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March 9, 2010

Mr. John Hill
U.S. Air Force Center for Engineering and the Environment
HQ AFCEE/IWP
3300 Sidney Brooks
Brooks City-Base, TX 78235-5112

SUBJECT: Annual Report – Year 3 for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17) Sites at Seneca Army Depot Activity; Contract FA8903-04-D-8675, Delivery Order 0031, CDRL A001G

Dear Mr. Hill:

Parsons Infrastructure & Technology Group Inc. (Parsons) is pleased to submit the draft Annual Report – Year 3 for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17) for sites at the Seneca Army Depot Activity (SEDA) in Romulus, New York.

This work was performed in accordance with the Scope of Work (SOW) for Contract No. FA8903-04-D-8674, Task Order No. 0031.

Parsons appreciates the opportunity to provide you with the report for this work. Should you have any questions, please do not hesitate to call me at (617) 449-1405 to discuss them.

Sincerely,

Todd Heino, P.E., VP
Project Manager

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cc: J. Chavez, AFCEE
S. Absolom, SEDA
K. Hoddinott, USACHPPM
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March 9, 2010

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SUBJECT: Annual Report – Year 3 for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17) Sites at Seneca Army Depot Activity; EPA Site ID# NY0213820830 and NY Site ID# 8-50-006

Dear Mr. Vazquez/Mr. Gupta/Mr. Sergott:

Parsons Infrastructure & Technology Group Inc. (Parsons) is pleased to submit the draft Annual Report – Year 3 for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17) sites at the Seneca Army Depot Activity (SEDA) in Romulus, New York (USEPA Site ID# NY0213820830 and NY Site ID# 8-50-006).

Parsons appreciates the opportunity to provide you with this report for this work. Should you have any questions, please do not hesitate to call me at (617) 449-1405 to discuss them.

Sincerely,

Todd Heino, P.E., VP
Project Manager

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US Army Corps of Engineers

Air Force Center for Engineering and the Environment

01539

Seneca Army Depot Activity
Romulus, New York

DRAFT
ANNUAL REPORT - YEAR 3

THE ABANDONED DEACTIVATION FURNACE (SEAD-16)
AND THE ACTIVE DEACTIVATION FURNACE (SEAD-17)
SENECA ARMY DEPOT ACTIVITY

AFCEE CONTRACT NO. FA8903-04-D-8675
TASK ORDER NO. 0031
CDRL A001G

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

PARSONS
MARCH 2010

DRAFT ANNUAL REPORT – YEAR 3

FOR THE ABANDONED DEACTIVATION FURNACE (SEAD-16)
AND THE ACTIVE DEACTIVATION FURNACE (SEAD-17)
SENECA ARMY DEPOT ACTIVITY, ROMULUS, NY

Prepared for:

AIR FORCE CENTER FOR ENGINEERING AND THE ENVIRONMENT

BROOKS CITY-BASE, TEXAS

and

SENECA ARMY DEPOT ACTIVITY

ROMULUS, NY

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Contract Number FA8903-04-D-8675
Task Order 0031, CDRL A001G
EPA Site ID# NY0213820830
NY Site ID# 8-50-006

March 2010

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1.0 INTRODUCTION

This third Annual Report for the Abandoned Deactivation Furnace (SEAD-16) and Active Deactivation Furnace (SEAD-17) sites at the Seneca Army Depot Activity (SEDA or the Depot) in Romulus, New York provides a review of annual groundwater monitoring data collected in 2009, recommendations for future long-term monitoring at SEAD-16 and SEAD-17, and the annual review of the effectiveness of the remedy implemented in 2007.

In accordance with the Record of Decision (ROD) for SEAD-16 and SEAD-17 (Parsons, 2006) and the Remedial Design Work Plan and Design Report (Parsons, 2007) (Final Work Plan), a remedial action was completed in August 2007 for both areas of concern (AOCs). The work is documented in the "Final Construction Completion Report for the Abandoned Deactivation Furnace (SEAD-16) and Active Deactivation Furnace (SEAD-17)" (Parsons, 2008) (CCR). The remedial action at SEAD-16 involved the removal of 1,862 cubic yards (cy) of soil that was impacted with metals and polycyclic aromatic hydrocarbons (PAHs). The remedial action at SEAD-17 involved the removal of 2,565 cy of metal-impacted soil.

The ROD for SEAD-16 and SEAD-17 also requires the implementation of land use controls (LUCs) that prohibit use of the land at the AOCs for residential purposes, and prohibits access to and use of groundwater until applicable cleanup standards are met [i.e., New York State Class GA Ambient Water Quality Standards (AWQS) *and/or* United States Environmental Protection Agency (EPA) *maximum contaminant levels (MCLs)*]. Once groundwater cleanup standards are achieved, the groundwater use restrictions may be eliminated upon approval of the EPA and the New York State Department of Environmental Conservation (NYSDEC). SEAD-16 and SEAD-17 are located within the Planned Industrial/Office Development and Warehousing (PID) area, which has area-wide LUCs that prohibit the development and use of the property for residential housing, elementary and secondary schools, childcare facilities and playgrounds, and prohibits access to and use of groundwater until concentrations have been reduced to levels that allow for unlimited exposure and unrestricted use.

The details of implementing the LUCs for SEAD-16 and SEAD-17 will be provided in the Land Use Control Remedial Design (LUC RD) Addendum 4. The LUC objectives for SEAD-16 and SEAD-17 are to prevent access to or use of groundwater, and to prevent residential use until cleanup levels are met. The LUC RD 4 will indicate that the LUC implementation actions at the affected sites may include lease restrictions, an environmental easement, deed restrictions, zoning, annual certification, and a five-year review. The annual certification will be submitted to the NYSDEC and EPA to document that the LUC at SEAD-16 and SEAD-17 is unchanged and that no activities have occurred that impair or violate the ability of the LUCs to protect the public health and environment. Additionally, a five-year review will be conducted to evaluate the effectiveness of the selected remedy for SEAD-16 and SEAD-17.

Long-term groundwater monitoring (LTM) is being performed at SEAD-16 and SEAD-17 as part of the post-closure monitoring and maintenance (PCMM) operations in accordance with the ROD and outlined in the Final Work Plan. The first year (Year 1) groundwater sampling event that was

conducted as part of the LTM for SEAD-16 and SEAD-17 was performed in December 2007, and results are documented in the CCR. The second year (Year 2) groundwater sampling event was conducted in December 2008 for SEAD-16 and SEAD-17, and the results of the Year 2 sampling event are documented in the "Final Annual Report – Year 2" (Parsons, 2009). The third year (Year 3) groundwater sampling event was conducted in November 2009 for both AOCs, and the results are presented and discussed in this report.

2.0 SITE BACKGROUND

2.1 Site Description

SEDA is a 10,587-acre former military facility located in Seneca County near Romulus, New York that was wholly owned by the United States Government and operated by the Department of the Army between 1941 and 2000; since 2000 portions of the Depot have been transferred to other parties for reuse. SEDA's primary mission was the receipt, storage, maintenance, and supply of military items. A location map for SEDA is shown in **Figure 1**. SEDA is located between Seneca Lake and Cayuga Lake in Seneca County, and is bordered by New York State Highway 96 to the east, New York State Highway 96A to the west, and sparsely populated farmland to the north and south.

SEAD-16 and SEAD-17 are located in the east-central portion of the former Depot, within the Depot's former ammunition storage area, where vehicular and pedestrian access is restricted. SEAD-16 and SEAD-17 are now located in the portion of the former Depot where land is designated for future planned industrial/office development and warehousing (PID) uses. The location of SEAD-16 and SEAD-17 is shown in **Figure 2**.

Both AOCs were historically used for the demilitarization of various small arms munitions. The munitions deactivation process involved heating the munitions in a rotating steel kiln. The heat would cause the munitions to detonate once the detonation temperature was reached. The byproducts produced during this detonation were then either swept out of the kiln through the stack or expelled from the kiln as bottom ash or debris.

SEAD-16 has been inactive and abandoned since the 1960s and consists of 2.6 acres of fenced land with grasslands in the north, east, and west; a storage area for empty boxes and wooden debris; and an unpaved roadway in the south. Building S-311, which previously housed the deactivation furnace, was demolished as part of the remedial action at SEAD-16 and the results are documented in the "Building Cleaning and Building Demolition Completion Report" (Parsons, 2008). Building S-366, known as the Process Support Building, is present on site along with two sets of SEDA railroad tracks and utilities.

SEAD-17, the Active Deactivation Furnace, was constructed to replace the deactivation furnace at SEAD-16. However, SEAD-17 has been inactive since 1989 as a result of Resource Conservation and Recovery Act (RCRA) permitting issues. SEAD-17 formerly consisted of the deactivation furnace building (Building S-367), which was demolished during the remedial action. Details and results of the demolition are documented in the "Building Cleaning and Building Demolition Completion Report" (Parsons, 2008). SEAD-17 is surrounded by a crushed shale road, beyond which are grasslands. Two small sheds are located in the eastern portion of SEAD-17. An unpaved road to the north permits vehicular access to SEAD-17.

2.2 Site Hydrology

The hydrogeologic setting of SEAD-16 and SEAD-17 is described in detail in Sections 3.1.6 and 3.2.6, respectively, of "Final Remedial Investigation (RI) Report at the Abandoned Deactivation Furnace

(SEAD-16) and the Active Deactivation Furnace (SEAD-17)" (Parsons, 1999). A brief summary of hydrogeologic conditions and chemical impacts found in the RI Report is presented below.

2.2.1 SEAD-16

Three groundwater monitoring wells (MW16-1, MW16-2, and MW16-3) were installed as part of the Expanded Site Investigation (ESI) conducted at SEAD-16 in 1993/1994. Four additional groundwater monitoring wells (MW16-4, MW16-5, MW16-6, and MW16-7) were installed during the RI. The locations of the seven groundwater monitoring wells installed at SEAD-16 are shown on **Figure 3**.

Prior to the completion of the remedial action, depth to groundwater was measured at SEAD-16 on three different occasions: April 1994, August 1996, and December 1996. Groundwater flow at SEDA generally trends to the west based on previous subsurface investigations conducted at the Depot. Previous investigation data suggest that a groundwater divide exists near, and approximately parallel to, Route 96 near Romulus, New York, indicating that the groundwater in the area encompassing SEAD-16 flows west. However, the groundwater elevation data are difficult to interpret since the varied ground surface cover type at SEAD-16 (i.e., vegetation, gravel, drainage swales, etc.) influences surface water infiltration. Available elevation data indicate that there may be a regional groundwater high southwest of the former Building S-311, which could contribute to local fluctuations in groundwater flow.

Horizontal hydraulic conductivities were determined for five wells that are screened in the till/weathered shale zone at SEAD-16. The saturated thickness in the till/weathered shale aquifer measured less than 2 feet when tested in September 1996. Hydraulic conductivity values for the shallow till/weathered shale aquifer range from 2.8×10^{-3} cm/sec to 2.5×10^{-2} cm/sec and the geometric mean was 7.3×10^{-3} cm/sec.

2.2.2 SEAD-17

Four groundwater monitoring wells (MW17-1, MW17-2, MW17-3, and MW17-4) were installed as part of the ESI conducted at SEAD-17. One additional groundwater monitoring well, MW17-5, was installed during the RI. The locations of the five groundwater monitoring wells installed at SEAD-17 are shown on **Figure 4**.

The depth to groundwater was measured at SEAD-17 during the same times as SEAD-16. Elevation data indicate that groundwater flows southwesterly.

The horizontal hydraulic gradient was calculated to be 0.01ft/ft between monitoring wells MW17-1 and MW17-3. Hydraulic conductivities were found to range from 2.9×10^{-3} cm/sec to 1.4×10^{-2} cm/sec.

2.3 Pre-Remedial Action Soil and Groundwater Conditions for SEAD-16

Pre-Remedial Action Soil Conditions

The primary historic constituents of concern (COCs) at SEAD-16 for soil include arsenic, copper, lead, and zinc. The highest concentrations of soil contamination resulted from operations that were performed within and in close proximity to the former Abandoned Deactivation Furnace Building and

the Process Support Building. Carcinogenic PAHs were detected in soils found at discrete locations within the AOC, with the highest concentrations detected in the surface soil samples collected adjacent to the northwestern corner of the former Abandoned Deactivation Furnace Building. Metals (antimony, copper, lead, mercury, and zinc) were found at concentrations greater than the site-specific cleanup goals in soil located in portions of the surrounding man-made drainage ditches.

Pre-Remedial Action Groundwater Conditions

Prior to completion of the remedial action, three rounds of groundwater sampling were conducted at SEAD-16. Compounds detected in the groundwater samples collected during the low-flow sampling events in 1996 are presented in **Appendix A**. For complete groundwater data results refer to the RI report.

Metals were detected above the applicable Class GA standards or EPA MCLs. All of these exceedances were less than or close to SEDA background concentrations, except for the exceedances of sodium. The Final Work Plan summarized that, although metals had been detected in the groundwater above their respective standards during previous sampling events, the groundwater was not impacted by site activities. This conclusion is based on a comparison of results to groundwater data collected from unaffected parts of the Depot.

2.4 Pre-Remedial Action Soil and Groundwater Conditions for SEAD-17

Pre-Remedial Action Soil Conditions

The primary historic COCs in the soil at SEAD-17 were metals, including antimony, arsenic, copper, lead, mercury, and zinc. The concentrations of metals were highest in samples collected closest to the location of the Active Deactivation Furnace Building, particularly near the southwestern corner of the building.

Pre-Remedial Action Groundwater Conditions

Prior to the completion of the remedial action, three rounds of groundwater sampling were conducted at SEAD-17, similar to the sampling that was conducted at SEAD-16 (April 1993 for the ESI and August and December 1996 for the RI). Compounds detected in the groundwater samples collected during the low-flow sampling events in 1996 are presented in Appendix A. Metals were detected at concentrations above the applicable Class GA standards or MCLs; however, these concentrations were lower than SEDA background concentrations, except for sodium. The Final Work Plan summarized that, although metals had been detected in the groundwater above their respective standards during previous sampling events, the groundwater was not impacted by site activities. This conclusion is based on a comparison of results to groundwater data collected from unaffected parts of the Depot.

2.5 Remedial Action Summary

The selected remedy for SEAD-16 and SEAD-17 consisted of the following elements:

- Excavation of soil impacted with metals and PAHs at concentrations greater than the site-specific cleanup standards;
- Stabilization of excavated soil exceeding the toxicity characteristic leaching procedure;
- Disposal of the material in an off-site landfill;
- Backfilling the excavated areas with clean backfill;
- Groundwater monitoring until concentrations are below applicable New York State Class GA or MCL standard levels;
- Establishment and maintenance of LUCs to prevent access to or use of groundwater and to prevent residential use of the land until cleanup standards are met; and
- Performance of a review of the selected remedy every 5 years to evaluate if the remedy remains protective of the public health and the environment in accordance with Section 121(c) of the CERCLA.

The excavation of the impacted soil at SEAD-16 and SEAD-17 began on July 9, 2007 and was completed on August 2, 2007 with 1,862 cy of impacted soil removed from SEAD-16 and 2,565 cy of impacted soil removed from SEAD-17. The limit of the excavations for SEAD-16 is shown on **Figure 3** and for SEAD-17 on **Figure 4**.

Soil was excavated from both SEAD-16 and SEAD-17 until confirmatory soil samples collected from the sidewalls (when appropriate), the excavation floor, and the perimeter were below site specific cleanup standards. The depth of excavation completed at SEAD-16 varied from 1 to 3 feet below ground surface (bgs) and the excavation depth at SEAD-17 varied from 1 to 2 feet bgs. The impacted soil from SEAD-16 and SEAD-17 was transported off-site, and disposed as non-hazardous material at the Ontario County Landfill in Flint, New York.

Deeper excavations at SEAD-16 and SEAD-17, including excavation areas surrounding the railroad tracks, were backfilled with clean bank-run gravel. SEAD-16 and SEAD-17 were graded to promote positive drainage. The areas at SEAD-17 that were vegetated prior to the remedial action were seeded to restore the vegetation. SEAD-16 was not seeded since it was not previously vegetated.

3.0 LONG TERM MONITORING RESULTS

3.1 Summary of Year 1 Groundwater Event

The first post-remedial action long-term groundwater monitoring event (Year 1) was performed at SEAD-16 and SEAD-17 between December 19, 2007 and December 21, 2007. The results of the Year 1 event are reported in the CCR.

In summary, at SEAD-16 five metals of concern (antimony, iron, lead, manganese, and sodium) were detected at concentrations above their respective Class GA or MCL standards; at SEAD-17 two metals, antimony and sodium, were each detected once at concentrations above their respective Class GA groundwater standards. Concentrations of other metals detected at SEAD-16 and SEAD-17 were below their respective Class GA groundwater and MCL standards. With the noted exception of sodium concentrations detected at SEAD-16, concentrations detected at both SEAD-16 and SEAD-17 were below SEDA background concentrations. The CCR concluded that the groundwater does not appear to be impacted by historic site activities.

3.2 Summary of Year 2 Groundwater Event

The second post-remedial action long-term groundwater monitoring event (Year 2) was performed at SEAD-16 and SEAD-17 between December 9, 2008 and December 11, 2008. The results of the Year 2 event were reported in "Final Annual Report – Year 2" (Parsons, 2009).

In summary, at SEAD-16 four metals (antimony, iron, lead, and sodium) were detected at concentrations above their respective Class GA or MCL standards; at SEAD-17 two COCs (iron and manganese) were detected at concentrations above their respective Class GA standards. Concentrations of all other metals detected at SEAD-16 and SEAD-17 were below their respective Class GA or MCL standards. The "Final Annual Report – Year 2" (Parsons, 2009) concluded that the groundwater does not appear to be impacted by historic site activities and there does not appear to be an indication that conditions are deteriorating at SEAD-16 and SEAD-17.

3.3 Year 3 Groundwater Sampling

The Year 3 post-remedial action groundwater sampling event was conducted at SEAD-16 and SEAD-17 between November 12, 2009 and November 18, 2009. Groundwater samples were collected from the six monitoring wells (MW16-1, MW16-2, MW16-4, MW16-5, MW16-6, and MW16-7) located at SEAD-16. Well MW16-3 was removed during the remedial action and was not sampled. Groundwater samples were collected from the five original monitoring wells (MW17-1, MW17-2, MW17-3, MW17-4, and MW17-5) located at SEAD-17.

3.3.1 Sample Collection

The samples were collected using low flow sampling techniques. A bladder pump was used to collect the samples from all wells except MW17-2 and MW17-3. A peristaltic pump was used to collect the groundwater samples at MW17-2 and MW17-3 since limited water was available. Sampling procedures, sample handling and custody, holding times, and collection of field parameters were conducted in accordance with the "Revised Final Sampling and Analysis Plan for Seneca Army

Depot Activity (SAP)" (Parsons, 2006c). Samples were collected from the 11 wells and submitted to TestAmerica for analysis of the following analytes:

- Antimony and Thallium by USEPA SW846 Method 6020;
- Mercury by USEPA SW846 7470A; and
- TAL metals by USEPA SW846 Method 6010B.

Quality control (QC) samples, including one duplicate and one matrix spike/matrix spike duplicate (MS/MSD) pair, were also collected at MW16-7. In the field, pH, oxidation-reduction potential (ORP), dissolved oxygen (DO), conductivity, temperature, and turbidity data were also collected from each well during the purging of the well prior to sampling, with the exception of MW17-2 and MW17-3.

3.3.2 Sample Filtering

As documented in "Final Annual Report – Year 2" (Parsons, 2009), metal concentrations that exceed Class GA or MCL standards in some SEAD-16 and SEAD-17 wells may be associated with the fluctuation of groundwater turbidity encountered in the wells during sampling. Turbidity measurements indicate that there are particles present in the sampled water, and if these particles are included in the sample analyzed, they can possibly impact (i.e., elevate) metal concentrations reported. With this in mind, samples from the Year 3 sampling event were collected in two ways: as extracted from the well (i.e., unfiltered) and filtered in the field through a 0.45-micron membrane filter. The purpose of filtering is to remove the particulates from suspension, resulting in a sample that is representative of the concentration of dissolved metals only, not the sum of the dissolved and suspended metals.

Both the filtered and unfiltered samples from all SEAD-16 and SEAD-17 wells were analyzed for the analytes listed in **Section 3.3.1**. A comparison of the unfiltered and filtered concentrations of all metals at SEAD-16 and SEAD-17 is shown in **Table 3A** and **Table 3B**. The data show that in cases where groundwater turbidity level was low, the difference between the filtered and unfiltered samples concentrations are minute. Most of the samples collected during the Year 3 event had low levels of turbidity, which accounts for the similar results in the filtered and unfiltered sample pairs. Samples with higher turbidity, such as those from MW16-5 or MW16-6 where turbidity was measured at 10 Nephelometric Turbidity Units (NTUs) and 7.3 NTUs, respectively, correspond to data that are more varied for some metals, such as aluminum and iron. The concentrations at MW17-2 and MW17-3 varied greatly between the filtered and unfiltered sample pairs. Both samples were observed in the field to be cloudy and turbid, and the turbidity reading at MW17-2 was 24.4 NTUs, the highest observed at any of the wells; a turbidity reading is not available for MW17-3.

The data demonstrate that when the samples exhibit low levels of turbidity, which suggests a lack or low levels of suspended particulates, there is little or no difference between the filtered and unfiltered metal concentrations. The data also demonstrate that if samples contain turbidity levels above 7 NTUs, suggesting a presence of suspended particulates, the concentrations in the filtered sample are

significantly lower than the concentrations in the unfiltered sample. This suggests that: (1) the filtered samples represent the dissolved concentrations of the metals in the groundwater; and (2) the unfiltered samples represent the sum of the dissolved and suspended metals contained in particles, such as surrounding soil particles, that are present in the sampled groundwater. As such, the following discussion of groundwater data from SEAD-16 and SEAD-17 discusses only the concentrations of metals in the filtered samples.

3.4 Year 3 Groundwater Elevations for SEAD-16 and SEAD-17

SEAD-16 groundwater elevation data were recorded on November 13, 2009 for Year 3 and are presented on **Table 1**. Groundwater elevation data collected during the pre-remedial action (April 4, 1994, August 1996, December 1996) and Year 1 post-remedial action are also shown on **Table 1**. Groundwater elevation data collected during previous investigations indicate that groundwater generally flows southwestward at SEAD-16; however, groundwater elevation data also indicate that there may be a regional high southwest of former Building 311 that could create local fluctuation in groundwater flow direction. During the most recent event, elevation data demonstrate that the regional high southwest of former Building 311 was influencing groundwater flow direction at SEAD-16 as shown on **Figure 5**.

SEAD-17 groundwater elevation data were recorded on November 13, 2009 for Year 3 and are presented on **Table 2**. Groundwater elevation data collected during the pre-remedial action (April 4, 1994, August 1996, December 1996) and Year 1 post remedial action events are shown on **Table 2**. Based on the most recent elevation data (November 2009), groundwater at SEAD-17 appears to flow westward as shown on **Figure 5**.

3.5 Year 3 Groundwater Data Analysis for SEAD-16

A summary of metals detected in the groundwater during the Year 3 annual sampling event for SEAD-16 is presented in **Table 4A**. Complete groundwater data results are presented in **Appendix B**. Antimony, iron, and sodium were detected at concentrations above their respective GA or MCL standard levels. Concentrations of metals above the GA standards were observed at each monitoring well at SEAD-16, with the exception of MW16-1.

Antimony exceeded its Class GA standard (3 μg/L) in three wells. The highest concentration of antimony was detected at MW16-7 (14.6 μg/L) (average of sample and duplicate pair), followed by a concentration of 6 μg/L at MW16-4, and 3.6 μg/L at MW16-2.

Iron exceeded its Class GA standard (300 μg/L) in two wells. The higher concentration of iron was detected at MW16-5 (800 J μg/L), followed by a concentration of 329 J μg/L detected at well MW16-4. The concentration of iron plus manganese detected in well MW16-5 also exceeded its combined GA standard (500 μg/L) with the primary contributing metal being iron. Although, manganese was detected in the groundwater samples collected from all SEAD-16 wells, it was detected at concentrations below its GA standard level (300 μg/L).

Sodium was detected at concentrations above its Class GA standard (20,000 µg/L) in samples collected from three of the SEAD-16 wells (MW16-4, MW16-6, and MW16-7). The highest concentration was found in well MW16-4 (380,000 J µg/L). The sodium concentrations found above the GA standard in the other two wells were 22,000 J µg/L at MW16-6 and 54,000 J µg/L (average of sample and duplicate pair) at MW16-7 (which is in the upgradient area of SEAD-16).

In summary, select metals continue to be detected in the groundwater at SEAD-16 at levels that exceed Class GA or MCL standard levels. In general, there does not appear to be evidence of an area-wide or expanding plume at SEAD-16, as identified by the contaminant concentrations detected in the groundwater monitoring wells. Access to and use of the groundwater is restricted at the AOC under the terms of the ROD and the groundwater is not being used as a potable water source. A municipal water supply derived from a non-groundwater source is available for the Depot and its current distribution includes the PID area. The groundwater access/use restriction will remain in effect at SEAD-16 until the groundwater concentrations have been reduced to levels below applicable Class GA and MCL standards, and until data that documents acceptable groundwater quality is present in the AOC is provided to and approved by the oversight agencies.

3.6 Year 3 Groundwater Data Analysis for SEAD-17

A summary of metals detected from the Year 3 groundwater sampling event for SEAD-17 is presented in **Table 4B**. Complete groundwater analytical results are presented in **Appendix B**. All metals at MW17-1, MW17-2, and MW17-4 were detected at concentrations below their respective Class GA or MCL standards in the filtered samples. At MW17-3, iron was the only metal detected above groundwater standards, and it exceeded its Class GA standard (300 µg/L) once with a concentration of 827 J µg/L. At MW17-5, the sole exceedance was sodium, which was detected at 364,000 J µg/L.

The Year 3 data demonstrate that the groundwater at SEAD-17 has not been impacted by metals. Access to and use of the groundwater is restricted at the AOC under the terms of the ROD and it is not being used as a potable water source. A municipal water supply derived from a non-groundwater source is available for the Depot and its current distribution includes the PID area. The groundwater access/use restriction will remain in effect at SEAD-17 until the groundwater concentrations have been reduced to levels below applicable Class GA and MCL standards, and until data that documents acceptable groundwater quality is present in the AOC is provided to and approved by the oversight agencies.

3.7 Groundwater Data Trends

A comparison of data from the Year 1, Year 2, and Year 3 (filtered only) events, as well as an assessment of any trends, are discussed below. A comparison of Year 1, Year 2, and Year 3, groundwater monitoring events for SEAD-16 and SEAD-17 is provided in **Table 4A** and **Table 4B**, respectively. The complete data set for the Year 1, Year 2, and Year 3 events is included in **Appendix B**.

3.7.1 Review of Groundwater Trends at SEAD-16

Over the last three years, lead has been detected once in MW16-5 and three times in MW16-7. Lead was detected below its MCL at MW16-5 during Year 2 and was not detected at that well during Year 1 or Year 3. The Year 2 detection of lead at MW16-5 is likely associated with the high turbidity (29 NTU) observed in that well; therefore, the single detection of lead at MW16-5 appears to be an anomaly associated with a measure of soil particles in the groundwater and high turbidity, and not an indication of lead-impacted groundwater. At MW16-7, lead was detected above its MCL in Years 1 and 2 (increasing from 26.5 µg/ in Year 1 to 88.6 µg/L in Year 2). Lead was detected in the filtered sample collected at MW16-7 during Year 3 at a significantly lower concentration, 4.7 J µg/L (average of sample and duplicate pair), which is below the MCL. The detections of lead at MW16-7 appear to be an anomaly; the decrease in concentrations of lead at MW16-7 and MW16-5 indicates that lead is not impacting the groundwater quality and is not spreading across the site.

The concentrations of antimony, iron, manganese, and sodium were generally similar over the three post-remediation groundwater events, with fluctuations and maximum concentrations observed during Year 2. The data from Year 3 was either consistent with or lower than the concentrations previously observed.

3.7.2 Review of Groundwater Trends at SEAD-17

In general, iron and manganese were detected in groundwater samples at concentrations that were similar to or followed a decreasing trend over the past three LTM events. The concentrations of antimony have decreased over time, and the concentrations of sodium have varied during the three sampling events. The metals were detected below their GA standards at most wells. A summary of the notable changes in concentrations between the three rounds, including exceedances of the GA standards, is presented below.

Over the past three years, antimony was detected six times and exceeded its Class GA standard once. Three of the detections were at MW17-2 (once each year); the Year 1 concentration of antimony at MW17-2 (3.44 µg/L) exceeded the Class GA groundwater standard of 3 µg/L, and the concentration of antimony decreased to levels below the Class GA standard each subsequent year to 2.76 µg/L in Year 2 and 2.2 µg/L in Year 3.

Iron was detected in all five wells during Year 1 and Year 2; but only the concentrations of iron detected at MW17-3 and MW17-4 during Year 2 were above the Class GA groundwater standard of300 µg/L. In Year 3, iron was not detected in MW17-1, MW17-2, or MW17-5; in MW17-3 the concentration of iron dropped from the Year 2 value to 827 J µg/L; and in MW17-4 the concentration of iron dropped below the standard to 60 µg/L.

Manganese was detected in all five wells during Year 1, Year 2, and Year 3; but only exceeded its Class GA standard of 300 µg/L once in Year 2 at a concentration of 911 µg/L at MW17-4.

Sodium was detected once during Year 1 at MW17-4, and in all samples collected from all wells during the Year 2 and Year 3 events. Two exceedances of the Class GA standard of 20,000 µg/L were observed: one during Year 1 at MW17-4 (28,500 µg/L), and one during Year 3 at MW17-5

(364,000 J µg/L). From Year 1 to Year 2, the concentration of sodium at MW17-4 decreased below the Class GA standard to 15,500 µg/L; in Year 3 the sodium concentration dropped further below the standard to 10,400 µg/L. Sodium concentrations in all other wells were consistent between Year 1, Year 2, and Year 3.

The variation in the concentrations of antimony, iron, manganese, and sodium do not relate to historic site activities. A comparison of the Year 1, Year 2, and Year 3 post remedial action groundwater data for SEAD-17 indicate that the overall concentrations of metals remained similar throughout the years and that no clear trends have emerged.

3.8 Routine Inspections of Monitoring Wells for SEAD-16 and SEAD-17

There is evidence that the wells at SEAD-16 are generally in good condition. It appears that perhaps some of the wells at SEAD-17 may be compromised. Observations from Year 3 indicate that roots may have breached MW17-2 and MW17-3, and MW17-5 may have a broken casing or root intrusion. These potential obstructions are not hindering sample collection efforts and corrective action is not necessary at this time.

4.0 REMEDY EVALUATION

As discussed in **Section 2.5**, a total of 4,427 cy of metal- and PAH-impacted soil were removed from SEAD-16 and SEAD-17. The impacted soil was removed to eliminate and minimize the migration of hazardous contaminates from soil to groundwater. Soil that exceeded the site-specific cleanup standards, as based on the confirmatory soil data, was removed from SEAD-16 and SEAD-17.

The long-term groundwater monitoring performed for all three years shows that the soil removal remedy has been effective in minimizing the migration of the identified COCs from soil to groundwater.

The remedy for SEAD-16 and SEAD-17 includes the implementation and maintenance of LUCs consisting of:

- Prevention of residential housing, elementary and secondary schools, childcare facilities and playground activities, and
- Prevention of access to or uses of the groundwater until concentrations are below the New York State Class GA Groundwater or EPA MCL standard levels.

As part of the LTM program, SEAD-16 and SEAD-17 were inspected to determine that the LUCs are being maintained. During the Year 3 event, it was confirmed that no residential housing, elementary and secondary schools, childcare facilities, or playgrounds have been constructed or established in these AOCs, and no access to or use of groundwater, beyond that which is gained by the exiting monitoring well network, was evident at either SEAD-16 or SEAD-17.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

- The soil excavation remedy at SEAD-16 and SEAD-17 has been effective in minimizing the migration of COCs from soil to the groundwater based on the three LTM sampling rounds.
- The results of the Year 3 LTM event demonstrate that field filtering is effective at minimizing the impact of turbidity on the groundwater data.
- Post-remediation groundwater monitoring results indicate that the groundwater has not been impacted by site activities, though concentrations were observed above the Class GA or MCL standards.
- The land and groundwater use restrictions imposed at SEAD-16 and SEAD-17 are maintained and there are no signs of unauthorized use or access to the AOCs.

5.2 Recommendations

Based on the pre-remedial groundwater data and the data collected during Years 1, 2, and 3 of the LTM program at SEAD-16 and SEAD-17, the Army recommends that the groundwater monitoring continue on an annual basis at SEAD-16 and SEAD-17 for 2010. At that time, the LTM program will be re-evaluated.

6.0 REFERENCES

NYSDEC, 1998 with 2000 and 2004 Addendum. Ambient Water Quality Standard and Guidance Values and Groundwater Effluent Limitations

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Parsons 2008. Building Cleaning and Building Demolition Completion Report, SENECA Army Depot Activity, Romulus, New York, Draft Final. November, 2008.

Parsons 2008. Construction Completion Report for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17), Final. September, 2008.

Parsons 2009. For the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17), Final. September, 2009.

TABLES

Table 1
SEAD-16 - Groundwater Table Elevations Summary
SEAD-16 & SEAD-17 Third Annual Groundwater Monitoring Report
Seneca Army Depot Activity

Monitoring Well	Top of PVC Elevation [(1)] (feet)	April 4, 1994		August 27, 1996		December 6, 1996		December 20, 2007		December 9, 2008		November 13, 2009	
		Depth to Water (feet)	Water Table Elevation (feet)	Depth to Water (feet)	Water Table Elevation (feet)	Depth to Water (feet)	Water Table Elevation (feet)	Depth to Water (feet)	Water Table Elevation (feet)	Depth to Water (feet)	Water Table Elevation (feet)	Depth to Water (feet)	Water Table Elevation (feet)
MW 16-1	735.54	3.52	732.02	6.45	729.09	3.25	732.29	4.25	731.29	4.28	731.23	5.76	729.78
MW 16-2*	734.56	3.65	730.91	4.50	730.06	3.71	730.85	4.20	730.36	4.20	730.26	4.35	730.21
MW 16-3	735.48	4.60	730.88	5.43	730.05	4.64	730.84	NA	NA	NA	NA	NA	NA
MW 16-4	733.93	NA	NA	4.83	729.10	2.93	731.00	3.00	730.93	3.42	730.48	3.91	730.02
MW 16-5*	733.40	NA	NA	4.76	728.64	2.20	731.20	1.90	731.50	3.32	730.08	3.10	730.30
MW 16-6	733.56	NA	NA	4.54	729.02	2.90	730.66	2.66	730.90	3.47	730.09	3.68	729.88
MW 16-7	734.42	NA	NA	5.06	729.36	4.23	730.19	4.45	729.97	4.63	729.77	4.75	729.67

Notes:
(1) Elevations are relative to the North American Vertical Datum (NAVD) 1988.
(2) April 4, 1994 data were collected as a part of the ESI and August 1996 and December 1996 were collected during the Remedial Investigation Report.
(3) Monitoring well MW16-3 was destroyed during the remedial action conducted at SEAD-16.
(4) December 2007 and 2008 data collected after the completion of the remedial action.
NA = Not Available.
* indicates that PVC riser pipe was cut during December 2008 sampling event.

Table 2
SEAD-17 - Groundwater Table Elevations Summary
SEAD-16 & SEAD-17 Third Annual Groundwater Monitoring Report
Seneca Army Depot Activity

Monitoring Well	Top of PVC Elevation (1) (feet)	April 4, 1994		August 29, 1996		December 6, 1996		December 19, 2007		December 9, 2008		November 11, 2009	
		Depth to Water (feet)	Water Table Elevation (feet)	Depth to Water (feet)	Water Table Elevation (feet)	Depth to Water (feet)	Water Table Elevation (feet)	Depth to Water (feet)	Water Table Elevation (feet)	Depth to Water (feet)	Water Table Elevation (feet)	Depth to Water (feet)	Water Table Elevation (feet)
MW 17-1	736.30	2.80	733.53	7.64	728.69	3.01	733.32	3.33	732.97	4.25	731.97	5.60	730.70
MW 17-2	733.75	3.19	730.56	7.24	726.51	3.45	730.30	3.31	730.44	4.07	733.70	5.27	728.48
MW 17-3*	732.15	2.38	729.77	7.14	725.01	2.47	729.68	2.67	729.48	3.96	732.20	6.15	726.00
MW 17-4	734.59	3.00	731.59	7.23	727.36	3.13	731.46	3.40	731.19	4.05	730.57	5.75	728.84
MW 17-5	733.58	NA	NA	6.92	726.66	2.65	730.93	2.90	730.68	3.46	730.16	4.65	728.93

Notes:
(1) Elevations are relative to the North American Vertical Datum (NAVD) 1988.
(2) April 4, 1994 data were collected as a part of the ESI and August 1996 and December 1996 were collected during the Remedial Investigation Report.
(3) December 2007 and 2008 data collected after the completion of the remedial action.
NA = Not Available.
* indicates that PVC riser pipe was cut during December 2008 sampling event.

Table 3A
Comparison of Filtered and Unfiltered Groundwater at SEAD-16
Round 3 - SEAD-16 & SEAD-17 Long-Term Monitoring
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Collected	SEAD-16 MW16-1 GW 16LM20014UNFIL 11/13/2009 SA LTM 3 Value (Q)	SEAD-16 MW16-1 GW 16LM20014FIL 11/13/2009 SA LTM 3 Value (Q)	SEAD-16 MW16-2 GW 16LM20015UNFIL 11/11/2009 SA LTM 3 Value (Q)	SEAD-16 MW16-2 GW 16LM20015FIL 11/11/2009 SA LTM 3 Value (Q)	SEAD-16 MW16-4 GW 16LM20016UNFIL 11/17/2009 SA LTM 3 Value (Q)	SEAD-16 MW16-4 GW 16LM20016FIL 11/17/2009 SA LTM 3 Value (Q)
Aluminum	UG/L	442	71%		0	10	14	45 J	24 U	205	24 U	68 J	24 U
Antimony	UG/L	16.3	64%	3	8	9	14	1 U	1 U	**3.6**	**3.6**	**6.3**	**6**
Arsenic	UG/L	0	0%	10	0	0	14	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U
Barium	UG/L	129	100%	1000	0	14	14	104	105	72.7	71.9	123	129
Beryllium	UG/L	0	0%	4	0	0	14	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Cadmium	UG/L	0	0%	5	0	0	14	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Calcium	UG/L	130000	100%		0	14	14	110000 J	111000 J	117000 J	118000 J	125000 J	130000 J
Chromium	UG/L	0	0%	50	0	0	14	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U
Cobalt	UG/L	2	14%		0	2	14	1.1 U	1.1 U	1.1 U	1.1 U	2 J	1.8 J
Copper	UG/L	6.2	86%	200	0	12	14	1.6 J	1.6 J	5.1 J	3.4 J	6.2 J	2.4 J
Iron	UG/L	1150	64%	300	5	9	14	19 UJ	19 UJ	197 J	19 UJ	**419** J	**329** J
Iron+Manganese	UG/L	1323	100%	500	4	14	14	21.4 J	20 J	260.7 J	58.5	**513.5** J	417.7 J
Lead	UG/L	12.1	29%	15	0	4	14	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U
Magnesium	UG/L	18000	100%		0	14	14	17900	18000	12300	12600	16000	16800
Manganese	UG/L	173	100%	300	0	14	14	2.4 J	1 J	63.7	39.5	94.5	88.7
Mercury	UG/L	0	0%	0.7	0	0	14	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Nickel	UG/L	2.6	100%	100	0	14	14	1.2 J	1.8 J	2.6 J	2.2 J	1.4 J	1.7 J
Potassium	UG/L	7010	100%		0	14	14	1100	1110	3140	3170	3270	3270
Selenium	UG/L	0	0%	10	0	0	14	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U
Silver	UG/L	0	0%	50	0	0	14	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Sodium	UG/L	380000	100%	20000	8	14	14	8000 J	8000 J	18800 J	19500 J	**363000** J	**380000** J
Thallium	UG/L	0	0%	2	0	0	14	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Vanadium	UG/L	1.3	29%		0	4	14	1 U	1 U	1 U	1 U	1.1 J	1.1 J
Zinc	UG/L	11.3	14%		0	2	14	3.6 U	3.6 U	11.3	11.1	3.6 U	3.6 U
Turbidity	NTU	17.9	100%		0	14	14	0.4	0.4	17.9	17.9	0.03	0.03

Notes:
1. Only exceeding metals are included in this sumamry table.
2. The criteria values are NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998)
and EPA Maximum Contamination Limit (MCL), Source http://www.epa.gov/safewater/mcl.html#inorganic.html
3. Shading indicates a concentration above the GA or MCL groundwater standard.

U = compound was not detected
J = the reported value is an estimated cocentration

Table 3A
Comparison of Filtered and Unfiltered Groundwater at SEAD-16
Round 3 - SEAD-16 & SEAD-17 Long-Term Monitoring
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Collected	SEAD-16 MW16-5 GW 16LM20017UNFIL 11/16/2009 SA LTM 3 Value (Q)	SEAD-16 MW16-5 GW 16LM20017FIL 11/16/2009 SA LTM 3 Value (Q)	SEAD-16 MW16-6 GW 16LM20018UNFIL 11/17/2009 SA LTM 3 Value (Q)	SEAD-16 MW16-6 GW 16LM20018FIL 11/17/2009 SA LTM 3 Value (Q)
Aluminum	UG/L	442	71%		0	10	14	164 J	24 U	442	107 J
Antimony	UG/L	16.3	64%	3	8	9	14	1 U	1 U	1 U	0.9 J
Arsenic	UG/L	0	0%	10	0	0	14	3.7 U	3.7 U	3.7 U	3.7 U
Barium	UG/L	129	100%	1000	0	14	14	42	42.8	80.2	78.5
Beryllium	UG/L	0	0%	4	0	0	14	0.3 U	0.3 U	0.3 U	0.3 U
Cadmium	UG/L	0	0%	5	0	0	14	0.3 U	0.3 U	0.3 U	0.3 U
Calcium	UG/L	130000	100%		0	14	14	110000 J	115000 J	112000 J	112000 J
Chromium	UG/L	0	0%	50	0	0	14	0.9 U	0.9 U	0.9 U	0.9 U
Cobalt	UG/L	2	14%		0	2	14	1.1 U	1.1 U	1.1 U	1.1 U
Copper	UG/L	6.2	86%	200	0	12	14	1.3 U	1.3 U	2.5 J	1.9 J
Iron	UG/L	1150	64%	300	5	9	14	**1150** J	**800** J	**440** J	55 J
Iron+Manganese	UG/L	1323	100%	500	4	14	14	**1323** J	**970** J	**515** J	153.4 J
Lead	UG/L	12.1	29%	15	0	4	14	2.9 U	2.9 U	2.9 U	2.9 U
Magnesium	UG/L	18000	100%		0	14	14	11800	12200	9950	9970
Manganese	UG/L	173	100%	300	0	14	14	173	170	75	98.4
Mercury	UG/L	0	0%	0.7	0	0	14	0.1 U	0.1 U	0.1 U	0.1 U
Nickel	UG/L	2.6	100%	100	0	14	14	2 J	1.8 J	2.6 J	1.2 J
Potassium	UG/L	7010	100%		0	14	14	2380	2370	2580	2380
Selenium	UG/L	0	0%	10	0	0	14	6.1 U	6.1 U	6.1 U	6.1 U
Silver	UG/L	0	0%	50	0	0	14	1.3 U	1.3 U	1.3 U	1.3 U
Sodium	UG/L	380000	100%	20000	8	14	14	2800 J	2700 J	**20600** J	**22000** J
Thallium	UG/L	0	0%	2	0	0	14	0.2 U	0.2 U	0.008 U	0.008 U
Vanadium	UG/L	1.3	29%		0	4	14	1.1 J	1 U	1.3 J	1 U
Zinc	UG/L	11.3	14%		0	2	14	3.6 U	3.6 U	3.6 U	3.6 U
Turbidity	NTU	17.9	100%		0	14	14	10	10	7.3	7.3

Notes:
1. Only exceeding metals are included in this sumamry table.
2. The criteria values are NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998)
and EPA Maximum Contamination Limit (MCL), Source http://www.epa.gov/safewater/mcl.html#inorganic.html
3. Shading indicates a concentration above the GA or MCL groundwater standard.

U = compound was not detected
J = the reported value is an estimated cocentration

Table 3A
Comparison of Filtered and Unfiltered Groundwater at SEAD-16
Round 3 - SEAD-16 & SEAD-17 Long-Term Monitoring
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Collected	SEAD-16 MW16-7 GW 16LM20020UNFIL 11/12/2009 DU LTM 3 Value (Q)	SEAD-16 MW16-7 GW 16LM20020FIL 11/12/2009 DU LTM 3 Value (Q)	SEAD-16 MW16-7 GW 16LM20019UNFIL 11/12/2009 SA LTM 3 Value (Q)	SEAD-16 MW16-7 GW 16LM20019FIL 11/12/2009 SA LTM 3 Value (Q)
Aluminum	UG/L	442	71%		0	10	14	116 J	25 J	182 J	32 J
Antimony	UG/L	16.3	64%	3	8	9	14	**16.3**	**13.9**	**15.7**	**15.2**
Arsenic	UG/L	0	0%	10	0	0	14	3.7 U	3.7 U	3.7 U	3.7 U
Barium	UG/L	129	100%	1000	0	14	14	80.3	83.9	81.6	83.6
Beryllium	UG/L	0	0%	4	0	0	14	0.3 U	0.3 U	0.3 U	0.3 U
Cadmium	UG/L	0	0%	5	0	0	14	0.3 U	0.3 U	0.3 U	0.3 U
Calcium	UG/L	130000	100%		0	14	14	82800 J	81900 J	84600 J	85000 J
Chromium	UG/L	0	0%	50	0	0	14	0.9 U	0.9 U	0.9 U	0.9 U
Cobalt	UG/L	2	14%		0	2	14	1.1 U	1.1 U	1.1 U	1.1 U
Copper	UG/L	6.2	86%	200	0	12	14	4.1 J	3.5 J	5 J	3.1 J
Iron	UG/L	1150	64%	300	5	9	14	61 J	19 UJ	135 J	19 UJ
Iron+Manganese	UG/L	1323	100%	500	4	14	14	168 J	171	244 J	155
Lead	UG/L	12.1	29%	15	0	4	14	9.4	4.9 J	12.1	4.4 J
Magnesium	UG/L	18000	100%		0	14	14	16200	14800	16500	15900
Manganese	UG/L	173	100%	300	0	14	14	107	152	109	136
Mercury	UG/L	0	0%	0.7	0	0	14	0.1 U	0.1 U	0.1 U	0.1 U
Nickel	UG/L	2.6	100%	100	0	14	14	1.1 J	2 J	1.7 J	1.9 J
Potassium	UG/L	7010	100%		0	14	14	5630	7010	5780	6520
Selenium	UG/L	0	0%	10	0	0	14	6.1 U	6.1 U	6.1 U	6.1 U
Silver	UG/L	0	0%	50	0	0	14	1.3 U	1.3 U	1.3 U	1.3 U
Sodium	UG/L	380000	100%	20000	8	14	14	**46100** J	**55900** J	**47100** J	**52100** J
Thallium	UG/L	0	0%	2	0	0	14	0.2 U	0.2 U	0.2 U	0.2 U
Vanadium	UG/L	1.3	29%		0	4	14	1 U	1 U	1 U	1 U
Zinc	UG/L	11.3	14%		0	2	14	3.6 U	3.6 U	3.6 U	3.6 U
Turbidity	NTU	17.9	100%		0	14	14	0.8	0.8	0.8	0.8

Notes:
1. Only exceeding metals are included in this sumamry table.
2. The criteria values are NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998)
and EPA Maximum Contamination Limit (MCL), Source http://www.epa.gov/safewater/mcl.html#inorganic.html
3. Shading indicates a concentration above the GA or MCL groundwater standard.

U = compound was not detected
J = the reported value is an estimated cocentration

Table 3B
Comparison of Filtered and Unfiltered Groundwater at SEAD-17
Round 3 - SEAD-16 & SEAD-17 Long-Term Monitoring
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Collected	SEAD-17 MW17-1 GW 17LM20010UNFIL 11/18/2009 SA LTM 3 Value (Q)	SEAD-17 MW17-1 GW 17LM20010FIL 11/18/2009 SA LTM 3 Value (Q)	SEAD-17 MW17-2 GW 17LM20011UNFIL 11/17/2009 SA LTM 3 Value (Q)	SEAD-17 MW17-2 GW 17LM20011FIL 11/17/2009 SA LTM 3 Value (Q)	SEAD-17 MW17-3 GW 17LM20012UNFIL 11/18/2009 SA LTM 3 Value (Q)	SEAD-17 MW17-3 GW 17LM20012FIL 11/18/2009 SA LTM 3 Value (Q)
Aluminum	UG/L	19600	100%		0	10	10	59 J	37 J	19600	88 J	1550 J	141 J
Antimony	UG/L	3.7	50%	3	1	5	10	1 U	1 U	**3.7**	2.2	1.5	1 U
Arsenic	UG/L	7.8	10%	10	0	1	10	3.7 U	3.7 U	7.8 J	3.7 U	3.7 U	3.7 U
Barium	UG/L	251	100%	1000	0	10	10	99	99.1	251	82.3	54.5	49.4
Beryllium	UG/L	1.2	10%	4	0	1	10	0.3 U	0.3 U	1.2 J	0.3 U	0.3 U	0.3 U
Cadmium	UG/L	1.7	10%	5	0	1	10	0.3 U	0.3 U	1.7	0.3 U	0.3 U	0.3 U
Calcium	UG/L	195000	100%		0	10	10	108000 J	109000 J	195000 J	154000 J	95900 J	99400 J
Chromium	UG/L	37.2	20%	50	0	2	10	0.9 U	0.9 U	37.2	0.9 U	5.2	0.9 U
Cobalt	UG/L	10.5	50%		0	5	10	1.1 U	1.1 U	10.5	1.1 U	1.7 J	1.5 J
Copper	UG/L	46.7	40%	200	0	4	10	1.3 U	1.3 U	46.7	2.9 J	7.9 J	2.5 J
Iron	UG/L	25500	70%	300	3	7	10	42 J	19 UJ	**25500** J	19 UJ	**2690** J	**827** J
Iron+Manganese	UG/L	25929	100%	500	3	10	10	67.6 J	57.9	**25929** J	20.5 J	**2858** J	**968** J
Lead	UG/L	103	20%	15	1	2	10	2.9 U	2.9 U	**103**	2.9 U	8.6	2.9 U
Magnesium	UG/L	27300	100%		0	10	10	24000	24300	23300	18200	9170	9850
Manganese	UG/L	429	100%	300	1	10	10	25.6	38.9	**429**	1.5 J	168	141
Nickel	UG/L	34	80%	100	0	8	10	1 U	1 U	34	1.2 J	4.5 J	3.1 J
Potassium	UG/L	7810	100%		0	10	10	254 J	260 J	7810	2390	1590	1290
Sodium	UG/L	366000	100%	20000	3	10	10	7400 J	7300 J	**20300** J	19800 J	6200 J	7500 J
Thallium	UG/L	0.08	20%	2	0	2	10	0.008 U	0.008 U	0.2 U	0.008 U	0.008 U	0.008 U
Vanadium	UG/L	32.8	20%		0	2	10	1 U	1 U	32.8	1 U	1.7 J	1 U
Zinc	UG/L	935	40%		0	4	10	3.6 U	3.6 U	935	28.6	45.7	21.1
Turbidity	NTU	6.2	100%		0	6	6	0.4	0.4	24.4	24.4		

Notes:
1. Only exceeding metals are included in this sumamry table.
2. The criteria values are NYSDEC Class GA Groundwater Standards
(TOGS 1.1.1, June 1998) and EPA Maximum Contamination Limit (MCL),
Source http://www.epa.gov/safewater/mcl.html#inorganic.html
3. Shading indicates a concentration above the GA or MCL groundwater standard.

U = compound was not detected
J = the reported value is an estimated cocentration

Table 3B
Comparison of Filtered and Unfiltered Groundwater at SEAD-17
Round 3 - SEAD-16 & SEAD-17 Long-Term Monitoring
Seneca Army Depot Activity

Facility								SEAD-17	SEAD-17	SEAD-17	SEAD-17
Location ID								MW17-4	MW17-4	MW17-5	MW17-5
Matrix								GW	GW	GW	GW
Sample ID								17LM20013UNFIL	17LM20013FIL	17LM20014UNFIL	17LM20014FIL
Sample Date								11/17/2009	11/17/2009	11/17/2009	11/17/2009
QC Code								SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM
Sampling Round								3	3	3	3
Parameter	**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)
Aluminum	UG/L	19600	100%		0	10	10	70 J	28 J	98 J	29 J
Antimony	UG/L	3.7	50%	3	1	5	10	1 U	1 U	1	1
Arsenic	UG/L	7.8	10%	10	0	1	10	3.7 U	3.7 U	3.7 U	3.7 U
Barium	UG/L	251	100%	1000	0	10	10	36.6	36.3	168	166
Beryllium	UG/L	1.2	10%	4	0	1	10	0.3 U	0.3 U	2 U	2 U
Cadmium	UG/L	1.7	10%	5	0	1	10	0.3 U	0.3 U	0.3 U	0.3 U
Calcium	UG/L	195000	100%		0	10	10	97600 J	96600 J	185000 J	184000 J
Chromium	UG/L	37.2	20%	50	0	2	10	0.9 U	0.9 U	0.9 U	0.9 U
Cobalt	UG/L	10.5	50%		0	5	10	1.3 J	1.5 J	1.1 U	1.1 U
Copper	UG/L	46.7	40%	200	0	4	10	1.3 U	1.3 U	1.3 U	1.3 U
Iron	UG/L	25500	70%	300	3	7	10	142 J	60 J	34 J	19 UJ
Iron+Manganese	UG/L	25929	100%	500	3	10	10	355 J	258 J	61.4 J	43.3
Lead	UG/L	103	20%	15	1	2	10	2.9 U	2.9 U	2.9 U	2.9 U
Magnesium	UG/L	27300	100%		0	10	10	13000	12900	27300	27100
Manganese	UG/L	429	100%	300	1	10	10	213	198	27.4	24.3
Nickel	UG/L	34	80%	100	0	8	10	2.4 J	2.2 J	1.8 J	1.7 J
Potassium	UG/L	7810	100%		0	10	10	866	844	1960	1920
Sodium	UG/L	366000	100%	20000	3	10	10	10500 J	10400 J	**366000** J	**364000** J
Thallium	UG/L	0.08	20%	2	0	2	10	0.008 U	0.008 U	0.08 J	0.08 J
Vanadium	UG/L	32.8	20%		0	2	10	1 U	1 U	1 U	1 U
Zinc	UG/L	935	40%		0	4	10	3.6 U	3.6 U	3.6 U	3.6 U
Turbidity	NTU	6.2	100%		0	6	6	6.2	6.2	0.04	0.04

Notes:
1. Only exceeding metals are included in this sumamry table.
2. The criteria values are NYSDEC Class GA Groundwater Standards
(TOGS 1.1.1, June 1998) and EPA Maximum Contamination Limit (MCL),
Source http://www.epa.gov/safewater/mcl.html#inorganic.html
3. Shading indicates a concentration above the GA or MCL groundwater standard.

U = compound was not detected
J = the reported value is an estimated cocentration

Table 4A
Post-Remedial Action Groundwater Summary at SEAD-16
SEAD-16 & SEAD-17 Third Annual Report
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Collected	SEAD-16 MW16-1 GW 16LM20001 12/20/2007 DU LTM 1 Value (Q)	SEAD-16 MW16-1 GW 16LM20000 12/20/2007 SA LTM 1 Value (Q)	SEAD-16 MW16-1 GW 16LM20013 12/9/2008 SA LTM 2 Value (Q)	SEAD-16 MW16-1 GW 16LM20014FIL 11/13/2009 SA LTM 3 Value (Q)	SEAD-16 MW16-2 GW 16LM20002 12/20/2007 SA LTM 1 Value (Q)	SEAD-16 MW16-2 GW 16LM20007 12/9/2008 SA LTM 2 Value (Q)	SEAD-16 MW16-2 GW 16LM20015FIL 11/11/2009 SA LTM 3 Value (Q)
Aluminum	UG/L	577	81%		0	17	21	91.6 J	61.4 J	148 J	24 U	98.8 J	97.1 J	24 U
Antimony	UG/L	15.2	81%	3	10	17	21	1.02	1 U	0.95 J	1 U	**3.36**	**5.53**	**3.6**
Barium	UG/L	290	100%	1000	0	21	21	59	60.4	125	105	64.6	69.7	71.9
Cadmium	UG/L	0.46	5%	5	0	1	21	0.36 U	0.36 U	0.33 U	0.3 U	0.36 U	0.33 U	0.3 U
Calcium	UG/L	275000	100%		0	21	21	105000 J	107000 J	176000	111000 J	143000 J	138000	118000 J
Chromium	UG/L	1.6	19%	50	0	4	21	0.84 U	0.84 U	0.88 U	0.9 U	0.84 U	0.88 U	0.9 U
Cobalt	UG/L	1.8	14%		0	3	21	0.89 U	0.89 U	1.1 U	1.1 U	0.89 U	1.1 U	1.1 U
Copper	UG/L	34.7	81%	200	0	17	21	1.3 U	1.3 U	1.3 U	1.6 J	4.5 J	4 J	3.4 J
Iron	UG/L	1200	81%	300	6	17	21	68.3	35.8 J	93.3	19 UJ	49.5 J	26.1 J	19 UJ
Iron+Manganese	UG/L	1238	100%	500	5	21	21	73	39 J	105	20 J	53 J	27	58.5
Lead	UG/L	88.6	24%	15	2	5	21	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U
Magnesium	UG/L	35200	100%		0	18	18	15900 J	16100 J	25800	18000	15600 J	15700	12600
Manganese	UG/L	631	100%	300	1	21	21	5	3.3	11.8	1 J	3.4	0.84 J	39.5
Mercury	UG/L	0.507	10%	0.7	0	2	21	0.12 U	0.12 U	0.12 U	0.1 U	0.12 U	0.148 J	0.1 U
Nickel	UG/L	5.5	62%	100	0	13	21	1.2 U	1.2 U	1 U	1.8 J	1.2 U	1.6 J	2.2 J
Potassium	UG/L	7010	100%		0	15	15	907 R	886 R	1340 J	1110	2050 R	2410 J	3170
Sodium	UG/L	434000	100%	20000	14	19	19	**25300** J	**24200** J	**182000**	8000 J	**49600** J	**63500**	19500 J
Thallium	UG/L	0.03	5%	2	0	1	21	0.03 U	0.03 U	0.09 U	0.2 U	0.03 U	0.09 U	0.2 U
Vanadium	UG/L	2.3	19%		0	4	21	0.78 U	0.78 U	0.98 U	1 U	0.78 U	0.98 U	1 U
Zinc	UG/L	34.4	67%		0	14	21	7.8 J	4.4 J	5.8 J	3.6 U	8.2 J	10.2	11.1
Turbidity	NTU	29	100%		0	21	21	0.4	0.4	5	0.4	7.3	1.4	17.9

Notes:
1. Only exceeding metals are included in this sumamry table.
2. The criteria values are NYSDEC Class GA Groundwater Standards
(TOGS 1.1.1, June 1998) and EPA Maximum Contamination Limit (MCL),
Source http://www.epa.gov/safewater/mcl.html#inorganic.html
3. Shading indicates a concentration above the GA or MCL groundwater standard.

U = compound was not detected
J = the reported value is an estimated cocentration

Table 4A
Post-Remedial Action Groundwater Summary at SEAD-16
SEAD-16 & SEAD-17 Third Annual Report
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Collected	SEAD-16 MW16-4 GW 16LM20003 12/20/2007 SA LTM 1 Value (Q)	SEAD-16 MW16-4 GW 16LM20009 12/9/2008 DU LTM 2 Value (Q)	SEAD-16 MW16-4 GW 16LM20008 12/9/2008 SA LTM 2 Value (Q)	SEAD-16 MW16-4 GW 16LM20016FIL 11/17/2009 SA LTM 3 Value (Q)	SEAD-16 MW16-5 GW 16LM20004 12/20/2007 SA LTM 1 Value (Q)	SEAD-16 MW16-5 GW 16LM20010 12/10/2008 SA LTM 2 Value (Q)	SEAD-16 MW16-5 GW 16LM20017FIL 11/16/2009 SA LTM 3 Value (Q)
Aluminum	UG/L	577	81%		0	17	21	167 J	101 J	104 J	24 U	160 J	563	24 U
Antimony	UG/L	15.2	81%	3	10	17	21	**5.11**	2.94	2.89	**6**	1.82	**4.23**	1 U
Barium	UG/L	290	100%	1000	0	21	21	44.5	279	290	129	38.9	22	42.8
Cadmium	UG/L	0.46	5%	5	0	1	21	0.36 U	0.33 U	0.33 U	0.3 U	0.36 U	0.33 U	0.3 U
Calcium	UG/L	275000	100%		0	21	21	87100 J	267000	275000	130000 J	89000 J	53100	115000 J
Chromium	UG/L	1.6	19%	50	0	4	21	1 J	0.88 U	0.88 U	0.9 U	1.1 J	1.2 J	0.9 U
Cobalt	UG/L	1.8	14%		0	3	21	0.89 U	1.1 U	1.1 U	1.8 J	0.89 U	1.1 U	1.1 U
Copper	UG/L	34.7	81%	200	0	17	21	5.4 J	4.2 J	4.4 J	2.4 J	3.1 J	10.6	1.3 U
Iron	UG/L	1200	81%	300	6	17	21	95.4	38.4 J	57 J	**329** J	**1200**	**699**	**800** J
Iron+Manganese	UG/L	1238	100%	500	5	21	21	127	46 J	65	417.7 J	**1238**	**731**	**970** J
Lead	UG/L	88.6	24%	15	2	5	21	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	10.1	2.9 U
Magnesium	UG/L	35200	100%		0	18	18	9440 R	34500	35200	16800	9380 R	6050	12200
Manganese	UG/L	631	100%	300	1	21	21	31.2	8	7.7	88.7	37.6	32.4	170
Mercury	UG/L	0.507	10%	0.7	0	2	21	0.12 U	0.12 U	0.12 U	0.1 U	0.12 U	0.12 U	0.1 U
Nickel	UG/L	5.5	62%	100	0	13	21	1.2 U	1.9 J	2.2 J	1.7 J	1.2 U	2.6 J	1.8 J
Potassium	UG/L	7010	100%		0	15	15	1300 R	3690 J	3830 J	3270	4420 R	2610 J	2370
Sodium	UG/L	434000	100%	20000	14	19	19	**40800** J	**419000**	**434000**	**380000** J	8410 R	2180	2700 J
Thallium	UG/L	0.03	5%	2	0	1	21	0.03 U	0.09 U	0.09 U	0.2 U	0.03 U	0.09 U	0.2 U
Vanadium	UG/L	2.3	19%		0	4	21	0.78 U	0.98 U	0.98 U	1.1 J	1.2 J	2.3 J	1 U
Zinc	UG/L	34.4	67%		0	14	21	5.3 J	9.8 J	14.6 J	3.6 U	34.4	10.3	3.6 U
Turbidity	NTU	29	100%		0	21	21	4.5	0.4	0.4	0.03	4.9	29	10

Notes:
1. Only exceeding metals are included in this sumamry table.
2. The criteria values are NYSDEC Class GA Groundwater Standards
(TOGS 1.1.1, June 1998) and EPA Maximum Contamination Limit (MCL),
Source http://www.epa.gov/safewater/mcl.html#inorganic.html
3. Shading indicates a concentration above the GA or MCL groundwater standard.

U = compound was not detected
J = the reported value is an estimated cocentration

Table 4A
Post-Remedial Action Groundwater Summary at SEAD-16
SEAD-16 & SEAD-17 Third Annual Report
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Collected	SEAD-16 MW16-6 GW 16LM20005 12/20/2007 SA LTM 1 Value (Q)	SEAD-16 MW16-6 GW 16LM20011 12/9/2008 SA LTM 2 Value (Q)	SEAD-16 MW16-6 GW 16LM20018FIL 11/17/2009 SA LTM 3 Value (Q)	SEAD-16 MW16-7 GW 16LM20006 12/20/2007 SA LTM 1 Value (Q)	SEAD-16 MW16-7 GW 16LM20012 12/10/2008 SA LTM 2 Value (Q)	SEAD-16 MW16-7 GW 16LM20020FIL 11/12/2009 DU LTM 3 Value (Q)	SEAD-16 MW16-7 GW 16LM20019FIL 11/12/2009 SA LTM 3 Value (Q)
Aluminum	UG/L	577	81%		0	17	21	168 J	189 J	107 J	45.9 J	577	25 J	32 J
Antimony	UG/L	15.2	81%	3	10	17	21	1 U	0.92 J	0.9 J	**9.58**	**13.6**	**13.9**	**15.2**
Barium	UG/L	290	100%	1000	0	21	21	31.8	39.1	78.5	170	122	83.9	83.6
Cadmium	UG/L	0.46	5%	5	0	1	21	0.36 U	0.33 U	0.3 U	0.46 J	0.33 U	0.3 U	0.3 U
Calcium	UG/L	275000	100%		0	21	21	80400 J	84300	112000 J	194000	133000	81900 J	85000 J
Chromium	UG/L	1.6	19%	50	0	4	21	0.84 U	0.88 U	0.9 U	0.84 U	1.6 J	0.9 U	0.9 U
Cobalt	UG/L	1.8	14%		0	3	21	0.89 U	1.1 U	1.1 U	1.6 J	1.1 J	1.1 U	1.1 U
Copper	UG/L	34.7	81%	200	0	17	21	3.4 J	2.1 J	1.9 J	34.7	20.2	3.5 J	3.1 J
Iron	UG/L	1200	81%	300	6	17	21	**418**	153	55 J	29.2 J	**770**	19 UJ	19 UJ
Iron+Manganese	UG/L	1238	100%	500	5	21	21	441	158	153.4 J	**660** J	**990**	171	155
Lead	UG/L	88.6	24%	15	2	5	21	2.9 U	2.9 U	2.9 U	**26.5**	**88.6**	4.9 J	4.4 J
Magnesium	UG/L	35200	100%		0	18	18	7100 R	7380	9970	32000 J	25100	14800	15900
Manganese	UG/L	631	100%	300	1	21	21	23.3	4.8	98.4	**631**	220	152	136
Mercury	UG/L	0.507	10%	0.7	0	2	21	0.12 U	0.12 U	0.1 U	0.507	0.12 U	0.1 U	0.1 U
Nickel	UG/L	5.5	62%	100	0	13	21	1.2 U	1 U	1.2 J	5.5 J	2.6 J	2 J	1.9 J
Potassium	UG/L	7010	100%		0	15	15	2690 R	2310 J	2380	5480 J	5670 J	7010	6520
Sodium	UG/L	434000	100%	20000	14	19	19	6110 R	9200	**22000** J	**68400** J	**74900**	**55900** J	**52100** J
Thallium	UG/L	0.03	5%	2	0	1	21	0.03 U	0.09 U	0.008 U	0.03 J	0.09 U	0.2 U	0.2 U
Vanadium	UG/L	2.3	19%		0	4	21	0.86 J	0.98 U	1 U	0.78 U	0.98 U	1 U	1 U
Zinc	UG/L	34.4	67%		0	14	21	5.5 J	3.7 J	3.6 U	3.6 U	8.6 J	3.6 U	3.6 U
Turbidity	NTU	29	100%		0	21	21	7	1.5	7.3	0.3	3.1	0.8	0.8

Notes:
1. Only exceeding metals are included in this sumamry table.
2. The criteria values are NYSDEC Class GA Groundwater Standards
(TOGS 1.1.1, June 1998) and EPA Maximum Contamination Limit (MCL),
Source http://www.epa.gov/safewater/mcl.html#inorganic.html
3. Shading indicates a concentration above the GA or MCL groundwater standard.

U = compound was not detected
J = the reported value is an estimated cocentration

Table 4B
Post-Remedial Action Groundwater Summary at SEAD-17
SEAD-16 & SEAD-17 Third Annual Report
Seneca Army Depot Activity

Facility								SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17
Location ID								MW17-1	MW17-1	MW17-1	MW17-2	MW17-2	MW17-2	MW17-3	MW17-3	MW17-3
Matrix								GW	GW	GW	GW	GW	GW	GW	GW	GW
Sample ID								17LM20000	17LM20005	17LM20010FIL	17LM20001	17LM20006	17LM20011FIL	17LM20002	17LM20007	17LM20012FIL
Sample Date								12/20/2007	12/11/2008	11/18/2009	12/20/2007	12/10/2008	11/17/2009	12/20/2007	12/10/2008	11/18/2009
QC Code								SA	SA	SA	SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								1	2	3	1	2	3	1	2	3
Parameter	**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)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Aluminum	UG/L	386	100%		0	15	15	204	219	37 J	110 J	142 J	88 J	106 J	386	141 J
Antimony	UG/L	3.44	40%	3	1	6	15	1 U	1 U	1 U	**3.44**	2.76	2.2	1 U	1 U	1 U
Barium	UG/L	166	100%	1000	0	15	15	70	79	99.1	58.8	51.8	82.3	39	29.3	49.4
Calcium	UG/L	184000	100%		0	15	15	98300 J	95600	109000 J	110000 J	112000	154000 J	69000 J	67200	99400 J
Chromium	UG/L	2.9	13%	50	0	2	15	0.84 U	0.88 U	0.9 U	0.84 U	2.9 J	0.9 U	0.84 U	0.88 U	0.9 U
Cobalt	UG/L	2.4	20%		0	3	15	0.89 U	1.1 U	1.1 U	0.89 U	1.1 U	1.1 U	0.89 U	1.1 U	1.5 J
Copper	UG/L	6.2	60%	200	0	9	15	1.3 U	1.3 U	1.3 U	6.2 J	4.4 J	2.9 J	2.6 J	2.8 J	2.5 J
Iron	UG/L	1760	80%	300	3	12	15	106	126	19 UJ	140	115	19 UJ	133	**1300**	**827** J
Iron+Manganese	UG/L	2671	100%	500	3	15	15	119	141	57.9	160	121	20.5 J	170	**1573**	**968** J
Magnesium	UG/L	27100	100%		0	12	12	21800 J	20600	24300	11000 R	11200	18200	7560 R	7400	9850
Manganese	UG/L	911	100%	300	1	15	15	13.2	14.9	38.9	20.5	6.1	1.5 J	36.7	273	141
Nickel	UG/L	3.1	60%	100	0	9	15	1.2 U	1.3 J	1 U	1.2 U	2.8 J	1.2 J	1.2 U	1.8 J	3.1 J
Potassium	UG/L	2390	100%		0	10	10	614 R	462 J	260 J	1690 R	1260 J	2390	2620 R	1840 J	1290
Sodium	UG/L	364000	100%	20000	2	11	11	7790 R	8380	7300 J	6620 R	7860	19800 J	4550 R	5500	7500 J
Thallium	UG/L	0.08	7%	2	0	1	15	0.03 U	0.09 U	0.008 U	0.03 U	0.09 U	0.008 U	0.03 U	0.09 U	0.008 U
Zinc	UG/L	72	80%		0	12	15	4.7 J	4 J	3.6 U	72 J	27.6	28.6	27 J	14.2	21.1
Turbidity	NTU	20.8	100%		0	13	13	4	3	0.4	3.3	6.6		1.2	20.8	

Notes:
1. Only exceeding metals are included in this sumamry table.
2. The criteria values are NYSDEC Class GA Groundwater Standards
(TOGS 1.1.1, June 1998) and EPA Maximum Contamination Limit (MCL),
Source http://www.epa.gov/safewater/mcl.html#inorganic.html
3. Shading indicates a concentration above the GA or MCL groundwater standard.

U = compound was not detected
J = the reported value is an estimated cocentration

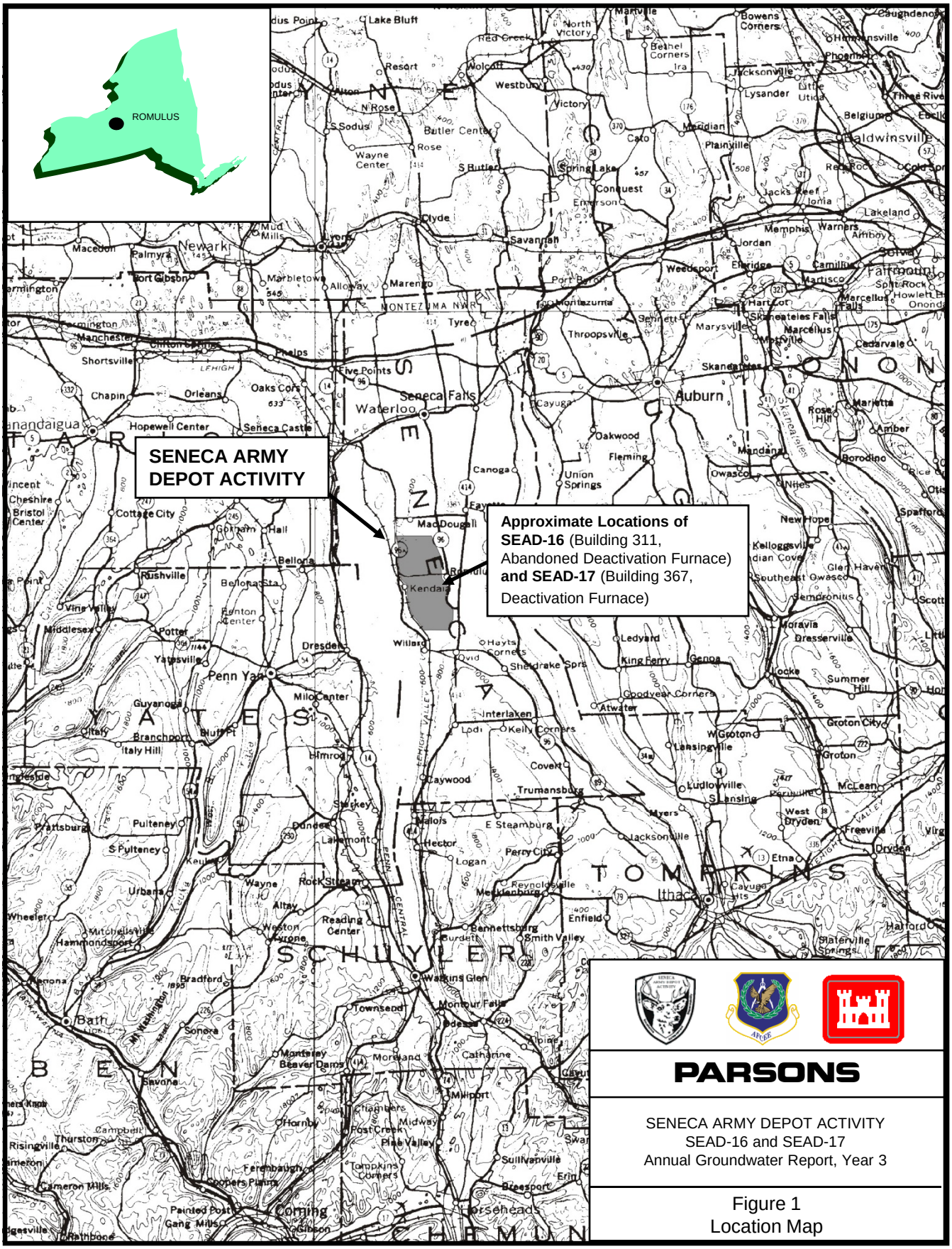
Table 4B
Post-Remedial Action Groundwater Summary at SEAD-17
SEAD-16 & SEAD-17 Third Annual Report
Seneca Army Depot Activity

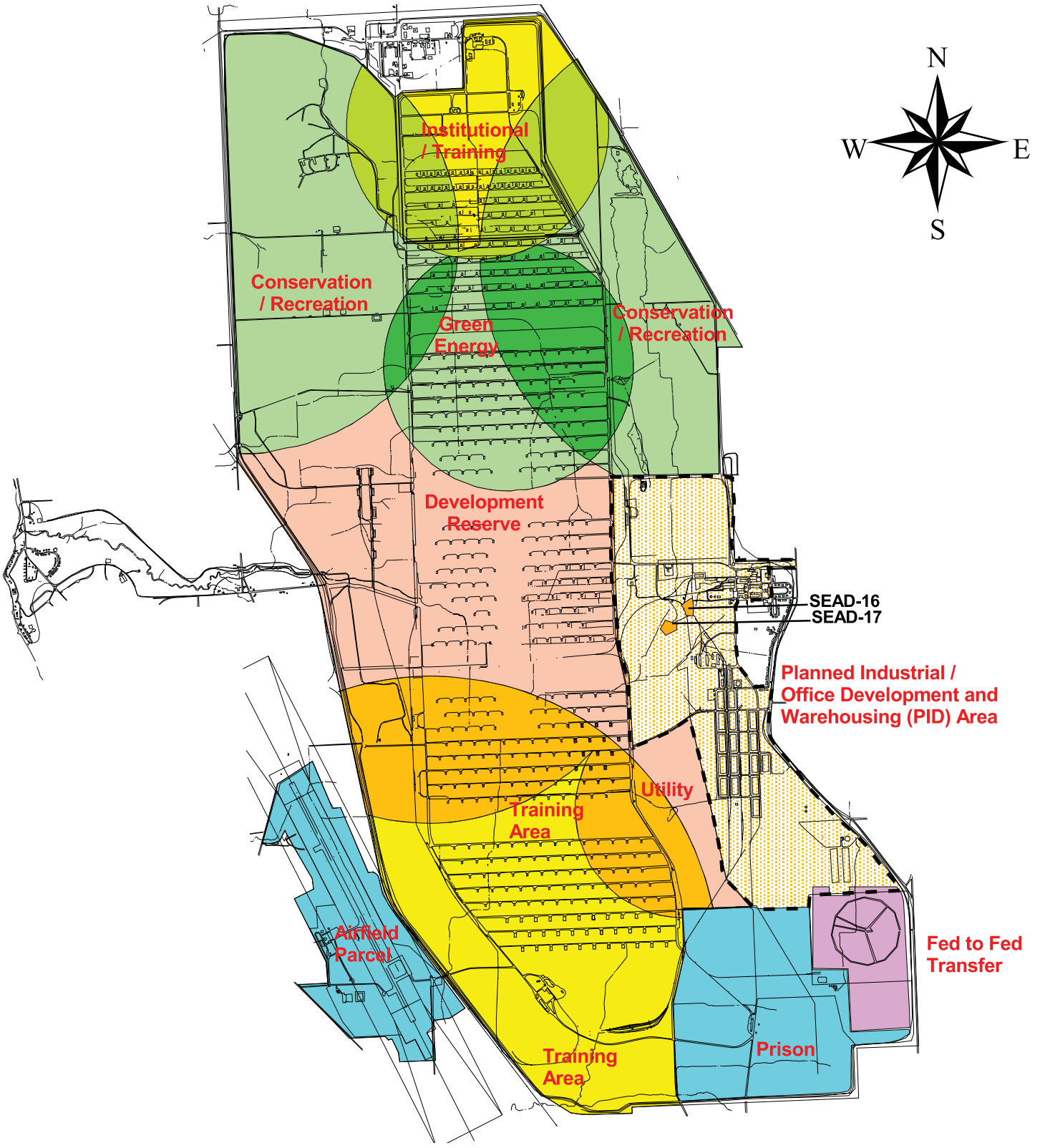
Facility								SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17
Location ID								MW17-4	MW17-4	MW17-4	MW17-5	MW17-5	MW17-5
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								17LM20003	17LM20008	17LM20013FIL	17LM20004	17LM20009	17LM20014FIL
Sample Date								12/20/2007	12/10/2008	11/17/2009	12/20/2007	12/11/2008	11/17/2009
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								1	2	3	1	2	3
Parameter	**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)	Value (Q)
Aluminum	UG/L	386	100%		0	15	15	50.2 J	125 J	28 J	98.5 J	125 J	29 J
Antimony	UG/L	3.44	40%	3	1	6	15	1 U	0.62 J	1 U	1 U	0.56 J	1
Barium	UG/L	166	100%	1000	0	15	15	32.5	35.9	36.3	86.7	82.9	166
Calcium	UG/L	184000	100%		0	15	15	74900 J	74700	96600 J	97100 J	97300	184000 J
Chromium	UG/L	2.9	13%	50	0	2	15	1 J	0.88 U	0.9 U	0.84 U	0.88 U	0.9 U
Cobalt	UG/L	2.4	20%		0	3	15	0.89 U	2.4 J	1.5 J	0.89 U	1.1 U	1.1 U
Copper	UG/L	6.2	60%	200	0	9	15	1.8 J	1.8 J	1.3 U	1.3 U	1.5 J	1.3 U
Iron	UG/L	1760	80%	300	3	12	15	45.4 J	**1760**	60 J	91.7	76	19 UJ
Iron+Manganese	UG/L	2671	100%	500	3	15	15	59 J	**2671**	258 J	128	85	43.3
Magnesium	UG/L	27100	100%		0	12	12	10400 R	10200	12900	15800 J	15600	27100
Manganese	UG/L	911	100%	300	1	15	15	13.7	**911**	198	36.5	8.9	24.3
Nickel	UG/L	3.1	60%	100	0	9	15	1.2 U	2.6 J	2.2 J	1.2 U	1.2 J	1.7 J
Potassium	UG/L	2390	100%		0	10	10	838 R	1190 J	844	972 R	824 J	1920
Sodium	UG/L	364000	100%	20000	2	11	11	**28500** J	15500	10400 J	7950 R	7360	**364000** J
Thallium	UG/L	0.08	7%	2	0	1	15	0.03 U	0.09 U	0.008 U	0.03 U	0.09 U	0.08 J
Zinc	UG/L	72	80%		0	12	15	5.1 J	6.7 J	3.6 U	4.7 J	41.6	3.6 U
Turbidity	NTU	20.8	100%		0	13	13	9.5	4.6	6.2	2.4	0.8	0.04

Notes:
1. Only exceeding metals are included in this sumamry table.
2. The criteria values are NYSDEC Class GA Groundwater Standards
(TOGS 1.1.1, June 1998) and EPA Maximum Contamination Limit (MCL),
Source http://www.epa.gov/safewater/mcl.html#inorganic.html
3. Shading indicates a concentration above the GA or MCL groundwater standard.

U = compound was not detected
J = the reported value is an estimated cocentration

FIGURES


ROMULUS
SENECA ARMY DEPOT ACTIVITY
Approximate Locations of SEAD-16 (Building 311, Abandoned Deactivation Furnace) and SEAD-17 (Building 367, Deactivation Furnace)
PARSONS
SENECA ARMY DEPOT ACTIVITY
SEAD-16 and SEAD-17
Annual Groundwater Report, Year 3
Figure 1
Location Map



1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 11000 Feet

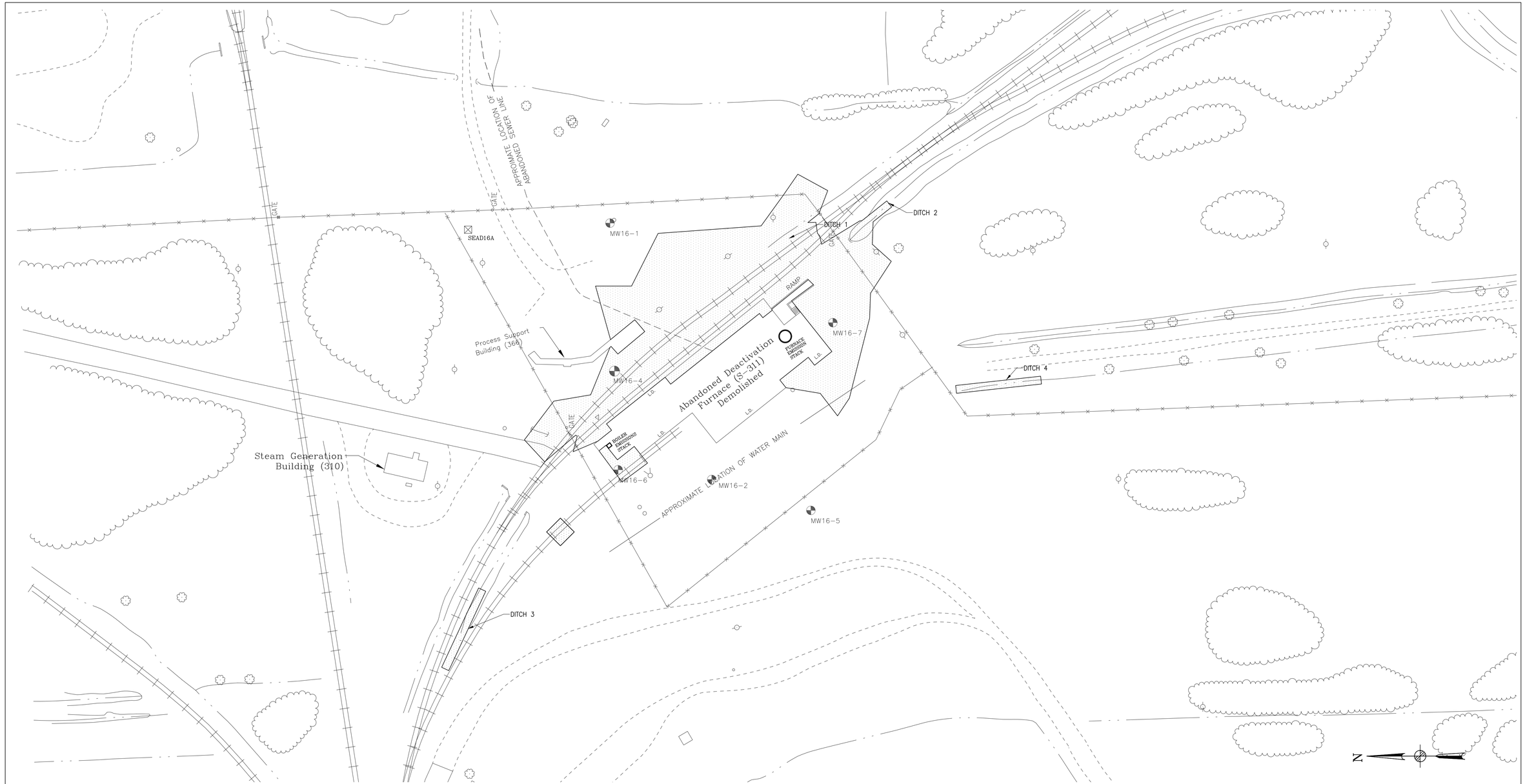
Area Covered by PID-wide Land Use Restrictions
- Prohibit the development and use of property for residential housing, elementary and secondary schools, childcare facilities and playgrounds.
- Prevent access to or use of the groundwater until the Class GA Groundwater Standards are met.

PARSONS

SENECA ARMY DEPOT ACTIVITY
Year 3 Annual Groundwater Report
SEAD-16 and SEAD-17

FIGURE 2
Location of SEAD-16 and SEAD-17
at Seneca Army Depot Activity

o:\seneca\pid luc\sead-16&17 annual report.apr\sead-16&17 Annual Report Figure 2



LEGEND:

- MINOR WATERWAY
- MAJOR WATERWAY
- FENCE
- BRUSH LINE
- RAILROAD
- UNPAVED ROAD
- SURVEY MONUMENT
- ROAD SIGN
- DECIDUOUS TREE
- L.D. LOADING DOCK
- FIRE HYDRANT
- MANHOLE
- GUIDE POST
- POLE
- UTILITY BOX
- OVERHEAD UTILITY POLE
- MAILBOX/RR SIGNAL
- MW16-5 MONITORING WELL LOCATION
- LIMITS OF EXCAVATION

NOTE:

MONITORING WELL MW16-3 WAS DESTROYED DURING THE REMEDIAL ACTION.

50 0 50 100

SCALE IN FEET

PARSONS

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY

SEAD-16 AND SEAD-17

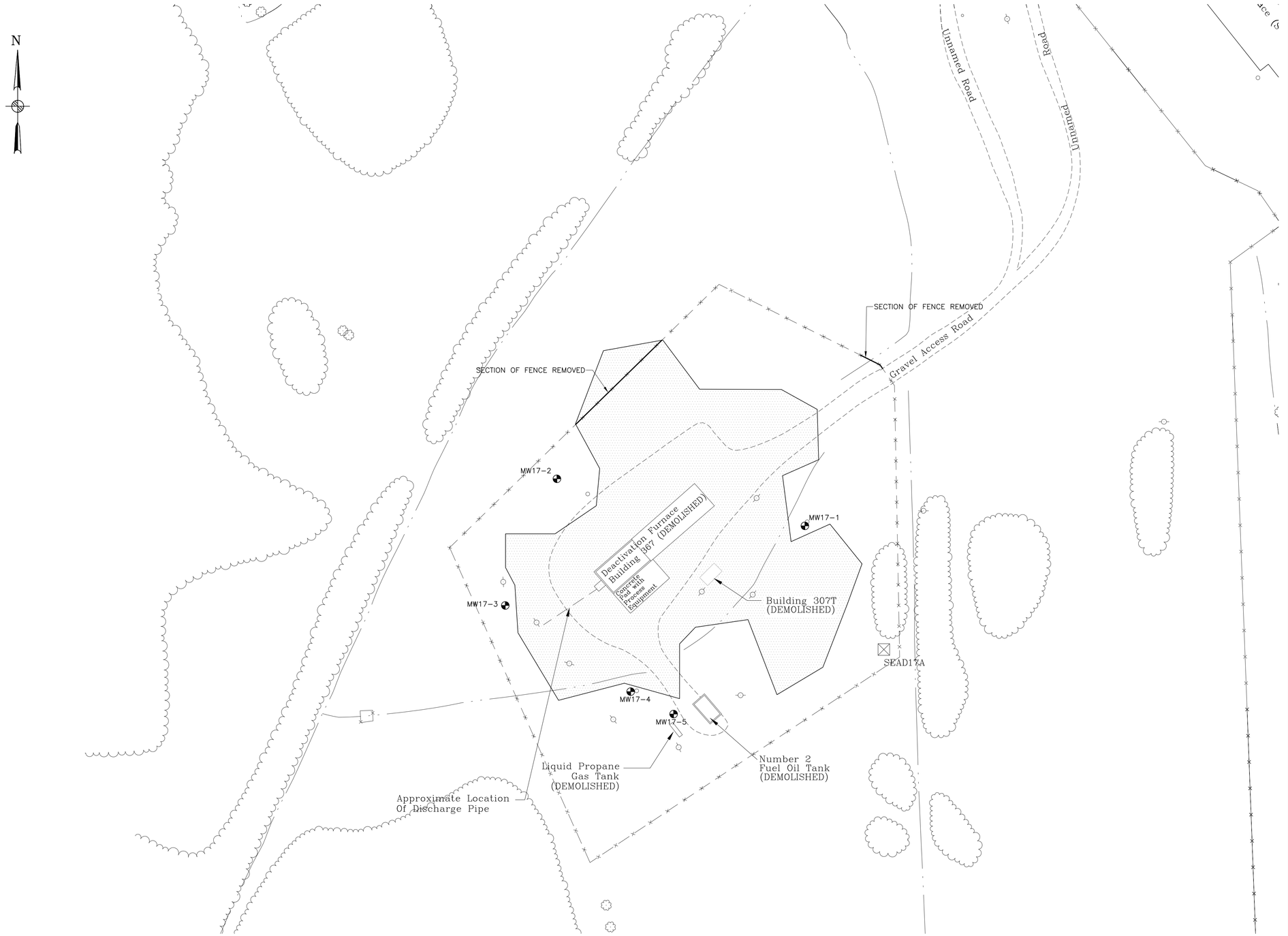
THIRD ANNUAL GROUNDWATER REPORT

DEPT.	Dwg. No.
ENVIRONMENTAL ENGINEERING	745172-01200

FIGURE 3
SEAD-16
SITE PLAN

SCALE	DATE	REV
1" = 100'	FEBRUARY 2010	-

FILE: P:\PIT\PROJECTS\SENECA PBC II\SEAD-16_17\ANNUAL REPORT - YR 3\DRAFT\FIGURES\FIGURE 3.DWG, DATE: 02/09/2010 04:00:06PM, p0018397



LEGEND:

- MINOR WATERWAY
- MAJOR WATERWAY
- FENCE
- UNPAVED ROAD
- BRUSH LINE
- RAILROAD
- SURVEY MONUMENT
- ROAD SIGN
- DECIDOUS TREE
- GUIDE POST
- FIRE HYDRANT
- MANHOLE
- MAILBOX/RR SIGNAL
- POLE
- UTILITY BOX
- OVERHEAD UTILITY POLE
- MW17-5 MONITORING WELL LOCATION
- LIMITS OF EXCAVATION

PARSONS

CLIENT/PROJECT TITLE

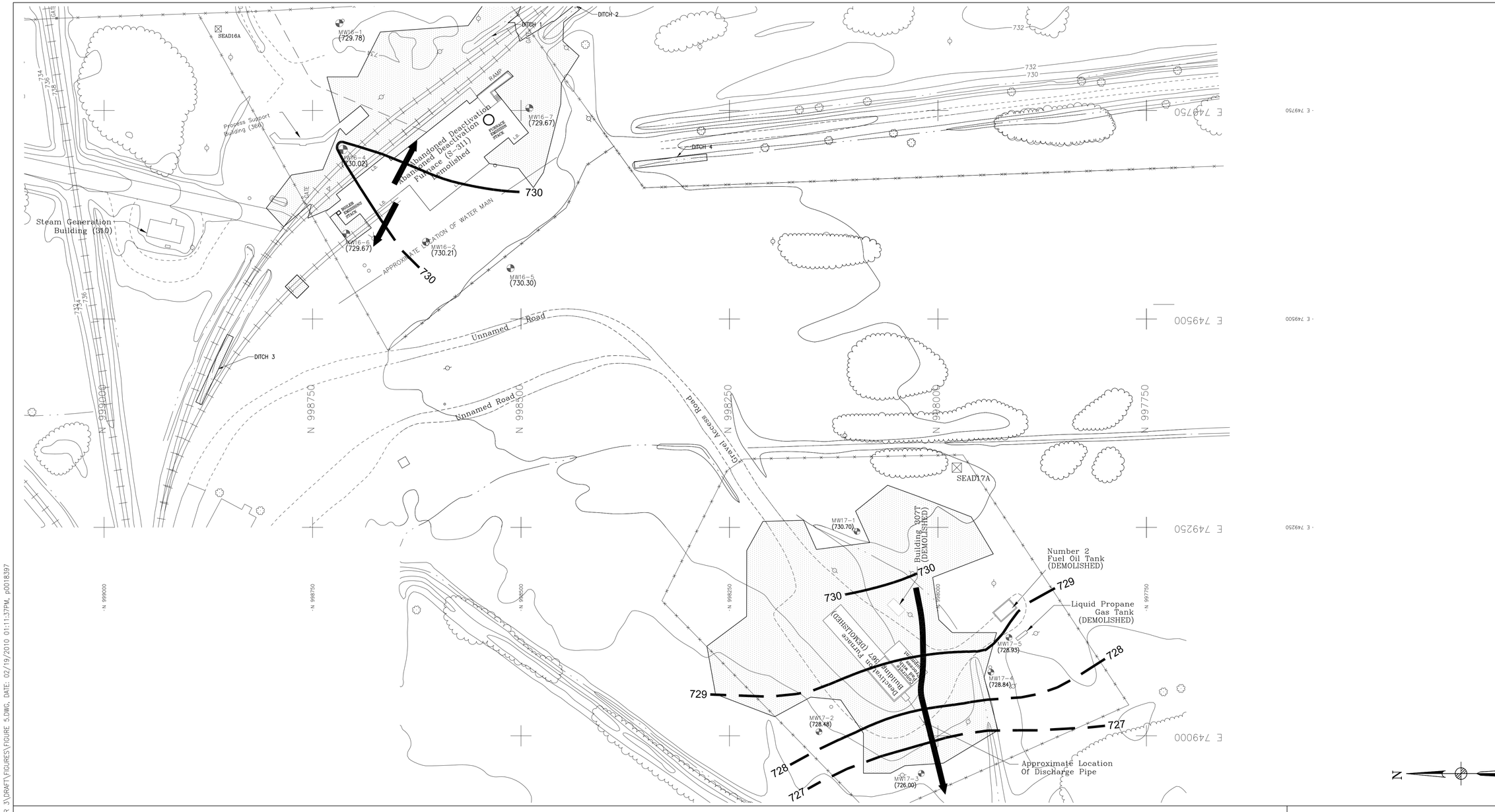
SENECA ARMY DEPOT ACTIVITY
SEAD-16 AND SEAD-17
THIRD ANNUAL GROUNDWATER REPORT

DEPT.	Dwg. No.
ENVIRONMENTAL ENGINEERING	745172-01200

FIGURE 4
SEAD-17
SITE PLAN

SCALE	DATE	REV
1" = 100'	FEBRUARY 2010	-

FILE: P:\PIT\PROJECTS\SENECA PBC II\SEAD-16_17\ANNUAL REPORT - YR 3\DRAFT\FIGURES\FIGURE 4.DWG, DATE: 02/09/2010 04:03:32PM, p0018397



LEGEND:

- ELEVATION CONTOUR (734)
- MINOR WATERWAY
- MAJOR WATERWAY
- FENCE
- BRUSH LINE
- RAILROAD
- UNPAVED ROAD
- SURVEY MONUMENT
- ROAD SIGN
- DECIDOUS TREE
- L.D. LOADING DOCK
- FIRE HYDRANT
- MANHOLE
- GUIDE POST
- POLE
- UTILITY BOX
- OVERHEAD UTILITY POLE
- MAILBOX/RR SIGNAL
- 729 GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- MW17-3 MONITORING WELL LOCATION
- LIMITS OF EXCAVATION
- MW17-3 (726.00) APPROXIMATE GROUNDWATER ELEVATION
- INDICATES APPROXIMATE DIRECTION OF GROUNDWATER FLOW

NOTES:

1. MONITORING WELL MW16-3 WAS DESTROYED DURING THE REMEDIAL ACTION.
2. GROUNDWATER FLOW DIRECTION BASED ON NOVEMBER 2009 GROUNDWATER DATA ELEVATION.

60 0 60 120
SCALE IN FEET

N

PARSONS

CLIENT/PROJECT TITLE
SENECA ARMY DEPOT ACTIVITY
SEAD-16 AND SEAD-17
THIRD ANNUAL GROUNDWATER REPORT

DEPT. ENVIRONMENTAL ENGINEERING
Dwg. No. 745172-01400

FIGURE 5
SEAD-16 AND 17
GROUNDWATER FLOW TREND

SCALE 1" = 120'
DATE FEBRUARY 2010
REV -

P:\PIT\PROJECTS\SENECA PBC II\SEAD-16_17\ANNUAL REPORT - YR 3\DRAFT\FIGURES\FIGURE 5.DWG, DATE: 02/19/2010 01:11:37PM, p0018397

APPENDICES

Appendix A Historic Groundwater Data

Appendix B Complete Groundwater Data Results for Year 1, Year 2, and Year 3

APPENDIX A

HISTORIC GROUNDWATER DATA

Appendix A Table
SEAD-16 Pre Remedial Groundwater Monitoring Results
SEAD-16 & SEAD-17 Third Annual Groundwater Monitoring Report
Seneca Army Depot Activity

LOC_ID:				MW16-1		MW16-1		MW16-2		MW16-2		MW16-3		MW16-3		MW16-4	
SAMP ID:				16101		16152		16102		16150		16110		16165		16105	
QC CODE:				SA		SA		SA		SA		SA		SA		SA	
STUDY ID:				RI ROUND1		RI ROUND2		RI ROUND1		RI ROUND2		RI ROUND1		RI ROUND2		RI ROUND1	
MATRIX:				WATER		WATER		WATER		WATER		WATER		WATER		WATER	
SAMPLE DATE:				8/27/1996		12/7/1996		8/27/1996		12/6/1996		8/30/1996		12/10/1996		8/28/1996	
PARAMETER	ACTION LEVEL	SOURCE [1]	UNIT	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
SEMIVOLATILE ORGANICS																	
3-Nitroaniline	5	GA	UG/L	26	UJ	25	U	25	U	25	U	25	U	25	U	26	U
4-Chloroaniline	5	GA	UG/L	10	UJ	10	U	10	U	10	U	10	U	10	U	10	U
Benzo[ghi]perylene			UG/L	10	UJ	10	U	10	U	10	U	1	J	10	U	10	U
Dibenz[a,h]anthracene			UG/L	10	UJ	10	U	10	U	10	U	0.7	J	10	U	10	U
Diethyl phthalate			UG/L	10	UJ	10	U	10	U	10	U	10	U	10	U	10	U
Indeno[1,2,3-cd]pyrene			UG/L	10	UJ	10	U	10	U	10	U	0.6	J	10	U	10	U
OTHER ANALYSES																	
Nitrate/Nitrite Nitrogen	10	GA	MG/L	0.02		0.01	U	0.67		2		0.04		0.64		0.29	
Percent Solids (Metals)				0		0		0		0		0		0		0	
Total Petroleum Hydrocarbons			MG/L	0.44	U	0.4	U	0.4	U	0.36	U	0.41	U	1		0.41	U
NITROAROMATICS																	
1,3-Dinitrobenzene	5	GA	UG/L	0.26	U	0.26	U	1.8	J	0.26	U	0.26	U	0.26	U	0.26	U
2,4-Dinitrotoluene	5	GA	UG/L	0.26	U	0.26	U	0.26	U	0.26	U	0.26	U	0.26	U	0.68	J
METALS																	
Aluminum			UG/L	1850		143	U	1010		490		336		36.1	U	24.9	
Antimony	3	GA	UG/L	2	U	3	U	2	U	3	U	**7.5**		5.3	U	2	U
Arsenic	10	MCL	UG/L	2.7	U	4.4	U	2.7	U	4.4	U	2.7	U	4.4	U	2.7	U
Barium	1,000	GA	UG/L	74.2		48.2	U	48.1		31.4	U	64.4		57.4	U	97.4	
Beryllium	4	MCL	UG/L	0.23		0.2	U	0.22		0.2	U	0.21		0.2	U	0.21	
Cadmium	5	GA	UG/L	0.3	U	0.6	U	0.3	U	0.6	U	0.3	U	0.6	U	0.3	U
Calcium			UG/L	157,000		116,000		193,000		164,000		99,800		85,500		130,000	
Chromium	50	GA	UG/L	2.7		1	U	2.3		1.1	U	1	U	1	U	1	U
Cobalt			UG/L	2.1		1.3	U	1.5		1.3	U	1.2	U	1.3	U	1.2	U
Copper	200	GA	UG/L	4.9		1.9	U	7.9		2.9	U	19.2		11.4	U	3.6	
Iron	300	GA	UG/L	**2,400**	**J**	296		**1,720**	**J**	**923**	**J**	**432**	**J**	77.8	U	38.2	
Lead	15	MCL	UG/L	1.7	U	1.5	U	5.9		6.8		6.1		1.5	U	1.7	U
Magnesium			UG/L	23,300		17,600		23,700		20,900		11,600		10,000		17,700	
Manganese	300	GA	UG/L	210		64.2		129		65.2		130		5.9	U	132	
Mercury	0.7	GA	UG/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
Nickel	100	GA	UG/L	4.7		2.5	U	11		3.1	U	3		2.5	U	2.2	
Potassium			UG/L	1670		998	U	4760		3410	U	2740		1900	U	4040	
Selenium	10	GA	UG/L	2.4	U	4.7	UJ	2.4	U	4.7	UJ	2.4	U	4.7	UJ	2.4	U
Sodium	20,000	GA	UG/L	8,750		3,870	U	19,100		17,000		9,480		7,660		17,200	
Thallium	2	MCL	UG/L	4.2	U	5.9	U	**9.2**		9.6	U	4.2	U	4.1	U	4.2	U
Vanadium			UG/L	3.3		1.6	U	2.9		1.6	U	1.2	U	1.6	U	1.2	U
Zinc			UG/L	15.6	R	5.8	U	37.4	R	13.5	U	32.4	R	42		4.5	R

LOC_ID:	MW16-4		MW16-5		MW16-6		MW16-6		MW16-7		MW16-7		MW16-7	
SAMP ID:	16156		16162		16111		16155		16104		16158		16159	
QC CODE:	SA		SA		SA		SA		SA		SA		DU	
STUDY ID:	RI ROUND2		RI ROUND2		RI ROUND1		RI ROUND2		RI ROUND1		RI ROUND2		RI ROUND2	
MATRIX:	WATER		WATER		WATER		WATER		WATER		WATER		WATER	
SAMPLE DATE:	12/7/1996		12/9/1996		9/3/1996		12/8/1996		8/28/1996		12/8/1996		12/8/1996	
PARAMETER	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
SEMIVOLATILE ORGANICS														
3-Nitroaniline	25	U	25	U	25	U	25	U	25	J	25	U	25	U
4-Chloroaniline	10	U	10	U	10	U	10	U	10	J	10	U	10	U
Benzo[ghi]perylene	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Dibenz[a,h]anthracene	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Diethyl phthalate	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Indeno[1,2,3-cd]pyrene	10	U	10	U	10	U	10	U	10	U	10	U	10	U
OTHER ANALYSES														
Nitrate/Nitrite Nitrogen	0.26		1.4		0.01	U	0.01	U	0.83		0.24		0.23	
Percent Solids (Metals)	0		0		0		0		0		0		0	
Total Petroleum Hydrocarbons	0.42	U	0.91		0.89		0.73		0.41	U	0.46	U	1.3	
NITROAROMATICS														
1,3-Dinitrobenzene	0.26	U	0.26	U	0.26	U	0.26	U	0.26		0.26	U	0.26	U
2,4-Dinitrotoluene	0.26	U	0.26	U	0.26	U	0.26	U	0.26	U	0.26	U	0.26	U
METALS														
Aluminum	36.1	U	148	U	208		170	U	12.4		67.4	U	52.9	U
Antimony	3	U	3	U	2	U	3	U	15.7	U	8.9	U	10	U
Arsenic	4.4	U	4.4	U	2.7	U	4.4	U	4	U	4.4	U	4.4	U
Barium	55.2	U	67.6	U	86.4		80.2	U	89.2		59.1	U	60.2	U
Beryllium	0.2	U	0.2	U	0.1	U	0.2	U	0.21		0.2	U	0.2	U
Cadmium	0.6	U	0.6	U	0.3	U	0.6	U	0.3	U	0.6	U	0.6	U
Calcium	158,000		90,000		44600		84,900		109,000		114,000		117,000	
Chromium	1	U	1	U	1.5		1	U	1		1	U	1	U
Cobalt	1.3	U	1.3	U	1.2		1.3	U	1.2		1.3	U	1.3	U
Copper	1.1	U	1.1	U	4.4		1.1	U	5.1		1.4	U	2.1	U
Iron	126		211		273	J	290		23.4		174		160	
Lead	1.5	U	3	U	1.7	U	1.5	U	8.4		9.9		9.2	
Magnesium	22,900		11,800		6370		12,800		16,900		22,600		23,200	
Manganese	66.9		51		**545**		**1,380**		85.7		43.2		44.3	
Mercury	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
Nickel	2.5	U	2.5	U	4.1		2.5	U	2.2		2.5	U	2.5	U
Potassium	1660	U	18800		3530		2230	U	3220		2090	U	2160	U
Selenium	4.7	UJ	4.7	UJ	2.4	U	4.7	UJ	2.4	U	4.7	UJ	4.7	UJ
Sodium	12,300		**49,500**		**396000**		**409,000**		12,000		9,940		10,200	
Thallium	4.1	U	6.9	U	**6.2**		4.1	U	**4.2**		**11**		4.1	U
Vanadium	1.6	U	1.6	U	2.9		1.6	U	1.2		1.6	U	1.6	U
Zinc	5.1	U	6.3	U	13.2	R	10.5	U	2.9	R	2.2	U	7.3	U

Notes:
1. The criteria values are NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998) and EPA Maximum Contamination Limit (MCL), Source http://www.epa.gov/safewater/mcl.html#inorganic.html
2. Shading indicates a concentration above groundwater standard.
3. A blank in the action level column indicates no Class GA and/or MCL standand or standard is a secondary value.

U = compound was not detected
J = the reported value is and estimated concentration
R = the compound was rejected

Appendix A Table
SEAD-17 Pre Remedial Groundwater Monitoring Results
SEAD-16 & SEAD-17 Third Annual Groundwater Monitoing Report
Seneca Army Depot Activity

			LOC_ID:	MW17-1		MW17-1		MW17-1		MW17-2		MW17-3		MW17-4		MW17-5		MW17-5	
			SAMP ID:	16108		16109		16171		16163		16166		16169		16106		16170	
			QC CODE:	SA		DU		SA		SA		SA		SA		SA		SA	
			STUDY ID:	RI ROUND1		RI ROUND1		RI ROUND2		RI ROUND2		RI ROUND2		RI ROUND2		RI ROUND1		RI ROUND2	
			MATRIX:	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
			SAMPLE DATE:	8/29/1996		8/29/1996		12/11/1996		12/9/1996		12/10/1996		12/11/1996		8/29/1996		12/11/1996	
PARAMETER	ACTION LEVEL	SOURCE [1]	UNIT	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
SEMIVOLATILE ORGANICS																			
Benzo[a]pyrene			UG/L	0.7	J	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Benzo[ghi]perylene			UG/L	2	J	1	J	10	U	10	U	10	U	10	U	10	U	10	U
Dibenz[a,h]anthracene			UG/L	1	J	0.9	J	10	U	10	U	10	U	10	U	10	U	10	U
Indeno[1,2,3-cd]pyrene			UG/L	2	J	1	J	10	U	10	U	10	U	10	U	10	U	10	U
OTHER ANALYSES																			
Nitrate/Nitrite Nitrogen	10	GA	MG/L	0.24		0.23		0.2		0.04		0.05		0.02		0.04		0.02	
Percent Solids (Metals)				0		0		0		0		0		0		0		0	
NITROAROMATICS																			
Tetryl			UG/L	0.26	U	0.26	U	0.26	U	0.26	U	0.26	U	0.26	U	0.26	U	0.26	U
METALS																			
Aluminum			UG/L	90.4		54.6		386		85.3	U	36.1	U	41.9	U	39.9		59	U
Antimony	3	GA	UG/L	2	U	2	U	3	U	3	U	3	U	3	U	2	U	3	U
Arsenic	10	MCL	UG/L	2.7	U	2.7	U	4.4	U	4.4	U	4.4	U	4.4	U	2.7	U	4.4	U
Barium	1,000	GA	UG/L	85		87		90.4	U	66.1	U	27.4	U	27.4	U	92.5		62.6	U
Beryllium	4	MCL	UG/L	0.26		0.21		0.2	U	0.2	U	0.2	U	0.2	U	0.23		0.2	U
Cadmium	5	GA	UG/L	0.3	U	0.31		0.6	U	0.6	U	0.6	U	0.6	U	0.3	U	0.6	U
Calcium			UG/L	108000		110000		104000		118000		108000		92000		108000		81100	
Chromium	50	GA	UG/L	1	U	1.5		1	U	1	U	1	U	1	U	1	U	1	U
Cobalt			UG/L	1.2	U	1.4		2	U	1.3	U	1.3	U	1.3	U	1.2	U	1.3	U
Copper	200	GA	UG/L	3.1		4.3		1.1	U	2.6	U	1.1	U	1.1	U	3.3		1.3	U
Iron	300	GA	UG/L	119		90.6		**572**	**J**	214		53.1	U	96.4	U	56.8		134	
Lead	15	MCL	UG/L	1.7	U	1.7	U	1.5	U	1.9	U	1.5	U	3	U	1.7	U	1.5	U
Magnesium			UG/L	22600		23000		22900		14600		15200		14200		17700		13600	
Manganese	300	GA	UG/L	21.3		20		9.7	U	73.8		0.7	U	22.5		73.2		62	
Mercury	0.7	GA	UG/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
Nickel	100	GA	UG/L	1.8		2.2		2.5	U	2.5	U	2.5	U	2.5	U	2.4		2.5	U
Potassium			UG/L	472		574		843	U	5320		772	U	1330	U	853		1070	U
Selenium	10	GA	UG/L	2.4	U	2.4	U	4.7	UJ	4.7	UJ	4.7	UJ	4.7	UJ	2.4	U	4.7	UJ
Silver	50	GA	UG/L	1.3	U	2.3		1.5	U	1.5	U	1.5	U	1.5	U	1.3	U	1.5	U
Sodium	20,000	GA	UG/L	9,290		9,620		8,190		18,700		**30,100**		**22,300**		11,700		8,970	
Thallium	2	MCL	UG/L	**4.40**		**7.1**		4.1	U	4.7	U	4.4	U	6.2	U	**4.7**		8.6	U
Vanadium			UG/L	1.2	U	1.4		1.6	U	1.6	U	1.6	U	1.6	U	1.2	U	1.6	U
Zinc			UG/L	2.5	R	3.2	R	14.4	U	63.9		7.7	U	8.3	U	6.2	R	4.4	U

Notes:
1. The criteria values are NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998) and EPA Maximum Contamination Limit (MCL), Source http://www.epa.gov/safewater/mcl.html#inorganic.html
2. Shading indicates a concentration above groundwater standard.
3. A blank in the action level column indicates no Class GA and/or MCL standand or standard is a secondary value.
4. Wells MW17-2, MW17-3, and MW17-4 were not sampled in August 1996 since they were dry.

U = compound was not detected
J = the reported value is and estimated concentration
R = the compound was rejected

APPENDIX B

COMPLETE GROUNDWATER DATA RESULTS FOR YEAR 1, YEAR 2, AND YEAR 3

Appendix B Table
SEAD-16 Post-Remedial Action Groundwater Monitoring Results
SEAD-16 & SEAD-17 Third Annual Groundwater Monitoring Report
Seneca Army Depot Activity

SITE LOCATION				SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16
LOCATION ID				MW16-1	MW16-1	MW16-1	MW16-2	MW16-2	MW16-4	MW16-4	MW16-4	MW16-5	MW16-5	MW16-6	MW16-6	MW16-7	MW16-7
MATRIX				GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
SAMPLE ID				16LM20001	16LM20000	16LM20013	16LM20002	16LM20007	16LM20003	16LM20009	16LM20008	16LM20004	16LM20010	16LM20005	16LM20011	16LM20006	16LM20012
SAMPLE DATE				12/20/2007	12/20/2007	12/9/2008	12/20/2007	12/9/2008	12/20/2007	12/9/2008	12/9/2008	12/20/2007	12/10/2008	12/20/2007	12/9/2008	12/20/2007	12/10/2008
QC CODE				DU	SA	SA	SA	SA	SA	DU	SA	SA	SA	SA	SA	SA	SA
STUDY ID				LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM
Parameter[1]	**Units**	**Criteria[2]**	**Action Level**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Aluminum	UG/L			91.6 J	61.4 J	148 J	98.8 J	97.1 J	167 J	101 J	104 J	160 J	563	168 J	189 J	45.9 J	577
Antimony	UG/L	GA	3	1.02	1 U	0.95 J	**3.36**	**5.53**	**5.11**	2.94	2.89	1.82	**4.23**	1 U	0.92 J	**9.58**	**13.6**
Arsenic	UG/L	MCL	10	4.2 U	4.2 U	3.7 U	4.2 U	3.7 U	4.2 U	3.7 U	3.7 U	4.2 U	3.7 U	4.2 U	3.7 U	4.2 U	3.7 U
Barium	UG/L	GA	1,000	59	60.4	125	64.6	69.7	44.5	279	290	38.9	22	31.8	39.1	170	122
Beryllium	UG/L	MCL	4	0.27 U	0.27 U	0.33 U	0.27 U	0.33 U	0.27 U	0.33 U	0.33 U	0.27 U	0.33 U	0.27 U	0.33 U	0.27 U	0.33 U
Cadmium	UG/L	GA	5	0.36 U	0.36 U	0.33 U	0.36 U	0.33 U	0.36 U	0.33 U	0.33 U	0.36 U	0.33 U	0.36 U	0.33 U	0.46 J	0.33 U
Calcium	UG/L			105000 J	107000 J	176000	143000 J	138000	87100 J	267000	275000	89000 J	53100	80400 J	84300	194000	133000
Chromium	UG/L	GA	50	0.84 U	0.84 U	0.88 U	0.84 U	0.88 U	1 J	0.88 U	0.88 U	1.1 J	1.2 J	0.84 U	0.88 U	0.84 U	1.6 J
Cobalt	UG/L			0.89 U	0.89 U	1.1 U	0.89 U	1.1 U	0.89 U	1.1 U	1.1 U	0.89 U	1.1 U	0.89 U	1.1 U	1.6 J	1.1 J
Copper	UG/L	GA	200	1.3 U	1.3 U	1.3 U	4.5 J	4 J	5.4 J	4.2 J	4.4 J	3.1 J	10.6	3.4 J	2.1 J	34.7	20.2
Iron	UG/L	GA	300	68.3	35.8 J	93.3	49.5 J	26.1 J	95.4	38.4 J	57 J	**1200**	**699**	**418**	153	29.2 J	**770**
Iron+Manganese	UG/L	GA	500	73	39 J	105	53 J	27	127	46 J	65	**1238**	**731**	441	158	**660** J	**990**
Lead	UG/L	MCL	15	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	10.1	2.9 U	2.9 U	**26.5**	**88.6**
Magnesium	UG/L			15900 J	16100 J	25800	15600 J	15700	9440 R	34500	35200	9380 R	6050	7100 R	7380	32000 J	25100
Manganese	UG/L	GA	300	5	3.3	11.8	3.4	0.84 J	31.2	8	7.7	37.6	32.4	23.3	4.8	**631**	220
Mercury	UG/L	GA	0.7	0.12 U	0.12 U	0.12 U	0.12 U	0.148 J	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.507	0.12 U
Nickel	UG/L	GA	100	1.2 U	1.2 U	1 U	1.2 U	1.6 J	1.2 U	1.9 J	2.2 J	1.2 U	2.6 J	1.2 U	1 U	5.5 J	2.6 J
Potassium	UG/L			907 R	886 R	1340 J	2050 R	2410 J	1300 R	3690 J	3830 J	4420 R	2610 J	2690 R	2310 J	5480 J	5670 J
Selenium	UG/L	GA	10	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U
Silver	UG/L	GA	50	1 U	1 U	1.3 U	1 U	1.3 U	1 U	1.3 U	1.3 U	1 U	1.3 U	1 U	1.3 U	1 U	1.3 U
Sodium	UG/L	GA	20,000	**25,300** J	**24,200** J	**182,000**	**49,600** J	**63,500**	**40,800** J	**419,000**	**434,000**	8,410 R	2,180	6,110 R	9,200	**68,400** J	**74,900**
Thallium	UG/L	MCL	2	0.03 U	0.03 U	0.09 U	0.03 U	0.09 U	0.03 U	0.09 U	0.09 U	0.03 U	0.09 U	0.03 U	0.09 U	0.03 J	0.09 U
Vanadium	UG/L			0.78 U	0.78 U	0.98 U	0.78 U	0.98 U	0.78 U	0.98 U	0.98 U	1.2 J	2.3 J	0.86 J	0.98 U	0.78 U	0.98 U
Zinc	UG/L			7.8 J	4.4 J	5.8 J	8.2 J	10.2	5.3 J	9.8 J	14.6 J	34.4	10.3	5.5 J	3.7 J	3.6 U	8.6 J

Notes:
1. The criteria values are NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998) and EPA Maximum Contamination Limit (MCL), Source http://www.epa.gov/safewater/mcl.html#inorganic.html
2. Shading indicates a concentration above groundwater standard.
3. A blank in the action level column indicates no Class GA and/or MCL standand or standard is a secondary value.

U = compound was not detected
J = the reported value is and estimated concentration
R = the compound was rejected

Appendix B Table
SEAD-17 Post-Remedial Action Groundwater Monitoring Results
SEAD-16 & SEAD-17 Third Annual Groundwater Monitoring Report
Seneca Army Depot Activity

SITE LOCATION				SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17
LOCATION ID				MW17-1	MW17-1	MW17-2	MW17-2	MW17-3	MW17-3	MW17-4	MW17-4	MW17-5	MW17-5
MATRIX				GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
SAMPLE ID				17LM20000	17LM20005	17LM20001	17LM20006	17LM20002	17LM20007	17LM20003	17LM20008	17LM20004	17LM20009
SAMPLE DATE				12/20/2007	12/11/2008	12/20/2007	12/10/2008	12/20/2007	12/10/2008	12/20/2007	12/10/2008	12/20/2007	12/11/2008
QC CODE				SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
STUDY ID				LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM
Parameter[1]	**Units**	**Criteria[2]**	**Action Level**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Aluminum	UG/L			204	219	110 J	142 J	106 J	386	50.2 J	125 J	98.5 J	125 J
Antimony	UG/L	GA	3	1 U	1 U	**3.44**	2.76	1 U	1 U	1 U	0.62 J	1 U	0.56 J
Arsenic	UG/L	MCL	10	4.2 U	3.7 U	4.2 U	3.7 U	4.2 U	3.7 U	4.2 U	3.7 U	4.2 U	3.7 U
Barium	UG/L	GA	1,000	70	79	58.8	51.8	39	29.3	32.5	35.9	86.7	82.9
Beryllium	UG/L	MCL	4	0.27 U	0.33 U	0.27 U	0.33 U	0.27 U	0.33 U	0.27 U	0.33 U	0.27 U	0.33 U
Cadmium	UG/L	GA	5	0.36 U	0.33 U	0.36 U	0.33 U	0.36 U	0.33 U	0.36 U	0.33 U	0.36 U	0.33 U
Calcium	UG/L			98300 J	95600	110000 J	112000	69000 J	67200	74900 J	74700	97100 J	97300
Chromium	UG/L	GA	50	0.84 U	0.88 U	0.84 U	2.9 J	0.84 U	0.88 U	1 J	0.88 U	0.84 U	0.88 U
Cobalt	UG/L			0.89 U	1.1 U	0.89 U	1.1 U	0.89 U	1.1 U	0.89 U	2.4 J	0.89 U	1.1 U
Copper	UG/L	GA	200	1.3 U	1.3 U	6.2 J	4.4 J	2.6 J	2.8 J	1.8 J	1.8 J	1.3 U	1.5 J
Iron	UG/L	GA	300	106	126	140	115	133	**1,300**	45.4 J	**1,760**	91.7	76
Iron+Manganese	UG/L	GA	500	119	141	160	121	170	**1,573**	59 J	**2,671**	128	85
Lead	UG/L	MCL	15	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U
Magnesium	UG/L			21,800 J	20,600	11,000 R	11,200	7,560 R	7,400	10,400 R	10,200	15,800 J	15,600
Manganese	UG/L	GA	300	13.2	14.9	20.5	6.1	36.7	273	13.7	911	36.5	8.9
Mercury	UG/L	GA	0.7	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Nickel	UG/L	GA	100	1.2 U	1.3 J	1.2 U	2.8 J	1.2 U	1.8 J	1.2 U	2.6 J	1.2 U	1.2 J
Potassium	UG/L			614 R	462 J	1690 R	1260 J	2620 R	1840 J	838 R	1190 J	972 R	824 J
Selenium	UG/L	GA	10	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U
Silver	UG/L	GA	50	1 U	1.3 U	1 U	1.3 U	1 U	1.3 U	1 U	1.3 U	1 U	1.3 U
Sodium	UG/L	GA	20,000	7,790 R	8,380	6,620 R	7,860	4,550 R	5,500	**28,500** J	15,500	7,950 R	7,360
Thallium	UG/L	MCL	2	0.03 U	0.09 U	0.03 U	0.09 U	0.03 U	0.09 U	0.03 U	0.09 U	0.03 U	0.09 U
Vanadium	UG/L			0.78 U	0.98 U	0.78 U	0.98 U	0.78 U	0.98 U	0.78 U	0.98 U	0.78 U	0.98 U
Zinc	UG/L			4.7 J	4 J	72 J	27.6	27 J	14.2	5.1 J	6.7 J	4.7 J	41.6

Notes:
1. The criteria values are NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998) and EPA Maximum Contamination Limit (MCL), Source http://www.epa.gov/safewater/mcl.html#inorganic.html
2. Shading indicates a concentration above groundwater standard.
3. A blank in the action level column indicates no Class GA and/or MCL standand or standard is a secondary value.

U = compound was not detected
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