAD-66

The total cancer risk from all exposure routes is within the USEPA target range for all four receptors under the industrial scenario. Likewise, the total non-cancer HI from all exposure routes is less than one for all four industrial receptors.

A risk assessment was also conducted for a residential scenario. The total cancer risk from all exposure routes is within or below the USEPA target range for both receptors. The total non-cancer HI from all exposure routes exceeds one for the child resident (HI=1). The elevated HI for this receptor is due solely to ingestion of soil with 4,4'-DDT being the significant risk contributor.

While 4,4'-DDT was detected in most samples (8 out of 9), only the maximum value exceeded the TAGM for 4,4'-DDT. The maximum value used as the Exposure Point Concentration (EPC) for this assessment ranges from 300 to 10,000 times all other measured concentrations. These results indicate that the actual average exposure to 4,4'-DDT would be much lower. It is unlikely that the child would be exposed to only soils in the corner of the site from which the maximum value was taken. For these reasons, 4,4'-DDT is not considered a COC in soil at this site for this exposure scenario.

An ecological risk assessment was conducted at SEAD-66, which is presented in Section 3.0 of the Decision Document. No significant ecological risk was found.

6.0 REMEDIAL OBJECTIVES

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 waste present at the site.

7.0 PREFERRED ALTERNATIVES

Based on the results of the investigations and mini risk assessments completed for the three sites, institutional controls (ICs) are proposed for SEAD-27, SEAD-64A, and SEAD-66. The objectives of the SEAD 27, 64A, and 66 ICs include the following land use restrictions:

1. Prevent residential activities, including housing and use as a daycare facility; and
2. Prevent access or use of the groundwater without prior Army/USEPA approval.

These land use restrictions were developed based on the results

of the SEAD-27, SEAD-64A, and SEAD-66 mini risk assessments. The risk assessments suggest that restricting residential activities and access/use of groundwater at SEAD 27, 64A, and 66 will ensure protection of human health and the environment by reducing the hazard indices and cancer risk to within an acceptable range.

The SEAD 27, 64A, and 66 land use restrictions will be maintained on all the property within the Planned Industrial/Office Development and Warehousing Area ("PID Area"). The proposed boundary for the land use restrictions is shown in **Figure 2**. The establishment of an area-wide land use restrictions is consistent with the intended reuse of the property by the Seneca County Industrial Development Authority (SCIDA) and will simplify IC implementation by having a single set of land use restrictions for the entire PID Area. In addition, a public water supply is available in the PID Area so that a site-wide groundwater restriction will have a minimal adverse impact on the future land use. The boundary also establishes the recognized limits of unrestricted land use.

The PID Area includes several sites that are subject to ongoing investigations and remediation. These sites include: SEAD 1, 2, 5, 16, 17, 25, 26, 39, 40, 50, 54, 59, 67, 71, 120G, 121C, and 121I. These sites (the "Retained Areas") will be retained by the Army pending completion of the CERCLA process. These Retained Areas are shown in dark brown on **Figure 2**. During the investigation and remediation of the Retained Areas, the Army will provide fencing and/or warning signs as appropriate to prevent unauthorized access to these sites. The Army will be completing the Records of Decisions (RODs) on these sites and after investigations or remedial actions in these areas are complete, the sites will continue to be subject to the site-wide restrictions. However, upon request by the SCIDA or other future property owner, the Army, USEPA, and NYSDEC will assess and evaluate the needs for land use restrictions in these areas on a site-by-site basis.

The PID Area also includes sites ("NA/NFA Sites") that are the subject of a concurrent, parallel No Action/No Further Action Proposed Plan and ROD. The NFA Proposed Plan and ROD will identify sites at which either no remediation is required or no further remediation is required. The NA sites located in the PID Area include SEADs 9, 10, 20, 22, 33, 36, 37, 42, 47, 49, 55, and 68. The NFA sites located in the PID Area include SEADs 28, 30, 31, and 34. These sites are shown on **Figure 2**. After the NFA ROD is completed, it is expected that the sites will continue to be subject to the site-wide restrictions. However, upon request by the SCIDA or other future property owner, the Army, USEPA, and NYSDEC will assess and evaluate the needs for land use restrictions in these areas on a site-by-site basis. A copy of the NFA Proposed Plan and ROD will be available at the Information Repository at SEDA.

The Army shall implement, maintain, monitor, report on, and enforce the land use restrictions according to the PID Area Remedial Design (RD) Plan. The PID Area RD Plan includes: a Site Description; the IC Land Use Restrictions, the IC Mechanism to ensure that the land use restrictions are not violated in the future, Reporting/Notification requirements. A copy of the PID Area RD Plan will be available at the Information Repository at SEDA.

8.0 REFERENCES

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GLOSSARY

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.*

Aquifer
An aquifer is a saturated permeable geologic unit or rock formation that can store significant quantities of water and transmit the water under ordinary hydraulic gradients, possibly to wells.

Army Corps of Engineers (USACOE)
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), the Huntsville Center for Engineering Support (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.

Baseline Risk Assessment
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.

Bedrock
Bedrock is the rock that underlies the soil; it can be permeable or non-permeable. The underlying bedrock as the Seneca Army Depot Activity is shale. *See also Confining Layer.*

Borehole
A borehole is a hole cut into the ground by means of a drilling rig.

BTEX
BTEX is the term used for benzene, toluene, ethylbenzene, and xylene-volatile aromatic compounds typically found in petroleum products, such as gasoline and diesel fuel.

Cadmium
Cadmium is a heavy metal that accumulates in the environment. *See also Heavy Metal.*

Cancer Slope Factor
The slope factor is a plausible upper-bound estimate of the probability of a response per unit intake of a chemical over a lifetime. The slope factor is used in risk assessments to estimate an upper-bound lifetime probability of an individual developing cancer as a result of exposure to a particular level of a potential carcinogen. Slope factors for each chemical are expressed in units of inverse mg chemical per kg body weight per day of exposure.

Chlorinated Ethenes
A group of volatile chlorinated organic compounds that includes tetrachloroethene, trichloroethene, dichloroethene and vinyl chloride.

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.

Clean Water Act (CWA)
CWA is a 1977 amendment to the Federal Water Pollution Control Act of 1972, which set the basic structure for regulating discharges of pollutants to U.S. waters. This law gave USEPA the authority to set wastewater discharge standards on an industry-by-industry basis and to set water quality standards for all contaminants in surface waters.

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)

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
CERCLA is a federal law passed in 1980 that created a special tax that funds a trust fund, commonly known as Superfund, to be used to investigate and clean up abandoned or uncontrolled hazardous waste sites. CERCLA required for the first time that USEPA step beyond its traditional regulatory role and provide response authority to clean up hazardous waste sites. USEPA has primary responsibility for managing cleanup and enforcement activities authorized under CERCLA. Under the program, USEPA can pay for cleanup when parties responsible for the contamination cannot be located or are unwilling or unable to perform the work, or take legal action to force parties responsible for contamination to clean up the site or reimburse the federal government for the cost of the cleanup. *See also Superfund.*

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 Required Detection Limit (CRDL)
A contractually specified detection limit that, under typical analytical circumstances, should be achievable.

Data Quality Objective (DQO)
DQOs are qualitative and quantitative statements specified to ensure that data of known and appropriate quality are obtained. The DQO process is a

series of planning steps, typically conducted during site assessment and investigation that is designed to ensure that the type, quantity, and quality of environmental data used in decision-making are appropriate. The DQO process involves a logical, step-by-step procedure for determining which of the complex issues affecting a site are the most relevant to planning a site investigation before any data are collected.

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

Dichloroethene
A group of volatile chlorinated organic compounds that include: 1,1-dichloroethene, cis 1,2-dichloroethene and trans 1,2-dichloroethene

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 materials 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.

Engineered Control
An engineered control, such as barriers placed between a contaminated area and the rest of a site, is a method of managing environmental and health risks. Engineered controls can be used to limit exposure pathways.

Environmental Protection Agency (USEPA)
The federal regulatory agency responsible for enforcing the 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.

Environmental Risk
Environmental risk is the chance that human health or the environment will suffer harm as the result of the presence of environmental hazards.

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, possibly in an aquifer, that fills pores between such materials as sand, soil, or gravel and that often supplies water to wells and springs. *See also Aquifer.*

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.

Herbicide
An herbicide is a chemical pesticide designed to control or destroy plants, weeds, or grasses.

Hydrocarbon
A hydrocarbon is an organic compound containing only hydrogen and carbon, often occurring in petroleum, natural gas, and coal

Hydrogeology
Hydrogeology is the study of groundwater, including its origin, occurrence, movement, and quality.

Information Repository
An information repository contains information about a Superfund site, including technical reports and reference documents and is located in a public building that is convenient for local residents, such as a public school, city hall, or library.

Inorganic Compound
An inorganic compound is a compound that generally does not contain carbon atoms (although carbonate and bicarbonate compounds are notable exceptions) and tends to be more soluble in water. Examples of inorganic compounds include various acids, potassium hydroxide, and metals.

Innovative Technology
An innovative technology is a process that has been tested and used as a treatment for hazardous waste or other contaminated materials, but lacks a long history of full-scale use and information about its cost and how well it works sufficient to support prediction of its performance under a variety of operating conditions. An innovative technology is one that is undergoing pilot-scale treatability studies that usually are conducted in the field or the laboratory and require installation of the technology, and provide performance, cost, and design objectives for the technology. Innovative technologies are being used under many federal and state cleanup programs to treat hazardous wastes that have been improperly released. For example, the innovative technology, reactive barrier wall, is being evaluated to manage off-site migration of contamination. *See also Emerging Technology and Established Technology.*

In Situ
The term in situ, "in its original place," or" on-site", means unexcavated and unmoved. In situ soil flushing and natural attenuation are examples of in situ treatment methods by which contaminated sites are treated without digging up or removing the contaminants.

Institutional Controls
An institutional control is a legal or institutional measure, which subjects a property owner to limit activities at or access to a particular property. They are used to ensure protection of human health and the environment, and to expedite property reuse. Fences, posting or warning signs, and zoning and deed restrictions are examples of institutional controls. See Land Use Control.

Land Disposal Restrictions (LDR)
LDR is a RCRA program that restricts the land disposal of RCRA hazardous wastes and requires treatment to established treatment standards. LDRs may be an important ARAR for Superfund actions. *See also Applicable or Relevant and Appropriate Requirement and Resource Conservation and Recovery Act.*

Landfill
A sanitary landfill is a land disposal site for non-hazardous solid wastes at which the waste is spread in layers compacted to the smallest practical volume.

Land Use Controls (LUCs)
An institutional control is a legal or institutional measure, which subjects a property owner to limit activities at or access to a particular property. They are used to ensure protection of human health and the environment, and to expedite property reuse. Fences, posting or warning signs, and zoning and deed restrictions are examples of institutional controls. See Institutional Control.

Lead
Lead is a heavy metal that is hazardous to health if breathed or swallowed. Its use in gasoline, paints, and plumbing compounds has been sharply restricted or eliminated by federal laws and regulations. *See also Heavy Metal.*

Medium
A medium is a specific environment (air, water, or soil) that is the subject of regulatory concern and activities.

Mercury
Mercury is a heavy metal that can accumulate in the environment and is highly toxic if breathed or swallowed. Mercury is found in thermometers, measuring devices, pharmaceutical and agricultural chemicals, chemical manufacturing, and electrical equipment. *See also Heavy Metal.*

Methane
Methane is a colorless, nonpoisonous, flammable gas created by anaerobic decomposition of organic compounds.

Maximum Contaminant Level (MCL)
Established under the Safe Drinking Water Act as concentrations of pollutants considered protective for drinking water.

Migration Pathway
A migration pathway is a potential path or route of contaminants from the source of contamination to contact with human populations or the environment. Migration pathways include air, surface water, groundwater, and land surface. The existence and identification of all potential migration pathways must be considered during assessment and characterization of a waste site.

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. USEPA is required to update the NPL at least once a year. *See also Hazard Ranking System and Superfund.*

Natural Attenuation
Natural attenuation is an approach to cleanup that uses natural processes to contain the spread of contamination from chemical spills and reduce the concentrations and amounts of pollutants in contaminated soil and groundwater. Natural subsurface processes, such as dilution, volatilization, biodegradation, adsorption, and chemical reactions with subsurface materials, are allowed to reduce concentrations of contaminants to acceptable levels. An in situ treatment method that leaves the contaminants in place while those processes occur, natural attenuation is being used to clean up petroleum contamination from LUSTs across the country.

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.

Nephelometric Turbidity Unit (NTU)
A measurement unit of turbidity in water. Small particles of soil particles, such as clays or silts, become suspended within 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 aquifer at the SEDA.

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.

Permeability
Permeability is a characteristic that represents a qualitative description of the relative ease with which rock, soil, or sediment will transmit a fluid (liquid or gas).

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.

Phenols
A phenol is one of a group of organic compounds that are byproducts of petroleum refining, tanning, and textile, dye, and resin manufacturing. Low concentrations of phenols cause taste and odor problems in water; higher concentrations may be harmful to human health or the environment.

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 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.

Potentially Responsible Party (PRP)
A PRP is an individual or company (such as owners, operators, transporters, or generators of hazardous waste) that is potentially responsible for, or contributing to, the contamination problems at a Superfund site. Whenever possible, USEPA requires PRPs, through administrative and legal actions, to clean up hazardous waste sites they have contaminated. *See also Comprehensive Environmental Response, Compensation, and Liability Act and Superfund.*

Proposed Plan
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 RI/FS process 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.

Preliminary Assessment and Site Inspection (PA/SI)
A PA/SI is the process of collecting and reviewing available information about a known or suspected hazardous waste site or release. The PA/SI usually includes a visit to the site.

Presumptive Remedies
Presumptive remedies are preferred technologies for common categories of CERCLA sites that have been identified through historical patterns of remedy selection and USEPA's scientific and engineering evaluation of performance data on technology implementation.

Quality Assurance (QA)
QA is a system of management activities that ensure that a process, item, or service is of the type and quality needed by the user. QA deals with setting policy and implementing an administrative system of management controls that cover planning, implementation, and review of data collection activities. QA is an important element of a quality system that ensures that all research design and performance, environmental monitoring and sampling, and other technical and reporting activities conducted by USEPA are of the highest possible quality.

Quality Control (QC)
QC refers to scientific precautions, such as calibrations and duplications, that are necessary if data of known and adequate quality are to be acquired. QC is technical in nature and is implemented at the project level. Like QA, QC is an important element of a quality system that ensures that all research design and performance, environmental monitoring and sampling, and other technical and reporting activities conducted by USEPA are of the highest possible quality.

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 Inspection* 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 Design and Remedial Action (RD/RA)
The RD/RA is the step in the Superfund cleanup process that follows the RI/FS and selection of a remedy. An RD is the preparation of engineering plans and specifications to properly and effectively implement the remedy. The RA is the actual construction or implementation of the remedy. *See also Remedial Investigation and Feasibility Study.*

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 -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.

RfD
The reference dose (RfD) is an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious effects during a lifetime.

Sediment Criteria
Technical guidance provided by NYSDEC, the Division of Fish and Wildlife, that describes allowable sediment quality for a variety of chemicals. The values provided in this document have been adopted as screening levels for comparison to site data. Exceedances of these values provide that basis for further evaluation and decision-making.

Semivolatile Organic Compound (SVOC)
SVOCs, composed primarily of carbon and hydrogen atoms, have boiling points greater than 2000°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 is undergoing closure and will cease military operations in 2000. Environmental clean-up activities will continue until all sites have been addressed.

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.

Source Control
This term refers to a group of alternatives that were assembled to address control the source of contamination. Most typically these alternatives involve addressing soil or sludge contamination.

Subsurface
Underground; 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.*

Superfund Amendment and Reauthorization Act (SARA)
SARA is the 1986 act amending CERCLA that increased the size of the Superfund trust fund and established a preference for the development and use of permanent remedies, and provided new enforcement and settlement

tools. *See also Comprehensive Environmental Response, Compensation, and Liability Act.*

Target Compound List (TCL)
The Target Compound List is a list of organic compounds that are required to analyzed when performing analytical procedures. The list includes volatile organic compounds, semi-volatile 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 soil clean-up limits at waste sites.

Toluene
Toluene is a colorless liquid chemical with a sweet, strong odor. It is used as a solvent in aviation gasoline and in making other chemicals, perfumes, medicines, dyes, explosives, and detergents.

Total Petroleum Hydrocarbon (TPH)
TPH refers to a measure of concentration or mass of petroleum hydrocarbon constituents present in a given amount of air, soil, or water

Toxicity
Toxicity is a quantification of the degree of danger posed by a substance to animal or plant life.

Toxicity Characteristic Leaching Procedure (TCLP)
The TCLP is a testing procedure used to identify the toxicity of wastes and is the most commonly used test for degree of mobilization offered by a solidification and stabilization process. Under this procedure, a waste is subjected to a process designed to model the leaching effects that would occur if the waste were disposed of in a RCRA Subtitle D municipal landfill. *See also Solidification and Stabilization.*

Trichloroethylene also known as Trichloroethene (TCE)
TCE is a stable, low-boiling colorless liquid that is used as a solvent, metal degreasing agent, and in other industrial applications. It is a volatile chlorinated organic chemical.

Unsaturated Zone
The unsaturated zone is the area between the land surface and the uppermost aquifer (or saturated zone). The soils in an unsaturated zone may contain air and water.

95th Upper Confidence Limit (UCL) of the Mean
A statistical value that is calculated for a chemical in a specific media within a given data set. It represents a value that the true mean will not exceed, with a 95% statistical certainty. The 95th UCL is commonly used in risk assessment calculations.

Vadose Zone
The vadose zone is the area between the surface of the land and the surface of the water table in which the moisture content is less than the saturation point and the pressure is less than atmospheric. The openings (pore spaces) also typically contain air or other gases. See also Unsaturated Zone.

Vapor
Vapor is the gaseous phase of any substance that is liquid or solid at atmospheric temperatures and pressures. Steam is an example of a vapor.

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.

Volatilization
Volatilization is the process of transfer of a chemical from the aqueous or liquid phase to the gas phase. Solubility, molecular weight, and vapor pressure of the liquid and the nature of the gas-liquid affect the rate of volatilization.

Vinyl Chloride
A volatile chlorinated organic chemical, produced as a breakdown product of trichloroethene. This compound is highly volatile, being a gas a room temperature.

Wastewater
Wastewater is spent or used water from an individual home, a community, a farm, or an industry that contains dissolved or suspended matter.

Water Table
A water table is the boundary between the saturated and unsaturated zones beneath the surface of the earth, i.e., the level of groundwater, and generally is the level to which water will rise in a well. *See also Aquifer and Groundwater*

TABLE 1
SENECA ARMY DEPOT ACTIVITY
PROPOSED PLAN FOR SITES REQUIRING LAND USE CONTROLS
Acreage of Each Land Use Category

Environmental Condition Category Number	Approximate Acreage[1]
Conservation/Recreation	8,300
Housing	200
Institutional	200
Special events and Training	500
Planned Industrial Development (PID) Area	620
Warehouse	550
Fed to Fed Transfer	170

1. Based on "Reuse Plan and Implementation Strategy for the Seneca Army Depot" (RKG 1996).

TABLE 2
SENECA ARMY DEPOT ACTIVITY
PROPOSED PLAN FOR SITES REQUIRING INSTITUTIONAL CONTROLS
SWMU List and CERFA Parcel Designation

SWMU Numbe	SWMU Description	CERFA Parcel Number and Label
SEAD-1	Building 307 – Hazardous Waste Container Storage Facility	19(3)HS/HR
SEAD-2	Building 301 – PCB Transformer Storage Facility	3-301Q-L(P
SEAD-5	Sewage Sludge Waste Piles	81(6)HS/HR
SEAD-9	Old Scrap Wood Site	90(6)PR(P)/HR
SEAD-10	Present Scrap Wood Site	3(1)
SEAD-16	Building S-311 – Former Deactivation Furnace	82(6)PS/PR/HS/HR
SEAD-17	Building 367 – Existing Deactivation Furnace	80(6)PS/HR
SEAD-20	Sewage Treatment Plant No. 4	94(6)HR
SEAD-22	Sewage Treatment Plant No. 314	136(4)PR
SEAD-25	Fire Training and Demonstration Pad	79(6)HR
SEAD-26	Fire Training Pit	66(6)HR
SEAD-27	Building 360 – Steam Cleaning Waste Tanks	51(5)PS/PR/HS/HR(P)
SEAD-28	Building 360 – Underground Waste Oil Tanks	51(5)PS/PR/HS/HR(P)
SEAD-30	Building 118 – Underground Waste Oil Tank	24(3)PS/PR/HS
SEAD-31	Building 117 – Underground Waste Oil Tank	25(2)PS/HS
SEAD-33	Building 121 – Underground Waste Oil Tanks	87(6)PS/PR/HR(P)
SEAD-34	Building 319 – Underground Waste Oil Tank	50(5)PS/PR/HR(P)
SEAD-36	Building 121 – Waste Oil-Burning Boilers (2 units)	87(6)PS/PR/HR(P)
SEAD-37	Building 319 – Wast Oil-Burning Boilers (2)	50(5)PS/PR/HR(P)
SEAD-39	Building 121 – Boiler Blowdown Leach Pit	87(6)PS/PR/HR(P)
SEAD-40	Building 319 – Boiler Blowdown Leach Pit	50(5)PS/PR/HR(P)
SEAD-42	Building 106 – Preventative Medicine Laboratory	27(2)PS/HS
SEAD-47	Building 321 and 806 – Radiation Calibration Source Storage	3(1) AND 98(6)PS/PR/HS/HR
SEAD-49	Building 356 – Columbite Ore Storage	45(3)HS/HR
SEAD-50	Tank Farm	72(6)HS/HR
SEAD-54	Asbestos Storage	72(6)HS/HR
SEAD-55	Building 357 – Tannin Storage	3(1)
SEAD-59	Fill Area West of Building 135	85(6)PR/HR
SEAD-64A	Debris Landfill South of Storage Pad	64(6)HR
SEAD-66	Pesticide Storage Near Building 5 and 6	92(6)HS/HR(P)
SEAD-68	Building S-335 – Old Pest Control Shop	108(7)HS(P)/HR(P)
SEAD-71	Alleged Paint Disposal Area	89(6)HR

TABLE 3
SUMMARY OF GROUNDWATER ANALYSES RESULTS
SEAD-27 (BUILDING 360)
PROPOSED PLAN FOR INSTITUTIONAL CONTROL SITES
SENECA ARMY DEPOT ACTIVITY

								Building 360 MW-1 groundwater 122B-2001 0 0 7/22/2002 SA 122B-RI	Building 360 MW-1 groundwater DRMO-2005 16.5 16.5 4/4/2003 SA PID-RI 2	Building 360 MW-1 groundwater DRMO-2008 16.5 16.5 4/4/2003 SA PID-RI 2	Building 360 MW-1 groundwater DRMO-2013 16.6 16.6 5/9/2003 SA PID-RI 3	Building 360 MW-1 groundwater 121C-2019 16.6 16.6 5/9/2003 SA PID-RI 3
	Units	Maximum Value	Frequency of Detection	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Collected	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
e	UG/L	4.4	63%	5	0	5	8		5 UJ	4.4 J	4.3	4.3
ne	UG/L	0.5	13%	1	0	1	8		5 U	5 U	0.4 U	0.5 J
	UG/L	8.4	13%		0	1	8		5 R	5 R	5.8 R	8.4 J
	UG/L	0.6	13%		0	1	8		5 UJ	5 UJ	0.3 U	0.3 U
nene	UG/L	1	25%	5	0	2	8		5 U	5 U	0.3 U	0.4 J
	UG/L	1	25%	5	0	2	8		5 UJ	5 UJ	1 J	1 J
	UG/L	2.4	75%	2	2	6	8		[redacted] J	[redacted] J	1.4	1.3
nthalate	UG/L	2.5	13%	5	0	1	8		1 U	1 U	1 U	1 U
	UG/L	508	55%	50	5	6	11	162 J	150 U	28.3 J	32 U	32 U
	UG/L	18.1	18%	3	2	2	11	14.4 J	3.8 U	3.8 U	7.5 U	7.5 U
	UG/L	7.1	9%	10	0	1	11	3.6 U	4.5 U	4.5 U	7.1	4.5 U
	UG/L	147	100%	1000	0	11	11	31 J	135	147	113	113
	UG/L	0.21	9%	4	0	1	11	0.2 U	0.1 U	0.1 U	0.9 U	0.9 U
	UG/L	3.9	27%	5	0	3	11	1.1 J	0.8 U	0.8 U	0.8 U	0.8 U
	UG/L	119149.7969	100%		0	11	11	105000	88700	96900	84200	87100
	UG/L	84	64%	50	1	7	11	8.7 J	1.4 U	1.4 U	1.4 U	1.4 U
	UG/L	7.4	27%		0	3	11	3.5 U	0.7 U	0.7 U	2.3 U	2.3 U
	UG/L	167	45%	200	0	5	11	7.3 J	3.6 U	3.6 U	2 U	2 U
	UG/L	255000	100%	300	8	11	11	[redacted]	3780 J	[redacted] J	[redacted]	[redacted]
	UG/L	204	18%	15	2	2	11	1.5 U	3 U	3 U	3 U	3 U
	UG/L	35800	100%		0	11	11	35800	11400	12500	11000	11400
	UG/L	1710	100%	50	11	11	11	128	1580	[redacted]	[redacted]	[redacted]
	UG/L	0.28	18%	0.7	0	2	11	0.1 U	0.2 U	0.2 U	0.2 U	0.2 U
	UG/L	38.8	64%	100	0	7	11	2.4 U	3 J	3.8 J	2 U	2 U
	UG/L	12300	100%		0	11	11	9920	9450 J	10600 J	8820	9430
	UG/L	7.5	45%	10	0	5	11	2.9 U	4.2 J	3.3 J	1.3 U	3.2 J
	UG/L	8.6	9%	50	0	1	11	1.5 U	3.7 U	3.7 U	3.7 U	3.7 U
	UG/L	45300	100%	20000	9	11	11	10400	40400	[redacted]	41100	44000
	UG/L	4.4	9%	2	1	1	11	6 U	5.3 U	5.3 U	4.4 J	4.2 U
	UG/L	10.3	27%		0	3	11	8 J	1.4 U	1.4 U	2.5 U	2.5 U
	UG/L	5740	100%	5000	2	11	11	3.8 J	7.1 J	7.1 J	14.4 J	17 J

TABLE 3
SUMMARY OF GROUNDWATER ANALYSES RESULTS
SEAD-27 (BUILDING 360)
PROPOSED PLAN FOR INSTITUTIONAL CONTROL SITES
SENECA ARMY DEPOT ACTIVITY

								Building 360 MW-2 groundwater 122B-2000 0 0 7/22/2002 SA 122B-RI	Building 360 MW-2 groundwater DRMO-2006 16.7 16.7 4/3/2003 SA PID-RI 2	Building 360 MW-2 groundwater DRMO-2014D 16.7 16.7 5/8/2003 DU PID-RI 3	Building 360 MW-2 groundwater DRMO-2014 16.7 16.7 5/8/2003 SA PID-RI 3
	Units	Maximum Value	Frequency of Detection	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Collected	Value (Q)	Value (Q)	Value (Q)	Value (Q)
e	UG/L	4.4	63%	5	0	5	8		5 UJ		0.4 U
ne	UG/L	0.5	13%	1	0	1	8		5 U		0.4 U
	UG/L	8.4	13%		0	1	8		5 R		5.9 UJ
	UG/L	0.6	13%		0	1	8		5 UJ		0.3 UJ
nene	UG/L	1	25%	5	0	2	8		5 U		0.3 U
	UG/L	1	25%	5	0	2	8		5 UJ		0.7 UJ
	UG/L	2.4	75%	2	2	6	8		5 U		0.3 U
thalate	UG/L	2.5	13%	5	0	1	8		1 U		1 U
	UG/L	508	55%	50	5	6	11	508	65.4 J	18.4 U	18.4 U
	UG/L	18.1	18%	3	2	2	11	18.1 J	3.8 U	3.8 U	3.8 U
	UG/L	7.1	9%	10	0	1	11	3.6 U	4.5 U	4.5 U	4.5 U
	UG/L	147	100%	1000	0	11	11	35.2 J	120	125.27 J	125 J
	UG/L	0.21	9%	4	0	1	11	0.21 J	0.1 U	0.1 U	0.1 U
	UG/L	3.9	27%	5	0	3	11	1.4 J	0.8 U	0.8 U	0.8 U
	UG/L	119149.7969	100%		0	11	11	113000	109000	119149.797	119000
	UG/L	84	64%	50	1	7	11	10.2	27.5	10.99	11.3
	UG/L	7.4	27%		0	3	11	3.5 U	0.85 J	0.7 U	0.7 U
	UG/L	167	45%	200	0	5	11	8.8 J	3.6 U	3.6 U	3.6 J
	UG/L	255000	100%	300	8	11	11	[redacted]	251 J	119.08	118
	UG/L	204	18%	15	2	2	11	1.5 U	3 U	3 U	3 U
	UG/L	35800	100%		0	11	11	34300	25300	27359.2598	27400
	UG/L	1710	100%	50	11	11	11	[redacted]	[redacted]	[redacted]	527
	UG/L	0.28	18%	0.7	0	2	11	0.1 U	0.2 U	0.2 U	0.2
	UG/L	38.8	64%	100	0	7	11	2.4 U	23.6	24.8 J	24.3 J
	UG/L	12300	100%		0	11	11	4440 J	2460	2021.03 J	2040 J
	UG/L	7.5	45%	10	0	5	11	2.9 U	3.4 J	1.3 U	1.3 U
	UG/L	8.6	9%	50	0	1	11	1.5 U	3.7 U	3.7 U	3.7 U
	UG/L	45300	100%	20000	9	11	11	10700	[redacted]	[redacted]	[redacted]
	UG/L	4.4	9%	2	1	1	11	6 U	5.3 U	5.3 U	5.3 U
	UG/L	10.3	27%		0	3	11	10.3 J	1.4 U	1.4 U	1.4 U
	UG/L	5740	100%	5000	2	11	11	6.2 J	10.4	18.32 J	17.9 J

TABLE 4
SEAD-64A SUMMARY OF GROUND WATER ANALYSES RESULTS - 2003 Sampling
Proposed Plan - Institutional Controls Sites
Seneca Army Depot Activity

								SEAD	SEAD-64A	SEAD-64A
								LOCATION ID	MW64A-2	MW64A-3
								MATRIX	GRND WTR	GRND WTR
								SAMPLE NUMBER	64A2001	64A2002
								SAMP_DEPTH_TOP		
								SAMP_DEPTH_BOT		
								SAMP_DATE	06/17/03	06/17/03
								SAMPLE TYPE	SA	SA
COMPOUND	UNIT	MAXIMUM	FREQUENCY OF DETECTION	CRITERIA LEVELS	NUMBER ABOVE CRITERIA	NUMBER OF DETECTS	NUMBER OF ANALYSES	Value	(Q)	Value	(Q)
Aluminum	UG/L	140	100%	50 (a)	2	2	2	140	J	63	J
Antimony	UG/L	13.9	100%	3 (b)	2	2	2	9.3	J	13.9	J
Arsenic	UG/L	5.8	50%	10 (c)	0	1	2	5.8	J	4.5	U
Barium	UG/L	43.4	100%	1000 (b)	0	2	2	33.2	J	43.4	J
Beryllium	UG/L	0	0%	4 (c)	0	0	2	0.9	U	0.9	U
Cadmium	UG/L	0	0%	5 (b)	0	0	2	0.8	U	0.8	U
Calcium	UG/L	146000	100%	NA	0	2	2	146000	J	110000	J
Chromium	UG/L	3.9	100%	50 (b)	0	2	2	2.8	J	3.9	J
Cobalt	UG/L	5.1	100%	NA	0	2	2	5.1	J	3.6	J
Copper	UG/L	5.4	100%	200 (b)	0	2	2	5.4	J	3.6	J
Iron	UG/L	1190	50%	300 (b)	1	1	2	[redacted]		34.9	U
Lead	UG/L	6.2	100%	25 (b)	0	2	2	4.1		6.2	
Magnesium	UG/L	17900	100%	NA	0	2	2	17900	J	15600	J
Manganese	UG/L	92.7	100%	50 (a)	1	2	2	[redacted]	J	21.8	J
Mercury	UG/L	0	0%	0.7 (b)	0	0	2	0.2	U	0.2	U
Nickel	UG/L	5.8	50%	100(b)	0	1	2	5.8	J	2	U
Potassium	UG/L	3480	100%	NA	0	2	2	3480	J	937	J
Selenium	UG/L	6.2	100%	10 (b)	0	2	2	2.4	J	6.2	
Silver	UG/L	0	0%	50 (b)	0	0	2	3.7	U	3.7	U
Sodium	UG/L	9350	100%	20000 (b)	0	2	2	7110	J	9350	J
Thallium	UG/L	9.9	50%	2 (c)	1	1	2	4.2	U	[redacted]	J
Vanadium	UG/L	3.5	50%	NA	0	1	2	3.5	J	2.5	U
Zinc	UG/L	27.2	100%	5000 (a)	0	2	2	27.2		11.6	J
FIELD DETERMINATIONS											
Conductivity	umhos/cm							NA		70	
Dissolved Oxyg	ppm							19.9		16.3	
Oxidation-Redu	mV							85		286	
pH	Standard Units							6.3		7.1	
Temperature	°C							20.8		13	
Turbidity	NTU							110		32	

NOTES:

a) Secondary Drinking Water Regulations
b) NY State Class GA Groundwater Regulations
c) Maximum Contaminant Level
NA = Not Available

U = The compound was not detected at or above this concentration.
J = The reported value is an estimated concentration.
UJ = The compound may have been present above this concentration, but was not detected due to problems with the analysis.

TABLE 5
REVISED CALCULATION OF INTAKE AND RISK FROM THE INGESTION OF GROUNDWATER BASED ON 2003 GROUNDWATER DATA
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-27
Proposed Plan - Institutional Control Sites
Seneca Army Depot Activity

g/kg-day) = $\frac{CW \times IR \times EF \times ED}{BW \times AT}$

s for Each Receptor are Listed at the Bottom):

ntration in Groundwater, from Groundwater EPC Data

ncy

ED=Exposure Duration
BW=Bodyweight
AT=Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Oral RfD	Carc. Slope Oral	EPC Groundwater [1]	Industrial Worker				Construction Worker				Worker at On-Site Day Care Center				Child at On-Site Day Ca		
			Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Ha Quo
(mg/kg-day)	(mg/kg-day)-1	(mg/liter)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)	
1.00E-01	NA	4.40E-03	4.31E-05		4E-04		Ingestion of Groundwater for Construction Worker				4.31E-05		4E-04		2.01E-04		2E
1.00E-01	NA	8.40E-03	8.22E-05		8E-04						8.22E-05		8E-04		3.84E-04		4E
3.00E-03	7.20E-01	2.40E-03	2.35E-05	8.39E-06	8E-03	6E-06					2.35E-05	8.39E-06	8E-03	6E-06	1.10E-04	9.39E-06	4E
1.40E-01	NA	1.71E+00	1.67E-02		1.2E-01						1.67E-02		1E-01		7.81E-02		6E
ient and Cancer Risk:					1E-01	6E-06							1E-01	6E-06			6E

Assumptions for Industrial Worker			Assumptions for Worker at On-Site Day Care Center			Assumptions for Chi On-Site Day Care C		
BW =	70	kg	BW =	70	kg	BW =	15	kg
IR =	1	liters/day	IR =	1	liters/day	IR =	1	liters/d
EF =	250	days/year	EF =	250	days/year	EF =	250	days/ye
ED =	25	years	ED =	25	years	ED =	6	years
AT (Nc) =	9,125	days	AT (Nc) =	9,125	days	AT (Nc) =	2,190	days
AT (Car) =	25,550	days	AT (Car) =	25,550	days	AT (Car) =	25,550	days

were intentionally left blank due to a lack of toxicity data.
vailable.
maximum detections during the two rounds of sampling conducted in Spring 2003 at MW-1 and MW-2.
d out of the risk assessment by comparing the site average value to twice average background values. To calculate the site average values, non-detects (designated with a "u") were considered zero. This was done in
methodology used for the risk calculations presented in the Final Decision Document - Mini Risk Assessment (Parsons, 2002). Likewise, the background data set used in the screening process was the same data set
calculations for SEAD-27 performed as part of the Mini Risk Assessment.

TABLE 5
REVISED CALCULATION OF INTAKE AND RISK FROM THE INGESTION OF GROUNDWATER BASED ON 2003 GROUNDWATER DATA
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-27
Proposed Plan - Institutional Control Sites
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{CW \times IR \times EF \times ED}{BW \times AT}$

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Variables (Assumptions for Each Receptor are Listed at the Bottom):

CW = Chemical Concentration in Groundwater, from Groundwater EPC Data
IR = Ingestion Rate
EF = Exposure Frequency
ED=Exposure Duration
BW=Bodyweight
AT=Averaging Time

Equation for Contribution to Cancer Risk = Chronic Daily Intake (Car) x Slope Factor
Equation for Total Lifetime Cancer Risk = Adult Contribution + Child Contribution

Analyte	Oral RfD (mg/kg-day)	Carc. Slope Oral (mg/kg-day)-1	EPC Groundwater [1] (mg/liter)	Resident (Adult) Intake (mg/kg-day) (Nc)	Resident (Adult) Intake (mg/kg-day) (Car)	Resident (Adult) Hazard Quotient	Resident (Adult) Contribution to Lifetime Cancer Risk	Resident (Child) Intake (mg/kg-day) (Nc)	Resident (Child) Intake (mg/kg-day) (Car)	Resident (Child) Hazard Quotient	Resident (Child) Contribution to Lifetime Cancer Risk	Resident Total Lifetime Cancer Risk
Volatile Organics												
1,1-Dichloroethane	1.00E-01	NA	4.40E-03	1.21E-04		1E-03		2.81E-04		3E-03		
Acetone	1.00E-01	NA	8.40E-03	2.30E-04		2E-03		5.37E-04		5E-03		
Vinyl chloride	3.00E-03	7.20E-01	2.40E-03	6.58E-05	2.25E-05	2E-02	2E-05	1.53E-04	1.32E-05	5E-02	1E-05	3E-05
Metals [2]												
Manganese	1.40E-01	NA	1.71E+00	4.68E-02		3E-01		1.09E-01		8E-01		
Total Hazard Quotient and Cancer Risk:						**4E-01**	**2E-05**			**8E-01**	**1E-05**	**3E-05**

Assumptions for Resident (Adult)			Assumptions for Resident (Child)		
BW =	70	kg	BW =	15	kg
IR =	2	liters/day	IR =	1	liters/day
EF =	350	days/year	EF =	350	days/year
ED =	24	years	ED =	6	years
AT (Nc) =	8,760	days	AT (Nc) =	2,190	days
AT (Car) =	25,550	days	AT (Car) =	25,550	days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.

1. EPC values based on maximum detections during the two rounds of sampling conducted in Spring 2003 at MW-1 and MW-2.
2. Metals were screened out of the risk assessment by comparing the site average value to twice average background values. To calculate the site average values, non-detects (designated with a "u") were considered zero. This was done in accordance with the methodology used for the risk calculations presented in the Final Decision Document - Mini Risk Assessment (Parsons, 2002). Likewise, the background data set used in the screening process was the same data set used in the initial risk calculations for SEAD-27 performed as part of the Mini Risk Assessment.

TABLE 6
REVISED CALCULATION OF INTAKE AND RISK FROM THE INGESTION OF GROUNDWATER BASED ON 2003 GROUNDWATER DATA
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-64A
Proposed Plan - Institutional Control Sites
Seneca Army Depot Activity

g/kg-day) = $\frac{CW \times IR \times EF \times ED}{BW \times AT}$

s for Each Receptor are Listed at the Bottom):

ntration in Groundwater, from Groundwater EPC Data

ncy

ED=Exposure Duration
BW=Bodyweight
AT=Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Contribution to Cancer Risk = Chronic Daily Intake (Car) x Slope Factor
Equation for Total Lifetime Cancer Risk = Adult Contribution + Child Contribution

Oral RfD	Carc. Slope Oral	EPC Groundwater	Warehouse Worker				Resident (Adult)				Resident (Child)				Residen
			Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Contribution to Lifetime Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Contribution to Lifetime Cancer Risk	Contributi to Lifetim Cancer Ri
(mg/kg-day)	mg/kg-day)-	(mg/liter)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)			
8.00E-05	NA	9.90E-03	9.69E-05		1E+00		2.71E-04		3E+00		6.33E-04		8E+00		
tient and Cancer Risk:					1E+00				3E+00				8E+00		NA
			Assumptions for Warehouse Worker				Assumptions for Resident (Adult)				Assumptions for Resident (Child)				
			BW =	70 kg			BW =	70 kg			BW =	15 kg			
			IR =	1 liter/day			IR =	2 liters/day			IR =	1 liters/day			
			EF =	250 days/year			EF =	350 days/year			EF =	350 days/year			
			ED =	25 years			ED =	24 years			ED =	6 years			
			AT (Nc) =	9,125 days			AT (Nc) =	8,760 days			AT (Nc) =	2,190 days			
			AT (Car) =	25,550 days			AT (Car) =	25,550 days			AT (Car) =	25,550 days			

e were intentionally left blank due to a lack of toxicity data.
vailable.
n maximum detections during the round of sampling conducted in Spring 2003.
d out of the risk assessment by comparing the site average value to twice average background values. To calculate the site average values, non-detects (designated with a "u") were considered zero. This was done in
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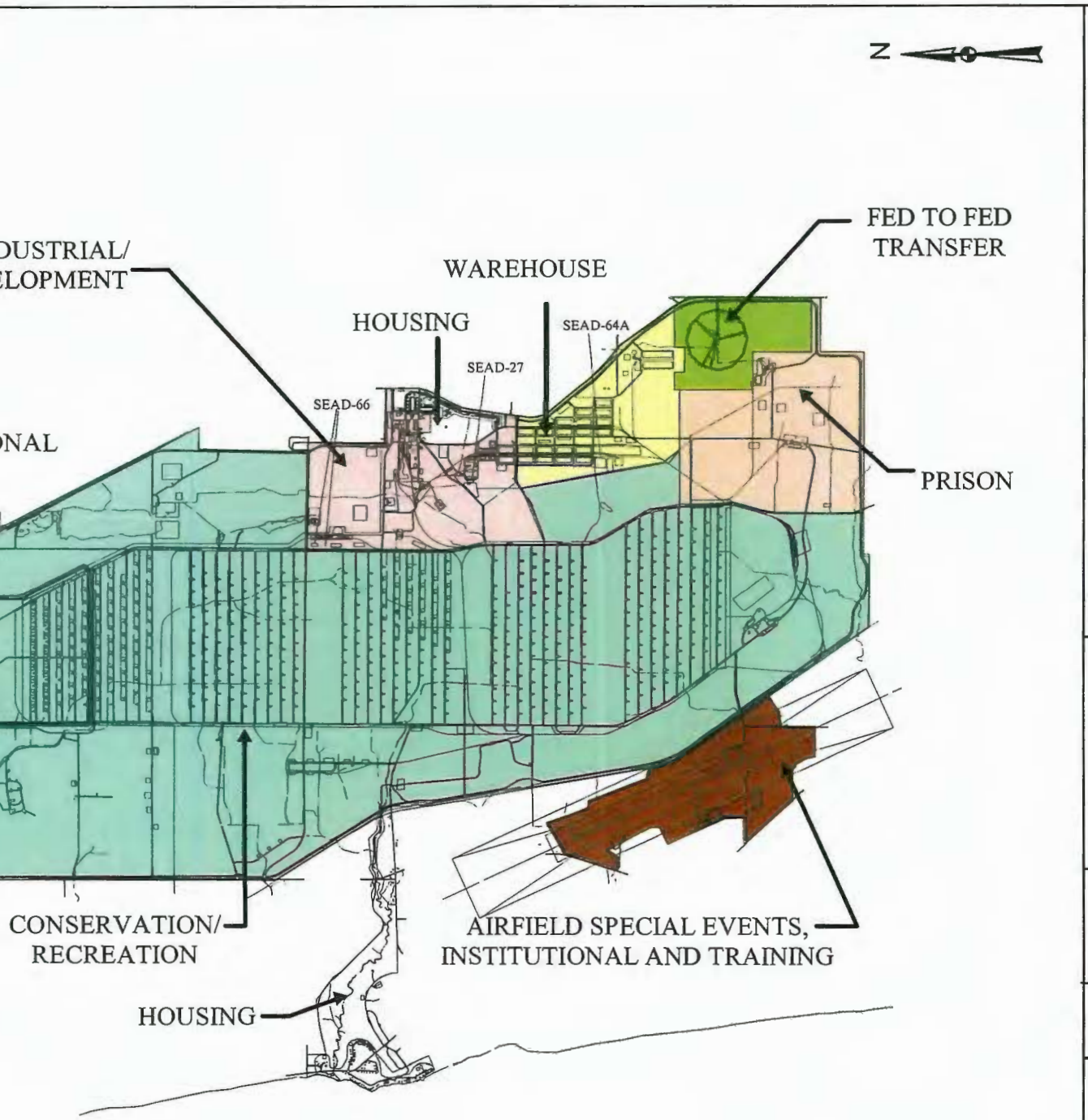
k calculations for SEAD-64A performed as part of the Mini Risk Assessment.



Airfield

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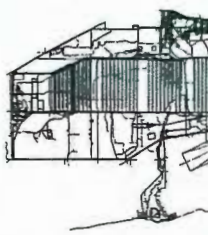
Activities at SEADs 27,
are restricted per Propo
Record of Deci



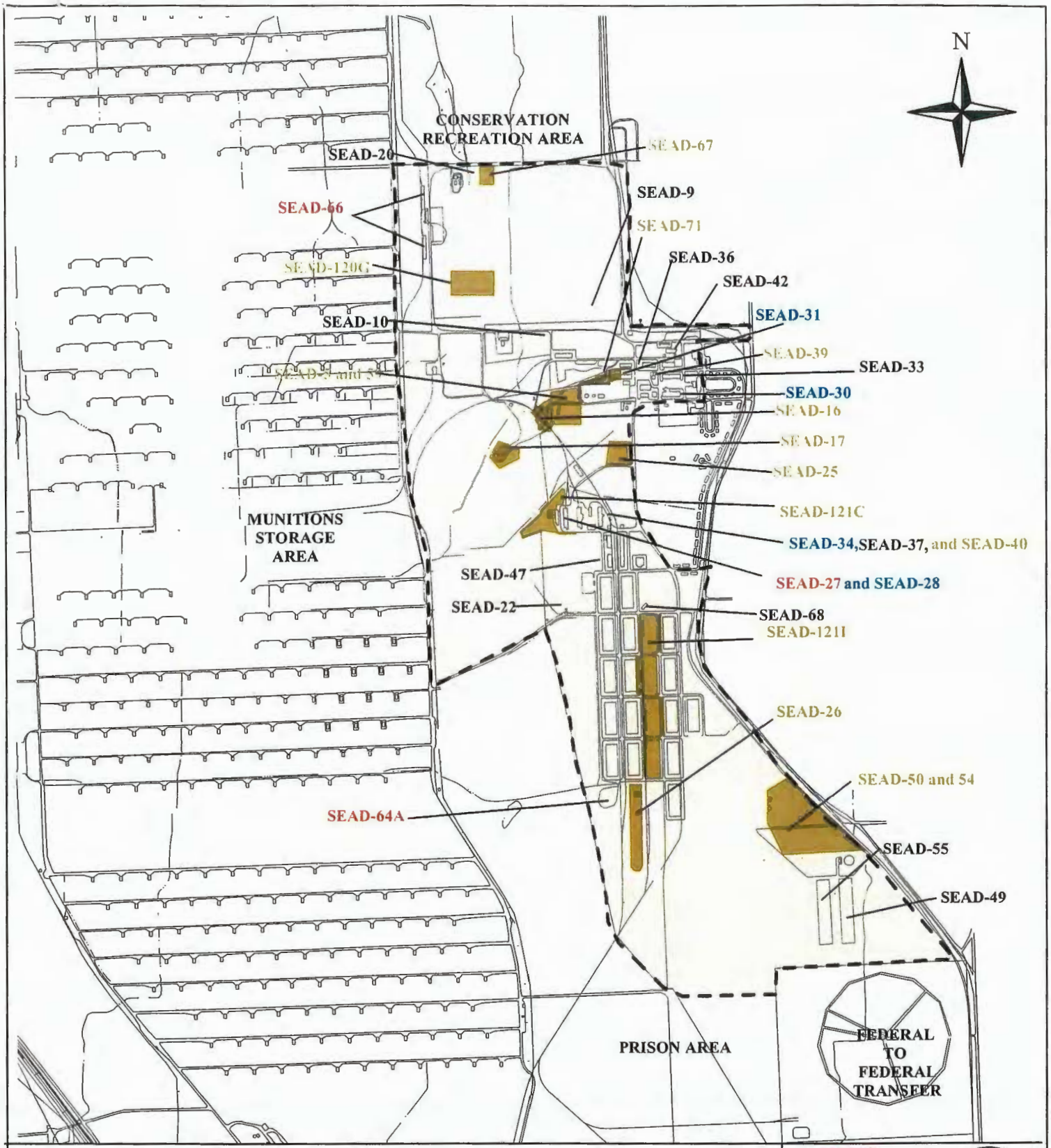
PARSO

Seneca Army Depo
Proposed Plan -

Figure
Future Land U
Location of IC

Project: 736026-01001

\\noc Sites fig1



LEGEND

Area Covered by Land Use Restriction
- No Residential Activity
- No Groundwater Use

700 0 700 1400 2100 Feet

Army Retained Property - No Unauthorized Access

SEAD-121I - Army Retained Site

SEAD-55 - No Action Site

SEAD-27 - Land Use Restriction Site

SEAD-28 - No Further Action Site

PARSONS

SENECA ARMY DEPOT ACTIVITY
Proposed Plan - IC Sites

FIGURE 2
EXTENT OF PID AREA
LAND USE RESTRICTION

Job #: 741175-02900 | JULY 2003

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