US Army Engineering & Support Center Huntsville AL

ANNUAL REPORT 2013 – YEAR 6 FOR SEAD-16 AND SEAD-17
SENECA ARMY DEPOT ACTIVITY

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PARSONS

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US Army, Engineering & Support Center
Huntsville, AL

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Seneca Army Depot Activity
Romulus, NY

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ANNUAL REPORT 2013 – YEAR 6
ABANDONED DEACTIVATION FURNACE (SEAD-16)
AND ACTIVE DEACTIVATION FURNACE (SEAD-17)
SENECA ARMY DEPOT ACTIVITY

Contract No. W912DY-08-D-0003
Task Order No. 0015
EPA Site ID# NY0213820830
NY Site ID# 8-50-006

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

Prepared for:

U.S. ARMY CORPS OF ENGINEERS, ENGINEERING AND SUPPORT CENTER,
HUNTSVILLE, ALABAMA

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SENECA ARMY DEPOT ACTIVITY

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1.0 INTRODUCTION

This *Draft Annual Report – Year 6* for the former Abandoned Deactivation Furnace (SEAD-16) and the former Active Deactivation Furnace (SEAD-17) sites at the Seneca Army Depot Activity (SEDA or the Depot) in Romulus, Seneca County, New York provides a review of annual groundwater monitoring data collected in December 2013, comparisons of the 2013 data to other pre- and post-remedial action (RA) groundwater sampling events, recommendations for future long-term monitoring (LTM) at SEAD-16 and SEAD-17, and the annual review of the effectiveness of the remedy implemented at the sites 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 RA was completed in August 2007 for SEAD-16 and SEAD-17, or the areas of concern (AOCs). The RA consisted of the excavation and disposal of soil contaminated with selected metals (antimony, arsenic, cadmium, copper, lead, mercury, thallium, and zinc) at levels above identified risk-based action levels from both AOCs. In addition, soil at SEAD-16 that was also contaminated with polyaromatic hydrocarbons (PAHs) at concentrations in excess of risk-based action levels was excavated and disposed at a licensed landfill. The RA implemented is documented in the *Final Construction Completion Report for the Abandoned Deactivation Furnace (SEAD-16) and Active Deactivation Furnace (SEAD-17)* (Parsons, 2008). The RA at SEAD-16 involved the removal of approximately 1,862 cubic yards (cy) of soil impacted with metals and PAHs. The RA at SEAD-17 involved the removal of approximately 2,565 cy of metals-impacted soil.

The ROD for SEAD-16 and SEAD-17 also requires the implementation, maintenance, inspection, and periodic reporting of land use controls (LUCs) prohibiting use of the land at the AOCs for residential purposes and access to and use of groundwater until applicable cleanup standards are met. Applicable cleanup standards refer to the lowest enforceable standard recorded either on New York State Class GA (NYS Class GA) Ambient Water Quality Standards or United States Environmental Protection Agency (EPA) maximum contaminant levels (EPA 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 Land Use Control Remedial Design (LUC RD) Addendum #4 identifies and implements the LUCs required by the SEAD-16 and SEAD-17 ROD at the identified AOCs, as well as other AOCs (SEADs 1, 2, 5, 59, 71, 121C, and 121I) in the PID area. The LUC objectives for SEAD-16 and SEAD-17 are to prevent access to or use of groundwater until New York State GA groundwater standards are achieved, and to prohibit residential housing, elementary and secondary schools, child care facilities and playground activities at the sites. Implementation of the LUCs at SEAD-16 and SEAD-17 may include lease restrictions, an environmental easement, deed restrictions, zoning, periodic certification, and a five-year review as is defined in the *Final Land Use Control Design for SEAD-27, 66, and 64A* (Army, 2006). The

LUC RD for SEAD-27, 66 and 64A is also known as the *LUC RD for the Planned Industrial/Office Development or Warehousing Area* that proposed the establishment of an area-wide set of land use restrictions for the PID/Warehouse Area to simplify institutional control implementation by having a single set of land use restrictions for the PID/Warehouse Area, which are consistent with its anticipated industrial land use. The periodic certification will be submitted to the NYSDEC and EPA to document that the LUCs at SEAD-16 and SEAD-17 are unchanged and that no activities have occurred that impair or violate the ability of the LUCs to protect public health and the environment.

Long-term groundwater monitoring 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 as outlined in the Final Work Plan. Results for the first year (Year 1) LTM event performed in December 2007 are documented in the *Final Construction Completion Report for the Abandoned Deactivation Furnace (SEAD-16) and Active Deactivation Furnace (SEAD-17)* (Parsons, 2008). The Year 2 LTM event was performed in December 2008, with results documented in the *Final Annual Report – Year 2* (Parsons, 2009). Results for the Year 3 LTM sampling event conducted in November 2009 are documented in the *Final Annual Report - Year 3* (Parsons, 2010). The Year 4 LTM sampling event was conducted in December 2010 for both AOCs, with the results presented in the Draft *Final Annual Report – Year 4* (Parsons, 2011). No LTM sampling event was conducted in 2011 due to budgetary constraints. The Year 5 LTM event was performed in December 2012, with results documented in the *Final Annual Report – Year 5* (Parsons, 2014). This report presents and discusses the results for Year 6's LTM event, which was conducted in December 2013.

2.0 SITE BACKGROUND

2.1 Site Description

SEDA, a 10,587-acre former military facility located in Seneca County near Romulus, New York, 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. The facility was wholly owned by the United States Government and was 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 presented as **Figure 1**.

SEAD-16 and SEAD-17 are located in the east-central portion of the SEDA, within SEDA's former ammunition storage area in an area where vehicular and pedestrian access is restricted. SEAD-16 and SEAD-17 are located in the portion of SEDA where land is presently designated for future PID uses. The locations of SEAD-16 and SEAD-17 are 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, the former Abandoned Deactivation Furnace, was used from approximately 1945 until the mid 1960s when its use ceased and the site was vacated. The site consisted of 2.6 acres of fenced land with grasslands in the north, east, and west; a storage area for empty boxes and wooden debris located to the west; and an unpaved roadway in the south. Building S-311, which previously housed the deactivation furnace, was located at the approximate center of this area, and was demolished as part of the RA at SEAD-16. Documentation of demolition activities is presented in the *Building Cleaning and Building Demolition Completion Report* (Parsons, 2008). Building S-366, known as the Process Support Building, is located to the northeast of former Building S-311, and is currently unused and vacant. In addition to Building S-366, two sets of SEDA railroad tracks and utilities are presently on-site.

SEAD-17, the former Active Deactivation Furnace, was constructed to replace the Abandoned Deactivation Furnace at SEAD-16. However, SEAD-17 was inactive after 1989 as a result of Resource Conservation and Recovery Act (RCRA) permitting issues. SEAD-17 formerly consisted of the deactivation furnace, associated air pollution control equipment, and a support building (Building S-367), which were demolished or dismantled during the RA. Details and results of the demolition are documented in the *Building Cleaning and Building Demolition Completion Report* (Parsons, 2008). The former SEAD-17 deactivation furnace facility and support building were surrounded by a crushed shale road, beyond which lie grasslands. An unpaved gravel 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 the *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 as described 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. As summarized in the *Final Construction Completion Report for the Abandoned Deactivation Furnace (SEAD-16) and Active Deactivation Furnace (SEAD-17)* (Parsons, 2008), MW16-3 was destroyed during the RA construction activities, and was not replaced as groundwater conditions on the southwest side of Building S-311 are adequately characterized by MW16-2 and MW16-5. The locations of the six existing groundwater monitoring wells and the former MW16-3 are shown on **Figure 3**.

Prior to the completion of the RA in August 2007, depth to groundwater was measured at SEAD-16 three times (April 1994, August 1996, and December 1996). Groundwater flow generally trends to the west based on previous subsurface investigations conducted at SEDA. Data from previous investigations suggest that a groundwater divide exists near, and approximately parallel to, Route 96 near Romulus, New York, indicating that the groundwater in the SEAD-16 area flows west. Based on available groundwater elevation data, it appears that there may be a regional groundwater high southwest of former Building S-311, which may contribute to local fluctuations in groundwater flow for the Site.

Horizontal hydraulic conductivities were determined for five wells 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 ranged from 2.8×10^{-3} cm/sec to 2.5×10^{-2} cm/sec; 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**. Prior to the completion of the RA, depth to groundwater was measured at SEAD-17 in April 1994, August 1996, and December 1996 (the same time groundwater levels were measured at SEAD-16). Interpretation of groundwater elevation data indicates that groundwater flows to the southwest.

A horizontal hydraulic gradient of 0.01ft/fl was calculated 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 included 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 (S-311) and the Process Support Building (Bld. 366). 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 RA, three rounds of low-flow groundwater sampling were conducted at SEAD-16, including one round in April 1994 as part of the ESI investigation activities, and two rounds in August and December 1996 as part of the RI activities. Compounds detected in the groundwater samples are presented in **Appendix A** (Refer to the RI Report for complete groundwater analyses). Total metals were detected above either the applicable NYS Class GA standards or EPA MCLs. Concentrations exceeding applicable standards were less than or close to SEDA background concentrations, except for the exceedances of sodium. A summary of SEDA background groundwater data providing summary statistics (including maximum and average concentrations, the standard deviation for the collected data, and the frequency of detection) is provided in **Appendix B**. The Final Work Plan (Parsons, 2007) 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 was based on a comparison of results to the baekground groundwater data collected from unaffected parts of SEDA.

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 coneentrations of metals were highest in samples collected closest to the location of the former Active Deactivation Furnace and its support building, particularly near the southwestern corner of the building.

Pre-Remedial Action Groundwater Conditions

Prior to the completion of the RA, three rounds of groundwater sampling were conducted at SEAD-17, concurrent with the sampling conducted at SEAD-16 as identified above. Compounds detected in the groundwater samples collected during the low-flow sampling events in 1996 for SEAD-17 are presented in **Appendix A**. Total metals were detected at concentrations above the applicable NYS Class GA standards or EPA MCLs; however, these concentrations were lower than SEDA background metal concentrations, except for sodium. (Sec SEDA background groundwater data summary in **Appendix B.**) 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 non-impacted areas of SEDA.

2.5 Remedial Action Summary

The selected remedy for SEAD-16 and SEAD-17 required the following:

- 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;
- Performing groundwater monitoring for select metals until groundwater concentrations do not exceed the applicable NYS Class GA or EPA MCL standards;
- Establishing and maintaining LUCs to prevent access to or use of groundwater and to prevent residential use of the land until cleanup standards are met; and
- Performing a review of the selected remedy every five years to evaluate if the remedy remains protective of the public health and the environment in accordance with Section 121(e) of the Comprehensive Environmental Remediation and Cleanup Liability Act (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. Approximately 1,862 cy of impacted soil was removed from SEAD-16 and approximately 2,565 cy of impacted soil was removed from SEAD-17. The limit of the excavations performed at 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 yielded analytical results below site-specific cleanup standards. The depth of excavation completed at SEAD-16 varied from approximately 1 to 3 feet below ground surface (bgs) and the excavation depth at SEAD-17 varied from approximately 1 to 2 feet bgs. The impacted soil from SEAD-16 and SEAD-17 was transported off-site, and was 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 RA 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 5 LTM Event

The Year 5 LTM groundwater sampling event was conducted at SEAD-16 and SEAD-17 between December 15, 2012 and December 17, 2012. The results of the Year 5 event were reported in *Final Annual Report Year 5* (Parsons, 2014). For summaries of Year 1 through 4 LTM groundwater sampling events, refer to *Final Annual Report – Year 5* (Parsons, 2014). Both filtered (i.e., dissolved) and unfiltered (i.e., total) samples were collected and characterized during this sampling event from the six monitoring wells located at SEAD-16, and from the five monitoring wells located at SEAD-17.

Concentrations of metals (including antimony, sodium, and iron) exceeding the applicable NYS Class GA standards were detected in the filtered samples collected from five of the six wells (MW16-1, MW16-2, MW16-4, MW16-5, and MW16-7) and unfiltered samples collected from the six wells at SEAD-16.

Antimony was detected above the applicable NYS Class GA standard for both the filtered and unfiltered samples collected from three wells (MW16-2, MW16-4, and MW16-7); sodium was detected above the applicable NYS Class GA standard in the unfiltered and filtered samples collected from MW16-1, MW16-4, and MW16-7; iron concentrations and the sum of iron and manganese compounds was detected above the applicable NYS Class GA standard in the unfiltered and filtered samples collected from MW16-5 and in the unfiltered sample analyzed from MW16-6. Concentrations of antimony and sodium were similar for unfiltered and filtered samples, with the highest concentrations of antimony and sodium detected in MW16-7 and MW16-4, respectively.

At SEAD-17, metal concentrations were detected below the applicable NYS Class GA and EPA MCL standards in both the filtered and unfiltered samples collected from the five monitoring wells with the exception of MW17-2. Antimony was the only metal detected above the applicable NYS Class GA standard in both unfiltered and filtered samples collected from MW17-2.

3.2 Year 6 LTM Event

The Year 6 post-RA LTM event was conducted at SEAD-16 and SEAD-17 from December 15, 2013 through December 17, 2013. Filtered and unfiltered groundwater samples were collected from six monitoring wells located at SEAD-16 and from five monitoring wells located at SEAD-17. This is the fourth sampling event that includes the collection of filtered and unfiltered samples. Field forms completed for the Year 6 sampling event are included in **Appendix C**. Groundwater data results for each LTM event are presented in **Appendix D**, and the laboratory analytical report for Year 6 included as **Appendix E**. A discussion of data validation results is presented in **Appendix F**; there were no non-compliance issues reported.

3.2.1 Year 6 Groundwater Elevations for SEAD-16 and SEAD-17

Prior to the collection of groundwater samples from each of the monitoring wells, groundwater elevation measurements were collected at each of the wells to be sampled. Groundwater elevation data for the Year 6 LTM event, as well as historic data, are presented in **Table 1** and **Table 2** for SEAD-16 and SEAD-17, respectively. Groundwater elevations were measured on December 9, 2013 at SEAD-16 and SEAD-17.

Groundwater elevation data, including historic groundwater elevation data, for SEAD-16 and SEAD-17 is presented as **Table 1** and **Table 2**, respectively.

Groundwater elevation data collected during previous investigations indicate that groundwater generally flows to the southwest at SEAD-16; however, historical groundwater elevation data also indicate that localized variation in groundwater flow direction may be due to higher groundwater elevations observed to the northeast and southwest of the former Building S-311. During the most recent (Year 6) LTM event, and similar to the Year 4 and Year 5 LTM groundwater flow observations at SEAD-16, groundwater elevation data suggest that there is a groundwater low in the vicinity of the former Building S-311 location. The higher groundwater elevations to the northeast and southwest of the apparent groundwater low in the vicinity of Building S-311 result in two apparent local groundwater flow directions (to the southeast and northwest, respectively) as shown on **Figure 5**.

Based on the most recent elevation data (December 2013), groundwater at SEAD-17 appears to flow generally to the west-southwest as shown on **Figure 5**, which is consistent with historical groundwater flow observations at SEAD-17.

3.2.2 Year 6 LTM Sample Collection

Samples for the Year 6 LTM event were collected using low flow sampling techniques. A peristaltic pump was used in place of a bladder pump to collect the groundwater samples during this event due to winter weather conditions, including standing air temperatures below 32 degrees Fahrenheit (0 degrees Celsius). A peristaltic pump is recommended for freezing conditions since the bladder pump recharge cycle sequence allows water to freeze in the exposed portion of the sample tubing, which may inhibit sample collection efforts due to ice plugs forming in the tubing.

Sample collection, handling and custody, holding times, and field parameter collection procedures were conducted in accordance with the *Revised Final Sampling and Analysis Plan for Seneca Army Depot Activity* (SAP) (Parsons, 2006c). Samples collected from the six SEAD-16 wells and the five SEAD-17 wells were submitted to TestAmerica (Savannah, GA) for the following analyses:

- Total and dissolved Target Analyte List (TAL) metals, exclusive of mercury, by USEPA SW846 Method 6020; and
- Total and dissolved mercury by USEPA SW846 7470A.

TestAmerica's Savannah, GA laboratory is certified by the Department of Defense's (DoD's) Environmental Laboratory Accreditation Program (ELAP) and the NELAC National Environmental Laboratory Accreditation Program (NELAP) for the above analyses/analytical methods for both potable and non-potable water.

Quality control (QC) samples, including one duplicate and one matrix spike/matrix spike duplicate (MS/MSD) pair, were collected at MW16-5. In the field, pH, oxidation-reduction potential (ORP), dissolved oxygen (DO), conductivity, temperature, and turbidity data were collected from each well during the purging cycle.

3.2.3 Year 6 LTM Sample Filtering

As documented in previous reports some of the metal concentrations that exceed NYS Class GA or EPA MCL standards in SEAD-16 and SEAD-17 wells may be associated with the groundwater turbidity fluctuations encountered in the wells at the time of sampling. With this in mind, both an unfiltered and filtered samples were collected for the Year 6 LTM event: after the purging was complete, a sample was collected directly from the well as unfiltered samples, and then another sample was collected and filtered through a 0.45-micron membrane filter in the field and submitted as the filtered sample. Samples collected from the wells during the Year 6 monitoring event had low turbidity levels (i.e., less than or equal to 4.83 NTU, all but the two samples from MW17-1 were less than 2.66 NTU).

3.2.4 Summary of Year 6 Groundwater Data Analysis for SEAD-16

A summary of metals detected in groundwater during the Year 6 LTM event for SEAD-16 is presented in **Table 3A**. Groundwater data results for each LTM event are presented in **Appendix D,** and the laboratory analytical report for Year 6 included as **Appendix E**. A discussion of data validation results is presented in **Appendix F**; there were no non-compliance issues reported. Data validation utilized the EPA Region 2 Standard Operating Procedures (SOPs) revised in March 2013.

Concentrations of metals including antimony, iron, and sodium were detected above applicable NYS Class GA standards in both filtered and unfiltered samples; metals exceedances for the filtered samples was detected from five of the six wells, and unfiltered sample exceedances was detected from the six wells. Antimony exceeded the NYS Class GA standard of 3 µg/L for both the filtered and unfiltered samples collected from TWO wells (MW16-2, and MW16-7). The highest concentrations of antimony were found at well MW16-7, where concentrations of 15 J µg/L and 16 J µg/L, were found in the unfiltered and filtered samples, respectively. Antimony concentrations measured in the unfiltered versus filtered samples collected from MW16-2 were also comparable, with the unfiltered sample yielding a concentration of 3.2 J µg/L, and the filtered sample's concentration was 3.6 J µg/L. Note that the concentrations reported are followed by the "J" qualifier, which indicates that the reported value based on the data validation is estimated.

Iron exceeded the NYS Class GA standard (300 µg/L) in the unfiltered and filtered samples analyzed from two wells (MW16-4 and MW16-5), The highest concentrations of iron were found at well MW16-5 duplicate sample, with unfiltered and filtered sample concentrations of 530 J µg/L and 490 J µg/L, respectively. The parent sample at MW16-5 had similar iron concentrations of 510 J µg/L and 440 J µg/L, respectively. Iron concentrations measured in the unfiltered versus filtered samples collected from MW16-4 were also comparable, with the unfiltered sample yielding a concentration of 380 J µg/L, and the filtered sample's concentration was 350 J µg/L.

Concentrations of the sum of iron and manganese compounds detected in unfiltered and filtered samples collected from wells MW16-4, MW16-5, and MW16-5 duplicate also exceeded the combined NYS Class GA standard of 500 µg/L with the primary contributing metal being iron. Although manganese was detected in the unfiltered and filtered groundwater samples collected from the six SEAD-16 wells, it was

not detected at concentrations above its NYS Class GA standard (300 µg/L) during the Year 6 LTM event.

Sodium was detected at concentrations above the NYS Class GA standard (20,000 µg/L) in unfiltered and filtered samples collected from wells MW16-1, MW16-2, MW16-4, and MW16-7. The highest concentrations were detected in the filtered and unfiltered samples collected from well MW16-4 at concentrations of 290,000 J µg/L and 270,000 J µg/L, respectively. Sodium exceedances were also found in the MW16-1 unfiltered and filtered samples at concentrations of 57,000 J µg/L and 60,000 J µg/L; respectively, in MW16-2 filtered and unfiltered samples at concentrations of 22,000 J µg/L and 21,000 J µg/L, respectively; and in the MW16-7 unfiltered and filtered samples at concentrations of 27,000 µg/L and 28,000 µg/L, respectively.

In summary, select metals (unfiltered and filtered) concentrations including antimony, iron, and sodium continue to be detected in the groundwater at SEAD-16 at levels that exceed NYS Class GA standards. In general, however, there is no evidence of an area-wide or expanding plume at SEAD-16, as illustrated by the stable occurrence of metals concentrations identified across the groundwater monitoring well network during the LTM sampling events. 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 non-groundwater sourced municipal water supply is available for SEDA and currently includes the PID area. The groundwater access/use restriction will remain in effect at SEAD-16 until the select metal concentrations in groundwater have been reduced to levels below applicable NYS Class GA and EPA MCL standards, and until data demonstrating acceptable groundwater quality in the AOC is provided to and approved by the applicable regulatory agencies.

3.2.5 Summary of Year 6 Groundwater Data Analysis for SEAD-17

A summary of metals detected in the Year 6 groundwater samples event for SEAD-17 is presented in **Table 3B**. Groundwater analytical results for each LTM event are presented in **Appendix D** and the laboratory analytical report for Year 6 is included as **Appendix E**. A discussion of data validation results is presented in **Appendix F**; there were no non-compliance issues reported. Data validation utilized the EPA Region 2 SOPs revised in March 2013.

Concentrations of metals in MW17-3 were detected below the applicable NYS Class GA and EPA MCL standards in both the filtered and unfiltered samples. Iron was detected at concentrations above the NYS Class GA standard (300 µg/L) in unfiltered and filtered samples collected from SEAD-17 wells MW17-1, MW17-2, MW17-4, and in the filtered sample collected from MW17-5. The highest concentrations were detected in the unfiltered and filtered samples collected from well MW17-4 at a concentration of 810 (J) µg/L in both samples. Iron exceedances were also found in MW17-1 unfiltered and filtered samples at concentrations of 680 J µg/L and 800 J µg/L, respectively, in MW17-2 unfiltered and filtered samples at concentrations of 470 J µg/L and 520 J µg/L, respectively; and in MW17-5 filtered sample at a concentration of 350 J µg/L. The iron exceedances at MW17-1 and MW17-5 were the first iron exceedances at these wells post-remedial action.

Concentrations of the sum of iron and manganese compounds detected in unfiltered and filtered samples collected from wells MW17-1, MW17-2, MW17-4 also exceeded the combined NYS Class GA standard of 500 µg/L with the primary contributing metal being iron. The sum of iron and manganese did not exceed the NYS Class GA standard in the filtered sample at MW17-5. Although manganese was detected in the unfiltered and filtered groundwater samples collected from the five SEAD-17 wells, it was not detected at concentrations above its NYS Class GA standard (300 µg/L) during the Year 6 LTM event.

The SEAD-17 Year 6 data continues to demonstrate that the groundwater at SEAD-17 has not been impacted by metals released from the former Active Deactivation Furnace site. Although the concentrations of iron were above the applicable NYS Class GA standards and the results are greater than what has been observed historically at the site, there is not sufficient trend information to indicate that there is a significant change in groundwater conditions. Access to and use of the groundwater is restricted at the AOC under the terms of the ROD, and is not being used as a potable water source. A non-groundwater sourced municipal water supply is available for the Depot, and currently includes the PID area. The groundwater access/use restriction will remain in effect at SEAD-17 until select metal concentrations in groundwater have been reduced to levels below applicable NYS Class GA and EPA MCL standards, and until data demonstrating acceptable groundwater quality in the AOC is provided to and approved by the applicable regulatory agencies.

3.2.6 Groundwater Data Trends

A comparison of data collected during the Years 1 to 6 LTM events to groundwater conditions noted prior to the RA is provided for SEAD-16 and SEAD-17 in the following discussions. Summaries of metal exceedances detected during the Year 6 groundwater monitoring event for SEAD-16 and SEAD-17 is provided in **Table 3A** and **Table 3B**, respectively. The data results for Year 1 through Year 6 LTM events is included as **Appendix D**.

3.2.6.1 Review of Groundwater Trends for SEAD-16

ESI and RI Data

Review of SEAD-16 data presented in the RI Report indicated that one or more concentrations measured for 14 metals (including arsenic, antimony, barium, beryllium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, sodium, and thallium) in 19 unfiltered groundwater samples collected during the ESI (performed in 1993/1994) and/or the RI (performed in 1999) exceeded NYS Class GA or EPA MCL standards in effect at the time of analysis. Of the 39 total instances where groundwater concentrations exceeded NYS Class GA or EPA MCL standards, 22 exceedances were associated with samples collected with peristaltic pumps (e.g., for the ESI sampling event) while the remaining 17 exceedances were found in samples collected using low-flow bladder pumps. Sample turbidities recorded during the RI sampling events were significantly lower than those recorded during the ESI sampling event, and thus are believed to be more representative of the water quality located at the site prior to the RA. Examination of the RI groundwater data shows that six metals were detected at concentrations in excess of NYS Class GA or EPA MCL standards in effect at the time of analysis:

- antimony (detected 2 times);

- iron (detected 5 times);
- lead (detected 1 time);
- manganese (detected 2 times);
- sodium (detected 3 times); and
- thallium (detected 4 times) EPA MCL.

Of these detections, antimony was detected at concentrations above the applicable NYS Class GA standard only in well MW16-3, with a maximum concentration of 12.3 µg/L. Iron was found at elevated concentrations in three wells: MW16-1 (at a maximum concentration of 2,400 J µg/L), MW16-2, and MW16-3. Lead was detected only in MW16-3 at a maximum concentration of 24.1 J µg/L; manganese was detected at elevated concentrations only in MW16-6 with a maximum level of 1,380 µg/L; sodium was detected in two wells (MW16-5 and MW16-6) with a maximum concentration of 409,000 µg/L detected at MW16-6; and thallium was detected in three wells including (MW16-2, MW16-5, and MW16-6), with a maximum concentration of 11 µg/L detected at MW16-6.

Post-Remedial Action Data

Over the six years since the completion of the RA at SEAD-16, a total of 70 groundwater samples, including 45 unfiltered and 25 filtered groundwater samples have been collected from the six wells located on SEAD-16. Filtered samples began being collected and analyzed during the Year 3 LTM event. Amongst the 70 characterized groundwater samples, there have been 99 exceedances of individual applicable NYS Class GA or EPA MCL standards (excluding duplicates). These exceedances were primarily distributed across five metals consisting of antimony (32 exceedances), iron (20 exceedances), lead (two exceedances), manganese (one exceedance), and sodium (44 exceedances). Of the 99 exceedances, 35 were detected in the filtered (dissolved) samples and 64 were detected in unfiltered (total) samples.

Antimony concentrations exceeding the NYS Class GA standard of 3 µg/L have been detected 32 times and most frequently have been detected in two wells, MW16-2 and MW16-7. Antimony detections above the NYS Class GA standards have inconsistently been found in well MW16-4 (five times, including two filtered from LTM events Year 4 and 5 and three unfiltered from LTM events Years 1, 3, and 5); and in MW16-5 (one unfiltered sample). Filtered and unfiltered sample results for antimony from wells MW16-2 and MW16-7 are generally comparable, suggesting that the metal is present as a dissolved species. The highest concentrations are found consistently in well MW16-7 where the overall maximum concentration (16.3µg/L) was detected in the sample/duplicate collected during the Year 3 sampling event in 2009. This maximum concentration is approximately equivalent to what was detected in the groundwater at the former MW16-3 prior to the RA. Antimony was detected in MW16-2 in Year 6 at concentrations less than in Years 1 through 5, and in MW16-7 at similar concentrations in Years 1-5.

Exceedances of the NYS Class GA standard for iron were noted 20 times, distributed across wells MW16-4 through MW 16-7 over the six LTM sampling events. Iron concentrations noted in filtered samples are generally lower than concentrations found in unfiltered samples indicating that the iron

concentrations are somewhat dependent on turbidity levels present in the groundwater at the time of sampling. The highest post RA concentration of iron detected in the groundwater at SEAD-16 is 1,300 µg/L (MW16-5, Year 5 LTM sampling event), which is roughly half of what was detected in the groundwater at the site prior to the RA.

Lead has been detected less frequently (30 of 70 LTM samples) and at lower concentrations (two exceedances post RA) in groundwater during the six years of post-RA monitoring. The two noted post-RA exceedances of the lead EPA MCL both occurred in well MW16-7 during the first and second LTM sampling events. Both of these samples were unfiltered, and since the last exceedance at MW16-7, lead levels in both the filtered and the unfiltered samples collected from this well have trended downward.

Sodium is a persistent contaminant identified in SEAD-16 wells, as it has been detected in every sample collected from the site, and at levels in excess of its NYS Class GA standard in 44 of the 68 samples (sodium was analyzed for in 70 samples, but two of the results were rejected during data validation). Sodium concentrations detected in the groundwater are currently higher than what was found prior to the RA, with concentrations possibly affected by the known county highway salt pile operation that is operated by the Seneca County Highway Department (located approximately 1,000 feet upgradient to the east-northeast of SEAD-16). The location of the Seneca County Highway Department salt piles are indicated on **Figure 5**.

Although enough data points are available to perform a limited statistical analysis [e.g., using the combined SEAD-16 pre-RA (1 to 3 samples per well) and post-RA (6 samples per well) datasets], the overall limited availability of data points and the high percentage of non-detects in the metal constituents results would not be conducive to providing a comprehensive evaluation. A review of the EPA's *Groundwater Unified Guidance* (EPA 2009) document provides numerous statistical methodologies; however, although the present number of data points could be used to perform a statistical analysis. The guidelines recommend 10 to15 distinct data points for accurate and meaningful results. Based on the limited data available the results would be inconclusive since there are at most six distinct data points for antimony in two of the wells (MW16-2 and MW16-7). Following the additional annual LTM events it is anticipated that a sufficient number of data points will be available to conduct a statistical analysis of the post-RA sampling data.

3.2.6.2 Review of Groundwater Trends at SEAD-17

ESI and RI Data

Review of SEAD-17 data presented in the RI Report indicated that one or more concentrations measured for four metals (i.e., iron, lead, sodium, and thallium) in 12 unfiltered groundwater samples exceeded NYS Class GA or EPA MCL standards in effect at the time of analysis. Of the 16 instances where groundwater concentrations exceeded the NYS Class GA or EPA MCL standards, 10 were associated with samples collected with a peristaltic pump (ESI sampling event) while the remaining six were found in samples collected using low-flow sampling with a bladder pump. As was indicated above for SEAD-16, sample water turbidities recorded during the RI sampling events were lower than those recorded during the ESI sampling event, and thus the analytical results from the RI samples are believed to be more

representative of the water quality present at SEAD-17. Examination of the RI groundwater data indicates that only three metals (iron, sodium, and thallium) were detected at concentrations above NYS Class GA or EPA MCL standards in effect at the time of analysis. Of these detections, iron was detected at an elevated concentration in one well (MW17-1 at a concentration of 572 J µg/L); sodium was detected in two wells (MW17-3, at a maximum concentration of 30,100 µg/L, and at MW17-4); and thallium was detected in two wells (MW17-1 at a maximum concentration of 7.1 µg/L, and at MW17-5).

Post-Remedial Action Data

Since the completion of the RA at SEAD-17, a total of 50 groundwater samples including 30 unfiltered and 20 filtered groundwater samples have been collected from the five wells located on SEAD-17. Filtered samples began being collected and analyzed during the Year 3 LTM event. Eighteen exceedances of NYS Class GA or EPA MCL standards primarily distributed across five metals have been detected, including antimony (four exceedances), iron (fourteen exceedances), lead (one exceedance), manganese (two exceedances), and sodium (four exceedances). Of the 25 NYS Class GA or EPA MCL standard exceedances, eight exceedances were detected in the filtered (dissolved) samples and 17 were detected in unfiltered (total) samples. Two exceedances of NYS Class GA or EPA MCL standards have been detected in well MW17-1 since the start of the post-RA LTM activities. Ten exceedances have been found in MW17-2; five exceedances have been found in well MW17-3 (with each of these exceedances of the NYS Class GA standard for iron); three exceedances in MW17-4; and three exceedances found in MW17-5.

Exceedances of the 3 µg/L NYS Class GA standard for antimony were detected at MW17-2 in the unfiltered samples during the Year 1, 3, and 5 LTM events; and in the filtered sample only for Year 5 LTM event. The unfiltered sample from MW17-2 collected during the Year 3 event did not contain antimony concentrations in excess of the 3 µg/L EPA MCL standard. The maximum concentration reported for antimony was detected in MWW17-2 during the Year 5 LTM event; a concentration of 4.4 J µg/L detected in the MW17-2 Year 5 unfiltered sample and a concentration of 4.0 J was detected in the filtered sample.

Exceedances of the NYS Class GA standard for iron were noted fourteen times in samples collected from five wells (MW17-1 with two exceedances, MW17-2 with three exceedances; MW17-3 with five exceedances; MW17-4 with three exceedances, and one exceedance at MW17-5). The maximum iron concentration was detected in the unfiltered sample collected from MW17-2 during the Year 3 event. Iron was not detected in the filtered sample collected during this event. Iron concentrations detected in five samples collected from MW17-3 (including three unfiltered and two filtered samples) were above the applicable 300 µg/L NYS Class GA standard. In the Year 6 event, the concentration of the iron exceedance in the filtered samples at three wells (MW17-1, MW17-2, and MW17-4) were greater than or equal to the exceedance concentration in the unfiltered sample.

Lead has been detected above the EPA MCL standard of 15 µg/L once on the site since the completion of the RA in MW17-2 (unfiltered sample collected during the Year 3 LTM sampling event in 2009). Lead was not detected in the filtered sample, as the lead concentration in this sample was non-detect.

Manganese concentrations exceeded the NYS Class GA standard of 300 µg/L for samples collected from MW17-2 (in the unfiltered sample collected during the Year 3 LTM sampling event in 2009) and MW17-4 (in the unfiltered sample collected during the Year 2 LTM sampling event in 2008). The sample collected from MW17-4 yielded the highest manganese concentration of 911 µg/L.

Sodium was detected at levels in excess of the 20,000 µg/L NYS Class GA standard four times in samples collected from MW17-2, MW17-4 and MW17-5. Of these detections, the sample results from MW17-5 are the most notable as the filtered/unfiltered samples collected during the Year 3 LTM sampling event (2009) both were in excess of 360,000 µg/L. Sodium results for the Year 2 (2008) and Year 4 (2010) LTM events for this well were below 10,000 µg/L, suggesting the Year 3 (2009) results are possibly a seasonal anomaly.

In general, post-RA LTM results indicate that groundwater quality at SEAD-17 is not impacted by historic operations conducted in this area. Many of the identified groundwater quality exceedances of sodium appeared either as random occurrences (e.g., sodium at MW17-5 in Year 3) or may be attributable to iron and manganese groundwater concentrations that are identified regionally in Seneca County and consistent with the Seneca groundwater background levels presented in Appendix B. Similar to SEAD-16, based on the limited data for SEAD-17 including pre-RA (1 to 3 samples per well) and post-RA (5 samples per well) datasets, the generally limited available data points and the high percentage of non-detects in the metal constituents results would yield inconclusive results. A review of the EPA's Groundwater – Unified Guidance (EPA, 2009) document provides numerous statistical methodologies which recommend more data points than are presently available. Once a sufficient number of data points has been obtained, a statistical analysis of the post-RA sampling data can be conducted.

3.3 Routine Inspections of SEAD-16 and SEAD-17 Monitoring Wells

Observation of the wells at SEAD-16 and SEAD-17 during the Year 6 LTM event indicates that the wells located on the site are in acceptable condition. No root material or other obstructions were observed in the wells at SEAD-16 and SEAD-17 during the Year 6 sampling event.

4.0 REMEDY EVALUATION

As discussed above in **Section 2.5**, approximately 4,427 cy of metal and PAH impacted soil were removed from SEAD-16 and SEAD-17 during the RA conducted in the summer of 2007. The impacted soil was removed to minimize or eliminate the migration of hazardous contaminants 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 over six years following the completion of the 2007 RA shows that the soil removal remedy has been effective in minimizing the migration of select metals from soil to groundwater. Pre-RA groundwater quality concerns associated with arsenic, barium, beryllium, chromium, copper, iron, lead, mercury, nickel and thallium have been eliminated, as each of these metals, with the exception of iron and lead, have not been detected in the groundwater at SEAD-16 in excess of the applicable NYS Class GA or EPA MCL standards since the RA was completed. Lead was found twice at levels in excess of the applicable EPA MCL, but these exceedances were confined to a single well (MW16-7) during the Year 1 and Year 2 post-RA LTM sampling events; lead exceedances in MW16-7 have not been detected during subsequent sampling events. While iron and manganese concentrations in excess of NYS Class GA groundwater quality standards are still present, these results appear to be partially affected by turbidity issues or are attributable to the regional groundwater quality, and are not attributable to site activities. Noted sodium exceedances found in the groundwater at SEAD-16 appear to originate from the salt storage area located upgradient of SEAD-16 which is operated by the Seneca County Highway Department and are not attributable to site activities. Antimony continues to be detected at concentrations above the applicable NYS Class GA standard, but these exceedances appear to be limited to two wells where concentrations have remained generally consistent since the RA was completed.

The groundwater quality at SEAD-17 appears to have improved since the completion of the RA. The few noted groundwater quality exceedances for metals other than iron and manganese appear to be limited to the initial Year 1 or Year 2 post-RA sampling events or to a sample where a turbidity impact is suspected (e.g., the sample collected from MW17-2 during the Year 3 LTM event), and where groundwater quality has improved since the exceedances were reported. Although the concentrations of iron were identified at concentrations above the applicable NYS Class GA standards and the results are greater than what has been observed historically at the site, there is not sufficient trend information to indicate that there a significant change in groundwater conditions. The noted iron exceedances reported for SEAD-17 at this time are isolated and are most likely attributable to regional groundwater quality and are not attributable to site activities.

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 NYS Class GA Groundwater or EPA MCL standards.

As part of the LTM program, SEAD-16 and SEAD-17 were inspected to determine if the LUCs are being maintained. During the Year 6 event, it was confirmed that no residential housing, elementary and/or 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 existing 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 controlling, and in some cases climinating, the migration of select metals from soil to groundwater based on evaluation of the results of the five post-RA LTM sampling events.
- The results of the Year 6 LTM event continue to demonstrate that field filtering may be an effective tool for identifying and evaluating an association between turbidity impacts and groundwater analytical data.
- Post-remediation groundwater monitoring results indicate that the groundwater has not been impacted by site activities, although concentrations were detected above the NYS Class GA or EPA MCL standards.
- The land use 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 evaluation of the pre-RA groundwater data and the data collected during Years 1 through 6 of the post-RA LTM program at SEAD-16 and SEAD-17, the Army recommends that groundwater monitoring continue on an annual basis at SEAD-16 and SEAD-17.

6.0 REFERENCES

Army, 2006. Final Land Use Control Remedial Design for SEAD-27, 66, and 64A, Seneca Army Depot, Romulus, New York. December 2006.

Army, 2010. Addendum 4 Addressing SEAD 1, 2, 5, 16, 17, 59, 71, 121C, and 121I, Land Use Control Remedial Design for SEAD 27, 66, and 64A, Seneca Army Depot Activity, Romulus, New York. April 2010.

EPA, 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, EPA 530/R-09-007, March 2009.

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

Parsons, 1995. Final Expanded Site Inspection, Seven High Priority SWMUs, SEAD 4, 16, 24, 25, 26, and 45. December 1995.

Parsons, 1999. Final Remedial Investigation (RI) Report at the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17). March 1999.

Parsons, 2006. Record of Decision for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17), Final. March 2006.

Parsons, 2006c. Revised Final Sampling and Analysis Plan for Seneca Army Depot Activity (SAP).

Parsons, 2007. Remedial Design Work Plan and Design Report for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17), Final. July 2007.

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. Final Annual Report (Year 2) for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17).

Parsons, 2010. Final Annual Report (Year 3) for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17).

Parsons, 2011. Draft Annual Report (Year 4) for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17).

Parsons, 2014. Final Annual Report (Year 5) for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17).

TABLES

Table 1
SEAD-16 - Groundwater Table Elevations Summary
Draft Annual Report - Year 6 for SEAD-16 and SEAD-17
Seneca Army Depot Activity

Pre-Remedial Action Groundwater Elevation Data

Monitoring Well	Top of PVC Elevation [1] (feet)	April 4, 1994		August 27, 1996		December 6, 1996	
		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
MW 16-2	734.56	3.65	730.91	4.50	730.06	3.71	730.85
MW 16-3	735.48	4.60	730.88	5.43	730.05	4.64	730.84
MW 16-4	733.93	NA	NA	4.83	729.10	2.93	731.00
MW 16-5	733.40	NA	NA	4.76	728.64	2.20	731.20
MW 16-6	733.56	NA	NA	4.54	729.02	2.90	730.66
MW 16-7	734.42	NA	NA	5.06	729.36	4.23	730.19

Post-Remedial Action Groundwater Elevation Data

Monitoring Well	Top of PVC Elevation [1] (feet)	December 20, 2007		2008 Top of PVC Elevation [3, 5] (feet)	December 9, 2008		November 13, 2009		December 13, 2010	
		Depth to Water (feet)	Water Table Elevation (feet)		Depth to Water (feet)	Water Table Elevation [4,5] (feet)	Depth to Water (feet)	Water Table Elevation [5] (feet)	Depth to Water (feet)	Water Table Elevation [5] (feet)
MW 16-1	735.54	4.25	731.29	735.54	4.28	731.26	5.76	729.78	3.16	732.38
MW 16-2	734.56	4.20	730.36	733.48	4.20	729.28	4.35	729.13	4.08	729.40
MW 16-3	735.48	NA	NA	735.48	NA	NA	NA	NA	NA	NA
MW 16-4	733.93	3.00	730.93	733.93	3.42	730.51	3.91	730.02	2.78	731.15
MW 16-5	733.40	1.90	731.50	735.82	3.32	732.50	3.10	732.72	1.68	734.14
MW 16-6	733.56	2.66	730.90	733.56	3.47	730.09	3.68	729.88	2.53	731.03
MW 16-7	734.42	4.45	729.97	734.42	4.63	729.79	4.75	729.67	4.41	730.01

Monitoring Well	2012 Top of PVC Elevation [6] (feet)	December 10, 2012		December 9, 2013	
		Depth to Water (feet)	Water Table Elevation [6] (feet)	Depth to Water (feet)	Water Table Elevation [6] (feet)
MW 16-1	735.53	3.15	732.38	2.94	732.59
MW 16-2	734.86	4.08	730.78	4.18	730.68
MW 16-3	NA	NA	NA	NA	NA
MW 16-4	734.51	2.71	731.80	2.64	731.87
MW 16-5	735.36	1.63	733.73	2.26	733.10
MW 16-6	734.25	2.37	731.88	2.65	731.60
MW 16-7	734.96	4.28	730.68	4.38	730.58

(1) Elevations are relative to the North American Vertical Datum (NAVD) 1988.
(2) April 4, 1994 data were collected as a part of the LSI and August 1996 and December 1996 were collected during the Remedial Investigation phase.
(3) Monitoring well MW16-3 was destroyed during the remedial action conducted at SEAD-16.
(4) PVC riser pipe for wells MW16-2 and MW16-5 was necessary to be cut during December 2008 sampling event due to the PVC preventing the metal casing lid from opening.
(5) MW16-2 and MW16-5 were re-surveyed in Dec 2008 and this data was used for water table elevation calculations for December 9, 2008 through December 13, 2010. MW16-2 Top of PVC elevation is 733.48 ft. and MW16-5 Top of PVC elevation is 735.82 ft.
(6) Wells were re-surveyed with GPS RTK equipment in November 2012. New ground surface and top of the PVC elevations were used for the December 2012 water table elevation calculation.
NA - Not Available.

Table 2
SEAD-17 - Groundwater Table Elevations Summary
Draft Annual Report - Year 6 for SEAD-16 and SEAD-17
Seneca Army Depot Activity

Pre-Remedial Action Groundwater Elevation Data

Monitoring Well	2008 Top of PVC Elevation	Top of PVC Elevation [1] (feet)	April 4, 1994		August 29, 1996		December 6, 1996	
			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	732.625	736.30	2.80	733.50	7.64	728.66	3.01	733.29
MW 17-2		733.75	3.19	730.56	7.24	726.51	3.45	730.30
MW 17-3		732.15	2.38	729.77	7.14	725.01	2.47	729.68
MW 17-4		734.59	3.00	731.59	7.23	727.36	3.13	731.46
MW 17-5		733.58	NA	NA	6.92	726.66	2.65	730.93

Post Remedial Action Groundwater Elevation Data

Monitoring Well	Top of PVC Elevation [1] (feet)	December 19, 2007		2008 Top of PVC Elevation	December 9, 2008		November 11, 2009		December 13, 2010	
		Depth to Water (feet)	Water Table Elevation (feet)		Depth to Water (feet)	Water Table Elevation [3,4] (feet)	Depth to Water (feet)	Water Table Elevation [4] (feet)	Depth to Water (feet)	Water Table Elevation [4] (feet)
MW 17-1	736.30	3.33	732.97	736.30	4.25	732.05	5.60	730.70	3.32	732.98
MW 17-2	733.75	3.31	730.44	733.75	4.07	729.68	5.27	728.48	2.2	731.55
MW 17-3	732.15	2.67	729.48	732.625	3.96	728.67	6.15	726.48	2.51	730.12
MW 17-4	734.59	3.40	731.19	734.59	4.05	730.54	5.75	728.84	3.4	731.19
MW 17-5	733.58	2.90	730.68	733.58	3.46	730.12	4.65	728.93	2.79	730.79

Monitoring Well	2012 Top of PVC Elevation [5] (feet)	December 10, 2012		December 9, 2013	
		Depth to Water (feet)	Water Table Elevation [5] (feet)	Depth to Water (feet)	Water Table Elevation [5] (feet)
MW 17-1	736.39	3.19	733.20	3.52	732.87
MW 17-2	733.65	2.79	730.86	3.15	730.50
MW 17-3	732.05	2.4	729.65	2.73	729.32
MW 17-4	734.62	3.18	731.44	3.2	731.42
MW 17-5	734.12	2.64	731.48	2.79	731.33

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 Phase.
(3) PVC riser pipe for MW17-3 was necessary to be cut during December 2008 sampling event due to the PVC preventing the metal casing lid from opening.
(4) MW17-3 was re-surveyed in December 2008 and this data was used for water table elevation calculations for December 9, 2008 through December 13, 2010. MW17-3 Top of PVC elevation is 732.63 ft.
(5) Wells were re-surveyed with GPS RTK equipment in November 2012. New ground surface and top of the PVC elevations were used for December 2012 water table elevation calculation.
NA = Not Available.

Table 3A
SEAD-16 - Year 6 Filtered and Unfiltered Groundwater Results
Annual Report - Year 6 for SEAD-16 and SEAD-17
Seneca Army Depot Activity

Area			SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16
Loc ID			MW16-1	MW16-1	MW16-2	MW16-2	MW16-4	MW16-4	MW16-5	MW16-5
Matrix			GW	GW	GW	GW	GW	GW	GW	GW
Sample ID			16LM20035F	16LM20035U	16LM20036F	16LM20036U	16LM20037F	16LM20037U	16LM20038F	16LM20038U
Sample Date			12/17/2013	12/17/2013	12/16/2013	12/16/2013	12/17/2013	12/17/2013	12/16/2013	12/16/2013
QC Type			SA	SA	SA	SA	SA	SA	SA	SA
Study ID			LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM
Sample Round			6	6	6	6	6	6	6	6
Filtered Status:			Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total
Parameter	**Units**	**Criteria Level**	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual
Aluminum	UG/L		23 UJ	50 UJ	23 UJ	50 UJ	23 UJ	50 UJ	23 UJ	50 UJ
Antimony	UG/L	3	2.3 UJ	2 UJ	**3.6 J**	**3.2 J**	2.3 UJ	2 UJ	2.3 UJ	2 UJ
Arsenic	UG/L	10	1.3 UJ	1.3 UJ	1.3 UJ	1.3 UJ	1.3 UJ	1.3 UJ	1.3 UJ	1.3 UJ
Barium	UG/L	1,000	63 J	69 J	70 J	66 J	140 J	150 J	40 J	38 J
Beryllium	UG/L	4	0.25 UJ	0.15 UJ	0.25 UJ	0.15 UJ	0.25 UJ	0.15 UJ	0.25 UJ	0.15 UJ
Cadmium	UG/L	5	0.095 UJ	0.13 UJ	0.095 UJ	0.13 UJ	0.095 UJ	0.15 J	0.095 UJ	0.13 UJ
Calcium	UG/L		140,000 J	130,000 J	120,000 J	100,000 J	210,000 J	190,000 J	100,000 J	88,000 J
Chromium	UG/L	50	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	3.6 J	2.5 UJ	2.5 UJ
Cobalt	UG/L		0.9 J	0.94 J	0.23 J	0.23 J	1 J	0.94 J	0.15 UJ	0.12 UJ
Copper	UG/L	200	1.2 J	1.1 UJ	4 J	4.7 J	1.2 J	1.5 J	1.1 UJ	1.1 UJ
Iron	UG/L	300	260 J	280 J	33 UJ	44 UJ	**350 J**	**380 J**	**440 J**	**510 J**
Iron and Manganese	UG/L	500	352 J	378 J	19 J	19 J	**580 J**	**590 J**	**670 J**	**680 J**
Lead	UG/L	15	0.2 UJ	0.5 UJ	0.38 J	1.1 J	0.28 J	0.65 J	0.2 UJ	0.5 UJ
Magnesium	UG/L		22,000 J+	22,000 J	14,000 J+	13,000 J	33,000 J+	31,000 J	10,000 J+	9,500 J
Manganese	UG/L	300	92 J	98 J	19 J	19 J	230 J	210 J	230 J	170 J
Mercury	UG/L	0.7	0.091 UJ	0.091 UJ	0.091 UJ	0.091 UJ	0.091 UJ	0.091 UJ	0.091 UJ	0.091 UJ
Nickel	UG/L	100	3.6 J	2 UJ	2 UJ	2 UJ	3.3 J	2.9 J	2 UJ	2 UJ
Potassium	UG/L		810 J	790 J	1,800 J	1,700 J	2,500 J	2,400 J	2,300 J	1,900 J
Selenium	UG/L	10	1 UJ	1.1 UJ	1 UJ	1.1 UJ	1 UJ	1.1 UJ	1 UJ	1.1 UJ
Silver	UG/L	50	0.25 UJ	0.18 UJ	0.25 UJ	0.18 UJ	0.25 UJ	0.18 UJ	0.25 UJ	0.18 UJ
Sodium	UG/L	20,000	**57,000 J**	**60,000 J**	**22,000 J**	**21,000 J**	**290,000 J**	**270,000 J**	1,400 J	1,300 J
Thallium	UG/L	2	0.5 UJ	0.25 UJ	0.5 UJ	0.25 UJ	0.5 UJ	0.25 UJ	0.5 UJ	0.25 UJ
Vanadium	UG/L		3.8 UJ	3.2 UJ	3.8 UJ	3.2 UJ	3.8 UJ	3.2 UJ	3.8 UJ	3.2 UJ
Zinc	UG/L		8.3 UJ	8.4 UJ	24 J	12 J	8.3 UJ	8.4 UJ	8.3 UJ	8.4 UJ

Notes:
1. The criteria values (where available) are NYS 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 the GA or MCL groundwater standard.
3. Dissolved samples were field filtered using a 0.45 micro filter.
4. A blank in the Criteria Level column indicates no standard established for that compound.

U = compound was not detected
J = the reported value is an estimated concentration
J+ = result is an estimated quantity, biased high
SA = Sample
DU = Duplicate Sample

Table 3A
SEAD-16 - Year 6 Filtered and Unfiltered Groundwater Results
Annual Report - Year 6 for SEAD-16 and SEAD-17
Seneca Army Depot Activity

Area			SEAD-16		SEAD-16		SEAD-16		SEAD-16	
Loc ID			MW16-5		MW16-5		MW16-6		MW16-6		MW16-7		MW16-7	
Matrix			GW		GW		GW		GW		GW		GW	
Sample ID			16LM20039F		16LM20039U		16LM20040F		16LM20040U		16LM20041F		16LM20041U	
Sample Date			12/17/2013		12/17/2013		12/17/2013		12/17/2013		12/17/2013		12/17/2013	
QC Type			DU		DU		SA		SA		SA		SA	
Study ID			LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round			6		6		6		6		6		6	
Filtered Status:			Dissolved		Total		Dissolved		Total		Dissolved		Total	
Parameter	**Units**	**Criteria Level**	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Aluminum	UG/L		23	UJ	50	UJ	23	UJ	50	UJ	23	UJ	50	UJ
Antimony	UG/L	3	2.3	UJ	2	UJ	2.3	UJ	2	UJ	**16**	**J**	**15**	**J**
Arsenic	UG/L	10	1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ
Barium	UG/L	1,000	41	J	41	J	53	J	58	J	100	J	100	J
Beryllium	UG/L	4	0.25	UJ	0.15	UJ	0.25	UJ	0.15	UJ	0.25	UJ	0.15	UJ
Cadmium	UG/L	5	0.095	UJ	0.13	UJ	0.095	UJ	0.13	UJ	0.095	UJ	0.13	UJ
Calcium	UG/L		110,000	J	95,000	J	92,000	J	84,000	J	120,000	J	110,000	J
Chromium	UG/L	50	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ
Cobalt	UG/L		0.15	UJ	0.12	UJ	0.35	J	0.34	J	0.19	J	0.2	J
Copper	UG/L	200	1.1	UJ	1.1	UJ	1.1	UJ	1.1	UJ	3.4	J	2.5	J
Iron	UG/L	300	**490**	**J**	**530**	**J**	180	J	210	J	33	UJ	44	UJ
Iron and Manganese	UG/L	500	**710**	**J**	**720**	**J**	340	J	360	J	16	J	15	J
Lead	UG/L	15	0.22	J	0.5	UJ	0.2	UJ	0.54	J	1.9	J	6	J
Magnesium	UG/L		11,000	J+	10,000	J	9,500	J+	9,500	J	26,000	J+	27,000	J
Manganese	UG/L	300	220	J	190	J	160	J	150	J	16	J	15	J
Mercury	UG/L	0.7	0.091	UJ	0.091	UJ	0.091	UJ	0.091	UJ	0.091	UJ	0.091	UJ
Nickel	UG/L	100	2	UJ	2	UJ	2	UJ	2	UJ	2	UJ	2	UJ
Potassium	UG/L		2,300	J	2,100	J	1,900	J	1,800	J	3,100	J	2,900	J
Selenium	UG/L	10	1	UJ	1.1	UJ	1	UJ	1.1	UJ	1	UJ	1.1	UJ
Silver	UG/L	50	0.25	UJ	0.18	UJ	0.25	UJ	0.18	UJ	0.25	UJ	0.18	UJ
Sodium	UG/L	20,000	1,400	J	1,300	J	14,000	J	13,000	J	**28,000**	**J**	**27,000**	**J**
Thallium	UG/L	2	0.5	UJ	0.25	UJ	0.5	UJ	0.25	UJ	0.5	UJ	0.25	UJ
Vanadium	UG/L		3.8	UJ	3.2	UJ	3.8	UJ	3.2	UJ	3.8	UJ	3.2	UJ
Zinc	UG/L		8.3	UJ	8.4	UJ	8.3	UJ	8.4	UJ	8.3	UJ	8.4	UJ

Notes:
1. The criteria values (where available) are NYS 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 the GA or MCL groundwater standard.
3. Dissolved samples were field filtered using a 0.45 micro filter.
4. A blank in the Criteria Level column indicates no standard established for that compound.

U = compound was not detected
J = the reported value is an estimated concentration
J+ = result is an estimated quantity, biased high

Table 3B
SEAD-17 - Year 6 Filtered and Unfiltered Groundwter Analyses
Annual Report - Year 6 for SEAD-16 and SEAD-17
Seneca Army Depot Activity

Area			SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17
Loc 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			17LM20025F	17LM20025U	17LM20026F	17LM20026U	17LM20027F	17LM20027U	17LM20028F	17LM20028U	17LM20029F	17LM20029U
Sample Date			12/15/2013	12/15/2013	12/15/2013	12/15/2013	12/15/2013	12/15/2013	12/15/2013	12/15/2013	12/15/2013	12/15/2013
QC Type			SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
Study ID			LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM
Sample Round			6	6	6	6	6	6	6	6	6	6
Filtered Status			Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total
Parameter	**Units**	**Criteria Level**	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual
Aluminum	UG/L		23 UJ	50 UJ	23 UJ	50 UJ	23 UJ	50 UJ	23 UJ	50 UJ	23 UJ	50 UJ
Antimony	UG/L	3	2.3 UJ	2 UJ	2.3 UJ	2 UJ	2.3 UJ	2 UJ	2.3 UJ	2 UJ	2.3 UJ	2 UJ
Arsenic	UG/L	10	1.3 J	1.3 UJ	1.3 UJ	1.3 UJ	1.3 UJ	1.3 UJ	1.3 UJ	1.3 UJ	1.3 UJ	1.3 UJ
Barium	UG/L	1,000	60 J	56 J	46 J	47 J	52 J	53 J	20 J	23 J	75 J	86 J
Beryllium	UG/L	4	0.25 UJ	0.15 UJ	0.25 UJ	0.15 UJ	0.25 UJ	0.15 UJ	0.25 UJ	0.15 UJ	0.25 UJ	0.15 UJ
Cadmium	UG/L	5	0.095 UJ	0.13 UJ	0.095 UJ	0.13 UJ	0.095 UJ	0.13 UJ	0.095 UJ	0.13 UJ	0.095 UJ	0.13 UJ
Calcium	UG/L		120,000 J	91,000 J	180,000 J	150,000 J	130,000 J	110,000 J	96,000 J	93,000 J	110,000 J	100,000 J
Chromium	UG/L	50	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ
Cobalt	UG/L		0.34 J	0.29 J	0.44 J	0.38 J	0.31 J	0.3 J	1 J	1.1 J	0.2 J	0.22 J
Copper	UG/L	200	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.3 J	1.1 J	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ
Iron	UG/L	300	**800 J**	**680 J**	**520 J**	**470 J**	33 UJ	110 J	**810 J**	**810 J**	**350 J**	140 J
Iron and Manganese	UG/L	500	**897 J**	**765 J**	**594 J**	**534 J**	2.3 J	112 J	**1,090 J**	**1,090 J**	374 J	167 J
Lead	UG/L	15	0.2 UJ	0.5 UJ	0.2 UJ	0.5 UJ	0.35 J	0.5 UJ	0.2 UJ	0.5 UJ	0.2 UJ	0.5 UJ
Magnesium	UG/L		24,000 J+	19,000 J	24,000 J+	22,000 J	15,000 J+	15,000 J	15,000 J+	15,000 J	18,000 J+	17,000 J
Manganese	UG/L	300	97 J	85 J	74 J	64 J	2.3 J	2 J	280 J	280 J	24 J	27 J
Mercury	UG/L	0.7	0.091 UJ	0.091 UJ	0.091 UJ	0.091 UJ	0.091 UJ	0.091 UJ	0.091 UJ	0.091 UJ	0.091 UJ	0.091 UJ
Nickel	UG/L	100	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ
Potassium	UG/L		500 J	400 J	1,100 J	1,000 J	870 J	840 J	450 J	430 J	1,200 J	1,100 J
Selenium	UG/L	10	1 UJ	1.1 UJ	1 UJ	1.1 UJ	1 UJ	1.1 UJ	1 UJ	1.1 UJ	1 UJ	1.1 UJ
Silver	UG/L	50	0.25 UJ	0.18 UJ	0.25 UJ	0.18 UJ	0.25 UJ	0.18 UJ	0.25 UJ	0.18 UJ	0.25 UJ	0.18 UJ
Sodium	UG/L	20,000	6,000 J	4,800 J	16,000 J	14,000 J	11,000 J	10,000 J	7,800 J	7,800 J	5,400 J	5,300 J
Thallium	UG/L	2	0.5 UJ	0.25 UJ	0.5 UJ	0.25 UJ	0.5 UJ	0.25 UJ	0.5 UJ	0.25 UJ	0.5 UJ	0.25 UJ
Vanadium	UG/L		3.8 UJ	3.2 UJ	3.8 UJ	3.2 UJ	3.8 UJ	3.2 UJ	3.8 UJ	3.2 UJ	3.8 UJ	3.2 UJ
Zinc	UG/L		8.3 UJ	8.4 UJ	11 J	9.3 J	35 J	33 J	8.3 UJ	8.4 UJ	8.3 UJ	8.4 UJ

1. The criteria values (where available) are NYS 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 the GA or MCL groundwater standard.
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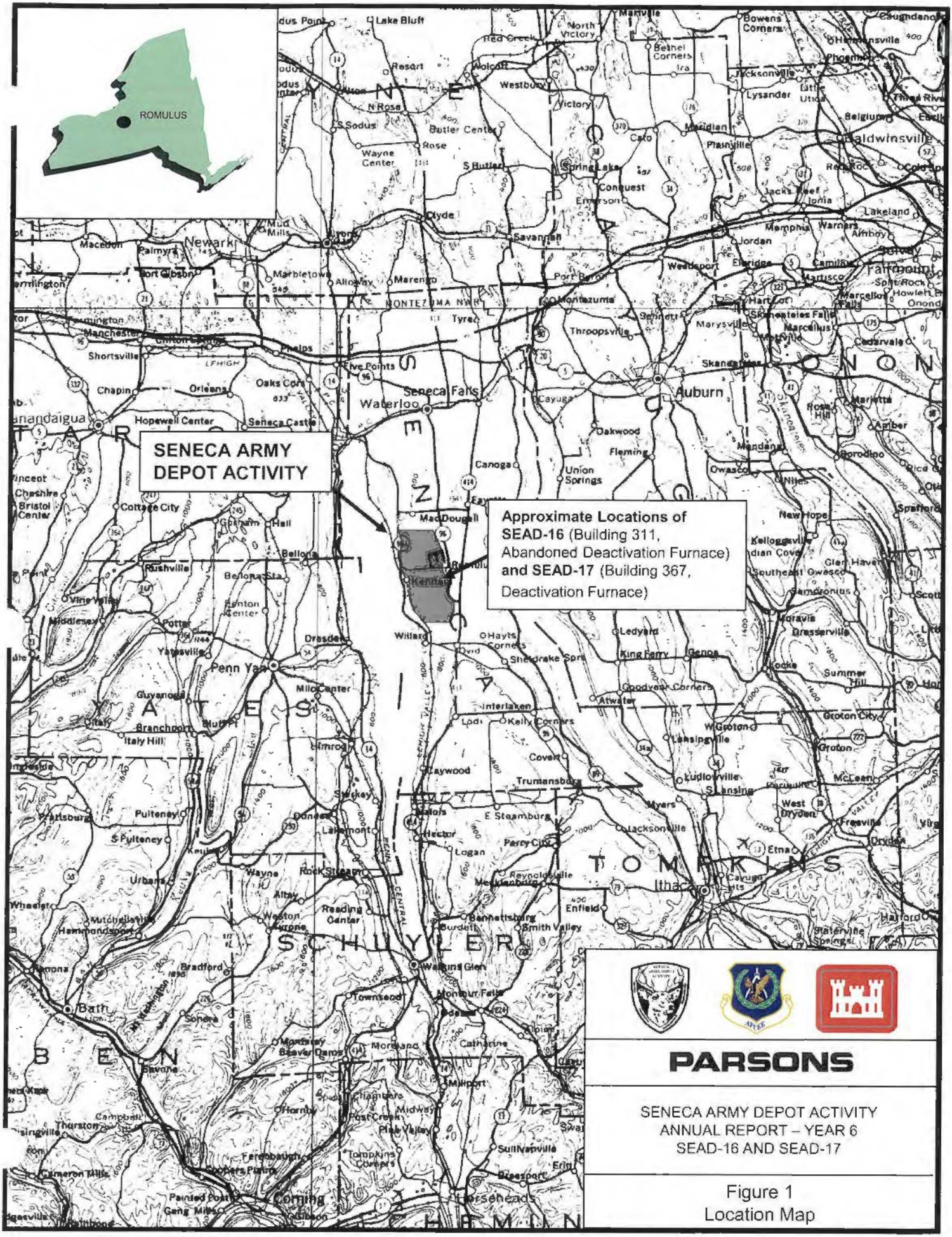
J+ = result is an estimated quantity, biased high

SA = Sample
DU = Duplicate Sample

FIGURES



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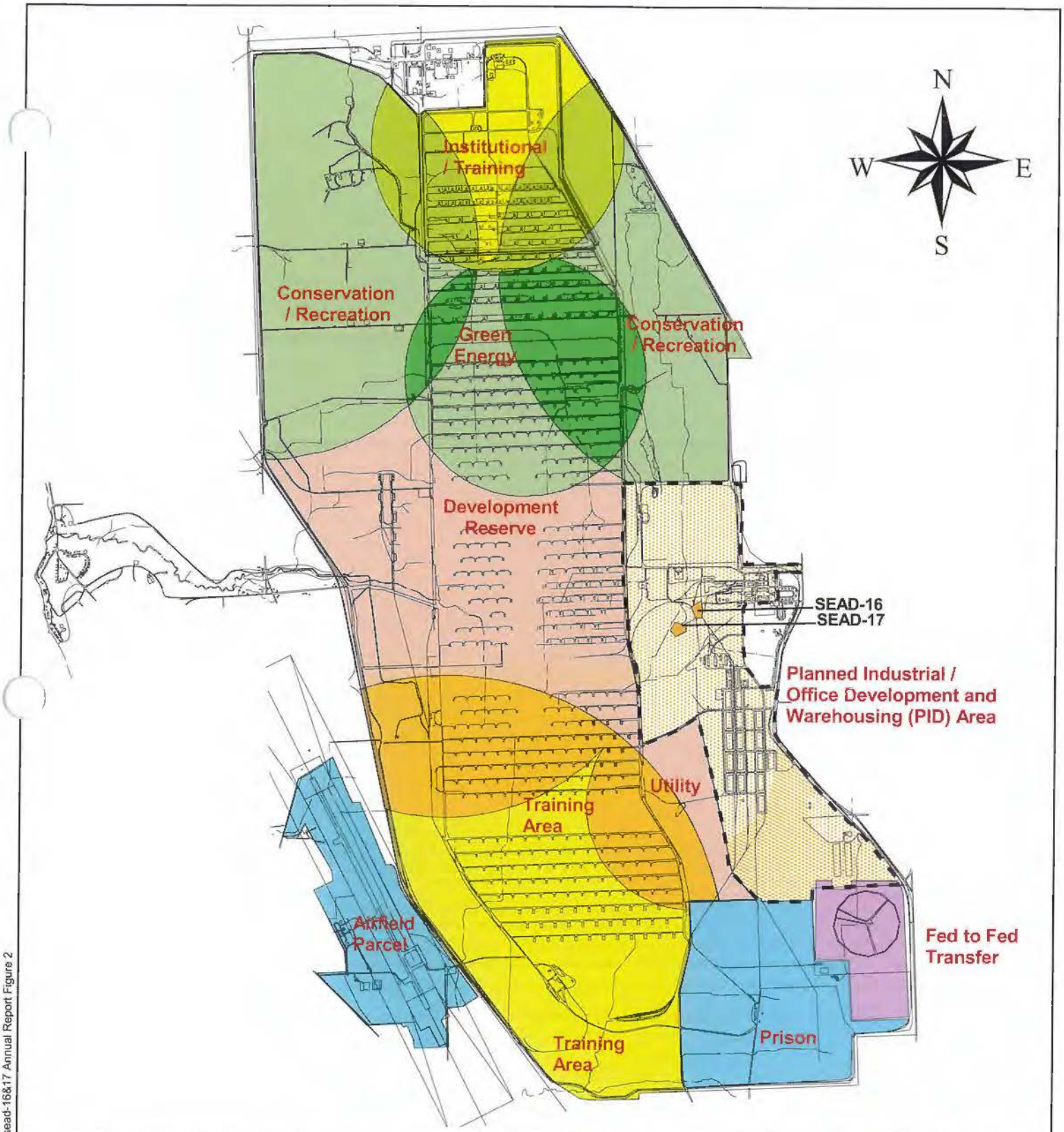

1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 11000 Feet

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 NYS Class GA Groundwater Standards are met.

PARSONS

SENECA ARMY DEPOT ACTIVITY
ANNUAL REPORT - YEAR 6
FOR SEAD-16 AND SEAD-17

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

o:\seneca\pid lucise\16&17 annual report\aprlsead-16&17 Annual Report Figure 2

ANNUAL REPORT - YEAR 6
FOR SEAD-16 AND SEAD-17

LEGEND:

- 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
- MONITORING WELL LOCATION
- LIMITS OF EXCAVATION
- DESTROYED MONITORING WELL LOCATION

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
ANNUAL REPORT - YEAR 6
SEAD-16 AND SEAD-17

DEPT. ENVIRONMENTAL ENGINEERING | Dwg. No. 748662-04300

FIGURE 3
SEAD-16
SITE PLAN

SCALE 1" = 100' | DATE FEBRUARY 2014 | REV -

FILE: P:\PIT\PROJECTS\HUNTSVILLE CONT W912DY-08-D-0003\TO#15 - LTM AND LUC\SEAD 16 AND 17 LTM\ANNUAL REPORT - YR 6 DEC 2013\DRAFT\FIGURES, DATE: 03/13/2014 11:48:41AM, p0018397

N

Unnamed Road

Unnamed Road

Gravel Access Road

MW17-2

MW17-1

Deactivation Furnace Building 867 (DEMOLISHED)

Building 307T (DEMOLISHED)

MW17-3

SEAD17A

MW17-4

MW17-5

Liquid Propane Gas Tank (DEMOLISHED)

Number 2 Fuel Oil Tank (DEMOLISHED)

Approximate Location Of Discharge Pipe

50 0 50 100

SCALE IN FEET

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
ANNUAL REPORT - YEAR 6
SEAD-16 AND SEAD-17

DEPT.	Dwg. No.
ENVIRONMENTAL ENGINEERING	748662-04300

FIGURE 4
SEAD-17
SITE PLAN

SCALE	DATE	REV
1" = 100'	FEBRUARY 2014	-

FILE: P:\PIT\PROJECTS\HUNTSVILLE CONT W9126Y-08-D-0003\TO#15 - LTM AND LUC\SEAD 16 AND 17 LTM\ANNUAL REPORT - YR 6 DEC 2013\DRAFT\FIGURES, DATE: 02/20/2014 08:24:17AM, p0018397

N

ANNUAL REPORT - YEAR 6
FOR SEAD-16 AND SEAD-17

LEGEND:

- ELEVATION CONTOUR
- 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)
- MONITORING WELL LOCATION
- LIMITS OF EXCAVATION
- (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 DECEMBER 2013 GROUNDWATER DATA ELEVATION.

100 0 100 200
SCALE IN FEET

PARSONS

CLIENT/PROJECT TITLE
SENECA ARMY DEPOT ACTIVITY
ANNUAL REPORT - YEAR 6
SEAD-16 AND SEAD-17

DEPT: ENVIRONMENTAL ENGINEERING
Dwg. No: 748662-04300

FIGURE 5
SEAD-16 AND SEAD-17
GROUNDWATER FLOW TREND

SCALE: 1" = 200'
DATE: FEBRUARY 2014
REV: -

P:\PIT\PROJECTS\HUNTSVILLE CENT W912DY-09-D-0003\TO#15 - LTM AND LUCS\SEAD 16 AND 17 LTM\ANNUAL REPORT - YR 6 DEC 2013\DRAFT\FIGURES, DATE: 02/20/2014 10:26:52AM, p0018397

APPENDICES

APPENDIX A

PRE-REMEDIAL ACTION MONITORING DATA

Appendix A
Pre-Remedial Action Groundwater Monitoring Results
Draft Annual Report - Year 6 for SEAD-16 and SEAD-17
Seneca Army Depot Activity

PARAMETER	ACTION LEVEL	SOURCE [1]	UNIT	LOC_ID:	MW16-1	MW16-1	MW16-2	MW16-2	MW16-3	MW16-3	MW16-4	MW16-4	MW16-5	MW16-6	MW16-6	MW16-7	MW16-7	MW16-7
				SAMP ID:	16101	16152	16102	16150	16110	16165	16105	16156	16162	16111	16155	16104	16158	16159
				QC CODE:	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	DU
				STUDY ID:	RI ROUND1	RI ROUND2	RI ROUND1	RI ROUND2	RI ROUND1	RI ROUND2	RI ROUND1	RI ROUND2	RI ROUND2	RI ROUND1	RI ROUND2	RI ROUND1	RI ROUND2	RI ROUND2
				MATRIX:	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
				SAMPLE DATE:	8/27/1996	12/7/1996	8/27/1996	12/6/1996	8/30/1996	12/10/1996	8/28/1996	12/7/1996	12/9/1996	9/3/1996	12/8/1996	8/28/1996	12/8/1996	12/8/1996
SEMIVOLATILE ORGANICS																		
3-Nitroaniline	5	GA	UG/L		26 UJ	25 U	25 U	25 U	25 U	25 U	26 U	25 U	25 U	25 U	25 U	25 J	25 U	25 U
4-Chloroaniline	5	GA	UG/L		10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 J	10 U	10 U
Benzo[ghi]perylene			UG/L		10 UJ	10 U	10 U	10 U	1 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	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	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Diethyl phthalate			UG/L		10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	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	10 U	10 U	10 U	10 U	10 U	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	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	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	0.42 U	0.91	0.89	0.73	0.41 U	0.46 U	1.3
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	0.26 U	0.26 U	0.26 U	0.26 U	0.26	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	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		1850	143 U	1010	490	336	36.1 U	24.9	36.1 U	148 U	208	170 U	12.4	67.4 U	52.9 U
Antimony	3	GA	UG/L		2 U	3 U	2 U	3 U	7.5	5.3 U	2 U	3 U	3 U	2 U	3 U	15.7 U	8.9 U	10 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	4.4 U	4.4 U	2.7 U	4.4 U	4 U	4.4 U	4.4 U
Barium	1,000	GA	UG/L		74.2	48.2 U	48.1	31.4 U	64.4	57.4 U	97.4	55.2 U	67.6 U	86.4	80.2 U	89.2	59.1 U	60.2 U
Beryllium	4	MCL	UG/L		0.23	0.2 U	0.22	0.2 U	0.21	0.2 U	0.21	0.2 U	0.2 U	0.1 U	0.2 U	0.21	0.2 U	0.2 U
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	0.6 U	0.6 U	0.3 U	0.6 U	0.3 U	0.6 U	0.6 U
Calcium			UG/L		157,000	116,000	193,000	164,000	99,800	85,500	130,000	158,000	90,000	44600	84,900	109,000	114,000	117,000
Chromium	50	GA	UG/L		2.7	1 U	2.3	1.1 U	1 U	1 U	1 U	1 U	1 U	1.5	1 U	1	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	1.3 U	1.3 U	1.2	1.3 U	1.2	1.3 U	1.3 U
Copper	200	GA	UG/L		4.9	1.9 U	7.9	2.9 U	19.2	11.4 U	3.6	1.1 U	1.1 U	4.4	1.1 U	5.1	1.4 U	2.1 U
Iron	300	GA	UG/L		2,400 J	296	1,720 J	923 J	432 J	77.8 U	38.2	126	211	273 J	290	23.4	174	160
Lead	15	MCL	UG/L		1.7 U	1.5 U	5.9	6.8	6.1	1.5 U	1.7 U	1.5 U	3 U	1.7 U	1.5 U	8.4	9.9	9.2
Magnesium			UG/L		23,300	17,600	23,700	20,900	11,600	10,000	17,700	22,900	11,800	6370	12,800	16,900	22,600	23,200
Manganese	300	GA	UG/L		210	64.2	129	65.2	130	5.9 U	132	66.9	51	545	1,380	85.7	43.2	44.3
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	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	2.5 U	2.5 U	4.1	2.5 U	2.2	2.5 U	2.5 U
Potassium			UG/L		1670	998 U	4760	3410 U	2740	1900 U	4040	1660 U	18800	3530	2230 U	3220	2090 U	2160 U
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	4.7 UJ	4.7 UJ	2.4 U	4.7 UJ	2.4 U	4.7 UJ	4.7 UJ
Sodium	20,000	GA	UG/L		8,750	3,870 U	19,100	17,000	9,480	7,660	17,200	12,300	49,500	396000	409,000	12,000	9,940	10,200
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	4.1 U	6.9 U	6.2	4.1 U	4.2	11	4.1 U
Vanadium			UG/L		3.3	1.6 U	2.9	1.6 U	1.2 U	1.6 U	1.2 U	1.6 U	1.6 U	2.9	1.6 U	1.2	1.6 U	1.6 U
Zinc			UG/L		15.6 R	5.8 U	37.4 R	13.5 U	32.4 R	42	4.5 R	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.
4. Reported metals results are for total metals.

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

Appendix A
Pre-Remedial Action Groundwater Monitoring Results
Draft Annual Report - Year 6 for SEAD-16 and SEAD-17
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:	GW		GW		GW		GW		GW		GW		GW		GW	
			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.
5. Reported metals results are for total metals.

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

APPENDIX B

SEDA BACKGROUND GROUNDWATER DATA SUMMARY

Appendix B
SEDA Background Groundwater Concentrations
Draft Annual Report - Year 6 for SEAD-16 and SEAD-17
Seneca Army Depot Activity

PARAMETER	UNIT	MAXIMUM	AVERAGE CONCENTRATION	STANDARD DEVIATION	FREQUENCY OF DETECTION	CRITERIA VALUE	TYPE OF CRITERIA	NUMBER OF EXCEEDENCES	NUMBER OF DETECTS	NUMBER OF ANALYSES
Aluminum	UG/L	42,400	2,732	8,207	87%	50	MCL	25	27	31
Antimony	UG/L	52.7	8.2	13.9	13%	3	GA	3	4	31
Arsenic	UG/L	10	1.7	2.2	13%	10	MCL	2	4	31
Barium	UG/L	337	78.2	62.6	94%	1000	GA	0	29	31
Beryllium	UG/L	2.2	0.2	0.4	13%	4	MCL	0	4	31
Cadmium	UG/L	0	0.5	0.5	0%	5	GA	0	0	31
Calcium	UG/L	181,000	115,619	25,274	100%			0	31	31
Chromium	UG/L	69.4	4.7	13.4	48%	50	GA	1	15	31
Cobalt	UG/L	34.6	3.7	7.4	45%			0	14	31
Copper	UG/L	32.5	3.3	6.9	48%	200	GA	0	15	31
Cyanide	UG/L	2.8	NA	NA	3%	200	GA	0	1	31
Iron	UG/L	69,400	4,476	13,429	100%	300	GA	22	31	31
Lead	UG/L	34.8	2.5	6.3	32%	15	MCL	1	10	31
Magnesium	UG/L	58,200	28,568	13,848	100%			0	31	31
Manganese	UG/L	1120	224	254	97%	300	SEC	22	30	31
Mercury	UG/L	0.06	0.04	0.02	23%	0.7	GA	0	7	31
Nickel	UG/L	99.8	7.3	18.7	61%	100	GA	0	19	31
Potassium	UG/L	10,200	3,833	3,010	94%			0	29	31
Selenium	UG/L	3.6	1.5	0.7	19%	10	GA	0	6	31
Silver	UG/L	0.98	1.0	1.0	6%	50	GA	0	2	31
Sodium	UG/L	59,400	14,601	13,877	97%	20000	GA	7	30	31
Thallium	UG/L	4.7	1.5	1.2	13%	2	MCL	4	4	31
Vanadium	UG/L	70.8	5.2	13.5	52%			0	16	31
Zinc	UG/L	143	23.1	34.5	84%	5000	MCL	0	26	31

GA NYSDEC Ambient Water Quality Standards for a source of Drinking Water from Groundwater (TOGS 1.1.1)
MCL Maximum Contaminant Level - Drinking Water Standards and Health Advisory (EPA 822-B-00-001)
SEC Secondary Drinking Water Regulations - Drinking Water Standards and Health Advisory (EPA 822-B-00-001)

APPENDIX C

FIELD FORMS - YEAR 6 LTM GROUNDWATER SAMPLING ACTIVITIES

GW ELEVATION

GROUNDWATER ELEVATION REPORT

PARSONS | CLIENT: | DATE: 12/9/13

PROJECT: SEAD-16/17 LTM | PROJECT NO:

LOCATION: SEDA | INSPECTOR: BBO / SD

MONITORING EQUIPMENT: INSTRUMENT | DETECTOR | BGD | TIME | REMARKS

WATER LEVEL INDICATOR: INSTRUMENT: 19047 Pew | CORRECTION FACTOR:

COMMENTS: overcast, overnight dusting of snow

WELL	TIME	DEPTH TO WATER	DEPTH TO BOTTOM	CORRECTED WATER LEVEL	MEASURED POW	INSTALLED POW	PRODUCT SPEC. GRAV.	WELL STATUS / COMMENTS
16-2	1324	4.18	5.78					PVC lifted, barely got metal lid open
16-6	1326	2.65	6.87					locked
16-4	1329	2.64	7.05					locked, no well cap, stuck in protective case
16-1	1331	2.94	7.97					locked
16-7	1336	4.38	6.74					locked, well cap tough to pull off, suction?
16-5	1339	2.26	5.05					locked
17-2	1344	3.15	7.68					locked
17-3	1346	2.73	7.47					locked
17-4	1348	3.20	8.40					locked no well cap, glove on instead
17-5	1350	2.74	10.13					locked
17-1	1354	3.52	10.22					locked, no well cap

(ALL DEPTH MEASUREMENTS FROM MARKED LOCATION ON RISER)

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW16-1

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 6
LOCATION: ROMULUS, NY

DATE: 12/17/13
INSPECTORS: BBO
PUMP #: Parsons Peristaltic
SAMPLE ID #: 16LM20035U/F

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	WIND DIRECTION (FROM) (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	MONITORING DETECTOR
1042	~12F	snowing		5-10	SE-NW	6-10" snow		

WELL VOLUME CALCULATION FACTORS

DIAMETER (INCHES):	0.25	1	2	3	4	6
GALLONS / FOOT:	0.0026	0.041	0.163	0.367	0.653	1.47
LITERS/FOOT	0.010	0.151	0.617	1.389	2.475	5.564

ONE WELL VOLUME (GAL) = [(POW - STABILIZED WATER LEVEL) X WELL DIAMETER FACTOR (GAL/FT)]

	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND
HISTORIC DATA	7.97'					

DATA COLLECTED AT WELL SITE	PID READING (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC)	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
		3.35' TOR			

RADIATION SCREENING DATA	PUMP PRIOR TO SAMPLING (cps)		PUMP AFTER SAMPLING (cps)	
		4.12' Top of Casing		

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL. (GALLONS)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (umhos)	pH	ORP (mV)	TURBIDITY (NTU)
1104	4.15	YSI in	the well						
1105		Pump	Started	YSI	YSI	Horiba	Horiba	Horiba	Hach Turb 6
1115	4.38	~106		2.49	7.1	0.818	6.93	125	14.0
1120	4.40			2.32	7.2	0.818	6.81	103	9.85
1125	4.40			1.96	7.3	0.813	6.75	64	6.55
1130	4.39	~156		1.79	7.4	0.815	6.72	44	4.60
1135	4.39		~0.5 gals	1.43	7.4	0.821	6.70	35	3.28
1140	4.38		~0.6	1.17	7.4	0.822	6.69	31	3.32
1145	4.39		~1.0 gals	1.12	7.4	0.827	6.69	28	2.22
1150	4.37	~118		0.88	7.5	0.829	6.67	28	1.56
1155	4.39		~1.5 gals	0.72	7.5	0.832	6.66	28	1.28
1200	4.39		~1.75 gals	0.69	7.5	0.833	6.68	26	1.23
1205	4.40		~2.0 gals	0.55	7.5	0.835	6.66	24	1.03
1210	4.43	~180	~2.25 gals	0.51	7.6	0.839	6.69	24	0.72
1215	4.44		~2.5 gals	0.44	7.5	0.839	6.70	22	1.45
1220	4.39		~2.6 gals	0.37	7.5	0.847	6.73	19	0.68
1225	4.38		~2.75 gals	0.30	7.6	0.851	6.81	15	0.80
1230	4.38			0.30	7.6	0.850	6.79	14	0.84
1232		Collected	samples	16LM20035F		1232	field filtered		
				16LM20035U		1234	unfiltered		
1241	4.40	Re Connected Flow		Cell to get		Post-Sample	Collected Geo Parsons		
1246	4.41		~3.5 gals	0.30	7.5	0.851	6.88	12	0.83

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW16-2

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 6
LOCATION: ROMULUS, NY

DATE: 12/16/13
INSPECTORS: BBO
PUMP #: Parston Peristalt
SAMPLE ID #: 16LM20036

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	WIND (FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	MONITORING DETECTOR
1314	~~28~~ 23F	Partly Sunny		5-15	SW→NE	6-10" snow		

WELL VOLUME CALCULATION FACTORS

DIAMETER (INCHES):	0.25	1	2	3	4	6
GALLONS / FOOT:	0.0026	0.041	0.163	0.367	0.654	1.47
LITERS/FOOT	0.010	0.151	0.617	1.389	2.475	5.564

ONE WELL VOLUME (GAL) = [(POW - STABILIZED WATER LEVEL) X WELL DIAMETER FACTOR (GAL/FT)]

	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND
HISTORIC DATA	5.78'					

	PID READING (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC)	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
DATA COLLECTED AT WELL SITE		4.25'			

RADIATION SCREENING DATA	PUMP PRIOR TO SAMPLING (cps)		PUMP AFTER SAMPLING (cps)	

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (us/cm)	pH	ORP (mV)	TURBIDITY (NTU)
1327	4.25	YSI in the well							
1327		Pump Started		YSI	YSI	Horiba	Horiba	Horiba	Hach Turbidimeter
1337	4.29	~152		3.02	4.6	0.432	6.93	248	30
1342	4.29			3.14	4.6	0.454	7.02	250	15.1
1347	4.28	~118		2.83	4.6	0.489	7.05	251	—
1352	4.28			2.22	4.6	0.522	7.08	255	3.86
1357	4.29		~1.0 gal	2.05	4.6	0.537	7.10	254	2.07
1402	4.29		~1.3 gals	1.83	4.6	0.559	7.11	254	0.99
1407	4.29		~1.6 gals	1.56	4.6	0.567	7.12	253	0.96
1414		Samples Collected		16LM20036F			1414	field filtered	
				16LM20036U			1418	unfiltered	
1423		Re-Connected Flow Cell to get Pre-Sample Collection Geo Params							
1428	4.30		~2.3 gals	1.23	4.5	0.590	7.11	253	0.84

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY | PARSONS | WELL #: MW 16-4

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 6
LOCATION: ROMULUS, NY

DATE: 12/17/13
INSPECTORS: Dillman
PUMP #: 19002
SAMPLE ID #: 16LM20037
Dissolved + Total metals

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	WIND (FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	MONITORING DETECTOR
	16°F	Windy, Cloudy, Flurries	100	10-15	West	Snow Covered		

WELL VOLUME CALCULATION FACTORS

DIAMETER (INCHES):	0.25	1	2	3	4	6
GALLONS / FOOT:	0.0026	0.041	0.163	0.367	0.654	1.47
LITERS/FOOT	0.010	0.151	0.617	1.389	2.475	5.564

ONE WELL VOLUME (GAL) = [(POW - STABILIZED WATER LEVEL(X WELL DIAMETER FACTOR (GAL/FT)]

HISTORIC DATA	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND
	7.10					

DATA COLLECTED AT WELL SITE	PID READING (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC)	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
		2.90			

RADIATION SCREENING DATA	PUMP PRIOR TO SAMPLING (cps)		PUMP AFTER SAMPLING (cps)	

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (umhos)	pH	ORP (mV)	TURBIDITY (NTU)
1120	2.90	Started	pump	YSI	YSI	Horiba	Horiba	Horiba	Hach Turbidimeter
1145	2.94	140		0.40	5.7	2.54	6.93	123	
1150	2.94	140		0.35	5.6	2.50	6.89	98	
1155	2.94	140		0.27	5.4	2.49	6.84	35	7.77
1200	2.94	140		0.21	5.3	2.51	6.84	19	7.81
1205	2.94	140		0.19	5.3	2.51	6.83	7	8.21
1210	2.94	140		0.16	5.3	2.52	6.81	-2	8.69
1215	2.94	146		0.15	5.3	2.53	6.80	-10	4.99
1220	2.94	146		0.15	5.3	2.53	6.81	-11	3.06
1225	2.94	146	2 gal.	0.13	5.3	2.52	6.80	-16	2.51
1230	2.94	146		0.12	5.3	2.52	6.80	-20	2.13
1235	2.94	148		0.12	5.3	2.51	6.80	-22	1.92
1240	2.94	148		0.10	5.3	2.51	6.80	-23	1.91
1245	2.94	148	3 gal	0.11	5.3	2.51	6.81	-23	1.81
1250	2.94	150		0.13	5.2	2.52	6.84	-17	1.82
1255	2.94	150		0.12	5.2	2.50	6.81	-24	1.87
1300	2.94	150		0.00	5.2	2.50	6.81	-24	1.90
1310		Sampled	Well	16LM20037F		1310		field filtered	
				16LM20037U		1310		unfiltered	
1313		Post-Sample Geo Param, Reconnected flow cell							
1318	2.95			0.10	5.2	2.48	6.86	-17	1.57

4.2 × 0.16 × 3 ⟶ = 2.02 gal

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW16-5
PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 6		DATE: 12/16/13
LOCATION: ROMULUS, NY		INSPECTORS: Dillmann
		PUMP #: 19002 Peristaltic
		SAMPLE ID #: 16LM20038 DP 16LM 20039

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	WIND (FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	MONITORING DETECTOR
	16	Windy Partly Sunny	90	10-15	NW	Snow Covered		

WELL VOLUME CALCULATION FACTORS

DIAMETER (INCHES):	0.25	1	2	3	4	6
GALLONS / FOOT:	0.0026	0.041	0.163	0.367	0.654	1.47
LITERS/FOOT	0.010	0.151	0.617	1.389	2.475	5.564

ONE WELL VOLUME (GAL) = [(POW - STABILIZED WATER LEVEL) X WELL DIAMETER FACTOR (GAL/FT)]

HISTORIC DATA	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND
	5.07					

DATA COLLECTED AT WELL SITE	PID READING (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC)	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
		2.00			

RADIATION SCREENING DATA	PUMP PRIOR TO SAMPLING (cps)		PUMP AFTER SAMPLING (cps)	

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (umhos)	pH	ORP (mV)	TURBIDITY (NTU)
1315	2.00		Start Pump	1335 YSI 3	210	Horiba U52 #15		800	Hach 1937
1340	2.50	150		0.56	4.3	0.355	6.73	-102	
1345	2.80	90		0.58	3.8	0.344	6.91	-100	
1350	3.14	102		0.65	3.3	0.329	7.05	-91	10.1
1355	3.26	104		0.55	3.3	0.326	7.15	-93	5.81
1400	3.30	104		0.51	3.3	0.325	7.21	-102	5.61
1405	3.38	108	0.9 gal	0.37	3.4	0.335	7.21	-107	2.88
1410	3.46	108		0.27	3.6	0.346	7.23	-112	3.22
1415	3.51	108		0.27	3.6	0.354	7.25	-116	2.85
1420	3.59	108		0.23	3.7	0.358	7.26	-118	2.54
1425	3.67	108		0.20	3.8	0.368	7.25	-121	2.12
1430	3.76	108		0.22	3.9	0.379	7.24	-122	1.93
1435	3.83	108	1.8 gal	0.19	4.0	0.388	7.23	-121	2.07
1440	3.96	108		0.17	4.1	0.393	7.23	-127	2.07
1445	Collect	Sample		@ 1445	Dup	at 1455	for Total & Dissolved	metals	
1520	4.41	108		0.16	4.6	0.410	7.20	-128	
	Collected		16LM20038U		1445	unfiltered			
			16LM20038F		1455	field filtered			

Tubing pump off bottom of well, water clear during sampling (@ 3.10')

and 49

C:\Documents and Settings\c0010112\My Documents\Field Forms\Field Forms for OB & S-25 GW.xls 12/15/2013

3.07 x .16 x 3 = 1.5 gal

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW16-6

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 6
LOCATION: ROMULUS, NY

DATE: 12/17/13
INSPECTORS: BDO
PUMP #: Parson Peristaltic
SAMPLE ID #: 16LM20040

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	WIND DIRECTION (FROM) (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	MONITORING DETECTOR
815	~12	snowy		5-10	SE→NW	8-10" snow		

WELL VOLUME CALCULATION FACTORS

DIAMETER (INCHES):	0.25	1	2	3	4	6
GALLONS / FOOT:	0.0026	0.041	0.163	0.367	0.654	1.47
LITERS/FOOT	0.010	0.151	0.617	1.389	2.475	5.564

ONE WELL VOLUME (GAL) = (POW - STABILIZED WATER LEVEL) X WELL DIAMETER FACTOR (GAL/FT)
3.91 x .163 = 0.65 gals x 3 = 1.95 gals — 1 Vol 2

HISTORIC DATA	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND
	6.87'					

DATA COLLECTED AT WELL SITE	PID READING (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC)	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
		2.88'			

RADIATION SCREENING DATA	PUMP PRIOR TO SAMPLING (cps)		PUMP AFTER SAMPLING (cps)	

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (umhos)	pH	ORP (mV)	TURBIDITY (NTU)
824	2.83	YSI	In the well						
824	3.68	Pump	Started	~~0~~ YSI	YSI	Horiba	Horiba	Horiba	Hach Turb
836	3.65			2.76	6.0	0.347	6.97	243	19.2
844	3.95	~80		2.23	5.9	0.354	7.06	242	12.6
849	4.08	~100		2.01	5.9	0.358	7.08	230	10.9
854	4.16			1.81	6.0	0.364	7.07	220	7.02
859	4.23		0.5 gals	1.90	6.0	0.367	7.06	181	5.51
904	4.29	~74		1.49	6.1	0.372	7.05	145	6.04
909	4.35	~84		1.40	6.1	0.376	7.04	208	5.84
914	4.43	~108	~1.0 gals	1.32	6.1	0.377	7.03	136	~~3.24~~ 3.34
919	4.48			1.21	6.1	0.377	7.03	144	2.48
924	4.56		~1.25 gals	1.09	6.1	0.385	7.03	208	2.64
929	4.64	~102	~1.5 gals	1.17	6.1	0.387	7.01	238	1.88
934	4.69			1.08	6.1	0.394	7.01	232	2.15
939	4.77	~94	~1.75 gals	1.17	6.1	0.403	6.97	132	1.73
944	~~4.88~~	4.84		1.02	6.1	0.409	6.96	78	2.35
949	4.93		~2.0 gals	0.88	6.1	0.418	6.94	43	1.46
954	4.99	~102		0.78	6.2	0.423	6.89	33	3.17
959	5.05		~2.25 gals	0.72	6.2	0.429	6.87	18	1.13
1004	5.12			0.68	6.3	0.433	6.86	11	1.08
1010		Sampler	Collected	16LM20040F		1010	field	filtered	
				16LM20040U		1014	unfiltered		

1017 528 Reattached Flow Cell for Post-Sample Collection QC Parsons

1022 5.35 ~2.5 gals 0.69 6.4 0.440 7.07 -14 2.28

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW 16-7

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 6
LOCATION: ROMULUS, NY

DATE: 12/17/13
INSPECTORS: Dillman
PUMP #: 9002
SAMPLE ID #: 16LM2004[N/F]

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	WIND (FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	MONITORING DETECTOR
8:35	14°F	cloudy, light snow	100	10-15	West	snow covered		

WELL VOLUME CALCULATION FACTORS

DIAMETER (INCHES):	0.25	1	2	3	4	6
GALLONS / FOOT:	0.0026	0.041	0.163	0.367	0.654	1.47
LITERS/FOOT	0.010	0.151	0.617	1.389	2.475	5.564

ONE WELL VOLUME (GAL) = [(POW - STABILIZED WATER LEVEL) X WELL DIAMETER FACTOR (GAL/FT)]

HISTORIC DATA	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND
	6.86					

DATA COLLECTED AT WELL SITE	PID READING (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC)	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
		4.48			

RADIATION SCREENING DATA	PUMP PRIOR TO SAMPLING (cps)		PUMP AFTER SAMPLING (cps)	

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (mmhos)	pH	ORP (mV)	TURBIDITY (NTU)
8:35	~~9.95~~ 4.48	90	Start Pump 495 85 3	2.10	5.8	Horiba U52 15	800		Hach 19315
8:40		100		5.54	6.0	0.662	6.79	228	
8:45	4.68	100		5.70	5.9	0.677	6.86	230	6.85
8:50	4.68	100		5.46	6.0	0.680	6.90	235	5.98
8:55	4.69	100		5.27	5.9	0.692	6.99	234	4.91
9:00	4.71	100		4.97	~~4.99~~	0.713	7.00	235	3.67
9:05	4.71	100		4.56	6.0	0.728	7.01	233	3.01
9:10	4.72	100		4.01	6.0	0.738	7.02	233	2.17
9:15	4.72	100		3.97	6.1	0.750	7.01	235	1.92
9:20	4.72	100		3.79	6.1	0.755	7.03	237	1.85
9:25	4.72	100		3.67	6.1	0.760	7.03	232	1.73
9:30	4.73	100	1.2 gal	3.42	6.2	0.769	7.02	233	1.90
9:35	4.73	100		3.31	6.2	0.772	7.07	230	1.70
9:40	4.73	100		3.19	6.3	0.776	7.07	229	1.92
9:45	4.74	100		3.00	6.3	0.780	7.07	229	1.70
9:50	4.74	100		2.74	6.3	0.785	7.08	225	1.47
9:55	4.74	100		2.61	6.3	0.790	7.08	225	1.67
10:00	4.95	100		2.51	6.3	0.792	7.09	224	1.60
10:05	4.95	100	2.1 gal	2.28	6.3	0.793	7.09	221	1.61
10:10	4.95	100		2.23	6.3	0.792	7.09	221	1.59
10:15	4.95	100	2.5 gal	2.13	6.3	0.788	7.10	219	2.17

10:25 Collect Sample Dissolved & Total metals and Hg

10:40 4.90 100 3.1 gal 1.87 6.2 0.796 7.11 219 2.20

POST SAMPLE READINGS

2.38 x .16 x 3 = 1.14 gal.

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW 17-1

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 6
LOCATION: ROMULUS, NY

DATE: 12/15/13
INSPECTORS: D Illman
PUMP #: 19002
SAMPLE ID #: 17LM20025 4 and F

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	WIND (FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	MONITORING DETECTOR
	27°	windy, cloudy	90	5-15	NW	snow covered		

WELL VOLUME CALCULATION FACTORS

DIAMETER (INCHES):	0.25	1	2	3	4	6
GALLONS / FOOT:	0.0026	0.041	0.163	0.367	0.654	1.47
LITERS/FOOT	0.010	0.151	0.617	1.389	2.475	5.564

ONE WELL VOLUME (GAL) = [(POW - STABILIZED WATER LEVEL) X WELL DIAMETER FACTOR (GAL/FT)]

	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND
HISTORIC DATA	10.22					

	PID READING (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC)	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
DATA COLLECTED AT WELL SITE		3.68			

RADIATION SCREENING DATA	PUMP PRIOR TO SAMPLING (cpm)		PUMP AFTER SAMPLING (cpm)	

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL. (GALLONS)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (umhos)	pH	ORP (mV)	TURBIDITY (NTU)
1:10	3.68		Start Pump	YSI	YSI	Horiba	Horiba	Horiba	Hach Turbidimeter
1:18	4.07			0.22	7.4	0.456	7.33	-56	—
1:21	4.10	130		0.14	7.3	0.458	7.32	-68	—
1:25	4.09	140		0.10	7.2	0.462	7.31	-76	27.4
1:30	4.09	140		0.10	7.1	0.468	7.30	-81	23.9
1:35	4.09	140		0.09	7.1	0.469	7.29	-83	26.5
1:40	4.09	140	1.1 gal	0.08	7.1	0.472	7.28	-85	19.8
1:45	4.13	140		0.10	7.1	0.473	7.28	-86	19.7
1:50	4.14	140		0.10	7.2	0.475	7.26	-86	19.4
1:55	4.16	140	2 gal	0.10	7.4	0.483	7.28	-87	15.8
2:00	4.18	140		0.11	7.3	0.485	7.27	-86	12.9
2:05	4.20	140		0.11	7.3	0.489	7.27	-84	9.47
2:10	4.20	140		0.12	7.3	0.489	7.27	-82	7.56
2:15	4.20	140	3 gal	0.12	7.3	0.510	7.27	-79	5.25
2:20	4.20	140		0.12	7.3	0.514	7.26	-77	6.45
2:25	4.20	140		0.11	7.3	0.519	7.27	-76	4.94
2:30	4.20	140	3.5	0.12	7.4	0.522	7.27	-75	5.67
3:05	4.19	140		0.13	7.2	0.519	7.30	-66	5.13
3:10	4.18	140		0.13	7.2	0.515	7.28	-69	5.18
3:15	4.16	140	4 gal	0.12	7.2	0.517	7.28	-71	4.47
Collect Sample 1515 for Total and Dissolved Metals and Hg									
3:40	4.15		Post sample Meas.	0.14	7.2	0.520	7.29	-63	4.83

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY | PARSONS | WELL #: MW17-2

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 6
LOCATION: ROMULUS, NY

DATE: 12/15/13
INSPECTORS: BDO
PUMP #: Parsons Peristaltic
SAMPLE ID #: 17LM20026 4/F

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	WIND (FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	MONITORING DETECTOR
938	26F	overcast/clear		0-5	W-E	6-8" snow		

WELL VOLUME CALCULATION FACTORS

DIAMETER (INCHES):	0.25	1	2	3	4	6
GALLONS / FOOT:	0.0026	0.041	0.163	0.367	0.654	1.47
LITERS/FOOT	0.010	0.151	0.617	1.389	2.475	5.564

ONE WELL VOLUME (GAL) = [(POW - STABILIZED WATER LEVEL) X WELL DIAMETER FACTOR (GAL/FT)]

	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND
HISTORIC DATA	7.68'					
	PID READING (OPENING WELL)	**DEPTH TO STATIC WATER LEVEL (TOC)**	**DEPTH TO STABILIZED WATER LEVEL (TOC)**	**DEPTH TO PUMP INTAKE (TOC)**	**PUMPING START TIME**	
DATA COLLECTED AT WELL SITE		3.65'				
RADIATION SCREENING DATA	PUMP PRIOR TO SAMPLING (cps)		PUMP AFTER SAMPLING (cps)			

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (umhos)	pH	ORP (mV)	TURBIDITY (NTU)
950	3.60	YSI in the well							
950		Pump Started		YSI	YSI	Horiba	Horiba	Horiba	Hach Turbidimeter
1000	4.38	~104		1.57	6.7	0.729	6.80	233	13.9
1005	4.52	~80		1.17	6.8	0.743	6.96	207	11.3
1010	4.67			0.87	6.8	0.757	7.02	111	10.4
1015	4.80	~100		0.80	6.9	0.770	7.02	46	5.98
1020	4.92		~0.5 gals	0.79	6.9	0.777	7.02	17	7.67
1025	4.99	~80		0.50	6.9	0.782	7.02	3	4.99
1030	5.12	90		0.28	6.9	0.786	7.02	-4	3.39
1035	5.35	~115		0.38	6.9	0.805	7.01	-9	2.97
1040	5.49	~100	~1.0 gals	0.23	6.9	0.795	7.01	-11	1.75
1045	5.49			0.32	6.9	0.796	7.01	-13	2.84
1050	5.54			0.27	6.9	0.801	7.00	-14	1.44
1055	5.58		~1.25 gals	0.17	6.9	0.804	7.00	-14	1.35
1100	5.59			0.17	7.6	0.798	7.00	-15	2.02
1105	5.63		~1.5 gals	0.15	7.0	0.802	7.00	-16	1.01
1110	5.67		~1.6 gals	0.17	7.0	0.802	6.99	-15	0.71
						Time			
1116		Sample	Collected	17LM20026 4		1121	unfiltered		
				17LM20026F		1118	field filtered		
1124		Re-Connected flowcell for Post-Sample Collection Gw Param							
1131	5.76		~2.0 gals Total purge	0.16	7.0	0.787	6.97	-11	1.59

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW 17-3

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 6
LOCATION: ROMULUS, NY

DATE: 12/15/13
INSPECTORS: D. Ilnicki
PUMP #: 19007
SAMPLE ID #: 17LM20027Q/F

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	WIND (FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS
	27°	Breezy, flurries	95	5-15	NW	Snow covered

MONITORING INSTRUMENT	MONITORING DETECTOR

WELL VOLUME CALCULATION FACTORS

DIAMETER (INCHES):	0.25	1	2	3	4	6
GALLONS / FOOT:	0.0026	0.041	0.163	0.367	0.653	1.47
LITERS/FOOT	0.010	0.151	0.617	1.389	2.475	5.564

ONE WELL VOLUME (GAL) = [(POW - STABILIZED WATER LEVEL) X WELL DIAMETER FACTOR (GAL/FT)]

HISTORIC DATA	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND
	7.35					

DATA COLLECTED AT WELL SITE	PID READING (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC)	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
		3.91			

RADIATION SCREENING DATA	PUMP PRIOR TO SAMPLING (cps)		PUMP AFTER SAMPLING (cps)	

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (mmhos)	pH	ORP (mV)	TURBIDITY (NTU)
1000	3.91		Start Pump	45E 85 32	10	HoRIBA U52	14444		Hach 2100Q 19319
1010	5.50	110		3.09	6.7	0.448	6.89	222	5.17
1015	5.56	110		2.89	6.9	0.454	6.94	219	4.60
1020	5.55	110		3.10	6.9	0.463	6.96	218	3.49
1025	5.57	100		2.94	7.0	0.479	7.00	214	2.91
1030	5.59	100		2.79	7.1	0.494	7.02	214	2.57
1035	5.61	100		2.76	7.1	0.495	7.02	215	2.28
1040	5.63	100		2.58	7.1	0.510	7.04	213	2.33
1045	5.64	100		2.57	7.2	0.519	7.03	212	2.31
1050	5.65	100	↑	2.47	7.2	0.520	7.05	210	2.12
1055	5.69	95	1.8 gal	2.34	7.2	0.540	7.06	208	1.99
1100	5.70	98		2.25	7.2	0.556	7.07	205	1.86
1105	5.74	101		2.04	7.3	0.552	7.08	202	2.11
1110	5.78	101		2.00	7.3	0.560	7.09	201	1.76
1115	5.81	101		2.03	7.3	0.563	7.09	198	1.76
1120	5.85	101	2.8 gal	2.00	7.3	0.570	7.10	199	1.76
1125	5.88	101		1.96	7.3	0.586	7.11	200	1.81
1130	5.90	101		1.77	7.3	0.592	7.11	199	2.40
1135	5.93	101		1.70	7.3	0.599	7.11	199	1.72
1140	5.94	101	3.1 gal	1.73	7.3	0.603	7.11	199	1.79
1150	6.04	101	3.3 gal	1.43	7.4	0.611	7.12	195	1.79

Collect sample for Total and Dissolved metals at 11:55

1215	101	3.5 gal	1.29	7.5	0.621	7.16	205	1.79

Post sample measurements

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: 4W17-4

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 6
LOCATION: ROMULUS, NY

DATE: 12/15/13
INSPECTORS: BDU
PUMP #: Parsons Peristaltic
SAMPLE ID #: 17LM20028

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	WIND DIRECTION (FROM) (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	MONITORING DETECTOR
1425	26	Mostly clear sky		0-10	S-7N	6-10" snow		

WELL VOLUME CALCULATION FACTORS

DIAMETER (INCHES):	0.25	1	2	3	4	6
GALLONS / FOOT:	0.0026	0.041	0.163	0.367	0.654	1.47
LITERS/FOOT	0.010	0.151	0.617	1.389	2.475	5.564

ONE WELL VOLUME (GAL) = [(POW - STABILIZED WATER LEVEL) X WELL DIAMETER FACTOR (GAL/FT)]

HISTORIC DATA	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND
	8.40'					

DATA COLLECTED AT WELL SITE	PID READING (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC)	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
		3.34'			

RADIATION SCREENING DATA	PUMP PRIOR TO SAMPLING (cps)		PUMP AFTER SAMPLING (cps)	

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL. (GALLONS)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (umhos)	pH	ORP (mV)	TURBIDITY (NTU)
1430	3.22	YSI in the well							
1435		Pump	Started	YSI	YSI	Horiba	Horiba	Horiba	Hach Turbidimeter
1444	3.68	~120		2.68*	6.3	0.491	7.25	89	11.2
1449	3.67	~130		2.64	6.2	0.501	7.11	71	8.51
1454	3.69			2.08	6.1	0.500	7.05	39	5.13
1459	3.70			1.72	6.2	0.503	6.99	17	3.75
1504	3.72		~0.5 gals	1.59	6.2	0.503	6.95	7	3.25
1509	3.74			1.43	6.2	0.506	6.93	-1	2.71
1514	3.74		~1.0 gals	1.44	6.2	0.506	6.92	-6	2.90
1519	3.75			1.14	6.3	0.508	6.90	-10	3.16
1524	3.70		~1.25 gals	0.90	6.3	0.507	6.90	-12	2.19
1529	3.80			0.70	6.3	0.506	6.87	-13	1.47
1534	3.85		~1.75 gals	0.76	6.2	0.508	6.86	-14	1.49
1539	3.81	~118		0.78	6.2	0.509	6.85	-15	1.23
1544	3.85		~2.0 gals	0.63	6.3	0.508	6.84	-16	1.08
1549	3.88			0.52	6.3	0.505	6.83	-16	1.32
1554	3.88		~2.25 gals	0.36	6.3	0.506	6.83	-17	1.41
1602		Samples	Collected	17LM20025H		Time 1605	unfiltered		
				17LM20028F		1602	field filtered		
1607		Re-Connected Flow	Cell to Cart			Post Sample Collection GW Parameters			
1612	3.89		2.5 gals	0.36	6.2	0.495	7.11	-31	2.15

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW17-5

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 6
LOCATION: ROMULUS, NY

DATE: 12/15/13
INSPECTORS: BBO
PUMP #: Parsan Peristaltic
SAMPLE ID #: 17LM20029

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	WIND (FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	MONITORING DETECTOR
1209	26F	cloudy		0-5	S→N	6-8" snow		
1330	20's	mostly cloudy		5-15	W→E			

WELL VOLUME CALCULATION FACTORS

DIAMETER (INCHES):	0.25	1	2	3	4	6
GALLONS / FOOT:	0.0026	0.041	0.163	0.367	0.654	1.47
LITERS/FOOT	0.010	0.151	0.617	1.389	2.475	5.564

ONE WELL VOLUME (GAL) = [(POW - STABILIZED WATER LEVEL) X WELL DIAMETER FACTOR (GAL/FT)]

	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND
HISTORIC DATA	10.3'					
	PID READING (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC)		DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
DATA COLLECTED AT WELL SITE		2.87'				
RADIATION SCREENING DATA	PUMP PRIOR TO SAMPLING (cps)			PUMP AFTER SAMPLING (cps)		

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (mmhos)	pH	ORP (mV)	TURBIDITY (NTU)
1228	2.87	YSI in the well							
1231		Pump Started		YSI	YSI	Horiba	Horiba	Horiba	Hach Turbidimeter
1239	2.93'	—		0.62	7.5	0.530	7.10	39	124
1244	2.93	~108		0.21	7.6	0.528	7.06	46	64.8
1249	2.95			0.11	7.6	0.525	7.04	56	28
1254	2.97		~0.5 gals	0.09	7.6	0.525	7.02	61	18.9
1259	2.97			0.10	7.7	0.524	7.01	64	14.9
1304	2.97		~1.0 gals	0.11	7.8	0.524	7.00	64	9.83
1309	2.94	~130	~1.4 gals	0.46	8.4	0.524	7.00	62	6.31
1314	2.96			0.37	8.4	0.524	7.00	59	13.8
1319	2.96		~1.75 gals	0.26	8.3	0.524	6.99	54	6.42
1324	2.96	~140	~2.0 gals	0.28	8.3	0.523	7.00	49	6.63
1329	2.96		~2.25 gals	0.30	8.2	0.523	6.98	50	5.19
1334	2.97		~2.5 gals	0.30	8.2	0.524	6.95	53	4.22
1339	2.96		~2.75 gals	0.28	8.2	0.524	6.91	55	3.54
1344	2.96		~2.75 gals	0.26	8.2	0.524	6.92	54	2.65
1350		Samples Collected		17LM20029F		1351	field filtered		
				17LM20029U		1354	unfiltered		
1358		Reconnected flow cell for Post-Sample Collection Geo Params							
1404	2.97		~3.4 gals	0.22	8.2	0.525	6.95	46	2.18

APPENDIX D

POST-REMEDIAL ACTION MONITORING RESULTS (YEARS 1 THROUGH 6)

Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 6)
Draft Annual Report - Year for SEAD-16 and SEAD-17
Seneca Army Depot Activity

Area							SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16
Loc ID							MW16-1	MW16-1	MW16-1	MW16-1	MW16-1	MW16-1	MW16-1
Matrix							GW	GW	GW	GW	GW	GW	GW
Sample ID							16LM20000	16LM20001	16LM20013	16LM20014FIL	16LM20014UNFIL	16LM20021FIL	16LM20021UNF
Sample Date							12/20/2007	12/20/2007	12/9/2008	11/13/2009	11/13/2009	12/16/2010	12/16/2010
QC Type							SA	DU	SA	SA	SA	SA	SA
Study ID							LTM	LTM	LTM	LTM	LTM	LTM	LTM
Sample Round							1	1	2	3	3	4	4
Filtered							Total	Total	Total	Dissolved	Total	Dissolved	Total
Parameter	Unit	Criteria [1] Source	Criteria [1] Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual
Inorganics													
Aluminum	UG/L				27	70	61.4 J	91.6 J	148 J	24 U	45 J	23 U	50 U
Antimony	UG/L	GA	3	32	39	70	1 U	1.02	0.95 J	1 U	1 U	2.3 U	2 U
Arsenic	UG/L	MCL	10	0	6	70	4.2 U	4.2 U	3.7 U	3.7 U	3.7 U	1.3 U	1.3 U
Barium	UG/L	GA	1,000	0	70	70	60.4	59	125	105	104	110	97 J
Beryllium	UG/L	MCL	4	0	0	70	0.27 U	0.27 U	0.33 U	0.3 U	0.3 U	0.25 U	0.15 U
Cadmium	UG/L	GA	5	0	3	70	0.36 U	0.36 U	0.33 U	0.3 U	0.3 U	0.095 U	0.13 U
Calcium	UG/L				70	70	107,000 J	105,000 J	176,000	111,000 J	110,000 J	140,000	130,000
Chromium	UG/L	GA	50	0	5	70	0.84 U	0.84 U	0.88 U	0.9 U	0.9 U	2.5 U	2.5 U
Cobalt	UG/L				29	70	0.89 U	0.89 U	1.1 U	1.1 U	1.1 U	1.1	1.1
Copper	UG/L	GA	200	0	51	70	1.3 U	1.3 U	1.3 U	1.6 J	1.6 J	1.1 U	1.1 U
Iron	UG/L	GA	300	20	49	70	35.8 J	68.3	93.3	19 UJ	19 UJ	77 J	100 J
Iron+Manganese	UG/L	GA	500	19	66	70	39 J	73	105	1 J	2.4 J	131 J	152 J
Lead	UG/L	MCL	15	2	30	70	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	0.2 U	0.5 U
Magnesium	UG/L				60	60	16,100 J	15,900 J	25,800	18,000	17,900	21,000	20,000 J
Manganese	UG/L	GA	300	1	66	70	3.3	5	11.8	1 J	2.4 J	54	52
Mercury	UG/L	GA	0.7	0	3	70	0.12 U	0.12 U	0.12 U	0.1 U	0.1 U	0.091 U	0.091 U
Nickel	UG/L	GA	100	0	38	70	1.2 U	1.2 U	1 U	1.8 J	1.2 J	2.8 J	2.7 J
Potassium	UG/L				64	64	886 R	907 R	1,340 J	1,110	1,100	1,200	1,100
Selenium	UG/L	GA	10	0	0	70	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	1 U	1.1 U
Silver	UG/L	GA	50	0	0	70	1 U	1 U	1.3 U	1.3 U	1.3 U	0.25 U	0.18 U
Sodium	UG/L	GA	20,000	44	68	68	24,200 J	25,300 J	182,000	8,000 J	8,000 J	170,000 J	160,000 J
Thallium	UG/L	MCL	2	0	1	70	0.03 U	0.03 U	0.09 U	0.2 U	0.2 U	0.5 U	0.25 U
Vanadium	UG/L				7	70	0.78 U	0.78 U	0.98 U	1 U	1 U	3.8 U	3.2 U
Zinc	UG/L				28	70	4.4 J	7.8 J	5.8 J	3.6 U	3.6 U	8.3 U	8.8 J

Notes:

1. The lowest value for either the New York Class GA Groundwater Standards (TOGS 1.1.1, June 1998, et al.) or the EPA Maximum Contaminant Limit (MCL), source http://www.epa.gov/safewater/mcl.html#inorganic.html is used. A blank cell indicates no criteria value available.
2. Data validation qualifier
   [empty cell] = data is not qualified
   U = compound not detected at concentration listed
   J = the reported value is an estimated concentration
   J+ = result is an estimated quantity, biased high
   R = the result was rejected due to QA/QC considerations
   UJ = detection limit is estimated
3. Shading indicates a concentration above the identified criteria value.
   SA = Sample
   DU = Duplicate Sample
4. Rejected values are not included in the number of samples analyzed.

Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 6)
Draft Annual Report - Year for SEAD-16 and SEAD-17
Seneca Army Depot Activity

Area							SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16	
Loc ID							MW16-1		MW16-1		MW16-1		MW16-1		MW16-2		MW16-2	
Matrix							GW		GW		GW		GW		GW		GW	
Sample ID							16LM20028F		16LM20028U		16LM20035F		16LM20035U		16LM20002		16LM20007	
Sample Date							12/15/2012		12/15/2012		12/17/2013		12/17/2013		12/20/2007		12/9/2008	
QC Type							SA		SA		SA		SA		SA		SA	
Study ID							LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round							5		5		6		6		1		2	
Filtered							Dissolved		Total		Dissolved		Total		Total		Total	
Parameter	Unit	Criteria [1] Source	Criteria [1] Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																		
Aluminum	UG/L				27	70	23	UJ	50	UJ	23	UJ	50	UJ	98.8	J	97.1	J
Antimony	UG/L	GA	3	32	39	70	2.3	UJ	2	UJ	2.3	UJ	2	UJ	**3.36**		**5.53**	
Arsenic	UG/L	MCL	10	0	6	70	1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ	4.2	U	3.7	U
Barium	UG/L	GA	1,000	0	70	70	78	J	78	J	63	J	69	J	64.6		69.7	
Beryllium	UG/L	MCL	4	0	0	70	0.25	UJ	0.15	UJ	0.25	UJ	0.15	UJ	0.27	U	0.33	U
Cadmium	UG/L	GA	5	0	3	70	0.095	UJ	0.13	UJ	0.095	UJ	0.13	UJ	0.36	U	0.33	U
Calcium	UG/L				70	70	120,000	J	120,000	J	140,000	J	130,000	J	143,000	J	138,000	
Chromium	UG/L	GA	50	0	5	70	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ	0.84	U	0.88	U
Cobalt	UG/L				29	70	0.15	UJ	0.16	J	0.9	J	0.94	J	0.89	U	1.1	U
Copper	UG/L	GA	200	0	51	70	5.2	J	5	UJ	1.2	J	1.1	UJ	4.5	J	4	J
Iron	UG/L	GA	300	20	49	70	33	UJ	44	UJ	260	J	280	J	49.5	J	26.1	J
Iron+Manganese	UG/L	GA	500	19	66	70	34	UJ	46	UJ	352	J	378	J	53	J	27	
Lead	UG/L	MCL	15	2	30	70	0.2	UJ	0.5	UJ	0.2	UJ	0.5	UJ	2.9	U	2.9	U
Magnesium	UG/L				60	60	18,000	J	18,000	J	22,000	J+	22,000	J	15,600	J	15,700	
Manganese	UG/L	GA	300	1	66	70	1	UJ	2	UJ	92	J	98	J	3.4		0.84	J
Mercury	UG/L	GA	0.7	0	3	70	0.091	UJ	0.091	UJ	0.091	UJ	0.091	UJ	0.12	U	0.148	J
Nickel	UG/L	GA	100	0	38	70	2.3	J	2	UJ	3.6	J	2	UJ	1.2	U	1.6	J
Potassium	UG/L				64	64	900	J	870	J	810	J	790	J	2,050	R	2,410	J
Selenium	UG/L	GA	10	0	0	70	1	UJ	1.1	UJ	1	UJ	1.1	UJ	6.1	U	6.1	U
Silver	UG/L	GA	50	0	0	70	0.25	UJ	0.18	UJ	0.25	UJ	0.18	UJ	1	U	1.3	U
Sodium	UG/L	GA	20,000	44	68	68	**63,000**	**J**	**62,000**	**J**	**57,000**	**J**	**60,000**	**J**	**49,600**	**J**	**63,500**	
Thallium	UG/L	MCL	2	0	1	70	0.5	UJ	0.25	UJ	0.5	UJ	0.25	UJ	0.03	U	0.09	U
Vanadium	UG/L				7	70	3.8	UJ	3.2	UJ	3.8	UJ	3.2	UJ	0.78	U	0.98	U
Zinc	UG/L				28	70	8.3	UJ	8.4	UJ	8.3	UJ	8.4	UJ	8.2	J	10.2	

Area							SEAD-16		SEAD-16		SEAD-16	
Loc ID							MW16-2		MW16-2		MW16-2	
Matrix							GW		GW		GW	
Sample ID							16LM20015FIL					
Sample Date							11/11/2009					
QC Type							SA					
Study ID							LTM					
Sample Round							3					
Filtered							Dissolved					
Parameter	Unit	Criteria [1] Source	Criteria [1] Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual				
Inorganics												
Aluminum	UG/L				27	70	24	U				
Antimony	UG/L	GA	3	32	39	70	**3.6**					
Arsenic	UG/L	MCL	10	0	6	70	3.7	U				
Barium	UG/L	GA	1,000	0	70	70	71.9					
Beryllium	UG/L	MCL	4	0	0	70	0.3	U				
Cadmium	UG/L	GA	5	0	3	70	0.3	U				
Calcium	UG/L				70	70	118,000	J				
Chromium	UG/L	GA	50	0	5	70	0.9	U				
Cobalt	UG/L				29	70	1.1	U				
Copper	UG/L	GA	200	0	51	70	3.4	J				
Iron	UG/L	GA	300	20	49	70	19	UJ				
Iron+Manganese	UG/L	GA	500	19	66	70	39.5					
Lead	UG/L	MCL	15	2	30	70	2.9	U				
Magnesium	UG/L				60	60	12,600					
Manganese	UG/L	GA	300	1	66	70	39.5					
Mercury	UG/L	GA	0.7	0	3	70	0.1	U				
Nickel	UG/L	GA	100	0	38	70	2.2	J				
Potassium	UG/L				64	64	3,170					
Selenium	UG/L	GA	10	0	0	70	6.1	U				
Silver	UG/L	GA	50	0	0	70	1.3	U				
Sodium	UG/L	GA	20,000	44	68	68	19,500	J				
Thallium	UG/L	MCL	2	0	1	70	0.2	U				
Vanadium	UG/L				7	70	1	U				
Zinc	UG/L				28	70	11.1					

Notes:

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Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 6)
Draft Annual Report - Year for SEAD-16 and SEAD-17
Seneca Army Depot Activity

Area							SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16
Loc ID							MW16-2	MW16-2	MW16-2	MW16-2	MW16-2	MW16-2	MW16-2
Matrix							GW	GW	GW	GW	GW	GW	GW
Sample ID							16LM20015UNFIL	16LM20022FIL	16LM20022UNF	16LM20023FIL	16LM20023UNF	16LM20029F	16LM20029U
Sample Date							11/11/2009	12/15/2010	12/15/2010	12/15/2010	12/15/2010	12/15/2012	12/15/2012
QC Type							SA	SA	SA	DU	DU	SA	SA
Study ID							LTM	LTM	LTM	LTM	LTM	LTM	LTM
Sample Round							3	4	4	4	4	5	5
Filtered							Total	Dissolved	Total	Dissolved	Total	Dissolved	Total
Parameter	Unit	Criteria [1] Source	Criteria [1] Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual
Inorganics													
Aluminum	UG/L				27	70	205	23 U	50 U	23 U	50 U	23 UJ	50 UJ
Antimony	UG/L	GA	3	32	39	70	3.6	6.1	6.6	6.1	6	7.8 J	7.1 J
Arsenic	UG/L	MCL	10	0	6	70	3.7 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 UJ	1.3 UJ
Barium	UG/L	GA	1,000	0	70	70	72.7	68	77 J	67	69 J	65 J	62 J
Beryllium	UG/L	MCL	4	0	0	70	0.3 U	0.25 U	0.15 U	0.25 U	0.15 U	0.25 UJ	0.15 UJ
Cadmium	UG/L	GA	5	0	3	70	0.3 U	0.095 U	0.13 U	0.095 U	0.13 U	0.095 UJ	0.13 UJ
Calcium	UG/L				70	70	117,000 J	100,000 J	110,000 J	96,000	100,000	110,000 J	100,000 J
Chromium	UG/L	GA	50	0	5	70	0.9 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 UJ
Cobalt	UG/L				29	70	1.1 U	0.15 U	0.12 U	0.15 U	0.12 U	0.15 UJ	0.12 UJ
Copper	UG/L	GA	200	0	51	70	5.1 J	4.4 J	5.9	4.5 J	5.1	4.5 J	5 J
Iron	UG/L	GA	300	20	49	70	197 J	33 U	89 J	33 U	63 J	33 UJ	44 UJ
Iron+Manganese	UG/L	GA	500	19	66	70	260.7 J	12	105 J	12	76 J	34 UJ	46 UJ
Lead	UG/L	MCL	15	2	30	70	2.9 U	0.21 J	1.3 J	0.2 U	0.97 J	0.24 J	0.66 J
Magnesium	UG/L				60	60	12,300	12,000	14,000 J	11,000	12,000 J	13,000 J	11,000 J
Manganese	UG/L	GA	300	1	66	70	63.7	12	16	12	13	1 UJ	2 UJ
Mercury	UG/L	GA	0.7	0	3	70	0.1 U	0.091 U	0.091 U	0.091 U	0.091 U	0.091 UJ	0.091 UJ
Nickel	UG/L	GA	100	0	38	70	2.6 J	2 U	2 J	2.2 J	2.2 J	2.2 J	2 UJ
Potassium	UG/L				64	64	3,140	2,300 J	2,500 J	2,200 J	2,200 J	2,200 J	1,900 J
Selenium	UG/L	GA	10	0	0	70	6.1 U	1 U	1.1 U	1 U	1.1 U	1 UJ	1.1 UJ
Silver	UG/L	GA	50	0	0	70	1.3 U	0.25 U	0.18 U	0.25 U	0.18 U	0.25 UJ	0.18 UJ
Sodium	UG/L	GA	20,000	44	68	68	18,800 J	33,000 J	34,000 J	31,000 J	32,000 J	20,000 J	17,000 J
Thallium	UG/L	MCL	2	0	1	70	0.2 U	0.5 U	0.25 U	0.5 U	0.25 U	0.5 UJ	0.25 UJ
Vanadium	UG/L				7	70	1 U	3.8 U	3.2 U	3.8 U	3.2 U	3.8 UJ	3.2 UJ
Zinc	UG/L				28	70	11.3	11 J	14 J	12 J	12 J	9.5 J	8.8 J

Notes:

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Seneca Army Depot Activity

Area							SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16	
Loc ID							MW16-2		MW16-2		MW16-4		MW16-4		MW16-4		MW16-4	
Matrix							GW		GW		GW		GW		GW		GW	
Sample ID							16LM20036F		16LM20036U		16LM20003		16LM20008		16LM20009		16LM20016FIL		16LM20016UNFIL	
Sample Date							12/16/2013		12/16/2013		12/20/2007		12/9/2008		12/9/2008		11/17/2009		11/17/2009	
QC Type							SA		SA		SA		SA		DU		SA		SA	
Study ID							LTM		LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round							6		6		1		2		2		3		3	
Filtered							Dissolved		Total		Total		Total		Total		Dissolved		Total	
Parameter	Unit	Criteria [1] Source	Criteria [1] Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																				
Aluminum	UG/L				27	70	23	UJ	50	UJ	167	J	104	J	101	J	24	U	68	J
Antimony	UG/L	GA	3	32	39	70	**3.6**	**J**	**3.2**	**J**	**5.11**		2.89		2.94		**6**		**6.3**	
Arsenic	UG/L	MCL	10	0	6	70	1.3	UJ	1.3	UJ	4.2	U	3.7	U	3.7	U	3.7	U	3.7	U
Barium	UG/L	GA	1,000	0	70	70	70	J	66	J	44.5		290		279		129		123	
Beryllium	UG/L	MCL	4	0	0	70	0.25	UJ	0.15	UJ	0.27	U	0.33	U	0.33	U	0.3	U	0.3	U
Cadmium	UG/L	GA	5	0	3	70	0.095	UJ	0.13	UJ	0.36	U	0.33	U	0.33	U	0.3	U	0.3	U
Calcium	UG/L				70	70	120,000	J	100,000	J	87,100	J	275,000		267,000		130,000	J	125,000	J
Chromium	UG/L	GA	50	0	5	70	2.5	UJ	2.5	UJ	1	J	0.88	U	0.88	U	0.9	U	0.9	U
Cobalt	UG/L				29	70	0.23	J	0.23	J	0.89	U	1.1	U	1.1	U	1.8	J	2	J
Copper	UG/L	GA	200	0	51	70	4	J	4.7	J	5.4	J	4.4	J	4.2	J	2.4	J	6.2	J
Iron	UG/L	GA	300	20	49	70	33	UJ	44	UJ	95.4		57	J	38.4	J	**329**	**J**	**419**	**J**
Iron+Manganese	UG/L	GA	500	19	66	70	19	J	19	J	127		65		46	J	417.7	J	**513.5**	**J**
Lead	UG/L	MCL	15	2	30	70	0.38	J	1.1	J	2.9	U	2.9	U	2.9	U	2.9	U	2.9	U
Magnesium	UG/L				60	60	14,000	J+	13,000	J	9,440	R	35,200		34,500		16,800		16,000	
Manganese	UG/L	GA	300	1	66	70	19	J	19	J	31.2		7.7		8		88.7		94.5	
Mercury	UG/L	GA	0.7	0	3	70	0.091	UJ	0.091	UJ	0.12	U	0.12	U	0.12	U	0.1	U	0.1	U
Nickel	UG/L	GA	100	0	38	70	2	UJ	2	UJ	1.2	U	2.2	J	1.9	J	1.7	J	1.4	J
Potassium	UG/L				64	64	1,800	J	1,700	J	1,300	R	3,830	J	3,690	J	3,270		3,270	
Selenium	UG/L	GA	10	0	0	70	1	UJ	1.1	UJ	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U
Silver	UG/L	GA	50	0	0	70	0.25	UJ	0.18	UJ	1	U	1.3	U	1.3	U	1.3	U	1.3	U
Sodium	UG/L	GA	20,000	44	68	68	**22,000**	**J**	**21,000**	**J**	**40,800**	**J**	**434,000**		**419,000**		**380,000**	**J**	**363,000**	**J**
Thallium	UG/L	MCL	2	0	1	70	0.5	UJ	0.25	UJ	0.03	U	0.09	U	0.09	U	0.2	U	0.2	U
Vanadium	UG/L				7	70	3.8	UJ	3.2	UJ	0.78	U	0.98	U	0.98	U	1.1	J	1.1	J
Zinc	UG/L				28	70	24	J	12	J	5.3	J	14.6	J	9.8	J	3.6	U	3.6	U

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Area							SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16	
Loc ID							MW16-4		MW16-4		MW16-4		MW16-4		MW16-4		MW16-5	
Matrix							GW		GW		GW		GW		GW		GW	
Sample ID							16LM20024FIL		16LM20024UNF		16LM20030F		16LM20030U		16LM20037F		16LM20004	
Sample Date							12/16/2010		12/16/2010		12/15/2012		12/15/2012		12/17/2013		12/20/2007	
QC Type							SA		SA		SA		SA		SA		SA	
Study ID							LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round							4		4		5		5		6		1	
Filtered							Dissolved		Total		Dissolved		Total		Dissolved		Total	
Parameter	Unit	Criteria [1] Source	Criteria [1] Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																		
Aluminum	UG/L				27	70	23	U	50	U	23	UJ	50	UJ	23	UJ	50	UJ	160	J
Antimony	UG/L	GA	3	32	39	70	2.3	U	2	U	4	J	3.9	J	2.3	UJ	2	UJ	1.82	
Arsenic	UG/L	MCL	10	0	6	70	1.3	U	1.3	U	1.5	J	1.3	J	1.3	UJ	1.3	UJ	4.2	U
Barium	UG/L	GA	1,000	0	70	70	220		240	J	240	J	230	J	140	J	150	J	38.9	
Beryllium	UG/L	MCL	4	0	0	70	0.25	U	0.15	U	0.25	UJ	0.15	UJ	0.25	UJ	0.15	UJ	0.27	U
Cadmium	UG/L	GA	5	0	3	70	0.095	U	0.13	U	0.095	UJ	0.23	J	0.095	UJ	0.15	J	0.36	U
Calcium	UG/L				70	70	210,000		210,000		230,000	J	220,000	J	210,000	J	190,000	J	89,000	J
Chromium	UG/L	GA	50	0	5	70	2.5	U	2.5	U	2.5	UJ	2.5	UJ	2.5	UJ	3.6	J	1.1	J
Cobalt	UG/L				29	70	0.7		0.71		1.9	J	1.9	J	1	J	0.94	J	0.89	U
Copper	UG/L	GA	200	0	51	70	1.4	J	2.8	J	4.1	J	11	J	1.2	J	1.5	J	3.1	J
Iron	UG/L	GA	300	20	49	70	130	J	150	J	130	J	140	J	350	J	380	J	1,200	
Iron+Manganese	UG/L	GA	500	19	66	70	260	J	290	J	270	J	280	J	580	J	590	J	1,238	
Lead	UG/L	MCL	15	2	30	70	0.7	J	3		0.2	UJ	3.4	J	0.28	J	0.65	J	2.9	U
Magnesium	UG/L				60	60	31,000		32,000	J	34,000	J	32,000	J	33,000	J+	31,000	J	9,380	R
Manganese	UG/L	GA	300	1	66	70	130		140		140	J	140	J	230	J	210	J	37.6	
Mercury	UG/L	GA	0.7	0	3	70	0.091	U	0.091	U	0.091	UJ	0.091	UJ	0.091	UJ	0.091	UJ	0.12	U
Nickel	UG/L	GA	100	0	38	70	2.2	J	2.3	J	2.6	J	3.2	J	3.3	J	2.9	J	1.2	U
Potassium	UG/L				64	64	2,600	J	2,600	J	3,200	J	3,100	J	2,500	J	2,400	J	4,420	R
Selenium	UG/L	GA	10	0	0	70	1	U	1.1	U	1	UJ	1.1	UJ	1	UJ	1.1	UJ	6.1	U
Silver	UG/L	GA	50	0	0	70	0.25	U	0.18	U	0.25	UJ	0.18	UJ	0.25	UJ	0.18	UJ	1	U
Sodium	UG/L	GA	20,000	44	68	68	540,000	J	550,000	J	340,000	J	310,000	J	290,000	J	270,000	J	8,410	R
Thallium	UG/L	MCL	2	0	1	70	0.5	U	0.25	U	0.5	UJ	0.25	UJ	0.5	UJ	0.25	UJ	0.03	U
Vanadium	UG/L				7	70	3.8	U	3.2	U	3.8	UJ	3.2	UJ	3.8	UJ	3.2	UJ	1.2	J
Zinc	UG/L				28	70	9.2	J	13	J	12	J	11	J	8.3	UJ	8.4	UJ	34.4	

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Area							SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16	
Loc ID							MW16-5		MW16-5		MW16-5		MW16-5		MW16-5		MW16-5	
Matrix							GW		GW		GW		GW		GW		GW	
Sample ID							16LM20010		16LM20017FIL		16LM20017UNFIL		16LM20025FIL		16LM20025UNF		16LM20031F		16LM20031U	
Sample Date							12/10/2008		11/16/2009		11/16/2009		12/15/2010		12/15/2010		12/15/2012		12/15/2012	
QC Type							SA		SA		SA		SA		SA		SA		SA	
Study ID							LTM		LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round							2		3		3		4		4		5		5	
Filtered							Total		Dissolved		Total		Dissolved		Total		Dissolved		Total	
Parameter	Unit	Criteria [1] Source	Criteria [1] Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																				
Aluminum	UG/L				27	70	563		24	U	164	J	23	U	160		23	UJ	50	UJ
Antimony	UG/L	GA	3	32	39	70	**4.23**		1	U	1	U	2.3	U	2	U	2.3	UJ	2	UJ
Arsenic	UG/L	MCL	10	0	6	70	3.7	U	3.7	U	3.7	U	1.3	U	1.3	U	2.6	J	2.7	J
Barium	UG/L	GA	1,000	0	70	70	22		42.8		42		34		33	J	34	J	39	J
Beryllium	UG/L	MCL	4	0	0	70	0.33	U	0.3	U	0.3	U	0.25	U	0.15	U	0.25	UJ	0.15	UJ
Cadmium	UG/L	GA	5	0	3	70	0.33	U	0.3	U	0.3	U	0.095	U	0.13	U	0.095	UJ	0.13	UJ
Calcium	UG/L				70	70	53,100		115,000	J	110,000	J	90,000		86,000		97,000	J	96,000	J
Chromium	UG/L	GA	50	0	5	70	1.2	J	0.9	U	0.9	U	2.5	U	2.5	U	2.5	UJ	2.5	UJ
Cobalt	UG/L				29	70	1.1	U	1.1	U	1.1	U	0.15	U	0.12	U	0.22	J	0.23	J
Copper	UG/L	GA	200	0	51	70	10.6		1.3	U	1.3	U	1.1	U	1.1	U	1.1	J	5	UJ
Iron	UG/L	GA	300	20	49	70	**699**		**800**	J	**1,150**	J	**480**	J	**660**	J	**1,100**	J	**1,300**	J
Iron+Manganese	UG/L	GA	500	19	66	70	**731**		**970**	J	**1,323**	J	**680**	J	**820**	J	**1,230**	J	**1,430**	J
Lead	UG/L	MCL	15	2	30	70	10.1		2.9	U	2.9	U	0.2	U	0.77	J	0.2	UJ	0.5	UJ
Magnesium	UG/L				60	60	6,050		12,200		11,800		10,000		9,700	J	9,900	J	9,800	J
Manganese	UG/L	GA	300	1	66	70	32.4		170		173		200		160		130	J	130	J
Mercury	UG/L	GA	0.7	0	3	70	0.12	U	0.1	U	0.1	U	0.091	U	0.091	U	0.1	J	0.091	UJ
Nickel	UG/L	GA	100	0	38	70	2.6	J	1.8	J	2	J	2	U	2	U	2.1	J	2	UJ
Potassium	UG/L				64	64	2,610	J	2,370		2,380		2,200	J	2,100	J	2,100	J	2,100	J
Selenium	UG/L	GA	10	0	0	70	6.1	U	6.1	U	6.1	U	1	U	1.1	U	1	UJ	1.1	UJ
Silver	UG/L	GA	50	0	0	70	1.3	U	1.3	U	1.3	U	0.25	U	0.18	U	0.25	UJ	0.18	UJ
Sodium	UG/L	GA	20,000	44	68	68	2,180		2,700	J	2,800	J	1,800	J	1,800	J	1,600	J	1,500	J
Thallium	UG/L	MCL	2	0	1	70	0.09	U	0.2	U	0.2	U	0.5	U	0.25	U	0.5	UJ	0.25	UJ
Vanadium	UG/L				7	70	2.3	J	1	U	1.1	J	3.8	U	3.2	U	3.8	UJ	3.2	UJ
Zinc	UG/L				28	70	10.3		3.6	U	3.6	U	8.3	U	8.4	U	8.3	UJ	8.4	UJ

Notes:

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Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 6)
Draft Annual Report - Year for SEAD-16 and SEAD-17
Seneca Army Depot Activity

Area							SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16	
Loc ID							MW16-5		MW16-5		MW16-5		MW16-5		MW16-6		MW16-6	
Matrix							GW		GW		GW		GW		GW		GW	
Sample ID							16LM20038F		16LM20038U		16LM20039F		16LM20039U		16LM20005		16LM20018FIL	
Sample Date							12/16/2013		12/16/2013		12/17/2013		12/17/2013		12/20/2007		11/17/2009	
QC Type							SA		SA		SA		SA		SA		SA	
Study ID							LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round							6		6		6		6		1		3	
Filtered							Dissolved		Total		Dissolved		Total		Total		Dissolved	
Parameter	Unit	Criteria [1] Source	Criteria [1] Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																		
Aluminum	UG/L				27	70	23	UJ	50	UJ	23	UJ	50	UJ	168	J	107	J
Antimony	UG/L	GA	3	32	39	70	2.3	UJ	2	UJ	2.3	UJ	2	UJ	1	U	0.92	J
Arsenic	UG/L	MCL	10	0	6	70	1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ	4.2	U	3.7	U
Barium	UG/L	GA	1,000	0	70	70	40	J	38	J	41	J	41	J	31.8		39.1	
Beryllium	UG/L	MCL	4	0	0	70	0.25	UJ	0.15	UJ	0.25	UJ	0.15	UJ	0.27	U	0.33	U
Cadmium	UG/L	GA	5	0	3	70	0.095	UJ	0.13	UJ	0.095	UJ	0.13	UJ	0.36	U	0.33	U
Calcium	UG/L				70	70	100,000	J	88,000	J	110,000	J	95,000	J	80,400	J	84,300	
Chromium	UG/L	GA	50	0	5	70	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ	0.84	U	0.88	U
Cobalt	UG/L				29	70	0.15	UJ	0.12	UJ	0.15	UJ	0.12	UJ	0.89	U	1.1	U
Copper	UG/L	GA	200	0	51	70	1.1	UJ	1.1	UJ	1.1	UJ	1.1	UJ	3.4	J	2.1	J
Iron	UG/L	GA	300	20	49	70	**440**	**J**	**510**	**J**	**490**	**J**	**530**	**J**	**418**		153	
Iron+Manganese	UG/L	GA	500	19	68	70	**670**	**J**	**680**	**J**	**710**	**J**	**720**	**J**	441		158	
Lead	UG/L	MCL	15	2	30	70	0.2	UJ	0.5	UJ	0.22	J	0.5	UJ	2.9	U	2.9	U
Magnesium	UG/L				60	60	10,000	J+	9,500	J	11,000	J+	10,000	J	7,100	R	7,380	
Manganese	UG/L	GA	300	1	66	70	230	J	170	J	220	J	190	J	23.3		4.8	
Mercury	UG/L	GA	0.7	0	3	70	0.091	UJ	0.091	UJ	0.091	UJ	0.091	UJ	0.12	U	0.12	U
Nickel	UG/L	GA	100	0	38	70	2	UJ	2	UJ	2	UJ	2	UJ	1.2	U	1	U
Potassium	UG/L				64	64	2,300	J	1,900	J	2,300	J	2,100	J	2,690	R	2,310	J
Selenium	UG/L	GA	10	0	0	70	1	UJ	1.1	UJ	1	UJ	1.1	UJ	6.1	U	6.1	U
Silver	UG/L	GA	50	0	0	70	0.25	UJ	0.18	UJ	0.25	UJ	0.18	UJ	1	U	1.3	U
Sodium	UG/L	GA	20,000	44	68	68	1,400	J	1,300	J	1,400	J	1,300	J	6,110	R	9,200	
Thallium	UG/L	MCL	2	0	1	70	0.5	UJ	0.25	UJ	0.5	UJ	0.25	UJ	0.03	U	0.09	U
Vanadium	UG/L				7	70	3.8	UJ	3.2	UJ	3.8	UJ	3.2	UJ	0.86	J	0.98	U
Zinc	UG/L				28	70	8.3	UJ	8.4	UJ	8.3	UJ	8.4	UJ	5.5	J	3.7	J

																	22,000	**J**
																	0.008	U
																	1	U
																	3.6	U

Notes:

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Draft Annual Report - Year for SEAD-16 and SEAD-17
Seneca Army Depot Activity

Area							SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16	
Loc ID							MW16-6		MW16-6		MW16-6		MW16-6		MW16-6		MW16-6	
Matrix							GW		GW		GW		GW		GW		GW	
Sample ID							16LM20018UNFIL		16LM20026FIL		16LM20026UNF		16LM20032F		16LM20032U		16LM20040F		16LM20040U	
Sample Date							11/17/2009		12/15/2010		12/15/2010		12/15/2012		12/15/2012		12/17/2013		12/17/2013	
QC Type							SA		SA		SA		SA		SA		SA		SA	
Study ID							LTM		LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round							3		4		4		5		5		6		6	
Filtered							Total		Dissolved		Total		Dissolved		Total		Dissolved		Total	
Parameter	Unit	Criteria [1] Source	Criteria [1] Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																				
Aluminum	UG/L				27	70	442		23	U	61	J	23	UJ	300	J	23	UJ	50	UJ
Antimony	UG/L	GA	3	32	39	70	1	U	2.3	U	2	U	2.3	UJ	2	UJ	2.3	UJ	2	UJ
Arsenic	UG/L	MCL	10	0	6	70	3.7	U	1.3	U	1.3	U	1.3	UJ	1.3	J	1.3	UJ	1.3	UJ
Barium	UG/L	GA	1,000	0	70	70	80.2		44		50	J	41	J	45	J	53	J	58	J
Beryllium	UG/L	MCL	4	0	0	70	0.3	U	0.25	U	0.15	U	0.25	UJ	0.15	UJ	0.25	UJ	0.15	UJ
Cadmium	UG/L	GA	5	0	3	70	0.3	U	0.095	U	0.13	U	0.095	UJ	0.13	UJ	0.095	UJ	0.13	UJ
Calcium	UG/L				70	70	112,000	J	68,000		78,000		70,000	J	74,000	J	92,000	J	84,000	J
Chromium	UG/L	GA	50	0	5	70	0.9	U	2.5	U	2.5	U	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ
Cobalt	UG/L				29	70	1.1	U	0.15	U	0.12	U	0.18	J	0.43	J	0.35	J	0.34	J
Copper	UG/L	GA	200	0	51	70	2.5	J	1.5	J	2	J	4.5	J	5	UJ	1.1	UJ	1.1	UJ
Iron	UG/L	GA	300	20	49	70	**440**	**J**	33	U	110	J	33	J	**790**	**J**	180	J	210	J
Iron+Manganese	UG/L	GA	500	19	66	70	**515**	**J**	2.1	J	113.5	J	43	J	**816**	**J**	340	J	360	J
Lead	UG/L	MCL	15	2	30	70	2.9	U	0.2	U	0.5	U	0.2	UJ	0.5	UJ	0.2	UJ	0.54	J
Magnesium	UG/L				60	60	9,950		6,600		7,600	J	7,200	J	7,600	J	9,500	J+	9,500	J
Manganese	UG/L	GA	300	1	66	70	75		2.1	J	3.5	J	10	J	26	J	160	J	150	J
Mercury	UG/L	GA	0.7	0	3	70	0.1	U	0.091	U	0.091	U	0.091	UJ	0.091	UJ	0.091	UJ	0.091	UJ
Nickel	UG/L	GA	100	0	38	70	2.6	J	2	U	2	U	2	UJ	2	J	2	UJ	2	UJ
Potassium	UG/L				64	64	2,580		1,500		1,800		2,400	J	2,400	J	1,900	J	1,800	J
Selenium	UG/L	GA	10	0	0	70	6.1	U	1	U	1.1	U	1	UJ	1.1	UJ	1	UJ	1.1	UJ
Silver	UG/L	GA	50	0	0	70	1.3	U	0.25	U	0.18	U	0.25	UJ	0.18	UJ	0.25	UJ	0.18	UJ
Sodium	UG/L	GA	20,000	44	68	68	**20,600**	**J**	7,600	J	8,400	J	8,700	J	8,000	J	14,000	J	13,000	J
Thallium	UG/L	MCL	2	0	1	70	0.008	U	0.5	U	0.25	U	0.5	UJ	0.25	UJ	0.5	UJ	0.25	UJ
Vanadium	UG/L				7	70	1.3	J	3.8	U	3.2	U	3.8	UJ	3.2	UJ	3.8	UJ	3.2	UJ
Zinc	UG/L				28	70	3.6	U	8.3	U	8.4	U	8.3	UJ	8.4	UJ	8.3	UJ	8.4	UJ

Notes:

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Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 6)
Draft Annual Report - Year for SEAD-16 and SEAD-17
Seneca Army Depot Activity

Area							SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16
Loc ID							MW16-7	MW16-7	MW16-7	MW16-7	MW16-7	MW16-7	MW16-7
Matrix							GW	GW	GW	GW	GW	GW	GW
Sample ID							16LM20006	16LM20012	16LM20019FIL	16LM20019UNFIL	16LM20020FIL	16LM20020UNFIL	16LM20027FIL
Sample Date							12/20/2007	12/10/2008	11/12/2009	11/12/2009	11/12/2009	11/12/2009	12/15/2010
QC Type							SA	SA	SA	SA	DU	DU	SA
Study ID							LTM	LTM	LTM	LTM	LTM	LTM	LTM
Sample Round							1	2	3	3	3	3	4
Filtered							Total	Total	Dissolved	Total	Dissolved	Total	Dissolved
Parameter	Unit	Criteria [1] Source	Criteria [1] Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual
Inorganics													
Aluminum	UG/L				27	70	45.9 J	577	32 J	182 J	25 J	116 J	23 U
Antimony	UG/L	GA	3	32	39	70	**9.58**	**13.6**	**15.2**	**15.7**	**13.9**	**16.3**	**15**
Arsenic	UG/L	MCL	10	0	5	70	4.2 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	1.3 U
Barium	UG/L	GA	1,000	0	70	70	170	122	83.6	81.6	83.9	80.3	69
Beryllium	UG/L	MCL	4	0	0	70	0.27 U	0.33 U	0.3 U	0.3 U	0.3 U	0.3 U	0.25 U
Cadmium	UG/L	GA	5	0	3	70	0.46 J	0.33 U	0.3 U	0.3 U	0.3 U	0.3 U	0.095 U
Calcium	UG/L				70	70	194,000	133,000	85,000 J	84,600 J	81,900 J	82,800 J	82,000
Chromium	UG/L	GA	50	0	5	70	0.84 U	1.6 J	0.9 U	0.9 U	0.9 U	0.9 U	2.5 U
Cobalt	UG/L				29	70	1.6 J	1.1 J	1.1 U	1.1 U	1.1 U	1.1 U	0.15 U
Copper	UG/L	GA	200	0	51	70	34.7	20.2	3.1 J	5 J	3.5 J	4.1 J	1.8 J
Iron	UG/L	GA	300	20	49	70	29.2 J	**770**	19 UJ	135 J	19 UJ	61 J	33 U
Iron+Manganese	UG/L	GA	500	19	66	70	**660 J**	**990**	136	244 J	152	168 J	35
Lead	UG/L	MCL	15	2	30	70	**26.5**	**88.6**	4.4 J	12.1	4.9 J	9.4	1 J
Magnesium	UG/L				60	60	32,000 J	25,100	15,900	16,500	14,800	16,200	18,000
Manganese	UG/L	GA	300	1	66	70	**631**	220	136	109	152	107	35
Mercury	UG/L	GA	0.7	0	3	70	0.507	0.12 U	0.1 U	0.1 U	0.1 U	0.1 U	0.091 U
Nickel	UG/L	GA	100	0	38	70	5.5 J	2.6 J	1.9 J	1.7 J	2 J	1.1 J	2 U
Potassium	UG/L				64	64	5,480 J	5,670 J	6,520	5,760	7,010	5,630	2,800 J
Selenium	UG/L	GA	10	0	0	70	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	1 U
Silver	UG/L	GA	50	0	0	70	1 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	0.25 U
Sodium	UG/L	GA	20,000	44	68	68	**68,400 J**	**74,900**	**52,100 J**	**47,100 J**	**55,900 J**	**46,100 J**	**29,000 J**
Thallium	UG/L	MCL	2	0	1	70	0.03 J	0.09 U	0.2 U	0.2 U	0.2 U	0.2 U	0.5 U
Vanadium	UG/L				7	70	0.78 U	0.98 U	1 U	1 U	1 U	1 U	3.8 U
Zinc	UG/L				28	70	3.6 U	8.6 J	3.6 U	3.6 U	3.6 U	3.6 U	8.3 U

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Area							SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16	
Loc ID							MW16-7		MW16-7		MW16-7		MW16-7		MW16-7		MW16-7	
Matrix							GW		GW		GW		GW		GW		GW	
Sample ID							16LM20027UNF		16LM20033F		16LM20033U		16LM20034F		16LM20034U		16LM20041U	
Sample Date							12/15/2010		12/15/2012		12/15/2012		12/15/2012		12/15/2012		12/17/2013	
QC Type							SA		SA		SA		DU		DU		DU	
Study ID							LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round							4		5		5		5		6		6	
Filtered							Total		Dissolved		Total		Dissolved		Total		Total	
Parameter	Unit	Criteria [1] Source	Criteria [1] Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																		
Aluminum	UG/L				27	70	50	U	23	UJ	50	UJ	23	UJ	50	UJ	23	UJ
Antimony	UG/L	GA	3	32	39	70	**16**		**13**	**J**	**13**	**J**	**13**	**J**	**14**	**J**	**16**	**J**
Arsenic	UG/L	MCL	10	0	6	70	1.3	U	1.3	J	1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ
Barium	UG/L	GA	1,000	0	70	70	71	J	100	J	100	J	99	J	100	J	100	J
Beryllium	UG/L	MCL	4	0	0	70	0.15	U	0.25	UJ	0.15	UJ	0.25	UJ	0.15	UJ	0.25	UJ
Cadmium	UG/L	GA	5	0	3	70	0.13	U	0.095	UJ	0.13	UJ	0.095	UJ	0.13	UJ	0.095	UJ
Calcium	UG/L				70	70	86,000		110,000	J	100,000	J	100,000	J	110,000	J	120,000	J
Chromium	UG/L	GA	50	0	5	70	2.5	U	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ
Cobalt	UG/L				29	70	0.12	U	0.23	J	0.22	J	0.24	J	0.24	J	0.19	J
Copper	UG/L	GA	200	0	51	70	2.7	J	4.1	J	8.3	J	1.7	J	5.6	J	3.4	J
Iron	UG/L	GA	300	20	49	70	45	J	33	UJ	44	UJ	33	UJ	44	UJ	33	UJ
Iron+Manganese	UG/L	GA	500	19	66	70	79	J	92	J	90	J	98	J	91	J	16	J
Lead	UG/L	MCL	15	2	30	70	6.3		1.3	J	2.5	J	2.3	J	2.6	J	1.9	J
Magnesium	UG/L				60	60	19,000	J	21,000	J	21,000	J	20,000	J	22,000	J	26,000	J+
Manganese	UG/L	GA	300	1	66	70	34		92	J	90	J	98	J	91	J	16	J
Mercury	UG/L	GA	0.7	0	3	70	0.091	U	0.091	UJ	0.091	UJ	0.091	UJ	0.091	UJ	0.091	UJ
Nickel	UG/L	GA	100	0	38	70	2	U	2	UJ	2.2	J	2	UJ	2.4	J	2	UJ
Potassium	UG/L				64	64	2,700	J	5,300	J	5,200	J	5,100	J	5,400	J	3,100	J
Selenium	UG/L	GA	10	0	0	70	1.1	U	1	UJ	1.1	UJ	1	UJ	1.1	UJ	1	UJ
Silver	UG/L	GA	50	0	0	70	0.18	U	0.25	UJ	0.18	UJ	0.25	UJ	0.18	UJ	0.25	UJ
Sodium	UG/L	GA	20,000	44	68	68	**28,000**	**J**	**35,000**	**J**	**32,000**	**J**	**33,000**	**J**	**32,000**	**J**	**28,000**	**J**
Thallium	UG/L	MCL	2	0	1	70	0.25	U	0.5	UJ	0.25	UJ	0.5	UJ	0.25	UJ	0.5	UJ
Vanadium	UG/L				7	70	3.2	U	3.8	UJ	3.2	UJ	3.8	UJ	3.2	UJ	3.8	UJ
Zinc	UG/L				28	70	8.4	U	8.3	UJ	8.4	UJ	8.3	UJ	8.4	UJ	8.3	UJ

Notes

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Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 6)
Draft Annual Report - Year for SEAD-16 and SEAD-17
Seneca Army Depot Activity

Area							SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17	
Loc ID							MW17-1		MW17-1		MW17-1		MW17-1		MW17-1		MW17-1	
Matrix							GW		GW		GW		GW		GW		GW	
Sample ID							17LM20000		17LM20005		17LM20010FIL		17LM20010UNFIL		17LM20016FIL		17LM20020F	
Sample Date							12/20/2007		12/11/2008		11/18/2009		11/18/2009		12/17/2010		12/11/2012	
QC Type							SA		SA		SA		SA		SA		SA	
Study ID							LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round							1		2		3		3		4		5	
Filtered							Total		Total		Dissolved		Total		Dissolved		Dissolved	
Parameter	Unit	Criteria [1] Source	Criteria [1] Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																		
Aluminum	UG/L				21	50	204		219		37	J	59	J	23	U	50	UJ
Antimony	UG/L	GA	3	4	12	50	1	U	1	U	1	U	1	U	2.3	U	2	UJ
Arsenic	UG/L	MCL	10	0	2	50	4.2	U	3.7	U	3.7	U	3.7	U	1.3	U	1.3	UJ
Barium	UG/L	GA	1,000	0	48	50	70		79		99.1		99		61		63	J
Beryllium	UG/L	MCL	4	0	1	50	0.27	U	0.33	U	0.3	U	0.3	U	0.25	U	0.15	U
Cadmium	UG/L	GA	5	0	2	50	0.36	U	0.33	U	0.3	U	0.3	U	0.095	U	0.13	U
Calcium	UG/L				48	50	98,300	J	95,600		109,000	J	108,000	J	96,000		100,000	
Chromium	UG/L	GA	50	0	4	50	0.84	U	0.88	U	0.9	U	0.9	U	2.5	U	2.5	U
Cobalt	UG/L				31	50	0.89	U	1.1	U	1.1	U	1.1	U	0.15	U	0.3	J
Copper	UG/L	GA	200	0	23	50	1.3	U	1.3	U	1.3	U	1.3	U	1.1	U	1.1	J
Iron	UG/L	GA	300	14	38	50	106		126		19	UJ	42	J	33	U	270	J
Iron+Manganese	UG/L	GA	500	13	46	50	119		141		38.9		67.6	J	4.2	J	312	J
Lead	UG/L	MCL	15	1	8	50	2.9	U	2.9	U	2.9	U	2.9	U	0.2	U	0.5	U
Magnesium	UG/L				41	43	21,800	J	20,600		24,300		24,000		19,000		20,000	J
Manganese	UG/L	GA	300	2	46	50	13.2		14.9		38.9		25.6		4.2	J	42	
Mercury	UG/L	GA	0.7	0	2	50	0.12	U	0.12	U	0.1	U	0.1	U	0.091	U	0.091	U
Nickel	UG/L	GA	100	0	14	50	1.2	U	1.3	J	1	U	1	U	2	U	2	U
Potassium	UG/L				43	45	614	R	462	J	260	J	254	J	690		690	J
Selenium	UG/L	GA	10	0	0	50	6.1	U	6.1	U	6.1	U	6.1	U	1	U	1.1	U
Silver	UG/L	GA	50	0	0	50	1	U	1.3	U	1.3	U	1.3	U	0.25	U	0.18	U
Sodium	UG/L	GA	20,000	4	44	46	7,790	R	8,380		7,300	J	7,400	J	6,000	J	6,200	J
Thallium	UG/L	MCL	2	0	2	50	0.03	U	0.09	U	0.008	U	0.008	U	0.5	U	0.25	U
Vanadium	UG/L				2	50	0.78	U	0.98	U	1	U	1	U	3.8	U	3.2	U
Zinc	UG/L				27	50	4.7	J	4	J	3.6	U	3.6	U	8.3	U	8.4	U

Notes

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Post-Remedial Action Groundwater Monitoring Results (Years 1 through 6)
Draft Annual Report - Year for SEAD-16 and SEAD-17
Seneca Army Depot Activity

Area							SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17	
Loc ID							MW17-1		MW17-1		MW17-1		MW17-2		MW17-2		MW17-2	
Matrix							GW		GW		GW		GW		GW		GW	
Sample ID							17LM20020U		17LM20025F		17LM20025U		17LM20001		17LM20006		17LM20011FIL		17LM20011UNFIL	
Sample Date							12/11/2012		12/15/2013		12/15/2013		12/20/2007		12/10/2008		11/17/2009		11/17/2009	
QC Type							SA		SA		SA		SA		SA		SA		SA	
Study ID							LTM		LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round							5		6		6		1		2		3		3	
Filtered							Total		Dissolved		Total		Total		Total		Dissolved		Total	
Parameter	Unit	Criteria [1] Source	Criteria [1] Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																				
Aluminum	UG/L				21	50	50	UJ	23	UJ	50	UJ	110	J	142	J	88	J	19,600	
Antimony	UG/L	GA	3	4	12	50	2.7	J	2.3	UJ	2	UJ	3.44		2.76		2.2		3.7	
Arsenic	UG/L	MCL	10	0	2	50	1.3	UJ	1.3	J	1.3	UJ	4.2	U	3.7	U	3.7	U	7.8	J
Barium	UG/L	GA	1,000	0	48	50	28	J	60	J	56	J	58.8		51.8		82.3		251	
Beryllium	UG/L	MCL	4	0	1	50	0.15	UJ	0.25	UJ	0.15	UJ	0.27	U	0.33	U	0.3	U	1.2	J
Cadmium	UG/L	GA	5	0	2	50	0.44	J	0.095	UJ	0.13	UJ	0.36	U	0.33	U	0.3	U	1.7	
Calcium	UG/L				48	50	55,000	J	120,000	J	91,000	J	110,000	J	112,000		154,000	J	195,000	J
Chromium	UG/L	GA	50	0	4	50	2.5	UJ	2.5	UJ	2.5	UJ	0.84	U	2.9	J	0.9	U	37.2	
Cobalt	UG/L				31	50	0.37	J	0.34	J	0.29	J	0.89	U	1.1	U	1.1	U	10.5	
Copper	UG/L	GA	200	0	23	50	5.4	J	1.1	UJ	1.1	UJ	6.2	J	4.4	J	2.9	J	46.7	
Iron	UG/L	GA	300	14	38	50	90	J	800	J	660	J	140		115		19	UJ	25,500	J
Iron+Manganese	UG/L	GA	500	13	46	50	98.1	J	897	J	765	J	160		121		1.5	J	25,929	J
Lead	UG/L	MCL	15	1	8	50	1.1	J	0.2	UJ	0.5	UJ	2.9	U	2.9	U	2.9	U	103	
Magnesium	UG/L				41	43	7,700	J	24,000	J+	19,000	J	11,000	R	11,200		18,200		23,300	
Manganese	UG/L	GA	300	2	46	50	8.1	J	97	J	85	J	20.5		6.1		1.5	J	429	
Mercury	UG/L	GA	0.7	0	2	50	0.091	UJ	0.091	UJ	0.091	UJ	0.12	U	0.12	U	0.1	U	0.1	U
Nickel	UG/L	GA	100	0	14	50	2	UJ	2	UJ	2	UJ	1.2	U	2.8	J	1.2	J	34	
Potassium	UG/L				43	45	410	J	500	J	400	J	1,690	R	1,250	J	2,390		7,810	
Selenium	UG/L	GA	10	0	0	50	1.1	UJ	1	UJ	1.1	UJ	6.1	U	6.1	U	6.1	U	6.1	U
Silver	UG/L	GA	50	0	0	50	0.18	UJ	0.25	UJ	0.18	UJ	1	U	1.3	U	1.3	U	1.3	U
Sodium	UG/L	GA	20,000	4	44	46	2,500	J	6,000	J	4,800	J	6,620	R	7,850		19,800	J	20,300	J
Thallium	UG/L	MCL	2	0	2	50	0.25	UJ	0.5	UJ	0.25	UJ	0.03	U	0.09	U	0.008	U	0.2	U
Vanadium	UG/L				2	50	3.2	UJ	3.8	UJ	3.2	UJ	0.78	U	0.98	U	1	U	32.8	
Zinc	UG/L				27	50	8.4	UJ	8.3	UJ	8.4	UJ	72	J	27.6		28.6		935	

Notes:

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Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 6)
Draft Annual Report - Year for SEAD-16 and SEAD-17
Seneca Army Depot Activity

Area							SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17	
Loc ID							MW17-2		MW17-2		MW17-2		MW17-2		MW17-2		MW17-3	
Matrix							GW		GW		GW		GW		GW		GW	
Sample ID							17LM20015FIL		17LM20015UNF		17LM20021F		17LM20021U		17LM20026F		17LM20026U		17LM20002	
Sample Date							12/16/2010		12/16/2010		12/11/2012		12/11/2012		12/15/2013		12/15/2013		12/20/2007	
QC Type							SA		SA		SA		SA		SA		SA		SA	
Study ID							LTM		LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round							4		4		5		5		6		6		1	
Filtered							Dissolved		Total		Dissolved		Total		Dissolved		Total		Total	
Parameter	Unit	Criteria [1] Source	Criteria [1] Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																				
Aluminum	UG/L				21	50	23	U	51	J	23	UJ	50	UJ	23	UJ	50	UJ	106	J
Antimony	UG/L	GA	3	4	12	50	2.3	U	2	U	4	J	4.4	J	2.3	UJ	2	UJ	1	U
Arsenic	UG/L	MCL	10	0	2	50	1.3	U	1.3	U	1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ	4.2	U
Barium	UG/L	GA	1,000	0	48	50	54		58	J	69	J	68	J	46	J	47	J	39	
Beryllium	UG/L	MCL	4	0	1	50	0.25	U	0.15	U	0.25	UJ	0.15	UJ	0.25	UJ	0.15	UJ	0.27	U
Cadmium	UG/L	GA	5	0	2	50	0.095	U	0.13	U	0.095	UJ	0.13	UJ	0.095	UJ	0.13	UJ	0.36	U
Calcium	UG/L				48	50	140,000		150,000		120,000	J	120,000	J	180,000	J	150,000	J	69,000	J
Chromium	UG/L	GA	50	0	4	50	2.5	U	2.5	U	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ	0.84	U
Cobalt	UG/L				31	50	0.32	J	0.46	J	0.39	J	0.42	J	0.44	J	0.38	J	0.89	U
Copper	UG/L	GA	200	0	23	50	1.5	J	1.9	J	7.7	J	7.8	J	1.1	UJ	1.1	UJ	2.6	J
Iron	UG/L	GA	300	14	38	50	33	U	130	J	33	UJ	44	UJ	520	J	470	J	133	
Iron+Manganese	UG/L	GA	500	13	46	50	23		173	J	12	J	14	J	584	J	534	J	170	
Lead	UG/L	MCL	15	1	8	50	0.2	U	0.6	J	0.2	UJ	0.99	J	0.2	UJ	0.5	UJ	2.9	U
Magnesium	UG/L				41	43	18,000		19,000	J	12,000	J	12,000	J	24,000	J+	22,000	J	7,560	R
Manganese	UG/L	GA	300	2	46	50	23		43		12	J	14	J	74	J	64	J	36.7	
Mercury	UG/L	GA	0.7	0	2	50	0.091	U	0.091	U	0.091	UJ	0.091	UJ	0.091	UJ	0.091	UJ	0.12	U
Nickel	UG/L	GA	100	0	14	50	2	U	2	U	2	UJ	2	UJ	2	UJ	2	UJ	1.2	U
Potassium	UG/L				43	45	1,300	J	1,300		2,500	J	2,500	J	1,100	J	1,000	J	2,620	R
Selenium	UG/L	GA	10	0	0	50	1	U	1.1	U	1	UJ	1.1	UJ	1	UJ	1.1	UJ	5.1	U
Silver	UG/L	GA	50	0	0	50	0.25	U	0.18	U	0.25	UJ	0.18	UJ	0.25	UJ	0.18	UJ	1	U
Sodium	UG/L	GA	20,000	4	44	46	14,000	J	14,000	J	8,400	J	8,400	J	16,000	J	14,000	J	4,550	R
Thallium	UG/L	MCL	2	0	2	50	0.5	U	0.25	U	0.5	UJ	0.25	UJ	0.5	UJ	0.25	UJ	0.03	U
Vanadium	UG/L				2	50	3.8	U	3.2	U	3.8	UJ	3.2	UJ	3.8	UJ	3.2	UJ	0.78	U
Zinc	UG/L				27	50	17	J	21		24	J	26	J	11	J	9.3	J	27	J

Notes:

1. The lowest value for either the New York Class GA Groundwater Standards (TOGS 1.1.1, June 1998, et al.) or the EPA Maximum Contaminant Limit (MCL), source http://www.epa.gov/safewater/mcl.html#inorganic html is used. A blank cell indicates no criteria value available.
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Draft Annual Report - Year for SEAD-16 and SEAD-17
Seneca Army Depot Activity

Area							SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17	
Loc ID							MW17-3		MW17-3		MW17-3		MW17-3		MW17-3		MW17-3	
Matrix							GW		GW		GW		GW		GW		GW	
Sample ID							17LM20007		17LM20012FIL		17LM20012UNFIL		17LM20017FIL		17LM20017UNF		17LM20022U	
Sample Date							12/10/2008		11/18/2009		11/18/2009		12/16/2010		12/16/2010		12/11/2012	
QC Type							SA		SA		SA		SA		SA		SA	
Study ID							LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round							2		3		3		4		4		5	
Filtered							Total		Dissolved		Total		Dissolved		Total		Total	
Parameter	Unit	Criteria [1] Source	Criteria [1] Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																		
Aluminum	UG/L				21	50	386		141	J	1,550	J	23	U	50	U	23	UJ	50	UJ
Antimony	UG/L	GA	3	4	12	50	1	U	1	U	1.5		2.3	U	2	U	2.3	UJ	2	UJ
Arsenic	UG/L	MCL	10	0	2	50	3.7	U	3.7	U	3.7	U	1.3	U	1.3	U	1.3	UJ	1.3	UJ
Barium	UG/L	GA	1,000	0	48	50	29.3		49.4		54.5		37		38	J	37	J	36	J
Beryllium	UG/L	MCL	4	0	1	50	0.33	U	0.3	U	0.3	U	0.25	U	0.15	U	0.25	UJ	0.15	UJ
Cadmium	UG/L	GA	5	0	2	50	0.33	U	0.3	U	0.3	U	0.095	U	0.13	U	0.095	UJ	0.13	UJ
Calcium	UG/L				48	50	67,200		99,400	J	95,900	J	90,000		93,000		74,000	J	67,000	J
Chromium	UG/L	GA	50	0	4	50	0.88	U	0.9	U	5.2		2.5	U	2.5	U	2.5	UJ	2.5	UJ
Cobalt	UG/L				31	50	1.1	U	1.5	J	1.7	J	0.63		0.7		0.15	UJ	0.12	UJ
Copper	UG/L	GA	200	0	23	50	2.8	J	2.5	J	7.9	J	1.1	U	1.1	U	3.3	J	5	UJ
Iron	UG/L	GA	300	14	38	50	**1,300**		**827**	**J**	**2,690**	**J**	**730**	**J**	**770**	**J**	33	UJ	44	UJ
Iron+Manganese	UG/L	GA	500	13	46	50	**1,573**		**968**	**J**	**2,858**	**J**	**890**	**J**	**940**	**J**	34	UJ	46	UJ
Lead	UG/L	MCL	15	1	8	50	2.9	U	2.9	U	8.6		0.2	U	0.5	U	0.24	J	0.78	J
Magnesium	UG/L				41	43	7,400		9,650		9,170		9,900		10,000	J	6,100	J	5,800	J
Manganese	UG/L	GA	300	2	46	50	273		141		168		160		170		1	UJ	2	UJ
Mercury	UG/L	GA	0.7	0	2	50	0.12	U	0.1	U	0.1	U	0.091	U	0.091	U	0.091	UJ	0.091	UJ
Nickel	UG/L	GA	100	0	14	50	1.8	J	3.1	J	4.5	J	2	U	2	U	2	UJ	2	UJ
Potassium	UG/L				43	45	1,840	J	1,290		1,590		1,200	J	1,200		1,800	J	1,700	J
Selenium	UG/L	GA	10	0	0	50	6.1	U	6.1	U	6.1	U	1	U	1.1	U	1	UJ	1.1	UJ
Silver	UG/L	GA	50	0	0	50	1.3	U	1.3	U	1.3	U	0.25	U	0.18	U	0.25	UJ	0.18	UJ
Sodium	UG/L	GA	20,000	4	44	46	5,500		7,500	J	6,200	J	6,000	J	6,100	J	3,300	J	3,100	J
Thallium	UG/L	MCL	2	0	2	50	0.09	U	0.008	U	0.008	U	0.5	U	0.25	U	0.5	UJ	0.25	UJ
Vanadium	UG/L				2	50	0.98	U	1	U	1.7	J	3.8	U	3.2	U	3.8	UJ	3.2	UJ
Zinc	UG/L				27	50	14.2		21.1		45.7		8.3	U	12	J	29	J	26	J

Notes:

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Seneca Army Depot Activity

Area							SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17	
Loc ID							MW17-3		MW17-3		MW17-4		MW17-4		MW17-4		MW17-4	
Matrix							GW		GW		GW		GW		GW		GW	
Sample ID							17LM20027F		17LM20027U		17LM20003		17LM20008		17LM20013FIL		17LM20018FIL	
Sample Date							12/15/2013		12/15/2013		12/20/2007		12/10/2008		11/17/2009		12/16/2010	
QC Type							SA		SA		SA		SA		SA		SA	
Study ID							LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round							6		6		1		2		3		4	
Filtered							Dissolved		Total		Total		Total		Dissolved		Dissolved	
Parameter	Unit	Criteria [1] Source	Criteria [1] Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																		
Aluminum	UG/L				21	50	23	UJ	50	UJ	50.2	J	125	J	28	J	70	J	23	U
Antimony	UG/L	GA	3	4	12	50	2.3	UJ	2	UJ	1	U	0.62	J	1	U	1	U	2.3	U
Arsenic	UG/L	MCL	10	0	2	50	1.3	UJ	1.3	UJ	4.2	U	3.7	U	3.7	U	3.7	U	1.3	U
Barium	UG/L	GA	1,000	0	48	50	52	J	53	J	32.5		35.9		38.3		36.6		27	
Beryllium	UG/L	MCL	4	0	1	50	0.25	UJ	0.15	UJ	0.27	U	0.33	U	0.3	U	0.3	U	0.25	U
Cadmium	UG/L	GA	5	0	2	50	0.095	UJ	0.13	UJ	0.36	U	0.33	U	0.3	U	0.3	U	0.095	U
Calcium	UG/L				48	50	130,000	J	110,000	J	74,900	J	74,700		96,600	J	97,600	J	90,000	
Chromium	UG/L	GA	50	0	4	50	2.5	UJ	2.5	UJ	1	J	0.88	U	0.9	U	0.9	U	2.5	U
Cobalt	UG/L				31	50	0.31	J	0.3	J	0.89	U	2.4	J	1.5	J	1.3	J	0.96	
Copper	UG/L	GA	200	0	23	50	1.3	J	1.1	J	1.8	J	1.8	J	1.3	U	1.3	U	1.1	U
Iron	UG/L	GA	300	14	38	50	33	UJ	110	J	45.4	J	**1,760**		60	J	142	J	240	J
Iron+Manganese	UG/L	GA	500	13	46	50	2.3	J	112	J	59	J	**2,671**		258	J	355	J	370	J
Lead	UG/L	MCL	15	1	8	50	0.35	J	0.5	UJ	2.9	U	2.9	U	2.9	U	2.9	U	0.2	U
Magnesium	UG/L				41	43	15,000	J+	15,000	J	10,400	R	10,200		12,900		13,000		13,000	
Manganese	UG/L	GA	300	2	46	50	2.3	J	2	J	13.7		**911**		198		213		130	
Mercury	UG/L	GA	0.7	0	2	50	0.091	UJ	0.091	UJ	0.12	U	0.12	U	0.1	U	0.1	U	0.091	U
Nickel	UG/L	GA	100	0	14	50	2	UJ	2	UJ	1.2	U	2.6	J	2.2	J	2.4	J	2	U
Potassium	UG/L				43	45	670	J	640	J	838	R	1,190	J	844		866		540	
Selenium	UG/L	GA	10	0	0	50	1	UJ	1.1	UJ	6.1	U	6.1	U	6.1	U	6.1	U	1	U
Silver	UG/L	GA	50	0	0	50	0.25	UJ	0.18	UJ	1	U	1.3	U	1.3	U	1.3	U	0.25	U
Sodium	UG/L	GA	20,000	4	44	46	11,000	J	10,000	J	**28,500**	**J**	15,500		10,400	J	10,500	J	12,000	J
Thallium	UG/L	MCL	2	0	2	50	0.5	UJ	0.25	UJ	0.03	U	0.09	U	0.008	U	0.008	U	0.5	U
Vanadium	UG/L				2	50	3.8	UJ	3.2	UJ	0.78	U	0.98	U	1	U	1	U	3.8	U
Zinc	UG/L				27	50	35	J	33	J	5.1	J	6.7	J	3.6	U	3.6	U	8.7	J

Notes:

1. The lowest value for either the New York Class GA Groundwater Standards (TOGS 1.1.1, June 1998, et al.) or the EPA Maximum Contaminant Limit (MCL), source http://www.epa.gov/safewater/mcl.html#inorganic.html is used. A blank cell indicates no criteria value available.
2. Data validation qualifier
   [empty cell] = data is not qualified
   U = compound not detected at concentration listed
   J = the reported value is an estimated concentration
   J+ = result is an estimated quantity, biased high
   R = the result was rejected due to QA/QC considerations
   UJ = detection limit is estimated.
3. Shading indicates a concentration above the identified criteria value.
   SA = Sample
   DU = Duplicate Sample
4. Rejected values are not included in the number of samples analyzed.

Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 6)
Draft Annual Report - Year for SEAD-16 and SEAD-17
Seneca Army Depot Activity

Area							SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17	
Loc ID							MW17-4		MW17-4		MW17-4		MW17-4		MW17-4		MW17-5		MW17-5	
Matrix							GW		GW		GW		GW		GW		GW		GW	
Sample ID							17LM20018UNF		17LM20023F		17LM20023U		17LM20028F		17LM20028U		17LM20004		17LM20009	
Sample Date							12/16/2010		12/11/2012		12/11/2012		12/15/2013		12/15/2013		12/20/2007		12/11/2008	
QC Type							SA		SA		SA		SA		SA		SA		SA	
Study ID							LTM		LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round							4		5		5		6		6		1		2	
Filtered							Total		Dissolved		Total		Dissolved		Total		Total		Total	
Parameter	Unit	Criteria [1] Source	Criteria [1] Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																				
Aluminum	UG/L				21	50	50	U	23	UJ	50	UJ	23	UJ	50	UJ	98.5	J	125	J
Antimony	UG/L	GA	3	4	12	50	2	U	2.3	UJ	2	UJ	2.3	UJ	2	UJ	1	U	0.56	J
Arsenic	UG/L	MCL	10	0	2	50	1.3	U	1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ	4.2	U	3.7	U
Barium	UG/L	GA	1,000	0	48	50	28	J	65	J	67	J	20	J	23	J	86.7		82.9	
Beryllium	UG/L	MCL	4	0	1	50	0.15	U	0.25	UJ	0.15	UJ	0.25	UJ	0.15	UJ	0.27	U	0.33	U
Cadmium	UG/L	GA	5	0	2	50	0.13	U	0.095	UJ	0.13	UJ	0.095	UJ	0.13	UJ	0.36	U	0.33	U
Calcium	UG/L				48	50	88,000		83,000	J	87,000	J	96,000	J	93,000	J	97,100	J	97,300	
Chromium	UG/L	GA	50	0	4	50	2.5	U	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ	0.84	U	0.88	U
Cobalt	UG/L				31	50	1.1		0.21	J	0.25	J	1	J	1.1	J	0.89	U	1.1	U
Copper	UG/L	GA	200	0	23	50	1.1	U	1.1	J	5	UJ	1.1	UJ	1.1	UJ	1.3	U	1.5	J
Iron	UG/L	GA	300	14	38	50	260	J	33	UJ	72	J	**810**	**J**	**810**	**J**	91.7		76	
Iron+Manganese	UG/L	GA	500	13	46	50	400	J	9.5	J	83	J	**1,090**	**J**	**1,090**	**J**	128		85	
Lead	UG/L	MCL	15	1	8	50	0.5	U	0.2	UJ	0.5	UJ	0.2	UJ	0.5	UJ	2.9	U	2.9	U
Magnesium	UG/L				41	43	13,000	J	15,000	J	15,000	J	15,000	J+	15,000	J	15,800	J	15,600	
Manganese	UG/L	GA	300	2	46	50	140		9.5	J	11	J	280	J	280	J	36.5		8.9	
Mercury	UG/L	GA	0.7	0	2	50	0.091	U	0.091	UJ	0.091	UJ	0.091	UJ	0.091	UJ	0.12	U	0.12	U
Nickel	UG/L	GA	100	0	14	50	2	U	2	UJ	2.1	J	2	UJ	2	UJ	1.2	U	1.2	J
Potassium	UG/L				43	45	530	J	750	J	780	J	450	J	430	J	972	R	824	J
Selenium	UG/L	GA	10	0	0	50	1.1	U	1	UJ	1.1	UJ	1	UJ	1.1	UJ	6.1	U	6.1	U
Silver	UG/L	GA	50	0	0	50	0.18	U	0.25	UJ	0.18	UJ	0.25	UJ	0.18	UJ	1	U	1.3	U
Sodium	UG/L	GA	20,000	4	44	46	12,000	J	8,900	J	8,600	J	7,800	J	7,800	J	7,950	R	7,360	
Thallium	UG/L	MCL	2	0	2	50	0.25	U	0.5	UJ	0.25	UJ	0.5	UJ	0.25	UJ	0.03	U	0.09	U
Vanadium	UG/L				2	50	3.2	U	3.8	UJ	3.2	UJ	3.8	UJ	3.2	UJ	0.78	U	0.98	U
Zinc	UG/L				27	50	8.4	U	8.3	UJ	8.4	UJ	8.3	UJ	8.4	UJ	4.7	J	41.6	

Notes:

1. The lowest value for either the New York Class GA Groundwater Standards (TOGS 1.1.1, June 1998, et al.) or the EPA Maximum Contaminant Limit (MCL), source http://www.epa.gov/safewater/mcl.html#inorganic.html is used. A blank cell indicates no criteria value available.
2. Data validation qualifier
   [empty cell] = data is not qualified
   U = compound not detected at concentration listed
   J = the reported value is an estimated concentration
   J+ = result is an estimated quantity, biased high
   R = the result was rejected due to QA/QC considerations
   UJ = detection limit is estimated.
3. Shading indicates a concentration above the identified criteria value
   SA = Sample
   DU = Duplicate Sample
4. Rejected values are not included in the number of samples analyzed.

Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 6)
Draft Annual Report - Year for SEAD-16 and SEAD-17
Seneca Army Depot Activity

Area							SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17	
Loc ID							MW17-5		MW17-5		MW17-5		MW17-5		MW17-5		MW17-5		MW17-5	
Matrix							GW		GW		GW		GW		GW		GW		GW	
Sample ID							17LM20014FIL		17LM20014UNFIL		17LM20019FIL		17LM20019UNF		17LM20024F		17LM20024U		17LM20029F		17LM20029U	
Sample Date							11/17/2009		11/17/2009		12/16/2010		12/16/2010		12/11/2012		12/11/2012		12/15/2013		12/15/2013	
QC Type							SA		SA		SA		SA		SA		SA		SA		SA	
Study ID							LTM		LTM		LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round							3		3		4		4		5		5		6		6	
Filtered							Dissolved		Total		Dissolved		Total		Dissolved		Total		Dissolved		Total	
Parameter	Unit	Criteria [1] Source	Criteria [1] Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																						
Aluminum	UG/L				21	50	29	J	98	J	23	U	50	U	23	UJ	50	UJ	23	UJ	50	UJ
Antimony	UG/L	GA	3	4	12	50	1		1		2.3	U	2	U	2.3	UJ	2	UJ	2.3	UJ	2	UJ
Arsenic	UG/L	MCL	10	0	2	50	3.7	U	3.7	U	1.3	U	1.3	U	1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ
Barium	UG/L	GA	1,000	0	48	50	166		168		81		82	J	24	J	26	J	75	J	86	J
Beryllium	UG/L	MCL	4	0	1	50	2	U	2	U	0.25	U	0.15	U	0.25	UJ	0.15	UJ	0.25	UJ	0.15	UJ
Cadmium	UG/L	GA	5	0	2	50	0.3	U	0.3	U	0.095	U	0.13	U	0.095	UJ	0.13	UJ	0.095	UJ	0.13	UJ
Calcium	UG/L				48	50	184,000	J	185,000	J	100,000		110,000		68,000	J	75,000	J	110,000	J	100,000	J
Chromium	UG/L	GA	50	0	4	50	0.9	U	0.9	U	2.5	U	2.5	U	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ
Cobalt	UG/L				31	50	1.1	U	1.1	U	0.17	J	0.19	J	0.31	J	0.31	J	0.2	J	0.22	J
Copper	UG/L	GA	200	0	23	50	1.3	U	1.3	U	1.1	U	1.1	U	3.7	J	5	UJ	1.1	UJ	1.1	UJ
Iron	UG/L	GA	300	14	38	50	19	UJ	34	J	83	J	110	J	44	J	160	J	**350**	**J**	140	J
Iron+Manganese	UG/L	GA	500	13	46	50	24.3		61.4	J	118	J	145	J	82	J	219	J	374	J	167	J
Lead	UG/L	MCL	15	1	8	50	2.9	U	2.9	U	0.2	U	0.5	U	0.2	UJ	0.5	UJ	0.2	UJ	0.5	UJ
Magnesium	UG/L				41	43	27,100		27,300		17,000		18,000	J	9,900	J	11,000	J	18,000	J+	17,000	J
Manganese	UG/L	GA	300	2	46	50	24.3		27.4		35		35		38	J	59	J	24	J	27	J
Mercury	UG/L	GA	0.7	0	2	50	0.1	U	0.1	U	0.091	U	0.091	U	0.12	J	0.091	UJ	0.091	UJ	0.091	UJ
Nickel	UG/L	GA	100	0	14	50	1.7	J	1.8	J	2	U	2	U	2	UJ	2	UJ	2	UJ	2	UJ
Potassium	UG/L				43	45	1,920		1,960		1,600	J	1,600		460	J	460	J	1200	J	1100	J
Selenium	UG/L	GA	10	0	0	50	6.1	U	6.1	U	1	U	1.1	U	1	UJ	1.1	UJ	1	UJ	1.1	UJ
Silver	UG/L	GA	50	0	0	50	1.3	U	1.3	U	0.25	U	0.18	U	0.25	UJ	0.18	UJ	0.25	UJ	0.18	UJ
Sodium	UG/L	GA	20,000	4	44	46	**364,000**	**J**	**366,000**	**J**	8,200	J	8,300	J	9,400	J	9,100	J	5,400	J	5,300	J
Thallium	UG/L	MCL	2	0	2	50	0.08	J	0.08	J	0.5	U	0.25	U	0.5	UJ	0.25	UJ	0.5	UJ	0.25	UJ
Vanadium	UG/L				2	50	1	U	1	U	3.8	U	3.2	U	3.8	UJ	3.2	UJ	3.8	UJ	3.2	UJ
Zinc	UG/L				27	50	3.6	U	3.6	U	20		8.4	U	8.3	UJ	8.4	UJ	8.3	UJ	8.4	UJ

Notes:

1. The lowest value for either the New York Class GA Groundwater Standards (TOGS 1.1.1, June 1998, et al.) or the EPA Maximum Contaminant Limit (MCL), source http://www.epa.gov/safewater/mcl.html#inorganic.html is used. A blank cell indicates no criteria value available.
2. Data validation qualifier
   [empty cell] = data is not qualified
   U = compound not detected at concentration listed
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   UJ = detection limit is estimated
3. Shading indicates a concentration above the identified criteria value
   SA = Sample
   DU = Duplicate Sample
4. Rejected values are not included in the number of samples analyzed

APPENDIX E

LABORATORY REPORTS

Laboratory Reports have been provided on the CD version of this report.

APPENDIX F

DATA VALIDATION

PRO. .T NAME/NO.	USACE - Seneca Army Depot SEAD-16/17 LTM Year 6
LAB:	TestAmerica
SDG:	680-97324-1 (aka J97324)
FRACTION:	Metals (SW846 6020A)
MEDIA:	Groundwater
NUMBER OF SAMPLES:	12 Unfiltered and 12 Filtered

CRITERIA	Did Analyses Meet all criteria as specified in the SOPS?	Region 2 Acceptable limits / criteria	Comments/Qualifying Actions	Qualifiers Added?
Data Completeness, Holding Times & Preservation	Yes	Cooler temp < 10 C, pH < 2 Holding Time Hg < 28 days, all other metals < 180 days from collection	Coolers were received at 0.6°C by the laboratory All samples were received in good condition based on the laboratory login report Samples were properly preserved and had pH < 2 Samples were analyzed within 9 days from collection	No
Calibration	Yes	r^2 ≥ 0.995 CCV every 10 samps or 2 hours ICV/CCV %R btw 90-110%	Calibrations available, taken every ten samples, and within recovery limits (90-110%) Initial Calibration Verification (Batch #680-309198) for Dissolved metals was conducted on 12/23/13 at 13:56. The ICV and subsequent CCVs for metals were all within accetance criteria. ICV (Batch #680-309582) for Total metals except Ba, Ca, & Ag was conducted on 12/23/13 at 13:56. The ICV and subsequent CCVs for metals were all within accetance criteria ICV (Batch #680-309339) for Total metals (Ba, Ca, and Ag) was conducted on 12/26/13 at 16:41 The ICV and subsequent CCVs for metals were all within accetance criteria	No
Blanks (prep blank, ICB, CCB)	No	Method blanks, 1 per 20 project samples	Initial Calibration Blank (ICB) (Batch #680-309198) analyzed on 12/23/13 at 14:03 for Dissolved metals and all metals were non-detected CCBs (Batch #680-309198) were analyzed from 12/23/13 at 14:25 to 12/24/13 at 08:59 for Dissolved metals every ten samples, all CCBs were non-detect for Dissolved metals except for Al (0.483 J ug/L at 15:32). No action was taken since no samples were analyzed before or after the 15:32 CCB. ICB (Batch #680-309339) analyzed on 12/23/13 at 14:03 for Total metals (except Ba, Ca, & Ag) and all metals were non-detected. CCBs (Batch #680-309339) were analyzed from 12/23/13 at 14:25 to 12/24/13 at 14:03 for Total metals (except Ba, Ca, & Ag) every ten samples all CCBs were non-detect for Total metals ICB (Batch #680-309582) analyzed on 12/26/13 at 16:48 for Total metals (Ba, Ca, & Ag) and all metals were non-detected. CCBs (Batch #680-309582) were analyzed from 12/26/13 at 17:08 to 23:00 for Total metals (Ba, Ca & Ag) every ten samples, all CCBs were non-detect for Total metals. One Preparation blank was analyzed for Dissolved metals and all results were non-detect. Two Preparation blanks were analyzed for Total metals and all results were non-detect	No
CRDL Standard	Yes	CRDL results btw 70-130%	CRDL analyses for all remaining metals conducted at the beginning and end of the analysis All met requirements.	No
Laboratory Control Sample	Yes	LCS/LCSD, 1 per 20 project samples or each preparation batch, LCS limits within 80-120%	Two aqueous LCS results were within the limits for Total metals (of 14 unfiltered project samples) One aqueous LCS results were within the limits for Dissolved metals (of 14 filtered project samples).	No
Duplicates	No	RPD < 20% or Absolute Diff < 2 RL when samp/dup value < 5x RL	Two field duplicate pairs were collected for this SDG; a unfiltered and filtered sample. Unfiltered sample 16LM20038U and its duplicate 16LM20039U, and filtered sample 16LM20038F and its duplicate 16LM20039F All RPDs were within acceptance limits. A lab duplicate was not analyzed for this SDG Qualify all sample results as J since a lab duplicate was not performed	Yes

PROJECT NAME/NO. USACE - Seneca Army Depot SEAD-16/17 LTM Year 6
LAB: TestAmerica
SDG: 680-97324-1 (aka J97324)
FRACTION: Metals (SW846 6020A)
MEDIA: Groundwater
NUMBER OF SAMPLES: 12 Unfiltered and 12 Filtered

CRITERIA	Did Analyses Meet all criteria as specified in the SOPS?	Region 2 Acceptable limits / criteria	Comments/Qualifying Actions	Qualifiers Added?
Matrix Spike/Matrix Spike Duplicates	No	MS/MSD. 1 per 20 project samples or each preparation batch. Recoveries within lab limits. MS/MSD %RPDs <= 20%. Spike Recovery limits 75-125%	One spike unfiltered sample was associated with this SDG; sample 16LM20038U. All spike metal recoveries were within the recovery except Mg (152% MS) and Zn (146% MSD), and Ca initial conc was >4x spike conc. The RPD limits were within the limits One spike filtered sample was associated with this SDG; sample 16LM20038F All spike metal recoveries were within the recovery, and Ca initial conc was >4x spike conc. The RPD limits were within the limits. The post digestion spike was performed on unfiltered 16LM20038U. Al (127%), Mg (127%), and Mn (1085%) recoveries were above the limits. Qualify Total Mg detects as J+, estimated high. The post digestion spike was performed on filtered 16LM20038F. Mn (1030%) recoveries were above the limits. Qualify Dissolved Mn results as J.	Yes
ICP Interference Check Sample (ICS)	Yes	ICS results within 80-120%.	All concentrations detected in all samples within the ICP Linear Range. No action was taken	No
ICP Tune Analysis	Yes	RSD < 5%	Tune Analysis was conducted on 12/23/13 and 12/26/13. All isotopes of each analyte had a RSD < 5%.	No
Internal Standard	Yes	Intensity within 60-125%	IS from 12/23/13 to 12/24/13 had %RI within acceptance limits. IS from 12/26/13 to 12/27/13 had %RI within acceptance limits.	No
Serial Dilution	Yes	Performed on samples of a similar matrix or 1 per 20 samples. %D ≤ 10% conc ≥ 25xDL (7470A/7471A) and 10x IDL (6010B) for 5-fold dilution.	Sample 16LM20038U serial dilution for all metal with %D < 10% and sample conc > 50xMDL met requirements. Sample 16LM20038F serial dilution for all metal with %D < 10% and sample conc > 50xMDL met requirements.	No
Total/Dissolved Comparison	No	%RPD less than 20%	Samples with Total and Dissolved results that have detected Dissolved concentrations greater than the Total and have a Dissolved concentration > 5xMDL. All sample results met this requirment except for in samples: 16LM20038U/16LM20038F for Mn (30%). Qualify these samples results as J.	Yes
Field Duplicate Precision	Yes	%RPD less than 20%	Two field duplicate pairs were collected for this SDG; a unfiltered and filtered sample. Unfiltered sample 16LM20038U and its duplicate 16LM20039U, and filtered sample 16LM20038F and its duplicate 16LM20039F. All RPDs were within acceptance limits.	No

RT = Retention Time; %D = Percent Deviation; %RPD = Relative Percent Difference; %RSD = Percent Relative Standard Deviation; RRF = Relative Response Factor; CCV = Continuing Calibration Verification
TCL = Target Compound List; MS = Matrix Spike, MSD = Matrix Spike Duplicate;