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April 12, 2010

Mr. John Nohrstedt
U.S. Army Corps of Engineers
Engineering and Support Center, Huntsville
Attn: CEHNC-FS-IS
4820 University Square
Huntsville, Alabama 35816-1822

SUBJECT: Annual Report and Year Three Review – Ash Landfill Operable Unit at Seneca Army Depot Activity; W912DY-08-D-0003, Delivery Order 0001

Dear Mr. Nohrstedt:

Parsons Infrastructure & Technology Group, Inc. (Parsons) is pleased to submit the Annual Report and Year Three Review for the third year of monitoring at the Ash Landfill Operable Unit at Seneca Army Depot Activity (SEDA) in Romulus, New York. This work was performed in accordance with the Scope of Work for Delivery Order 0001 under Contract W912DY-08-D-0003. This Annual Report and Year Three Review provides a review of long-term groundwater monitoring for 2009 and provides recommendations for future long-term monitoring at the site. This document also provides an annual review of the effectiveness of the remedy implemented in 2006. This document recommends the continuation of monitoring on a semi-annual basis for the next year.

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

Sincerely,

Todd Heino, P.E.
Program Manager

Enclosures

cc: S. Absolom, SEDA
K. Hoddinott, USACHPPM
R. Battaglia, USACE, NY

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April 12, 2010

Mr. Julio Vazquez
USEPA Region II
Superfund Federal Facilities Section
290 Broadway, 18th Floor
New York, NY 10007-1866

Mr. Kuldeep K. Gupta, P.E.
New York State Department of Environmental Conservation (NYSDEC)
Division of Environmental Remediation
Remedial Bureau A, Section C
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Albany, NY 12233-7015

Mr. Mark Sergott
Bureau of Environmental Exposure Investigation, Room 300
New York State Department of Health
547 River Street, Flanigan Square
Troy, NY 12180

SUBJECT: Annual Report and Year Three Review – Ash Landfill Operable Unit at Seneca Army Depot Activity; EPA Site ID# NY0213820830 and NY Site ID# 8-50-006

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

Parsons Infrastructure & Technology Group, Inc. (Parsons) is pleased to submit the Annual Report and Year Three Review for the third year of annual monitoring at the Ash Landfill Operable Unit at Seneca Army Depot Activity (SEDA) in Romulus, New York (EPA Site ID# NY0213820830 and NY Site ID# 8-50-006). This Annual Report and Year Three Review provides a review of long-term groundwater monitoring for 2009 and recommendations for future long-term monitoring at the site. This document also provides an annual review of the effectiveness of the remedy implemented in 2006. This document recommends the continuation of monitoring on a semi-annual basis for the next year.

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

Sincerely,

Todd Heino, P.E.
Program Manager

Enclosures

cc: M. Heaney, TechLaw
S. Absolom, SEDA
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K. Hoddinott, USACHPPM

US Army, Engineering & Support Center
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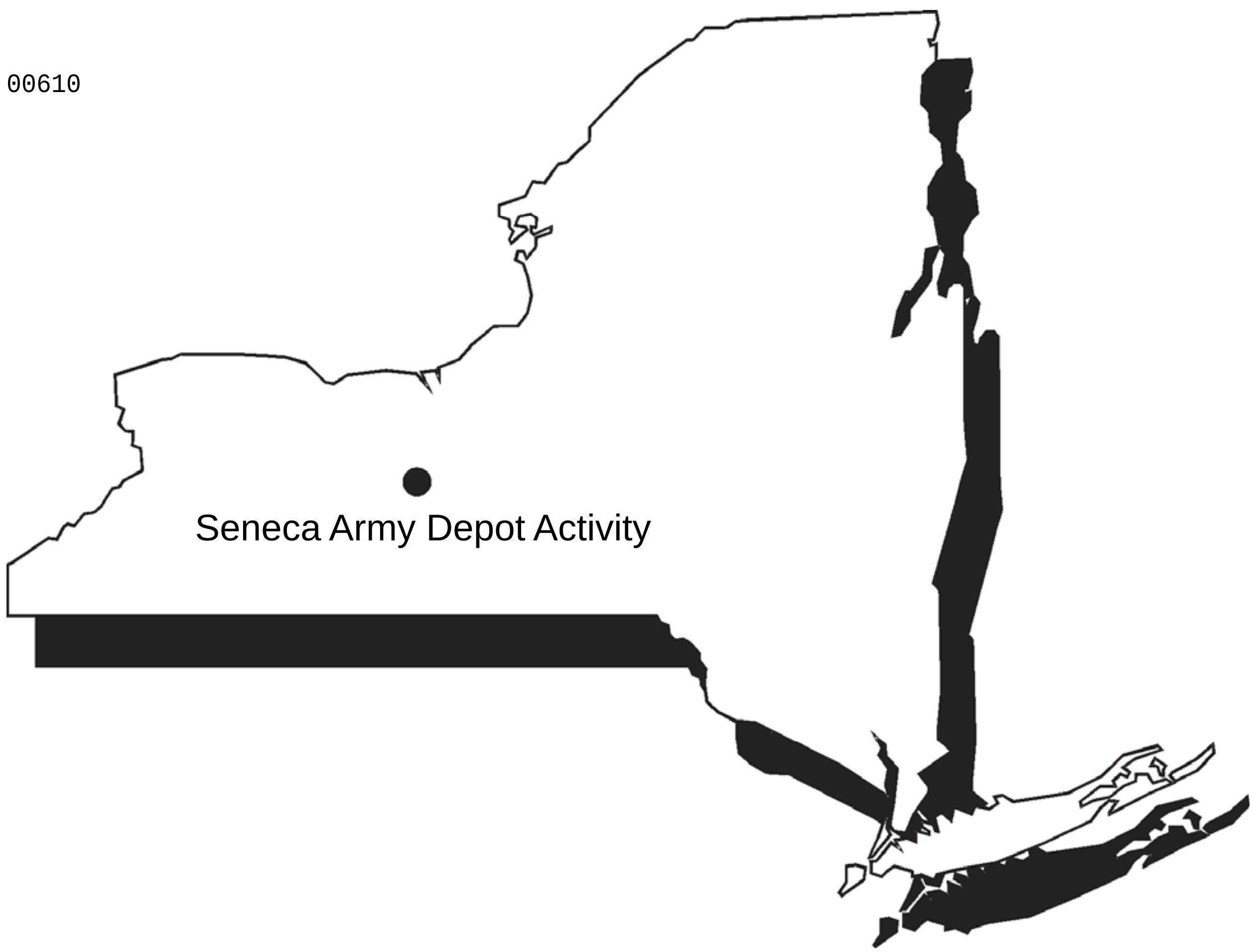

FINAL

ANNUAL REPORT AND YEAR THREE REVIEW

FOR THE ASH LANDFILL OPERABLE UNIT
SENECA ARMY DEPOT ACTIVITY

Contract No. W912DY-08-D-0003
Task Order No. 0001
EPA Site ID# NY0213820830
NY Site ID# 8-50-006

PARSONS

August 2010

FINAL
ANNUAL REPORT AND YEAR 3 REVIEW
FOR THE
ASH LANDFILL OPERABLE UNIT
SENECA ARMY DEPOT ACTIVITY, ROMULUS, NEW YORK

Prepared for:

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

and

SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

Prepared by:

PARSONS
100 High Street
Boston, MA 02110

Contract Number W912DY-08-D-0003
Task Order No. 0001
EPA Site ID# NY0213820830
NY Site ID# 8-50-006 **August 2010**

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1.0 INTRODUCTION

This Annual Report is for the Ash Landfill Operable Unit (OU), located at the Seneca Army Depot Activity (SEDA or the Depot) in Romulus, New York (**Figure 1**). This report provides a review of the third year of long-term groundwater monitoring of the full-scale biowall system installed in 2006. This report also provides recommendations for future long-term monitoring at the site. This report is based on an annual review of the effectiveness of the remedy implemented in 2006, and includes the following:

- A comparison of the groundwater data to the long-term groundwater monitoring (LTM) objectives, listed below in **Section 1.1**;
- An evaluation of the need to recharge (i.e., add substrate) the biowalls, as outlined in the Remedial Design Report (RDR) (Parsons, 2006c) in **Section 3.4**; and
- An assessment of the remedy's compliance with the United States Environmental Protection Agency's (USEPA's) "Guidance for Evaluation of Federal Agency Demonstrations (Section 12(h)(s))."

A remedial action (RA) was completed in October and November 2006 in accordance with the Record of Decision (ROD) for the Ash Landfill OU (Parsons, 2004), the Remedial Design Work Plan (Parsons, 2006b), and the RDR (Parsons, 2006c), The RA involved the following:

- Installation of three dual biowall systems, A1/A2, B1/B2, and C1/C2, to address volatile organic compounds (VOCs) in groundwater that exceed New York State Department of Environmental Conservation's (NYSDEC's) Class GA groundwater standards;
- Construction and establishment of a 12-inch vegetative cover over the Ash Landfill and the Non-Combustible Fill Landfill (NCFL) to prevent ecological receptors from coming into direct contact with the underlying soils that are contaminated with metals and polycyclic aromatic hydrocarbons (PAHs);
- Excavation and disposal of Debris Piles A, B, and C; and
- Re-grading of the Incinerator Cooling Water Pond to promote positive drainage.

As part of the RA at the Ash Landfill OU, LTM is being performed as part of the post-closure operations. Groundwater monitoring is required as part of the remedial design, which was formulated to comply with the ROD. The first of four rounds of groundwater sampling in the first year of LTM was completed between January 3, 2007 and January 4, 2007; the second round was completed between March 15, 2007 and March 17, 2007; the third round was completed between June 5, 2007 and June 7, 2007; and the last round was completed between November 13, 2007 and November 15, 2007.

The analytical and geochemical results were presented in four letter reports, submitted April 12, 2007 (Quarter 1), June 5, 2007 (Quarter 2), September 19, 2007 (Quarter 3), and February 21, 2008 (Quarter 4). The results of the Year 1 LTM were reported and evaluated in the "Annual Report and One-Year Review for the Ash Landfill" (Parsons, 2008). As part of the Year 1 report, the Army recommended that the frequency of LTM events at the Ash Landfill OU be reduced from quarterly to semi-annually; this recommendation was approved by the USEPA and NYSDEC.

The first round of Year 2 semi-annual monitoring, referred to as Round 5, was completed between June 24, 2008 and June 26, 2008. Round 6 of the semi-annual monitoring was completed between December 11, 2008 and December 15, 2008. The results of Year 2 of the LTM program were presented in the "Annual Report and Year Two Review" (Parsons, 2009). The first round of Year 3 semi-annual monitoring, referred to as Round 7, was completed between June 1, 2009 and June 4, 2009. Round 8 of the semi-annual monitoring was completed between December 14, 2009 and December 18, 2009.

This Annual Report reviews the results of the third year of the LTM program as part of the ongoing evaluation of the remedy and provides conclusions and recommendations about the effectiveness of the remedial action, including the groundwater remedy and the vegetative landfill covers.

1.1 Long-Term Groundwater Monitoring Objectives

Three types of long-term groundwater monitoring are being performed: 1) plume performance monitoring, 2) biowall process monitoring, and 3) off-site compliance monitoring. On-site performance monitoring is being conducted to measure groundwater contaminant concentrations and to evaluate the effectiveness of the biowall remedy for the Ash Landfill OU. The objectives of performance and compliance monitoring are as follows:

- Confirm that there are no exceedances of groundwater standards for contaminants of concern (COC) at the off-site compliance monitoring well MW-56;
- Document the effectiveness of the biowalls to remediate and attenuate the chlorinated ethene plume; and
- Confirm that groundwater concentrations throughout the plume are decreasing to eventually meet NYSDEC Class GA groundwater standards.

Biowall process monitoring is being conducted at two locations (shown in **Figure 2**) to determine if, and when, any biowall maintenance activities should be performed. The first location is within Biowalls B1/B2 in the segment that runs along the pilot-scale biowalls that were installed in July 2005. The second location is within Biowall C2, the furthest downgradient biowall. The objectives of biowall process monitoring for operations and maintenance (O&M) activities are as follows:

- Monitor the long-term performance and sustainability of the biowalls;

- Monitor substrate depletion and geochemical conditions under which the effectiveness of the biowalls may decline; and
- Determine if, and when, the biowalls need maintenance (i.e., need to be recharge with additional organic substrate).

2.0 SITE BACKGROUND

2.1 Site Description

SEDA is a 10,587-acre former military facility located in Seneca County near Romulus, New York, that was owned by the United States Government and operated by the Department of the Army since 1941. SEDA is located between Seneca Lake and Cayuga Lake 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 location of the Ash Landfill OU, also referred to as the Ash Landfill, is composed of five solid waste management units (SWMUs). As shown in **Figure 3**, the five SWMUs that comprise the Ash Landfill OU are the Incinerator Cooling Water Pond (SEAD-3), the Ash Landfill (SEAD-6), the NCFL (SEAD-8), the Debris Piles (SEAD-14), and the Abandoned Solid Waste Incinerator Building (SEAD-15).

Prior to the development of the Ash Landfill OU, the land in this area was used for farming. From 1941 (the date SEDA was constructed) to 1974, uncontaminated trash was burned in a series of burn pits near the abandoned incinerator building (Building 2207). According to the U.S. Army Environmental Hygiene Agency (USAEHA) Interim Final Report, Groundwater Contamination Survey No. 38-26-0868-88 (July 1987), the ash from the refuse burning pits was buried in the Ash Landfill (SEAD-6) from 1941 until the late 1950's or early 1960's.

The incinerator was built in 1974. Between 1974 and 1979, materials intended for disposal were transported to the incinerator. Each week the Depot generated approximately 18 tons of refuse, the majority of which was incinerated. The source for the refuse was domestic waste from Depot activities and family housing. Large items that could not be burned were disposed of at the NCFL (SEAD-8). The NCFL encompasses approximately three acres located southeast of the incinerator building, immediately south of a SEDA railroad line. The NCFL was used as a disposal site for non-combustible materials, including construction debris, from 1969 until 1977.

Ash and other residue from the incinerator were temporarily disposed in an unlined cooling pond immediately north of the incinerator building. The cooling pond consisted of an unlined depression approximately 50 feet in diameter and approximately 6 to 8 feet deep. When the pond filled, the fly ash and residues were removed, transported, and buried in the adjacent ash landfill east of the cooling pond. The refuse was dumped in piles and occasionally spread and compacted. No daily or final cover was applied during operation. According to an undated aerial photograph of the incinerator during operation, the active area of the Ash Landfill extended at least 500 feet north of the incinerator building, near a bend in a dirt road. A fire destroyed the incinerator on May 8, 1979, and the landfill was subsequently closed. Post-closure the landfill was apparently covered with native soil of various thicknesses, but was not closed with an engineered cover or cap. Other areas at the site were used as a grease pit and for burning debris.

2.2 Site Geology/Hydrogeology

The site is underlain by a broad north-to-south trending series of rock terraces covered by a mantle of glacial till. As part of the Appalachian Plateau, the region is underlain by a tectonically undisturbed sequence of Paleozoic rocks consisting of shales, sandstones, conglomerates, limestones and dolostones. At the Ash Landfill site, these rocks (the Ludlowville Formation) are characterized by gray, calcareous shales and mudstones and thin limestones with numerous zones of abundant invertebrate fossils. Locally, the shale is soft, gray, and fissile. The shale, which has a thin weathered zone at the top, is overlain by 2 to 3 feet of Pleistocene-age[1] till deposits. The till matrix varies locally, but generally consists of unsorted silt, clay, sand, and gravel.

The thickness of the till at the Ash Landfill OU generally ranges from 4 to 15 feet. At the location of the biowalls, the thickness of the till and weathered shale is approximately 10 to 15 feet. Groundwater is present in both the shallow till/weathered shale layer and in the deeper competent shale layer. In both water-bearing units, the predominant direction of groundwater flow is to the west, toward Seneca Lake. Based on the historical data, the wells at the Ash Landfill site exhibit rhythmic and seasonal fluctuations in the water table and the saturated thickness. Historic data at the Ash Landfill OU indicate that the saturated interval is thinnest (generally, between 1 and 3 feet thick) in the month of September and is thickest (generally, between 6 and 8.5 feet thick) between December and March.

The average linear velocity of the groundwater in the till/weathered shale layer was calculated during the Remedial Investigation (RI) in 1994 using the following parameters: 1) average hydraulic conductivity of 4.5×10^{-4} centimeters per second (cm/sec) (1.28 feet per day [ft/day]), 2) estimated effective porosity of 15% to 20%, and 3) groundwater gradient of 1.95×10^{-2} feet per foot (ft/ft) (Parsons Engineering Science, Inc., 1994). The average linear velocity was calculated to 0.166 ft/day or 60.7 feet per year (ft/yr) at 15% effective porosity and 0.125 ft/day or 45.5 ft/yr at 20% effective porosity. The actual velocity of on-site groundwater may be locally influenced by zones of higher-than-average permeability; these zones are possibly associated with variations in the porosity of the till/weathered shale.

[1] The Pliestocene Age, also known as the Late Wisconsin Age, occurred 20,000 years before present.

2.3 Soil and Groundwater Impacts

The nature and extent of the COCs at the Ash Landfill OU were evaluated through a comprehensive RI program. It was determined that surface water and sediment were not media of concern and did not require remediation. A groundwater contaminant plume that emanated from the northern end of the Ash Landfill was delineated during the RI. The primary COCs in groundwater at the Ash Landfill are VOCs; the primary COCs in soil at the Ash Landfill are chlorinated and aromatic compounds, semivolatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAHs), and, to a lesser degree, metals. Release of the COCs is believed to have occurred during the former activities at the Ash Landfill OU (described above).

Soil

VOCs, specifically trichloroethene (TCE), were detected in the soil in the “Bend in the Road” area. Located northwest of the Ash Landfill, this area is believed to be the source of the groundwater plume. Between 1994 and 1995, the Army conducted a Non-Time Critical Removal Action (NTCRA), also known as an Interim Removal Measure (IRM), to address VOC and PAH contamination in soil near the “Bend in the Road.” The excavation limits of the NTCRA are shown on **Figure 3**. The NTCRA successfully reduced the risk associated with potential exposure to contaminated soil, and prevented continued leaching of VOCs to groundwater. Since the NTCRA, concentrations of VOCs in groundwater near the original source area have decreased by two orders of magnitude. Further remediation for VOCs in the soil at the “Bend in the Road” was not required.

The other COCs detected in the soil were PAHs and metals. PAHs were detected at concentrations above NYSDEC’s Technical and Administrative Guidance Memorandum (TAGM) values in the NCFL and the Debris Piles present around the former Ash Landfill. In general, the highest PAH concentrations were detected in the NCFL and small Debris Pile surface soils. The metals that were detected at elevated concentrations (significantly above TAGMs) in soils were copper, lead, mercury, and zinc. These elevated concentrations were found in the Ash Landfill, the NCFL, and the Debris Piles, with the highest concentrations of metals detected at the surface of the Debris Piles. These piles are small, localized, surface features that are visibly discernable and do not extend into the subsurface.

Groundwater

The primary potential impact to human health and the environment is a groundwater contaminant plume containing dissolved chlorinated solvents, primarily TCE, isomers of dichloroethene (DCE), and vinyl chloride (VC). The plume originates in the "Bend in the Road" area near the northwestern edge of the Ash Landfill and is approximately 1,100 feet long by 625 feet wide. The nearest exposure points for groundwater are three farmhouse wells located approximately 1,250 feet from the leading edge of the plume near the farmhouse. The location of the farmhouse relative to the plume at the Ash Landfill is shown on **Figure 4**. Two of the farmhouse wells draw water from the till/weathered shale aquifer and the remaining well draws water from the bedrock aquifer. As discussed in Section 4.4 of the RI (Parsons, 1994), plume profiles were constructed for geologic cross sections at the Ash Landfill; based on these profiles it was determined that the plume is vertically restricted to the upper till/weathered shale aquifer and is not present in the deeper competent shale aquifer. As noted above, the source area of the plume was removed by the NTCRA.

2.4 Summary of the Remedial Action

2.4.1 Biowalls

Three biowall pairs were installed to address groundwater contamination on-site, as documented in the Construction Completion Report (Parsons, 2007). The biowalls were constructed by excavating a linear trench to competent bedrock then backfilling the trench to the ground surface with a mixture of mulch and sand.

Biowalls A1/A2, B1/B2, and C1/C2 (as shown in **Figure 2**) were constructed perpendicular to the chlorinated solvent plume at the locations prescribed in the RDR. The entire length of Biowalls A1/A2 and the northern portion of B1/B2 were combined into a single double-width trench (minimum of 6 feet in width) due to unstable soil conditions that caused trench widening. Approximately 2,840 linear feet (lf) of biowalls were constructed in the areas downgradient of the Ash Landfill at depths ranging from 7 feet below ground surface (bgs) to 18.5 feet bgs.

A 12-inch soil cover was placed over the entire length of the biowalls to impede surface water from preferentially flowing into the biowall trenches. Trench spoils were used as the cover material and were compacted with a backhoe. A site visit in December 2009 confirmed that the mulch backfill in the trenches has settled to ground surface.

2.4.2 Incinerator Cooling Water Pond

As specified in the RDR, the Incinerator Cooling Water Pond (ICWP) was re-graded to meet the surrounding grade to prevent the accumulation of water in this inactive pond. Prior to re-grading, the vegetation on the berms surrounding the ICWP was removed with an excavator. The soil berm was then regraded with a dozer to match the surrounding grade. The ICWP was seeded with a standard meadow mix to promote vegetation and to prevent erosion.

2.4.3 Ash Landfill and NCFL Vegetative Cover

A soil cover comprised of mulch, biowall trench spoils that met the site cleanup criteria, and off-site topsoil was placed over the 2.2 acres of the Ash Landfill. The Ash Landfill was covered with 4,380 cubic yards (cy) of fill to achieve a minimum cover thickness of 12 inches. Biowall trench spoils that met the site cleanup criteria and off-site topsoil were placed over the 3.4 acre NCFL. The NCFL was covered with 6,015 cy of fill to achieve a minimum cover thickness of 12 inches. The purpose of the covers is to prevent terrestrial wildlife from directly contacting or incidentally ingesting metal-impacted soils.

2.4.4 Debris Pile Removal

During the RA, approximately 200 cy of debris was removed from Debris Piles B and C. Approximately 1,000 cy of debris was removed from within and beyond the staked limits of Debris Pile A. The total volume of debris removed was approximately 1,200 cy (1,548 tons).

2.5 Description of Technology Used in Biowalls

Reductive dechlorination is the most important process for natural biodegradation of highly chlorinated solvents (USEPA, 1998) (see **Figure 5**). Complete dechlorination of TCE and other chlorinated solvents is the goal of anaerobic biodegradation via mulch biowall technology.

Biodegradation causes measurable changes in groundwater geochemistry that can be used to evaluate the effectiveness of substrate addition in stimulating biodegradation. For anaerobic reductive dechlorination to be an effective process, generally groundwater must be sulfate-reducing or methanogenic. Thus, groundwater in which anaerobic reductive dechlorination is occurring should have the following geochemical signature:

- Depleted concentrations of dissolved oxygen (DO), nitrate, and sulfate;
- Elevated concentrations of methane, carbon dioxide, chloride, and alkalinity; and
- Reduced oxidation reduction potential (ORP).

Treatment of chlorinated ethenes in groundwater using a biowall relies on the flow of groundwater under a natural hydraulic gradient through the biowall to promote contact with slowly-soluble organic matter. As the groundwater flows through the organic matter in the biowall, an anaerobic treatment zone is established in the biowall. The treatment zone may also extend downgradient of the biowall as soluble organic matter migrates with groundwater and stimulates microbial processes.

Solid-phase organic substrates used to stimulate anaerobic biodegradation of chlorinated ethenes include plant mulch and compost. To enhance microbial activity, the mulch may be composted prior to emplacement to more readily degraded material, or mulch may be mixed with an outside source of compost. Mulch is primarily composed of cellulose and lignin, and contains “green” plant material that provides nitrogen and nutrients for microbial growth. These substrates are mixed with coarse sand and placed in a trench or excavation in a permeable reactive biowall configuration. Biodegradable vegetable oil may be added to the mulch mixture to increase the availability of soluble organic carbon.

Degradation of the organic substrate by microbial processes in the subsurface provides a number of breakdown products, including metabolic acids (e.g., butyric and acetic acids). The breakdown products and acids produced by degradation of mulch in a saturated subsurface environment provide secondary fermentable substrates for the generation of molecular hydrogen, which is the primary electron donor utilized in anaerobic reductive dechlorination of chlorinated ethenes. Thus, a mulch biowall has the potential to stimulate reductive dechlorination of chlorinated ethenes for many years. If necessary, mulch biowalls can be periodically recharged with liquid substrates (e.g., vegetable oils) to extend the life of the biowall. Vegetable oil is a substrate that is readily available to microorganisms as a carbon source that helps establish and continually develop the microbial population. Used in combination with mulch, vegetable oil has the potential to extend the duration of organic carbon release.

3.0 LONG-TERM MONITORING DATA ANALYSIS AND GROUNDWATER REMEDY EVALUATION

3.1 Sample Collection

Four rounds of sampling were conducted during the first year of LTM, as follows:

- The first quarter, referred to as 1Q2007, was completed between January 3, 2007 and January 4, 2007;
- The second quarter, referred to as 2Q2007, was completed between March 15, 2007 and March 17, 2007;
- The third quarter, referred to as 3Q2007, was completed between June 5, 2007 and June 7, 2007; and
- The fourth quarter, referred to as 4Q2007, was completed between November 13, 2007 and November 15, 2007.

Two rounds of sampling were conducted during the second year of LTM, as follows:

- Round five, referred to as 5R2008, was completed between June 24, 2008 and June 26, 2008; and
- Round six, referred to as 6R2008, was completed between December 11, 2008 and December 15, 2008.

Two rounds of sampling were conducted during the third year of LTM, as follows:

- Round seven, referred to as 7R2009, was completed between June 1, 2009 and June 4, 2009; and

- Round eight, referred to as 8R2009, was completed between December 15, 2009 and December 18, 2009.

The first year of sampling was quarterly, and at that time, the sampling rounds were identified as xQyyyy, where "x" is the round number, and "yyyy" is the 4 digit year. After the first year, the sample frequency was modified to semiannual. An "R" was used to replace the "Q" to denote the round. The round number has been used sequentially since the first quarterly round.

Groundwater samples were collected using low flow sampling techniques during each of the 2009 sampling rounds. Bladder pumps were used to purge the wells and collect the samples during these rounds. Sampling procedures, sample handling and custody, holding times, and collection of field parameters were conducted in accordance with the "Final Sampling and Analysis Plan for Seneca Army Depot Activity (SAP)" (Parsons, 2006a). Field forms for 8R2009 are included on a CD in **Appendix A**.

Fourteen monitoring wells were sampled and classified into three groups (listed in **Table 1**): eleven on-site plume performance monitoring wells, one off-site compliance monitoring well, and five biowall process monitoring wells. The off-site performance monitoring well, MW-56, is monitored on a semi-annual basis, and was monitored in January 2007, June 2007, June 2008, December 2008, June 2009, and December 2009. The well locations are shown on **Figure 6**.

Three of the biowall process monitoring wells are also plume performance wells (MWT-23, MWT-28, and MWT-29). These five wells are either within or immediately upgradient or downgradient of the biowalls and are used to assess if, and when, the biowalls may require additional substrate. The Annual Report – Year 1 recommended that groundwater samples collected from monitoring wells PT-17 and MWT-7 be analyzed for additional geochemical parameters that are included for the process monitoring wells to better monitor the progress of the treatment zone.

As indicated in **Table 1**, samples from the wells in the biowall process monitoring group (MWT-23, MWT-26, MWT-27, MWT-28, and MWT-29) and from two wells from the on-site plume performance group (PT-17 and MWT-7) were submitted to Test America Laboratories, Inc. in Buffalo, New York to be analyzed for:

- VOCs by USEPA SW846 Method 8260B
- Sulfate by USEPA Method 300.1
- Total organic carbon (TOC) by USEPA SW846 Method 9060A

Samples from these wells were also submitted to Microseeps, Inc. located in Pittsburgh, Pennsylvania for analysis for methane, ethane, and ethene (MEE) by AM20GAX, Microseeps' version of Method RSK 175.

During sampling in the field, the following geochemical parameters were recorded for the duration of low-flow sampling for each groundwater sample:

- pH, ORP, conductivity, and temperature were measured with a Horiba U-22 multi-parameter instrument;
- DO was measured with a YSI 55 meter; and
- Turbidity was measured with a Lamotte 2020 turbidity meter.

In addition, a HACH® DR/850 Colorimeter was used in the field to measure manganese and ferrous iron at PT-17, MWT-7, MWT-23, MWT-26, MWT-27, MTW-28, and MWT-29. Manganese and ferrous iron were measured by USEPA Method 8034 and USEPA Method 8146, respectively. A summary of the samples collected is presented in **Table 1**.

3.2 Groundwater Elevations

Historic groundwater elevations and groundwater elevations from the three years of LTM round are presented in **Figure 7** and **Table 2**. Groundwater contours and groundwater flow direction based on 8R2009 are provided in **Figure 8**; these data show that groundwater levels were relatively low during the eighth sampling event.

3.3 Geochemical Data

Biodegradation causes measurable changes in groundwater geochemistry that can be used to evaluate the effectiveness of substrate addition in stimulating biodegradation. For anaerobic reductive dechlorination to be an effective process, typically groundwater will be sulfate-reducing or methanogenic. As mentioned above, geochemical parameters collected in the field that also serve as water quality indicators (i.e., pH, ORP, DO, conductivity, and temperature) were recorded for all the wells in the LTM program. Analysis for the additional geochemical parameters of TOC, sulfate, and MEE, and field tests for ferrous iron and manganese, were completed at PT-18A, MWT-7, MWT-23, MWT-26, MWT-27, MWT-28, and MWT-29. According to USEPA guidance on natural attenuation of chlorinated solvents (USEPA, 1998), analysis of these geochemical parameters may be used to as supporting evidence that anaerobic reductive dechlorination is occurring if the following geochemical conditions are observed:

- Depleted concentrations of DO and sulfate,
- Elevated concentrations of methane,
- Reduced ORP,
- Elevated concentrations of soluble organic substrate in groundwater (TOC), and
- An increase in the concentrations of ferrous iron and manganese relative to background conditions.

Geochemical parameter results are shown in **Table 3,** which is organized with the most upgradient well listed first and the most downgradient well listed last. A comparison of the geochemical parameters for wells MWT-26 (upgradient of Biowall B1) to MWT-28 (in Biowall B2) for Year 3, summarized below, demonstrates the change in geochemistry across the B1/B2 Biowalls.

Dissolved Oxygen

DO is the most favored electron acceptor (yields the most energy) used by microbes during biodegradation of organic carbon, and its presence can inhibit the anaerobic degradation of chlorinated ethenes. In the wells sampled within Biowalls B1/B2 and Biowall C2, DO levels are depleted (less than 1.0 milligrams per liter [mg/L]) in both Year 3 events (see **Table 3**). DO is depleted due to the presence of organic substrate in the biowalls. The depletion of DO enhances the potential for anaerobic degradation of chlorinated ethenes in groundwater. The data also show that historically DO concentrations are higher in winter than in summer; the increase in DO concentrations between the two Year 3 sampling events, 7R2009 and 8R2009, likely reflects seasonal variation and not a systemic increase in DO.

Sulfate

Sulfate is used as an electron acceptor during sulfate reduction, competing with anaerobic reductive dechlorination for available substrate/electron donor. Sulfate levels lower than 20 mg/L are desired to prevent inhibition of reductive dechlorination of chlorinated ethenes (USEPA, 1998). In Year 3, the sulfate levels detected within the biowalls (at MWT-27, MWT-28, and MWT-23) were orders of magnitude lower than the concentration of sulfate detected upgradient of Biowalls B1/B2 at MWT-26 (see **Table 3**). These conditions indicate that sulfate is being depleted and that sulfate should not inhibit anaerobic dechlorination within the biowalls.

Methane

The presence of methane in groundwater is indicative of strongly reducing methanogenic conditions. An increase in the concentrations of methane indicates that reducing conditions are optimal for anaerobic reductive dechlorination to occur. Methane was detected in the well upgradient of Biowall B1/B2 (MWT-26) at a concentration of 610 micrograms per liter (μg/L) in Round 8. Compared to this concentration, concentrations of methane increased by three orders of magnitude at all process wells located within biowalls, and by two orders of magnitude in the process well immediately downgradient of Biowall B2 (see **Table 3**). These data demonstrate that there is an increase in the level of methanogenic activity within the biowalls and in downgradient areas, compared to upgradient locations.

Oxidation-Reduction Potential

ORP indicates the level of electron activity in groundwater and the tendency of groundwater to accept or transfer electrons. Low ORP, less than -100 millivolts (mV), is conducive for anaerobic reductive dechlorination to occur (USEPA, 1998). During Round 8, ORP values upgradient of Biowall A1/A2 were significantly higher than ORP values in the wells within the biowalls, which were less than or close to -100 mV (see **Table 3**). The ORP levels within Biowalls B1/B2 and C2 indicate that reducing conditions within the biowalls are sufficient to support sulfate reduction, methanogenesis, and anaerobic reductive dechlorination.

Total Organic Carbon

The presence of organic substrate is necessary to stimulate and sustain anaerobic degradation processes. In biowalls, organic carbon acts as an energy source for anaerobic bacteria and drives reductive dechlorination. Typically concentrations of TOC greater than 20 mg/L are sufficient to maintain sulfate reducing and methanogenic conditions (USEPA, 1998). As shown in **Table 3**, TOC concentrations in Biowalls B1/B2 were greater than the TOC concentrations upgradient of the biowalls. Downgradient of Biowall B2 (at MWT-29), the concentration of TOC decreased below the threshold value of 20 mg/L. There is a decrease in the concentration of TOC as readily degraded organics (i.e., vegetable oil and cellulose) in the mulch mixture are consumed; however, TOC concentrations on-site remain sufficiently high enough to serve as an energy source for anaerobic bacteria in the biowalls. As discussed below, the change in TOC concentrations appears to have little impact on the efficiency at which chlorinated organics are degraded within the biowalls and does not indicate that the biowalls need to be recharged at this time.

Ferrous Iron and Manganese

As described in USEPA (1998), iron III (ferric iron) is an electron acceptor used by iron-reducing bacteria under anaerobic conditions; Iron II (ferrous iron) is the product. Iron III is relatively insoluble in groundwater relative to Iron II. Therefore, an increase in concentrations of Iron II in groundwater is a clear indication that anaerobic iron reduction is occurring. Similarly, USEPA (1998) states that manganese (IV) is an electron acceptor used by manganese-reducing bacteria under anaerobic environments; soluble manganese (II) is the product. Under anaerobic conditions like those at the Ash Landfill, the presence of manganese and ferrous iron in groundwater at concentrations above the natural background concentrations demonstrates that manganese reduction and iron reduction are occurring at the site. These data support the conclusion that conditions within the biowalls are anaerobic and conducive to the degradation of chlorinated ethenes.

Summary

Monitoring data for wells within the biowalls during the third year of LTM indicate the following:

- DO remains below 1.0 mg/L at Biowalls B1/B2 and Biowall C2;
- Concentrations of TOC remain elevated, ranging from 15.6 mg/L to 81.7 mg/L;
- ORP remains low, ranging from -148 mV to -90 mV;

- Sulfate remains below 20 mg/L;
- Methane concentrations are 13 mg/L or higher; and
- Ferrous iron and manganese concentrations are increasing in the biowalls, indicating that conditions are conducive to the degradation of chlorinated ethenes.

A multiple lines-of-evidence approach that evaluates geochemical parameters together with the analytical data indicates that conditions in the biowalls are sufficient to support anaerobic degradation processes. Substrate in the biowalls has not been significantly depleted and biodegradation continues to occur within the biowalls. Highly anaerobic conditions persist within the biowalls and sufficient levels of organic carbon, ORP, sulfate, and methane are being sustained for effective anaerobic degradation of chlorinated ethenes.

3.4 Chemical Data Analysis and Groundwater Remedy Evaluation

Table 4 summarizes the concentrations of chlorinated ethenes detected in groundwater during the eight rounds of LTM. **Table 4** is organized with the most upgradient well listed first and the most downgradient well listed last. A complete presentation of the groundwater data is provided in **Appendix B**. **Figure 6** presents the chlorinated ethene data for the eight rounds. The discussion below focuses on data collected during Year 3 (Rounds 7 and 8) of the LTM program, and addresses how the remedial action objectives are being achieved.

Achievement of first performance monitoring objective:

- *Confirm that there are no exceedances of groundwater standards for contaminants of concern (COC) at the off-site trigger monitoring well MW-56;*

Concentrations of chlorinated ethenes at off-site well MW-56 remain low or non-detect, with concentrations of TCE, cis-DCE, and VC meeting regulatory standards. As shown in **Table 34**, VC and TCE were not detected in any of the rounds at MW-56; cis-DCE was detected at MW-56 below its Class GA groundwater standard (5 µg/L) in Round 7. The third year of LTM confirmed that there were no exceedances of COC groundwater standards at MW-56.

Achievement of second performance monitoring objective:

- *Document the effectiveness of the biowalls to remediate and attenuate the chlorinated ethene plume;*

TCE remains above the Class GA groundwater standard (5 µg/L) at PT-18A (upgradient of biowalls). Concentrations of TCE at PT-18A vary from 2,700 µg/L in the fourth round to 220 µg/L in the fifth round, rebounding to 2,100 µg/L in the eighth round (see **Table 4**). Concentrations of TCE at well MWT-25 (upgradient of Biowall A) have consistently decreased from 50 µg/L in the first quarter to below the Class GA groundwater standard at a concentration of 4.2 µg/L in Round 8.

Concentrations of TCE within the biowalls at MWT-27 (in Biowall B1), MWT-28 (in Biowall B2), and MWT-23 (in Biowall C2) remain below detection limits, which is an expected performance measure, and concentrations of cis-DCE and VC are also not elevated within the biowalls. Cis-DCE was reported below detection limits in the biowalls in all rounds. Concentrations of VC remain below detection limits in all rounds in all biowall wells, with the exception of Round 8 when VC was reported above the detection limit at an estimated concentration of 3.1 J µg/L. Continued sampling is necessary to confirm that the concentration of VC at MWT-27 will remain below detection or below its Class GA standard in upcoming sampling events.

The reduction in concentrations of TCE to below detection, coupled with concentrations of cis-DCE and VC not being elevated within the biowalls, suggests that complete mineralization of chlorinated ethenes is occurring. Therefore, the biowalls are operating as expected with no loss of performance within the biowalls.

Ethene, a final product of reductive dechlorination, is only slightly elevated within the biowalls. This suggests that multiple anaerobic degradation processes may be occurring within in the biowalls. For example, ethene is not produced by anaerobic oxidation of cis-DCE or VC, nor by abiotic transformation of chlorinated ethenes by reduced iron sulfides. Alternatively, concentrations of ethene may be low since ethene can be further reduced under highly anaerobic conditions or can off-gas with carbon dioxide or methane since it is volatile.

The overall trend in the concentrations of TCE, cis-DCE, and VC at well MWT-26 (between Biowalls A1/A2 and Biowalls B1/B2) is decreasing over time. Concentrations of TCE, cis-DCE, and VC at this well increased during 2009. The area downgradient of MWT-26 is bounded by Biowalls B1/B2 in which the concentrations of TCE, cis-DCE, and VC remain non-detect or below their respective Class GA standards. The Army will continue to monitor well MWT-26 to see if an increasing trend in concentrations persists.

Concentrations at MWT-24 (downgradient of Biowall C2) show an overall decline over time, with some seasonal variation in cis-DCE (from 210 µg/L in the first quarter to 32 µg/L in the eighth round), and substantial decline in VC (from 45 µg/L in the second quarter to 4 µg/L in the eighth round). TCE has been below the Class GA groundwater standard (5 µg/L) at MWT-24 in all rounds, with the exception of 6.0 µg/L in Round 6 that was likely due to seasonal fluctuation (i.e., the effects of desorption during a period with frequent precipitation and subsequent high water levels).

The changes in groundwater concentrations of TCE, DCE, and VC as the groundwater passes through the biowalls are shown in **Figures 9A** through **9H** for Rounds 1 through 8, respectively. These figures show that the concentrations of TCE in groundwater within the biowalls are reduced to concentrations below detection limits. The concentration of TCE rebounds with distance downgradient of Biowalls C1/C2; this increase may be due to residual TCE that is desorbing from aquifer soils or diffusing out of low permeability soils. These results indicate that the biowalls treat the water within the biowalls and create a measurable, albeit slower, improvement in downgradient water quality, as well.

Anaerobic degradation of TCE may also occur in areas of the aquifer formation that are downgradient of the biowalls, where the presence of soluble organic carbon released from the biowalls enhances reductive dechlorination processes. In these downgradient areas, the concentrations of cis-DCE and VC are higher than they are within the biowalls. This suggests that sequential biotic reductive dechlorination of chlorinated organics is the primary degradation process in the downgradient reaction zones, with the presence of low concentrations of TCE being due to desorption from the aquifer matrix or from back diffusion of contaminated groundwater from low permeability soils. The elevated concentration of ethene (12 µg/L) observed at MWT-29 in Round 8 , as compared to the upgradient concentration of 1.8 µg/L at MWT-26, also indicates that downgradient biotic reductive dechlorination is occurring. Further downgradient, TCE was detected at MWT-7, which is 310 feet downgradient of Biowalls C1/C2 at a concentration of 350 µg/L in Round 8. Additional rounds of data will be evaluated to determine long-term trends in this area.

Achievement of third performance monitoring objective:

- *Confirm that groundwater concentrations throughout the plume are decreasing to eventually meet GA standards.*

In general, concentrations of TCE, cis-DCE, and VC decreased over the eight sampling events at the wells within and downgradient of the biowalls. Time plots for monitoring wells MWT-25, MWT-26, MWT-27, MWT-28, MWT-29, MWT-22, PT-22, MWT-23, MWT-24, and PT-24 are presented in **Figures 10A** through **10J**, respectively. These plots show an overall decreasing trend for the COCs. **Figure 10B** shows an increase in concentrations at MWT-26 in Rounds 7 and 8, which may be due to desorption and back diffusion from low permeability soils. **Figures 10E**, **10F**, and **10G** show that the concentrations at MWT-29, MWT-22, and PT-22, respectively, which are located downgradient of Biowalls B1/B2, have decreased during Year 3 of LTM compared to the previous year. This confirms that the higher concentrations that were observed during 6R2008 were likely the result of desorption during periods of seasonal high water levels, and do not reflect an overall increasing concentration trend. The time plots of the downgradient wells (MWT-29, MWT-22, MWT-24, and PT-24) show that TCE concentrations in the wells in the vicinity and downgradient of the biowalls are decreasing over time.

An exponential regression, which models first-order decay typical in biological processes, has been calculated for each monitoring well. The regression serves as a means of estimating the time required for the concentrations of chlorinated organics to meet their respective GA groundwater standards. **Table 5** summarizes the trend for each contaminant in each well and provides an estimate of the date when the standards will be achieved as estimated by the exponential regressions. Time plots with regression lines are included as **Appendix C**.

Table 5 shows that, with the exception of the PT-18A (source area well), PT-17 (downgradient of biowalls), and MWT-7 (immediately upgradient of the ZVI wall), all concentrations at the wells either comply with the Class GA groundwater standard or are expected to comply with their respective standards by 2051, with most reaching the standards by 2023. These dates are intended to provide an indication of the timeframe required for concentrations to reach acceptable levels and are not meant as a time commitment for the remedy.

There may be limiting factors in reaching the groundwater standards by the specified date, such as desorption and back diffusion from low permeability soils, that may drive the actual time required to reach compliance. As an example, the estimates of compliance dates for PT-22 in Year 3 have both increased and decreased as compared to Year 1 and Year 2 estimates, with increases likely due to the effect of desorption on the groundwater concentrations observed during Round 6 when groundwater levels were high.

Time plots of the concentration of TCE, cis-DCE, and VC for wells PT-18A, PT-17, and MWT-7 are provided in **Figures 11A**, **11B**, and **11C**, respectively; these plots include historic data prior to the installation of the biowalls. **Figures 11A**, **11B,** and **11C** indicate that there is an overall decreasing trend for TCE, an overall increasing trend for cis-DCE, and no trend for VC at PT-18A, PT-17, and MWT-7. Since PT-18A is located in the Ash Landfill source area upgradient of all biowalls, decreasing trends at this location reflect natural attenuation processes.

PT-17 and MWT-7 are located 150 ft and 310 ft from Biowalls C1/C2, respectively. As such, it is possible that treatment zones have not been established this far downgradient of the biowalls. Nevertheless, an increasing trend for DCE paired with a decreasing trend for TCE may indicate that reductive dechlorination is occurring at these locations. Dates to achieve compliance at these locations cannot be estimated due to the natural variation in concentrations over time and further monitoring is necessary to determine any trends in chlorinated ethene concentrations at these wells. To date, concentrations at these wells are within historic levels and the Army will continue to evaluate any impacts of the biowalls on this portion of the plume.

Other Compounds

Non-chlorinated organics were detected in the groundwater at the Ash Landfill OU, and the data are presented in **Appendix B**. Toluene and ethyl benzene were detected in the biowalls in the first four sampling events in Year 1. The maximum concentration of toluene was 580 μg/L at MWT-23 in Quarter 4, and the maximum concentration of ethyl benzene was 1.3 J μg/L at MWT-23 in Quarter 3. The concentrations of toluene and ethyl benzene detected during Year 2 decreased significantly. Toluene was detected at a maximum concentration of 300 μg/L at MWT-23 in Round 5, and ethyl benzene was detected with a maximum concentration of 0.85 J μg/L at MWT-23 in Round 5. In Year 3, concentrations of toluene and ethyl benzene in the biowalls were below their respective Class GA groundwater standards in Round 7, and were compounds were not detected in Round 8. Neither toluene nor ethyl benzene is a historic COC, nor are the detections of toluene and ethyl benzene believed to be associated with historic site operations or degradation products of reductive dechlorination. The three years of data demonstrate that the concentrations of these compounds have decreased to levels below the detection and are no longer of any concern.

Ketones were detected in some monitoring wells at the site, with higher concentrations detected in the wells located within the biowalls (see **Appendix B**). The maximum detections of acetone and methyl ethyl ketone were observed at well MWT-28 (in Biowall B2) in Quarter 1 at concentrations of 2,600 J μg/L and 4,900 J μg/L, respectively. Concentrations of ketones decreased significantly in the Year 2 sampling events. The maximum concentration of acetone was 26 J μg/L at MWT-27 in Round 6 (the associated sample duplicate was below the detection limit), and the maximum concentration of methyl ethyl ketone was 12 μg/L at MWT-23 in Round 5. Concentrations of ketones decreased even further in Year 3. The maximum concentration of acetone was 1.9 J μg/L in MWT-28, and methyl ethyl ketone was not detected in any of the biowall wells. Ketones were produced by fermentation reactions in the biowalls when concentrations of soluble organic carbon were high. However, ketones are readily degradable under aerobic conditions, have not persisted at the site, and were not detected within 100 feet of the site boundary.

3.5 Biowall Recharge Evaluation

The RDR calls for a recharge evaluation at the end of each year of monitoring. The evaluations completed at the end of Year 1 and Year 2 concluded that recharge was not required and that a recharge evaluation would be performed again at the end of Year 3.

Recharge Evaluation Process

A recharge evaluation, defined on Figure 7-3 of the RDR and described below, is the determination of the need to recharge a biowall segment. The evaluation consists of the following:

- Determining the need to recharge a biowall segment requires a review of chemical concentrations and geochemical parameters by an experienced professional. A specific, absolute set of conditions or parameter values are not appropriate to determine the need to recharge. Rather, a lines-of-evidence approach will be used that correlates a decrease in the efficiency of the system to degrade chloroethenes to geochemical evidence that indicates the cause is due to substrate depletion.

- The following parameters will be evaluated on an annual basis using at least two consecutive rounds of sampling data in order to determine if recharge of the biowalls is necessary:

  - COC concentrations in the biowalls (e.g., MWT-27, MWT-28, and MWT-23). If COC concentrations have rebounded by greater than 50% for any single sampling event, this will indicate that recharge should be considered. Concentrations within the biowalls, not at downgradient locations, will be used to make this evaluation so that the effectiveness of the wall itself is being measured without the interference of effects such as desorption and mixing.

– Geochemical parameters, specifically ORP, TOC, and DO, in the biowalls (e.g., at MWT-27, MWT-28, and MWT-23). Benchmark values will be used initially to evaluate anaerobic conditions in the groundwater. The benchmarks are:

  - ORP < -100 mV
  - TOC > 20 mg/L
  - DO < 1.0 mg/L

Parameters described in the bullets above are intended to be used as guidelines and will be considered in evaluating if, and when, a depletion of bioavailable organic substrate results in a rebound in geochemical redox conditions under which effective anaerobic degradation of chlorinated ethenes does not occur.

Recharge Evaluation for Year 3

The recharge evaluation for Year 3 indicates that recharging the biowalls is not necessary at this time.

Section 3.2 presents the geochemical data for Year 3. The values of geochemical parameters measured in Year 3 support the interpretation that reductive dechlorination is occurring in Biowalls A1/A2, B1/B2, and C1/C2. The tables below show that the geochemical parameters for the wells within the biowalls meet the benchmark values and that groundwater conditions remain highly reducing.

Parameter	**Benchmark Value**	**MWT-27 (Qs 1, 2, 3, 4, Rs 5, 6, 7, 8)**
ORP (mV)	< -100	-158, -145, -141, -166, -133, -126, -128, -102
TOC (mg/L)	> 20	2050, 1350, 755, 167, 89, 54, 81.7, 50
DO (mg/L)	< 1.0	0.25, 0.08, 0, 0.06, 0.18, 0.13, 0.06, 0.15

Parameter	**Benchmark Value**	**MWT-28 (Qs 1, 2, 3, 4, Rs 5, 6, 7, 8)**
ORP (mV)	< -100	-150, -113, -131, -151, -91, -95, -135, -148
TOC (mg/L)	> 20	1775, 171, 309, 92, 49, 28, 28.2, 25.5
DO (mg/L)	< 1.0	0.16, 0.09, 0, 0.08, 0.15, 0.10, 0.18, 0.29

Parameter	Benchmark Value	MWT-23 (Qs 1, 2, 3, 4, Rs 5, 6, 7, 8)
ORP (mV)	< -100	-122, -109, -87, -144, -129, -104, -117, -90
TOC (mg/L)	> 20	260, 210, 303, 151, 29, 20, 15.6, 17.4
DO (mg/L)	< 1.0	0.26, 0.35, 0, 0.12, 0.15, 0.20, 0.07, 0.63

Section 3.3 presents the analytical data for Year 3. As shown in the table below, concentrations of TCE, cis-DCE, and VC in the biowalls remain low and have not rebounded by greater than 50% for any sampling event. Further, the ability of the biowalls to sustain a high degree of reductive dechlorination is well established.

		TCE (µg/L)	cis-DCE (µg/L)	VC (µg/L)
MWT-27	Q1	ND	ND	ND
	Q2	ND	ND	ND
	Q3	ND	ND	ND
	Q4	ND	ND	ND
	R5	ND	ND	ND
	R6	ND	ND	ND
	R7	ND	ND	ND
	R8	ND	ND	3.1 J
MWT-28	Q1	ND	ND	ND
	Q2	ND	ND	ND
	Q3	ND	ND	ND
	Q4	ND	ND	ND
	R5	ND	ND	ND
	R6	ND	ND	ND
	R7	ND	ND	ND
	R8	ND	ND	ND
MWT-23	Q1	ND	60	23
	Q2	ND	11	4.8
	Q3	ND	3.1	ND
	Q4	ND	3.6 J	3.65
	R5	ND	ND	ND
	R6	0.4	2.4	2.8
	R7	ND	ND	ND
	R8	ND	0.47	ND

The analytical data show that concentrations of TCE, cis DCE, and VC at MWT-28 remain below detections limits. At MWT-23 concentrations of the COCs have decreased since the first quarterly sampling event to levels generally below detection limits. As noted above, at MWT-27 the concentrations of TCE and cis-DCE have remained below detection limits and there was an isolated detection of VC above the Class GA groundwater standard at an estimated 3.1 J µg/L in Round 8. This detection was the first instance in which VC was detected at MWT-27, and it is not possible to determine an accurate percent increase with prior concentrations below detection. The Army will continue to monitor MWT-27 in subsequent monitoring events to determine any trend for VC at this well.

Based on the review of the analytical and geochemical data, the biowalls do not need to be recharged and the biowall system continues to meet the long-term monitoring objectives established in the RDR (Parsons, 2006c).

3.6 Soil Remedy Evaluation

Part of the remedial action was installing a 12-inch vegetative cover over the Ash Landfill and the NCFL. The covers have been inspected and field observations from Year 3 note that the landfills are vegetated with grass and clover. At the NCFL, visual observations noted a small amount of soil erosion and the presence of rodent trails; however, the erosion and the trails cut less than 6 inches into the cover. Therefore, underlying soil has not been exposed to the environment and corrective action is not required. The Army will continue to monitor the integrity of the covers and ensure that the vegetative covers have not been breached and that the underlying soil is not exposed.

3.7 Land Use Controls (LUCs)

The remedy for the Ash Landfill OU requires the implementation and maintenance of land use controls (LUCs). The LUC requirements are detailed in the "Land Use Control Remedial Design for SEAD-27, 66, and 64A, *Final*" (2006d). The selected LUCs for the Ash Landfill OU are as follows:

- Prevent access to or use of the groundwater until cleanup levels are met;
- Maintain the integrity of any current or future remedial or monitoring system, such as monitoring wells and impermeable reactive barriers;
- Prohibit excavation of the soil or construction of inhabitable structures (temporary or permanent) above the area of the existing groundwater plume; and
- Maintain the vegetative soil layer over the ash fill areas and the NCFL to limit ecological contact.

As part of the LTM program, the Army inspected the site to determine that the LUCs are being maintained. While performing the groundwater sampling, it was confirmed that no prohibited facilities have been constructed and no access to or use of groundwater was evident. As discussed in **Section 3.5**, the vegetative covers are limiting ecological contact with the underlying soil.

During 7R2009 and 8R2009, groundwater monitoring wells were inspected by field personnel. The integrity of all wells at the Ash Landfill is intact and each well is viable for groundwater elevation readings and groundwater sampling, where appropriate.

3.8 Operating Properly and Successfully

The implemented design has met the requirements for "operating properly and successfully" (OPS) as outlined in Section 12(h)(s) of the USEPA "Guidance for Evaluation of Federal Agency Demonstrations" (USEPA, 1996). Parsons submitted a letter on behalf of the Army to USEPA, dated June 6, 2008, declaring that the Army has determined that the remedy meets the OPS requirements. The Army submitted a letter under separate cover on February 26, 2009 further certifying that the "information, data and analysis provided in Parsons' June 6, 2008 letter was true and accurate." On March 11, 2009, the USEPA transmitted a letter to the Army approving the Army's OPS demonstration. The data for Year 3 of the LTM program are consistent with the data for Year 1 and Year 2 and demonstrate that the remedy is OPS, as described below.

The remedial action is operating "properly."

The USEPA guidance describes that "a remedial action is operating 'properly' if it is operating as designed." The Construction Completion Report (CCR) (Parsons, 2007) details that the vegetative covers were installed as designed, meeting or exceeding the 12-inch of soil cover requirement. **Section 3.5** describes that the covers are intact and effectively prevent ecological contact with the underlying soil; therefore, the vegetative covers are operating properly.

The CCR also details the construction of the biowalls. Deviation from the intended design resulted in wider-than-intended biowalls that required the emplacement of additional mulch; since this is an enhancement of the design, it is fair to say that the biowalls were constructed as designed. The geochemical data presented and discussed in **Section 3.1** indicate that conditions that are favorable to anaerobic reductive dechlorination have been established within and near the biowalls, which was the expectation of the design of the biowall system.

The remedial action is operating "successfully."

A remedial action may receive the USEPA's designation of "operating successfully" (1) if "a system will achieve the cleanup levels or performance goals delineated in the decision document" and (2) if the remedy is protective of human health and the environment. The data presented in **Section 3.3** demonstrate that concentrations of VOCs are decreasing and will eventually meet the Class GA groundwater standards. The time plots presented in **Figures 10A** through **10J** show a decreasing trend for the COCs at the Ash Landfill OU; **Table 5** summarizes the trends in concentrations of COCs over time and provides time estimates for compliance based on exponential regressions of the time plots. The time estimates do not provide exact dates that Class GA groundwater standards will be achieved; rather they demonstrate that the concentrations in groundwater will eventually meet the groundwater standards.

Recent inspection of the vegetative covers at the Ash Landfill and the NCFL indicate that the covers are preventing ecological receptors from contacting the underlying soil; therefore, there is no threat to the environment. The LUCs have been maintained and no one is accessing the groundwater; therefore, there is no threat to human health. Based on a review of the site data, an inspection of the condition of the vegetative covers, and a confirmation that the LUCs are being maintained, the Army believes that the remedial action is operating successfully.

Based on an assessment of the design and construction of the remedial action, as well as an evaluation of the geochemical and analytical data from the three years of groundwater monitoring, the Army believes that the remedial action at the Ash Landfill meets the requirements to be designated as "operating properly and successfully".

4.0 LONG-TERM MONITORING CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

Based on the results of the long-term monitoring at the Ash Landfill since the installation of the full-scale biowalls, the Army has made the following conclusions:

- TCE within the biowalls remains below or close to detection limits;
- TCE, cis-DCE, and VC are present in the groundwater at the site at concentrations above respective Class GA groundwater standards;
- Chemical results indicate that the concentrations of chlorinated ethenes are decreasing as they pass through the biowall systems;
- Geochemical parameters indicate that anaerobic treatment zones have been established within and downgradient of the biowalls, and that conditions suitable for reductive dechlorination to occur have been sustained;
- Concentrations of chlorinated ethenes at off-site well MW-56 are below Class GA groundwater standards;
- Continued monitoring is required to determine trends in concentrations of COCs at PT-18A, PT-17, and MWT-7;
- Recharge of the biowalls is not necessary at this time; and
- The remedial action continues to meets the requirements of the USEPA's "operating properly and successfully" designation.

4.2 Recommendations

Based on the first three years of long-term monitoring at the Ash Landfill OU, the Army recommends continuing the semi-annual frequency of monitoring based on the process shown in **Figure 12** (which is also Figure 7-3 of the RDR). The recommendations for LTM during year three of monitoring are as follows:

- Biowall process monitoring wells (MWT-26, MWT-27, MWT-28, MWT-29, and MWT-23) will be monitored on a semi-annual basis. Each year a recharge evaluation will be completed. As stated in the RDR (Parsons, 2006b), if a recharge is conducted, MWT-26, MWT-27, and MWT-29 would be excluded from the LTM program, as detailed in **Figure 12**. MWT-28 and MWT-23 will continue to be monitored as part of the performance monitoring wells to supplement data that will be used to determine whether additional biowall recharge is required. The recharge evaluation(s) conducted each year after the first biowall recharge would review the chemical and geochemical data at MWT-28 and MWT-23, and determine if the contaminant increase is a result of poor biowall performance or due to other issues such as seasonal variations in groundwater levels, unusual precipitation events, or desorption and back diffusion.

- Performance monitoring wells (PT-17, PT-18A, PT-22, PT-24, MWT-7, MWT-22, MWT-24, and MWT-25) will continue to be monitored on a semi-annual basis in a manner consistent with the Year 3 LTM program. In the three years of LTM events at the Ash Landfill OU, the concentrations of COCs, specifically TCE, in the wells downgradient of the source area (near PT-18A) have decreased.

- The off-site performance monitoring well (MW-56) will continue to be monitored on a semi-annual basis.

- The vegetative covers at the Ash Landfill and the NCFL will be inspected annually to ensure that they remain intact and protective of ecological receptors.

- The frequency of monitoring and the need to recharge the biowalls will be reviewed in the annual report submitted after the completion of the fourth year of LTM, based on the process outlined in **Figure 12**.

5.0 REFERENCES

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TABLES

Table 1
Groundwater Sample Collection
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

	Monitoring Well Group			**Laboratory Analysis**			
Monitoring Wells	**On-Site Plume**	**Biowall Process**	**Off-Site Performance**	VOC 8260B	TOC 9060A	MEE RSK-175	Sulfate EPA 300.1
PT-18A	X (all)			X (all)			
MWT-25	X (all)			X (all)			
MWT-26		X (all)		X (all)	X (all)	X (all)	X (all)
MWT-27		X (all)		X (all)	X (all)	X (all)	X (all)
MWT-28	X (all)	X (all)		X (all)	X (all)	X (all)	X (all)
MWT-29	X (all)	X (all)		X (all)	X (all)	X (all)	X (all)
MWT-22	X (all)			X (all)			
PT-22	X (all)			X (all)			
MWT-23	X (all)	X (all)		X (all)	X (all)	X (all)	X (all)
MWT-24	X (all)			X (all)			
PT-17	X (all)			X (all)	X (5,6,7,8)	X (5,6,7,8)	X (5,6,7,8)
MWT-7	X (all)			X (all)	X (5,6,7,8)	X (5,6,7,8)	X (5,6,7,8)
PT-24	X (all)			X (all)	X (7)	X (7)	X (7)
MW-56			X (1,3,5,6,7,8)	X (all)			

Notes:
1. All samples were analyzed for field parameters including pH, ORP, dissolved oxygen, conductivity, temperature, and turbidity.
(all) - This well was sampled in all rounds of the LTM program.
(7) - This well was sampled in Round 7 of the LTM program.
(1,3,5,6,7,8) - This well was sampled in Quarters 1 and 3, and Rounds 5 - 8 of the LTM program.
(5,6,7,8) - These wells were sampled in Rounds 5 - 8 of the LTM program.

Table 2
Groundwater Elevation Data
Round 8 - December 2009
Ash Landfill Long-Term Monitoring
Seneca Army Depot Activity

Monitoring Well	Top of Riser Elevation (ft)	Well Depth (rel. TOC) (ft)	LTM R8 - December 2009: Saturated Thickness (ft)	Depth to Groundwater (ft)	Water Level Elevation (ft)	Historical Data: Groundwater Elevation (ft) Maximum	Minimum	Range	Well Depth (ft)
PT-17	640.14	11.65	7.48	4.17	635.97	636.67	629.05	7.11	11.65
PT-18A	659.05	12.85	3.48	9.37	649.68	651.39	649.85	1.54	12.85
PT-22	648.61	11.81	2.95	8.86	639.75	644.30	637.47	6.83	11.81
PT-24	636.40	11.88	6.55	5.33	631.07	632.76	627.80	4.96	11.88
MW-56	630.51	6.88	3.18	3.7	626.81	627.58	621.66	5.92	6.88
MWT-7	638.34	13.64	7.41	6.23	632.11	633.50	628.07	6.92	13.64
MWT-22	650.663	14.9	7.28	7.62	643.04	648.13	642.83	5.30	14.90
MWT-23	646.772	13.7	4.81	8.89	637.88	640.45	637.33	2.89	13.70
MWT-24	641.564	13	5.16	7.84	633.72	635.84	633.70	2.12	13.00
MWT-25	654.507	13.25	7.01	6.24	648.27	648.87	646.79	2.08	13.25
MWT-26	652.191	13.22	6.55	6.67	645.52	647.48	645.23	2.25	13.22
MWT-27	652.993	12.9	5.46	7.44	645.55	647.58	645.23	2.35	12.90
MWT-28	652.685	12.85	5.43	7.42	645.27	646.63	644.89	1.74	12.85
MWT-29	651.816	13.1	5.54	7.56	644.26	645.43	643.86	1.57	13.10

Table 3
Groundwater Geochemical Data
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

	Well ID	Location Description	Sample ID	Sample Round	pH	Turbidity (NTU)	Specific Conductance (mS/cm)	DO (mg/L)	ORP (mV)	TOC (mg/L)	Sulfate (mg/L)	Ethane (ug/L)	Ethene (ug/L)	Methane (ug/L)	Manganese (ug/L)	Ferrous Iron (ug/L)
Upgradient	PT-18A	upgradient of biowalls	ALBW20059	1Q2007	6.63	141	1.69	1.33	93							
			ALBW20074	2Q2007	6.44	110	2.87	0.76	-177							
			ALBW20088	3Q2007	6.71	5	1.66	0	-23							
			ALBW20103	4Q2007	6.41	0	1.25	0.04	-5							
			ALBW20117	5R2008	6.36	1.9	1.75	0.22	-10						8.2	> 3.3
			ALBW20132	6R2008	6.58	0.56	2.04	1.76	83							
			ALBW20147	7R2009	6.77	0.45	2.01	0.12	66							
			ALBW20162	8R2009	6.71	0	2.04	0.62	154							
	MWT-25	upgradient of Biowall A	ALBW20064	1Q2007	8	9.6	0.29	2.83	63							
			ALBW20079	2Q2007	7.27	14	2.2	2.8	52							
			ALBW20093	3Q2007	7.36	6.2	2.43	4.14	100							
			ALBW20108	4Q2007	6.9	0	1.2	0.21	65							
			ALBW20123	5R2008	6.91	0.52	1.47	0.15	-41						1.4	0.75
			ALBW20138	6R2008	6.69	1.32	1.36	2.91	90							
			ALBW20153	7R2009	7.03	1.6	1.46	0.1	-31							
			ALBW20168	8R2009	7.21	0	0.792	3.35	98							
	MWT-26	**upgradient of Biowalls B1/B2**	ALBW20066	1Q2007	6.89	10	2.01	1.84	-3	3.9 J	958	ND	ND	ND		
			ALBW20081	2Q2007	7.26	9	1.9	0.48	-135	15.2	738	0.4	7.8	210	2.1	> 3.3
			ALBW20095	3Q2007	6.89	2.2	1.94	0.21	-170	10.3	473	1	13	390	3.1	> 3.3
			ALBW20111	4Q2007	7.08	50	1.9	0.89	-40	6.1	1,060	0.16	0.4	44	0.0	1.09
			ALBW20126	5R2008	7.05	0.67	1.88	0.31	-71	5.6	600	0.82	2.9	210	1.3	0.81
			ALBW20141	6R2008	7.01	28.7	1.58	3.54	60	4.4	541	0.05	0.03	10	0.6	0.22
			ALBW20156	7R2009	6.95	2.7	1.75	0.34	-11	6.9	570	3.2	2.7	1,100	0.5	0.71
			ALBW20171	8R2009	7.01	10	2.45	4.66	71	5.6	912	2.2	1.8	610	0.7	0.18
	MWT-27	**in Biowall B1**	ALBW20067	1Q2007	6.34	120	5.31	0.25	-158	2,050 J	ND	ND	ND			
			ALBW20082	2Q2007	6.65	87	4.37	0.08	-145	1,350	ND	0.15	2.7	15,000	> 22	> 3.3
			ALBW20096	3Q2007	6.59	154	3.35	0	-141	755	1.9 J	0.08	0.33	13,500	> 22	> 3.3
			ALBW20112	4Q2007	6.43	58	5.76	0.06	-166	167	31.7	ND	0.01	13,000	> 22	2.19
			ALBW20127	5R2008	6.49	40	3.07	0.18	-133	88.9	ND	2.3	0.05	13,000	> 22	3.23
			ALBW20142	6R2008	5.95	24.5	2.59	0.13	-126	53.5	24	1.6	0.13	15,000	> 22	3.05
			ALBW20157	7R2009	6.68	38	2.99	0.06	-128	81.7	0.93 J	5.1	0.15	14,000	22	1.88
			ALBW20172/73	8R2009	6.32	5.1	2.38	0.15	-102	50.0	14.0	4.4	1.2	15,500	9	1.26
	MWT-28	**in Biowall B2**	ALBW20068	1Q2007	7.5	163	0.61	0.16	-150	1,775 J	1.7	ND	ND	12,500 J		
			ALBW20083	2Q2007	6.6	21	2.3	0.09	-113	171	ND	0.67	0.48	19,000	7.5	> 3.3
			ALBW20098	3Q2007	6.56	100	2.74	0	-131	309	ND	0.01 J	0.06	11,000	> 22	> 3.3
			ALBW20113	4Q2007	6.48	10	1.72	0.08	-151	92	ND	0.01	ND	11,000	> 22	2.15
			ALBW20128	5R2008	6.31	14	2.16	0.15	-91	49.2	ND	0.65	0.04	12,000	> 22	> 3.3
			ALBW20144	6R2008	5.76	17	1.58	0.10	-95	27.9	48.3	2	0.12	19,000	5.3	1.98
			ALBW20158/59	7R2009	6.49	8.5	1.73	0.18	-135	28.2	ND	1.8	0.06	13,000	20.8	2.87
			ALBW20174	8R2009	6.4	10.8	1.88	0.29	-148	25.5	3.16	1.6	0.12	15,000	6.5	2.15
	MWT-29	**downgradient of Biowall B2**	ALBW20070	1Q2007	6.49	7.2	2.1	0.33	-76	25.1 J	113	ND	ND	ND		
			ALBW20084/5	2Q2007	6.8	1.7	2.21	0.39	-53	36.7	173	25	150	8,100	7.5	> 3.3
			ALBW20099	3Q2007	6.64	1.8	1.68	0.11	-79	15.7	151	13	160	2,800	8.1	2.84
			ALBW20114	4Q2007	7.04	12.2	1.88	0.21	-101	20.9	289	19	200	2,600	8.6	> 3.3
			ALBW20129/30	5R2008	6.44	2.7	1.85	0.17	-115	14.1	174	14.5	140	3,100	0.0	> 3.3
			ALBW20145	6R2008	6.57	3.69	1.58	1.32	67	13.6	312	14	19	2,700	3.3	0.20
			ALBW20160	7R2009	6.8	1.9	1.8	0.15	-105	11.8	300	10	47	3,000	6.8	2.97
			ALBW20175	8R2009	6.87	0	2.05	0.58	-75	8.2	644	6.7	12	1,500	6.3	0.96
	MWT-22	downgradient of Biowall B2	ALBW20071	1Q2007	7.7	4.5	0.13	0.09	-80							
			ALBW20075	2Q2007	6.72	41	2.16	0.3	-65							
			ALBW20100	3Q2007	6.45	2.7	2.03	0.05	-107							
			ALBW20115	4Q2007	6.53	7.5	1.81	0.18	-132							
			ALBW20121	5R2008	6.38	14	2.21	0.3	-34						18.2	> 3.3
			ALBW20136	6R2008	6.44	8.17	1.86	0.57	-19							
			ALBW20151	7R2009	6.59	13	2.14	0.31	-91							
			ALBW20166	8R2009	6.5	15	0.898	0.34	-65							
	PT-22	between Biowalls B and C	ALBW20060	1Q2007	7.70	4.5	0.13	0.09	-80							
			ALBW20086	2Q2007	6.78	7	1.18	0.78	-54							
			ALBW20089	3Q2007	6.67	0	1.44	0.09	-97							
			ALBW20104	4Q2007	6.73	5.1	1.26	0.17	-166							
			ALBW20118	5R2008	6.69	7.4	1.38	0.29	-119						0.3	1.38
			ALBW20133	6R2008	6.79	1.96	1.20	0.69	-37							
			ALBW20148	7R2009	6.76	11	1.53		-123							
			ALBW20163	8R2009	6.74	6.3	1.45	1.0	-73							
	MWT-23	**in Biowall C2**	ALBW20065	1Q2007	7.2	5	0.2	0.26	-122	260 J	ND	ND	ND	12,000		
			ALBW20080	2Q2007	6.51	30	1.8	0.35	-109	210	ND	45	5.9	23,000	5.4	2.73
			ALBW20094	3Q2007	6.3	69.3	1.82	0	-87	303	ND	4.1	0.28	18,000	> 22	2.99
			ALBW20109	4Q2007	6.32	21	2.21	0.12	-144	151	2.8	0.58	0.35	16,000	> 22	2.32
			ALBW20125	5R2008	6.27	29	1.54	0.15	-129	28.4	ND	0.53	0.05	18,000	> 22	> 3.3
			ALBW20140	6R2008	6.44	32	1.86	0.20	-104	20.1	6.3	4.6	1.2	19,000	> 22	2.75
			ALBW20155	7R2009	7.72	16	1.5	0.07	-117	15.6	ND	1.6	0.16	21,000	22	2.08
			ALBW20170	8R2009	6.78	10	2.1	0.63	-90	17.4	ND	1	0.06	18,000	7	3.3
	MWT-24	downgradient of Biowalls C1/C2	ALBW20063	1Q2007	7.02	10	0.762	0.27	-160							
			ALBW20078	2Q2007	6.91	59	1.08	0.32	-146							
			ALBW20092	3Q2007	6.8	5.4	1.48	0.03	-115							
			ALBW20107	4Q2007	6.81	134	1.32	0.41	-114							
			ALBW20122	5R2008	6.65	45	1.21	0.35	-43						9.1	1.54
			ALBW20137	6R2008	6.40	10	1.31	0.09	40							
			ALBW20152	7R2009	6.81	6.7	1.34	0.11	-20							
			ALBW20164	8R2009	6.61	23	0.558	1.31	59							
	PT-17[1]	downgradient of biowalls	ALBW20058	1Q2007	8	3.8	92	0.23	-111							
			ALBW20073	2Q2007	7.1	14	0.729	0.76	-151							
			ALBW20087	3Q2007	6.99	0.4	0.732	0.9	-157							
			ALBW20102	4Q2007	7.12	8.7	2	NS	-24							
			ALBW20116	5R2008		70		0.24		6	15.2	98	66	5700		
			ALBW20131	6R2008	6.68	0.85	0.796	0.30	26	2.6	45.8	6.9	6.6	380	2.8	0.43
			ALBW20146	7R2009	7.19	0.2	1	0.30	-20	4.9	28	50	56	8300	7.5	0.53
			ALBW20161	8R2009	6.75	4	0.345	0.58	-52	2.4	46.2	9.9	5	1,500	2.1	0.07
	MWT-7	immed. upgradient of ZVI wall	ALBW20062	1Q2007	6.8	19.6	0.581	0.01	62							
			ALBW20077	2Q2007	6.95	8	0.763	0.76	52							
			ALBW20091	3Q2007	6.91	4	0.586	0.19	22							
			ABLW20106	4Q2007	6.88	0	0.9	0.16	14							
			ALBW20120	5R2008	6.85	15	0.974	0.43	37	2.3	29.1	6.7	2	400	0.2	0.09
			ALBW20135	6R2008	6.85	7.37	0.859	0.28	66	29.1	3	11	0.27	670	0.8	0.16
			ALBW20150	7R2009	7.61	2.6	0.786	0.05	16	3.1	27	7.8	0.76	1100	0	0.05
			ALBW20165	8R2009	7.12	0.9	0.555	0.46	32	4.5	29.3	17	0.52	2,900	0.01	0.14
	PT-24	downgradient of ZVI wall	ALBW20061	1Q2007	8.1	10	70	0.37	-59							
			ALBW20076	2Q2007	7.58	0	0.464	2.2	-59							
			ALBW20090	3Q2007	7.22	1.3	0.557	0.13	-80							
			ALBW20105	4Q2007	7.35	9.7	2.38	0.19	-46							
			ALBW20119	5R2008	6.99	4.3	0.9	0.16	-104						0.5	0.55
			ALBW20134	6R2008	6.84	5.8	0.656	0.11	-10							
			ALBW20149	7R2009	7.14	4.1	0.679	0.05	-101							
			ALBW20164	8R2009	7.32	1	0.41	0.34	-192						1.9	0.2
	MW-56	off-site well	ALBW20072	1Q2007	6.85	3.3	0.462	0.37	-102							
			ALBW20101	3Q2007	6.9	0	0.603	NS	-65							
			ALBW20124	5R2008	6.73	2	0.763	0.18	-132						0.4	1.18
			ALBW20139	6R2008	6.85	6	0.545	0.81	-125							
			ALBW20154	7R2009	7.01	0.1	0.623	0.23	-186							
Downgradient			ALBW20169	8R2009	6.59	7.3	0.311	1.86	-149							

Notes:
1. Empty cells indicate that the specified analysis was not completed for that well.
2. Analysis of TOC, sulfate, methane, ethane, and ethene were completed for the biowall process wells only.
3. During the 5R2008 event the water level in PT-17 was extremely low and water quality readings were not collected.
4. Wells in bold are the biowall process monitoring wells.
ND = Non-detect.
NS = Not sampled; water level was below the indicator probe.
> = The concentration exceeded the range of the Hach DR/850 Colorimeter field kit.
1Q2007 - First quarter of LTM (January 2007)
2Q2007 - Second quarter of LTM (March 2007)
3Q2007 - Third quarter of LTM (June 2007)
4Q2007 - Fourth quarter of LTM (November 2007)
5R2008 - Fifth Round of LTM (June 2008)
6R2008 - Sixth Round of LTM (December 2008)
7R2009 - Seventh round of LTM (June 2009)
8R2009 - Eighth Round of LTM (December 2009)

Table 4
Chlorinated Organics in Groundwater
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

Upgradient

Sample Identification		Sample Date	PCE (ug/L)	TCE (ug/L)	1,1-DCE (ug/L)	cis-DCE (ug/L)	DCE (ug/L)	VC (ug/L)	1,1-DCA (ug/L)
	Class GA Standard (ug/L)		5	5	5	5	5	2	5
PT-18A	upgradient of walls	3-Jan-07	1 U	2000	0.64 J	220	1.6	2.4	1 U
		17-Mar-07	1 U	1000	0.73 J	170	1.4	2.9	1 U
		5-Jun-07	1 U	1100	1.4	430	3.3	3.3	1 U
		15-Nov-07	1 U	2700	2.1	720	3.4	8.2	1 U
		24-Jun-08	1 U	220	1 U	200	0.9 J	1.4	1 U
		12-Dec-08	0.36 U	1400	1.3	510	2.4	4.6	0.75 U
		4-Jun-09	0.36 U	810 J	0.8 J	260	1.8	2.6	0.75 U
		17-Dec-09	1.5 U	2100	1.5 U	630	3.5 J	7.1	2 J
MWT-25	upgradient of Biowall A	3-Jan-07	1 U	50	1 U	41	0.56 J	1.6	1 U
		17-Mar-07	1 U	55	1 U	84	1.2	9.6	1 U
		6-Jun-07	1 U	28	1 U	36	0.5 J	2.1	1 U
		15-Nov-07	1 U	26	1 U	17	1 U	0.64 J	1 U
		24-Jun-08	1 U	19	1 U	17	1 U	1 U	1 U
		15-Dec-08	0.36 U	3.2	0.29 U	0.63 J	0.13 U	0.24 U	0.75 U
		3-Jun-09	0.36 U	12	0.29 U	10	0.13 U	0.24 U	0.75 U
		17-Dec-09	0.36 U	4.2	0.38 U	3.3	0.42 U	0.24 U	0.29 U
MWT-26	**upgradient of Biowalls B1/B2**	3-Jan-07	1 U	10	1 U	19	0.6 J	2	1 U
		17-Mar-07	1 U	11	1 U	17	1	6.1	1 U
		5-Jun-07	1 U	3.2	1 U	11	0.7 J	4.4	1 U
		15-Nov-07	1 U	2.8	1 U	2.8	1 U	1 U	1 U
		24-Jun-08	1 U	1.7	1 U	3.3	1 U	1 U	1 U
		15-Dec-08	0.36 U	1.9	0.29 U	1	0.13 U	0.24 U	0.75 U
		3-Jun-09	0.36 U	3.6	0.29 U	6	0.13 U	3.5	0.75 U
		17-Dec-09	0.36 U	5.8	0.38 U	8.1	0.42 U	4.2	0.29 U
MWT-27	**in Biowall B1**	3-Jan-07	20 U	20 UJ	20 UJ	49 J	20 UJ	20 UJ	20 UJ
		16-Mar-07	20 U	20 U	20 U	20 U	20 U	20 U	20 U
		5-Jun-07	20 U	20 U	20 U	20 U	20 U	20 U	20 U
		15-Nov-07	10 U	10 U	10 U	10 U	10 U	10 U	10 U
		24-Jun-08	4 U	4 U	4 U	4 U	4 U	4 U	4 U
		15-Dec-08	3.6 U	1.8 U	2.9 U	1.6 U	1.3 U	2.4 U	7.5 U
		3-Jun-09	3.6 U	1.8 U	2.9 U	1.6 U	1.3 U	2.4 U	7.5 U
		16-Dec-09	1.8 U	2.3 U	1.9 U	1.9 U	2.1 U	3.1 J	1.5 U
MWT-28	**in Biowall B2**	3-Jan-07	20 U	20 UJ	20 UJ	20 UJ	20 UJ	20 UJ	20 UJ
		16-Mar-07	20 U	20 U	20 U	20 U	20 U	20 U	20 U
		5-Jun-07	20 U	20 U	20 U	20 U	20 U	20 U	20 U
		15-Nov-07	5 U	5 U	5 U	5 U	5 U	5 U	5 U
		25-Jun-08	4 U	4 U	4 U	4 U	4 U	4 U	4 U
		15-Dec-08	3.6 U	1.8 U	2.9 U	1.6 U	1.3 U	2.4 U	7.5 U
		3-Jun-09	0.36 U	0.18 U	0.29 U	0.16 U	0.13 U	0.24 U	0.75 U
		18-Dec-09	1.8 U	2.3 U	1.9 U	1.9 U	2.1 U	1.2 U	1.5 U
MWT-29	**downgradient of Biowall B2**	3-Jan-07	2 U	22	2 U	280	6.5	140	2 U
		16-Mar-07	4 U	19	4.5 U	220	7.75	165	4.5 U
		5-Jun-07	2 U	7.6	2 U	100	2.1	81	2 U
		14-Nov-07	1 U	4.4	1 U	96	0.83 J	74	1 U
		25-Jun-08	1 U	3.3	1 U	84	0.65 J	74	1 U
		15-Dec-08	0.36 U	6.6	0.29 U	91	0.6 J	80	0.75 U
		3-Jun-09	0.36 U	4.5	0.29 U	61	0.67 J	43	0.75 U
		16-Dec-09	0.36 U	3.5	0.38 U	37	0.65 J	29	0.29 U
MWT-22	downgradient of Biowall B2	3-Jan-07	2 U	5.2	2 U	130	2.7	98	2 U
		17-Mar-07	4 U	3.8 J	4 U	90	4 U	64	4 U
		6-Jun-07	1 U	6.5	1 U	120	3.2	81	1 U
		14-Nov-07	1 U	2.6	1 U	99	0.85 J	180	1 U
		25-Jun-08	5 U	3 J	5 U	68	5 U	42	5 U
		15-Dec-08	1.8 U	5.9	1.4 U	160	0.65 U	140	3.8 U
		3-Jun-09	0.36 U	2.2	0.29 U	66	0.77 J	89	0.75 U
		16-Dec-09	1.8 U	2.3 U	1.9 U	57	2.1 U	52	1.5 U
PT-22	between Biowalls B and C	3-Jan-07	1 U	11	1 U	57	0.86 J	22	1 U
		15-Mar-07	1 U	16	1 U	41	0.51 J	13	1 U
		5-Jun-07	1 U	8.5	1 U	61	0.72 J	32	1 U
		14-Nov-07	1 U	9.7	1 U	30	0.67 J	11	1 U
		26-Jun-08	1 U	4.1	1 U	26	0.57 J	13	1 U
		15-Dec-08	0.36 U	35	0.29 U	52	0.41 J	1.3	0.75 U
		2-Jun-09	0.36 U	6.9	0.29 U	41	0.81 J	11	0.75 U
		16-Dec-09	0.36 U	8.7	0.38 U	29	0.42 U	9.5	0.29 U
MWT-23	**in Biowall C2**	3-Jan-07	4 U	4 U	4 U	60	4 U	23	4 U
		16-Mar-07	4 U	4 U	4 U	11	4 U	4.8	4 U
		6-Jun-07	2 U	2 U	2 U	3.1	2 U	2 U	2 U
		16-Nov-07	7 U	7 U	2.6 U	3.6 J	7 U	3.7 J	7 U
		25-Jun-08	1 U	1 U	1 U	1 U	1 U	1 U	1 U
		12-Dec-08	0.36 U	0.41 J	0.29 U	2.4	0.13 U	2.8	0.75 U
		2-Jun-09	0.36 U	0.18 U	0.29 U	0.42 U	0.13 U	0.24 U	0.75 U
		15-Dec-09	0.36 U	0.46 U	0.38 U	0.47 J	0.42 U	0.24 U	0.29 U
MWT-24	downgradient of Biowalls C1/C2	3-Jan-07	1 U	0.94 J	1 U	210	2.1	19	0.81 J
		15-Mar-07	1 U	1 U	1 U	68	0.88 J	45	0.83 J
		5-Jun-07	2 U	2 U	2 U	19	2 U	22	1.1 J
		13-Nov-07	1 U	1.6	1 U	6.7	1 U	3.8	1 U
		26-Jun-08	5 U	5 U	5 U	31	5 U	5 U	5 U
		12-Dec-08	0.36 U	6	0.29 U	52	0.13 U	3.6	0.75 U
		2-Jun-09	0.36 U	4.8	0.29 U	38	0.13 U	7.3	0.75 U
		15-Dec-09	0.36 U	4.7	0.7 J	32	0.42 U	4	0.29 U
PT-17	downgradient of biowalls	2-Jan-07	1 U	6	1 U	62	1 U	21	1 U
		15-Mar-07	2 U	11	2 U	26	2 U	21	2 U
		5-Jun-07	1 U	3.4	1 U	43	0.77 J	9.9	1 U
		13-Nov-07	1 U	15	1 U	27	0.54 J	22	1 U
		26-Jun-08	1 U	8.5	1 U	21	1 U	23	1 U
		11-Dec-08	0.36 U	9.2	0.29 U	24	0.46 J	10	0.75 U
		2-Jun-09	0.36 U	8	0.29 U	56	1.1	55	0.75 U
		15-Dec-09	0.36 U	7.8	0.38 U	65	1.8	20	0.29 U
MWT-7	immed. upgradient of ZVI wall	4-Jan-07	1 U	490	1 U	35	1 U	0.51 J	1 U
		15-Mar-07	1 U	440	1 U	42	1 U	9.7	1 U
		5-Jun-07	1 U	410	1 U	61	1 U	18	1 U
		13-Nov-07	1 U	510	1 U	90	1 U	24	1 U
		25-Jun-08	1 U	440	1 U	90	1 U	12	1 U
		15-Dec-08	0.36 U	410	0.29 U	79	0.13 U	13	0.75 U
		2-Jun-09	0.36 U	330	0.29 U	68	0.13 U	9.3	0.75 U
		15-Dec-09	0.36 U	350	0.38 U	140	0.55 J	21	0.48 J
PT-24	downgradient of ZVI wall	2-Jan-07	1 U	4	1 U	54	0.86 J	0.6 J	0.68 J
		15-Mar-07	1 U	2.8	1 U	38	0.81 J	1 U	1 U
		5-Jun-07	1 U	3.1	1 U	60	1.6	2.6	0.75 J
		13-Nov-07	1 U	3.8	1 U	39	1 U	1 U	0.56 J
		26-Jun-08	1 U	2.4	1 U	48	1.1	1.9	0.69 J
		12-Dec-08	0.36 U	2.2	0.29 U	34	0.36 J	0.26 J	0.75 U
		2-Jun-09	0.36 U	1.7	0.29 U	32	0.83 J	2	0.75 U
		15-Dec-09	0.36 U	1.7	0.38 U	28	0.61 J	1.6	0.29 U
MW-56	off-site well	4-Jan-07	1 U	1 U	1 U	1.2	1 U	1 U	1 U
		6-Jun-07	1 U	1 U	1 U	1.7	1 U	1 U	1 U
		26-Jun-08	1 U	1 U	1 U	1.3	1 U	1 U	1 U
		11-Dec-08	0.36 U	0.33 J	0.29 U	0.4 J	0.13 U	0.24 U	0.75 U
		4-Jun-09	0.36 U	0.18 U	0.29 U	1	0.13 U	0.24 U	0.75 U
		18-Dec-09	0.36 U	0.46 U	0.38 U	0.56 J	0.42 U	0.24 U	0.29 U

Downgradient

Notes:

1. Sample duplicate pairs were collected at MWT-28 in Jan-07; MWT-29 in MAR-07 and Jun-08; MWT-27 in Jun-07, Dec-08, and Dec-09; and MWT-23 in Nove-07. If an analyte was detected in the sample but not detected in the duplicate (or vice versa) the non-detect value was taken at half and average with the detect value.
2. Wells in bold are the biowall process monitoring wells.
3. Grey shading indicates that the concentration was detected above its Class GA groundwater standard. The Class GA Groundwater standard for TCE and cis-DCE is 5 ug/L; for VC the Class GA standard is 2 ug/L.

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

Table 5
Groundwater Trends
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

Sampled Wells	Location			TCE	cis-1,2-DCE	VC
PT-18A[1]	upgradient of walls	Sample Date: Trend: Est. Date[2]:	17-Dec-09	2100 Decreasing	630 Increasing	7.1 No Trend
MWT-25	upgradient of Biowall A	Sample Date: Trend: Est. Date[2]:	17-Dec-09	4.2 Compliant	3.3 Compliant	0.24 U Compliant
MWT-26	upgradient of Biowalls B1/B2	Sample Date: Trend: Est. Date[4]:	17-Dec-09	5.8 Decreasing	8.1 Decreasing	4.2 Decreasing
MWT-27[3]	in Biowall B1	Sample Date: Trend: Est. Date[2]:	16-Dec-09	2.3 U Compliant	1.9 U Compliant	3.1 J No Trend
MWT-28	in Biowall B2	Sample Date: Trend: Est. Date[2]:	18-Dec-09	2.3 U Compliant	1.9 U Compliant	1.2 U Compliant
MWT-29	downgradient of Biowall B2	Sample Date: Trend: Est. Date[2]:	16-Dec-09	3.5 Compliant	37 Decreasing 26-Jun-2013	29 Decreasing 26-May-2016
MWT-22	downgradient of Biowall B2	Sample Date: Trend: Est. Date[2]:	16-Dec-09	2.3 U Compliant	57 Decreasing 23-Jan-2024	52 Decreasing 14-Sep-2051
PT-22	between Biowalls B and C	Sample Date: Trend: Est. Date[2]:	16-Dec-09	8.7 Decreasing 16-Oct-2020	29 Decreasing 15-Aug-2023	9.5 Decreasing 30-Jan-2012
MWT-23	in Biowall C2	Sample Date: Trend: Est. Date[2]:	15-Dec-09	0.46 U Compliant	0.47 J Compliant	0.24 U Compliant
MWT-24	downgradient of Biowalls C1/C2	Sample Date: Trend: Est. Date[2]:	15-Dec-09	4.7 Compliant	32 Decreasing 13-Sep-2018	4 Decreasing 6-Aug-2010
PT-17[1]	downgradient of biowalls	Sample Date: Trend: Est. Date[2]:	15-Dec-09	7.8 Decreasing	65 Increasing	20 No Trend
MWT-7[1]	immed. Upgradient of ZVI wall	Sample Date: Trend: Est. Date[2]:	15-Dec-09	350 Decreasing	140 Increasing	21 No Trend
PT-24	downgradient of ZVI wall	Sample Date: Trend: Est. Date[2]:	15-Dec-09	1.7 Compliant	28 Decreasing 28-Apr-2019	1.6 Compliant
MW-56	off-site well	Sample Date: Trend: Est. Date[2]:	18-Dec-09	0.46 U Compliant	0.56 J Compliant	0.24 U Compliant

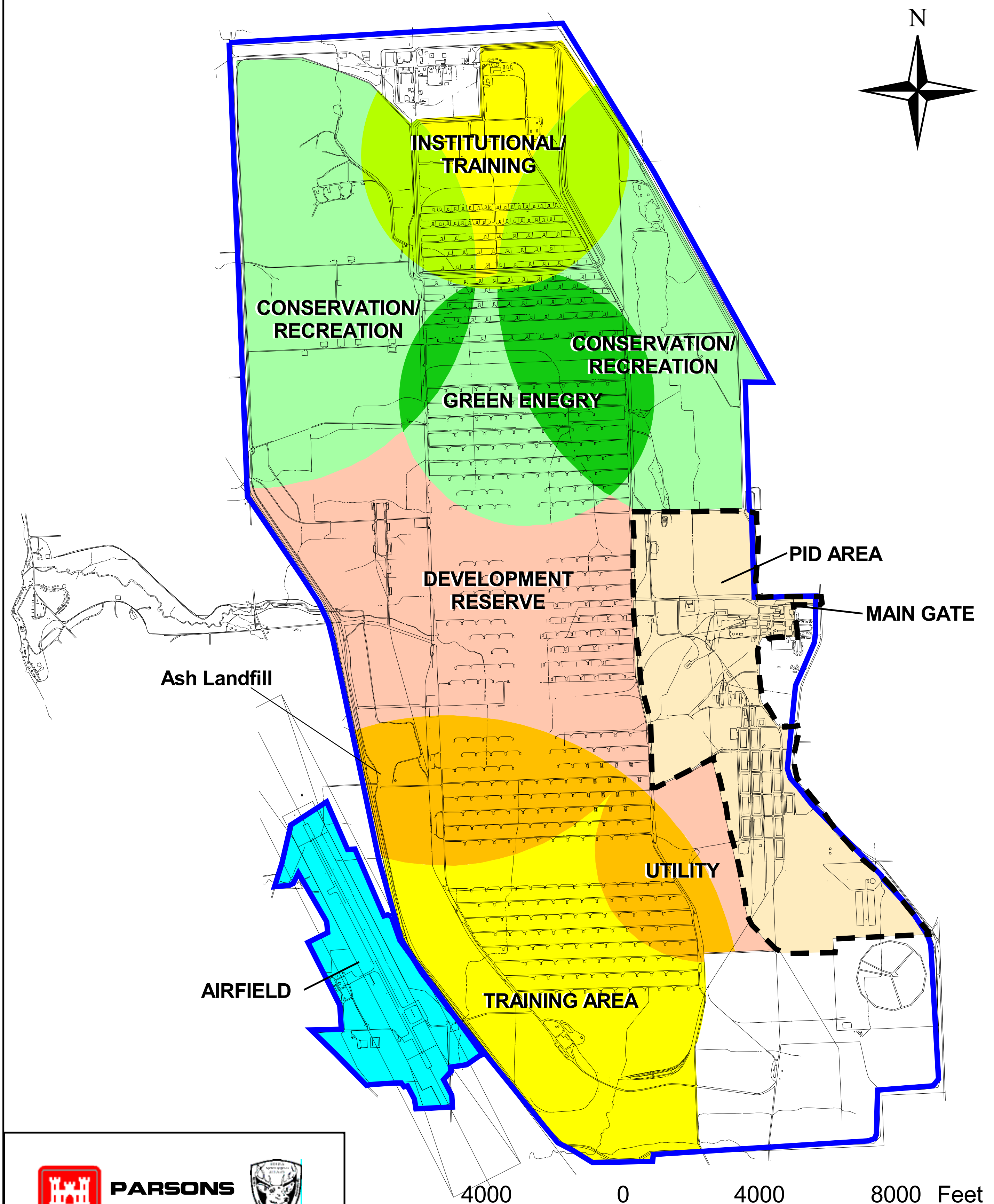
Notes:

1. The concentration of TCE at these wells has not been impacted by the biowall system and dates to achieve compliance cannot be estimated at this time due to the natural variation in concentrations over time.
2. The date that the groundwater standard will be achieved is estimated based on an exponential regression of the time plots for each well. The dates are rough estimates that indicate that the groundwater concentrations will eventually reach the GA standard and are not intended to represent a definitive timeframe in which the GA standards will be achieved.
3. The concentrations presented were an average of the sample duplicate pair.
4. Overall concentrations follow a decreasing trend; however further monitoring is needed to elucidate the dates at which compounds can be expected to reach groundwater standards.

U = compound was not detected.

J = the reported value is an estimated concentration.

FIGURES



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SENECA ARMY DEPOT ACTIVITY
ASH LANDFILL
ASH LANDFILL ANNUAL REPORT

FIGURE 1
ASH LANDFILL LOCATION AT SEDA

August 2010

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LEGEND:

- PAVED ROAD
- DIRT ROAD
- GROUND CONTOUR AND ELEVATION
- TREE
- WETLAND & DESIGNATION
- BRUSH
- CHAIN LINK FENCE
- UTILITY POLE
- APPROXIMATE LOCATION OF FIRE HYDRANT
- FUEL OR UNDERGROUND STORAGE TANK
- SURVEY MONUMENT (SEAD-1 EL.630.90')
- MONITORING WELL AND DESIGNATION (PT-22)
- RAILROAD TRACKS
- WATER MAIN
- POST CONSTRUCTION AS BUILT GROUND ELEVATION CONTOUR (670)
- PILOT STUDY BIOWALL (2005)
- SINGLE BIOWALL (2006)
- DOUBLE-WIDE BIOWALL (2006)
- ZERO VALENT IRON WALL (1998)
- SEDA PROPERTY BOUNDARY

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SENECA ARMY DEPOT
ASH LANDFILL
ASH LANDFILL ANNUAL REPORT

DEPT.	Dwg. No.
ENVIRONMENTAL ENGINEERING	

FIGURE 2
ASH LANDFILL
SITE PLAN

SCALE	DATE	REV
1" = 200'	AUGUST 2010	–

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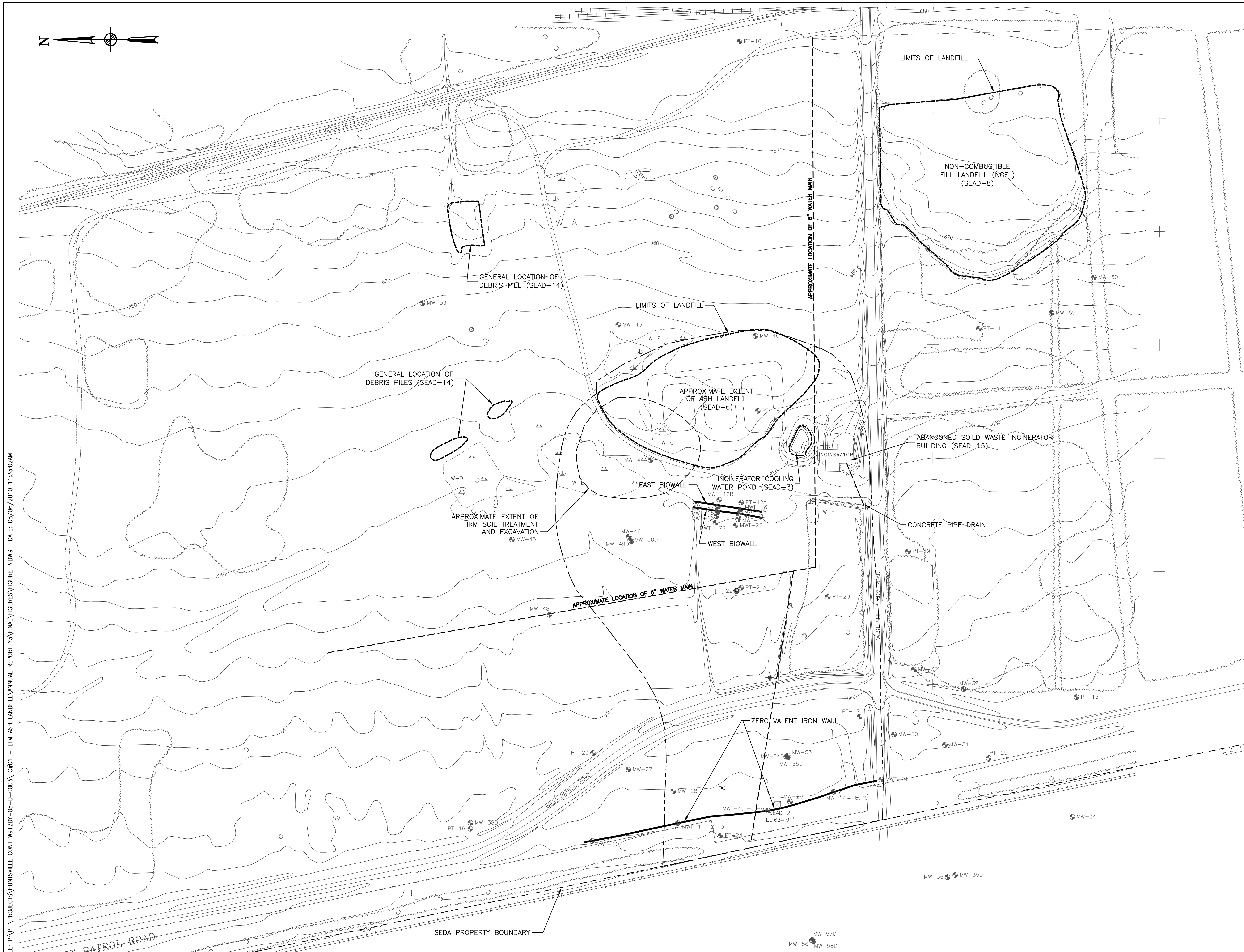

FILE: P:\PIT\PROJECTS\HUNTSVILLE CONT W912DY-08-D-0003\TO#01 - LTM ASH LANDFILL\ANNUAL REPORT Y3\FINAL\FIGURES\FIGURE 3.DWG, DATE: 08/06/2010 11:33:02AM

LEGEND:

- PAVED ROAD
- DIRT ROAD
- GROUND CONTOUR AND ELEVATION
- TREE
- WETLAND & DESIGNATION
- BRUSH
- CHAIN LINK FENCE
- UTILITY POLE
- APPROXIMATE LOCATION OF FIRE HYDRANT
- FUEL OR UNDERGROUND STORAGE TANK
- SURVEY MONUMENT (SEAD-1 EL.630.90')
- MONITORING WELL AND DESIGNATION (PT-22)
- RAILROAD TRACKS
- WATER MAIN
- APPROXIMATE EXTENT OF IRM SOIL TREATMENT AND EXCAVATION
- APPROXIMATE AREA REQUIRING LAND USE CONTROLS
- SEDA PROPERTY BOUNDARY

NOTE:
FIGURE SHOWS PRE-CONSTRUCTION CONDITIONS

100 0 100 200
(feet)

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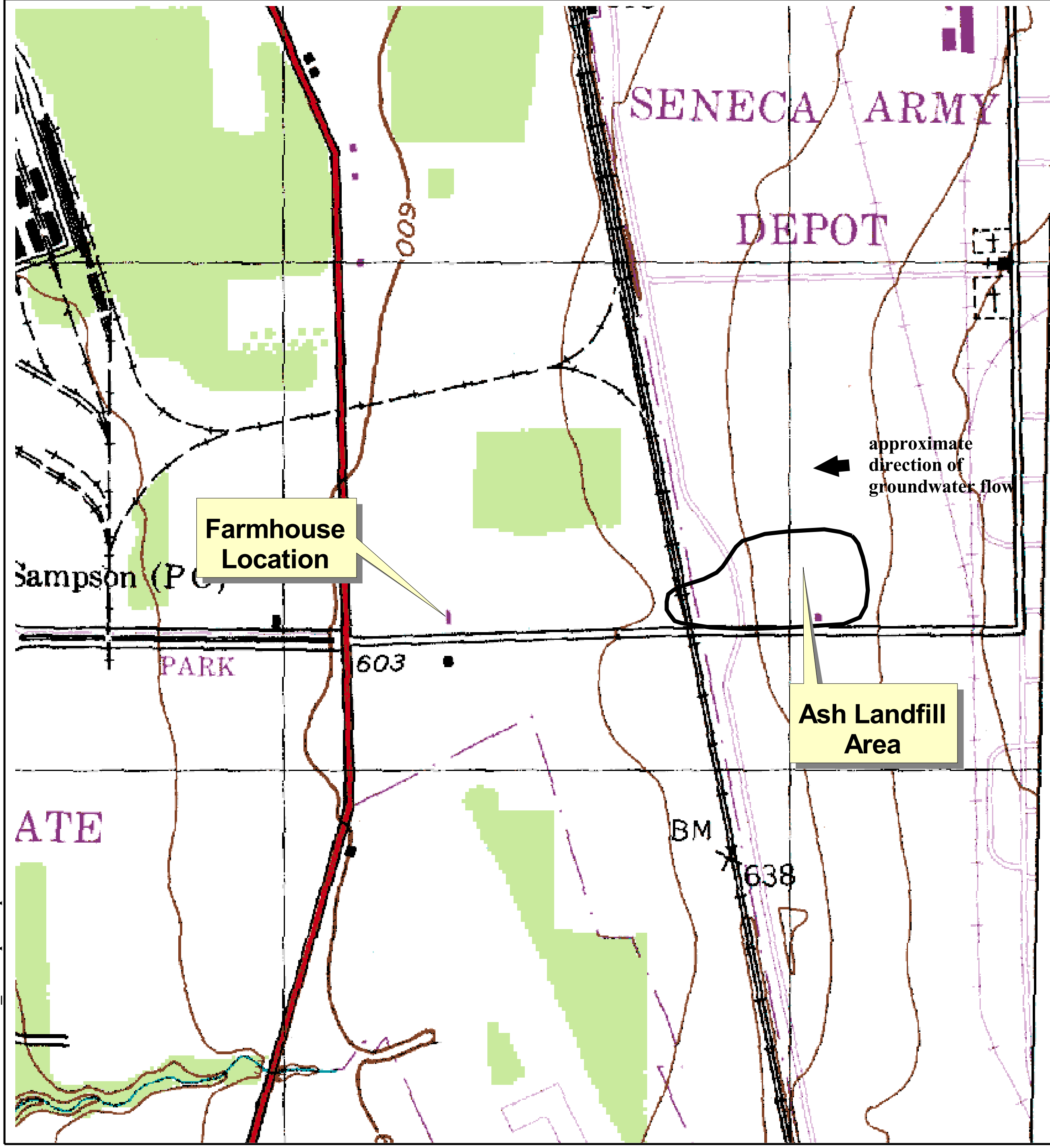
SENECA ARMY DEPOT
ASH LANDFILL
ASH LANDFILL ANNUAL REPORT

DEPT. ENVIRONMENTAL ENGINEERING
Dwg. No.

FIGURE 3
ASH LANDFILL
HISTORIC SITE MAP

SCALE 1" = 200'
DATE AUGUST 2010
REV



Approximate 10 µg/L total chlorinated ethenes isocontour based on groundwater results of August 2004.

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SENECA ARMY DEPOT ACTIVITY
ASH LANDFILL
ASH LANDFILL ANNUAL REPORT

FIGURE 4

LOCATION OF FARMHOUSE

SCALE: 1" = 1000'

DATE: AUGUST 2010

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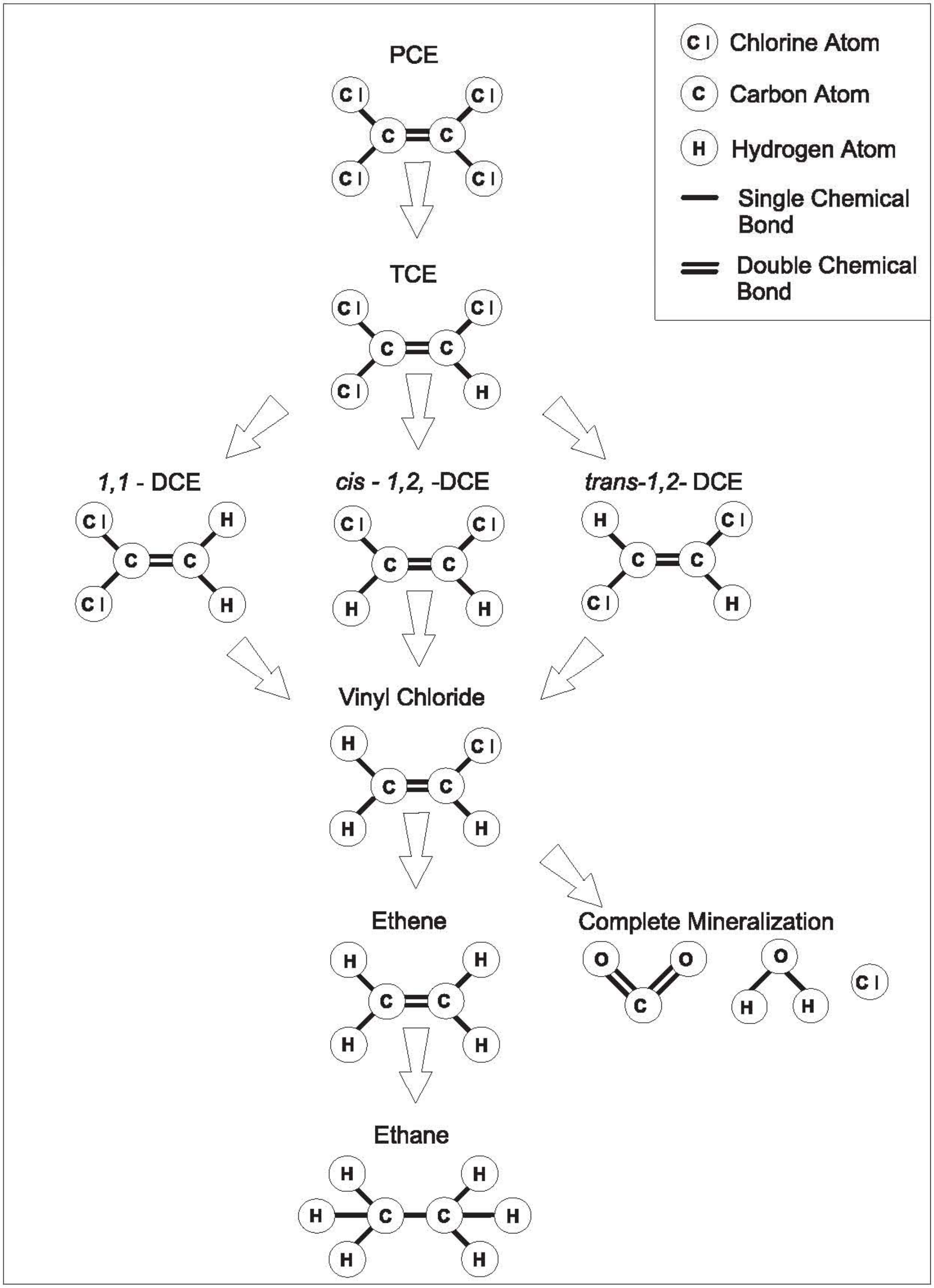
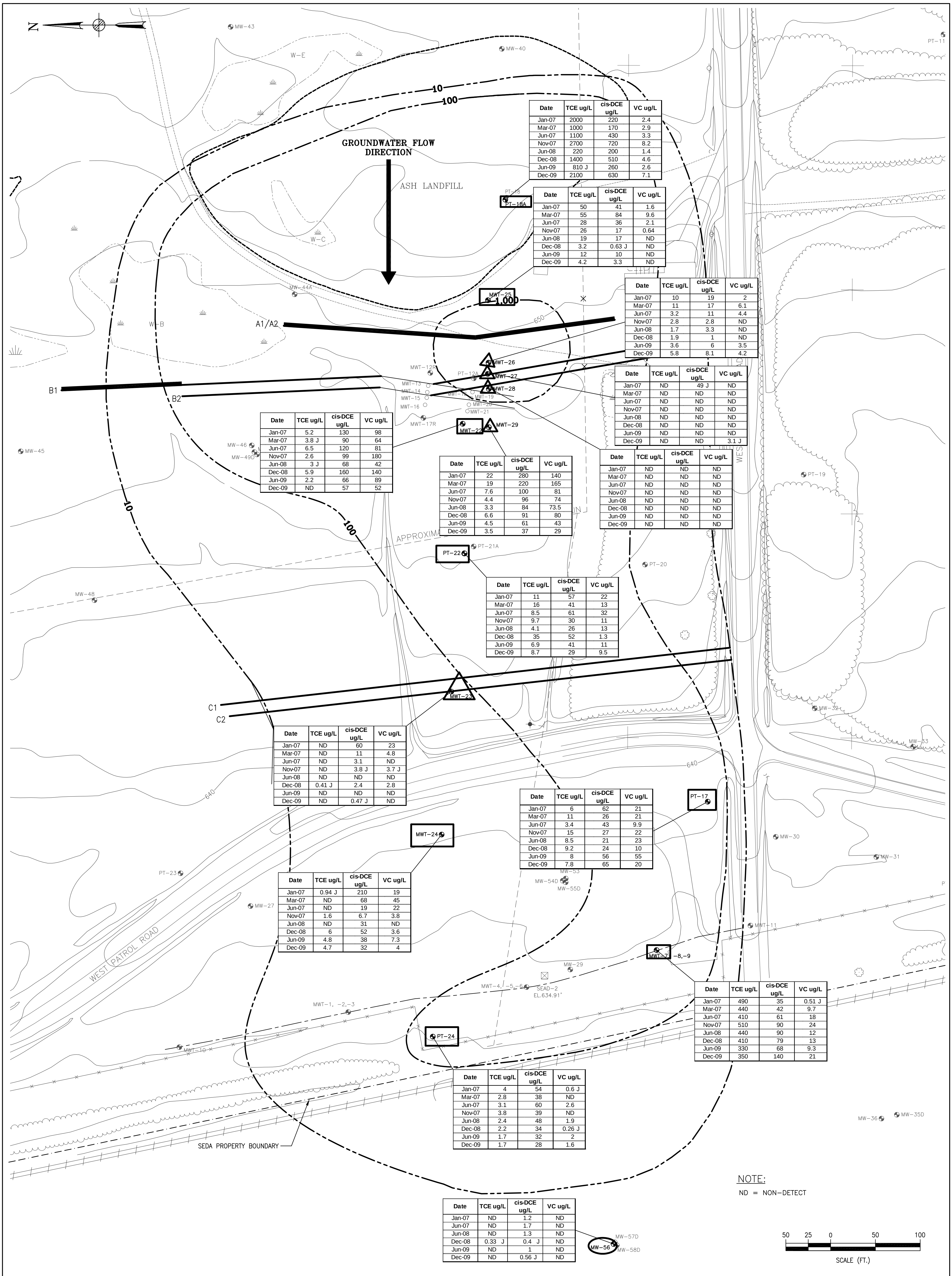
Figure 5
Reductive Dechlorination of Chlorinated Ethenes
Ash Landfill Annual Report
Seneca Army Depot Activity



(USEPA, 1998)



Date	TCE ug/L	cis-DCE ug/L	VC ug/L
Jan-07	2000	220	2.4
Mar-07	1000	170	2.9
Jun-07	1100	430	3.3
Nov-07	2700	720	8.2
Jun-08	220	200	1.4
Dec-08	1400	510	4.6
Jun-09	810 J	260	2.6
Dec-09	2100	630	7.1

Date	TCE ug/L	cis-DCE ug/L	VC ug/L
Jan-07	50	41	1.6
Mar-07	55	84	9.6
Jun-07	28	36	2.1
Nov-07	26	17	0.64
Jun-08	19	17	ND
Dec-08	3.2	0.63 J	ND
Jun-09	12	10	ND
Dec-09	4.2	3.3	ND

Date	TCE ug/L	cis-DCE ug/L	VC ug/L
Jan-07	10	19	2
Mar-07	11	17	6.1
Jun-07	3.2	11	4.4
Nov-07	2.8	2.8	ND
Jun-08	1.7	3.3	ND
Dec-08	1.9	1	ND
Jun-09	3.6	6	3.5
Dec-09	5.8	8.1	4.2

Date	TCE ug/L	cis-DCE ug/L	VC ug/L
Jan-07	ND	49 J	ND
Mar-07	ND	ND	ND
Jun-07	ND	ND	ND
Nov-07	ND	ND	ND
Jun-08	ND	ND	ND
Dec-08	ND	ND	ND
Jun-09	ND	ND	ND
Dec-09	ND	ND	3.1 J

Date	TCE ug/L	cis-DCE ug/L	VC ug/L
Jan-07	5.2	130	98
Mar-07	3.8 J	90	64
Jun-07	6.5	120	81
Nov-07	2.6	99	180
Jun-08	3 J	68	42
Dec-08	5.9	160	140
Jun-09	2.2	66	89
Dec-09	ND	57	52

Date	TCE ug/L	cis-DCE ug/L	VC ug/L
Jan-07	22	280	140
Mar-07	19	220	165
Jun-07	7.6	100	81
Nov-07	4.4	96	74
Jun-08	3.3	84	73.5
Dec-08	6.6	91	80
Jun-09	4.5	61	43
Dec-09	3.5	37	29

Date	TCE ug/L	cis-DCE ug/L	VC ug/L
Jan-07	ND	ND	ND
Mar-07	ND	ND	ND
Jun-07	ND	ND	ND
Nov-07	ND	ND	ND
Jun-08	ND	ND	ND
Dec-08	ND	ND	ND
Jun-09	ND	ND	ND
Dec-09	ND	ND	ND

Date	TCE ug/L	cis-DCE ug/L	VC ug/L
Jan-07	11	57	22
Mar-07	16	41	13
Jun-07	8.5	61	32
Nov-07	9.7	30	11
Jun-08	4.1	26	13
Dec-08	35	52	1.3
Jun-09	6.9	41	11
Dec-09	8.7	29	9.5

Date	TCE ug/L	cis-DCE ug/L	VC ug/L
Jan-07	ND	60	23
Mar-07	ND	11	4.8
Jun-07	ND	3.1	ND
Nov-07	ND	3.8 J	3.7 J
Jun-08	ND	ND	ND
Dec-08	0.41 J	2.4	2.8
Jun-09	ND	ND	ND
Dec-09	ND	0.47 J	ND

Date	TCE ug/L	cis-DCE ug/L	VC ug/L
Jan-07	6	62	21
Mar-07	11	26	21
Jun-07	3.4	43	9.9
Nov-07	15	27	22
Jun-08	8.5	21	23
Dec-08	9.2	24	10
Jun-09	8	56	55
Dec-09	7.8	65	20

Date	TCE ug/L	cis-DCE ug/L	VC ug/L
Jan-07	0.94 J	210	19
Mar-07	ND	68	45
Jun-07	ND	19	22
Nov-07	1.6	6.7	3.8
Jun-08	ND	31	ND
Dec-08	6	52	3.6
Jun-09	4.8	38	7.3
Dec-09	4.7	32	4

Date	TCE ug/L	cis-DCE ug/L	VC ug/L
Jan-07	490	35	0.51 J
Mar-07	440	42	9.7
Jun-07	410	61	18
Nov-07	510	90	24
Jun-08	440	90	12
Dec-08	410	79	13
Jun-09	330	68	9.3
Dec-09	350	140	21

Date	TCE ug/L	cis-DCE ug/L	VC ug/L
Jan-07	4	54	0.6 J
Mar-07	2.8	38	ND
Jun-07	3.1	60	2.6
Nov-07	3.8	39	ND
Jun-08	2.4	48	1.9
Dec-08	2.2	34	0.26 J
Jun-09	1.7	32	2
Dec-09	1.7	28	1.6

Date	TCE ug/L	cis-DCE ug/L	VC ug/L
Jan-07	ND	1.2	ND
Jun-07	ND	1.7	ND
Jun-08	ND	1.3	ND
Dec-08	0.33 J	0.4 J	ND
Jun-09	ND	1	ND
Dec-09	ND	0.56 J	ND

LEGEND:

- PAVED ROAD
- DIRT ROAD
- GROUND CONTOUR AND ELEVATION
- TREE
- WETLAND & DESIGNATION
- MONITORING WELL AND DESIGNATION
- RAILROAD TRACKS
- BRUSH
- CHAIN LINK FENCE
- UTILITY POLE
- APPROXIMATE LOCATION OF FIRE HYDRANT
- FUEL OR UNDERGROUND STORAGE TANK
- SURVEY MONUMENT
- ABANDONED MONITORING WELL
- APPROXIMATE LOCATION OF WATER MAIN
- PILOT STUDY BIOWALL (2005)
- SINGLE BIOWALL (2006)
- DOUBLE-WIDE BIOWALL (2006)
- ZERO VALENT IRON WALL (1998)
- GROUNDWATER TOTAL CHLORINATED ETHENE ISOCONTOUR (UG/L) BASED ON AUGUST 2004 DATA
- OFF-SITE PERFORMANCE MONITORING WELL IN L.T.M. PROGRAM
- ON-SITE PLUME PERFORMANCE MONITORING WELL IN L.T.M. PROGRAM
- BIOWALL PROCESS MONITORING WELL IN L.T.M. PROGRAM

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ASH LANDFILL ANNUAL REPORT

DEPT. ENVIRONMENTAL ENGINEERING | Dwg. No.

FIGURE 6
CHLORINATED ETHENES CONCENTRATIONS IN GROUNDWATER

SCALE 1" = 100' | DATE AUGUST 2010 | REV –

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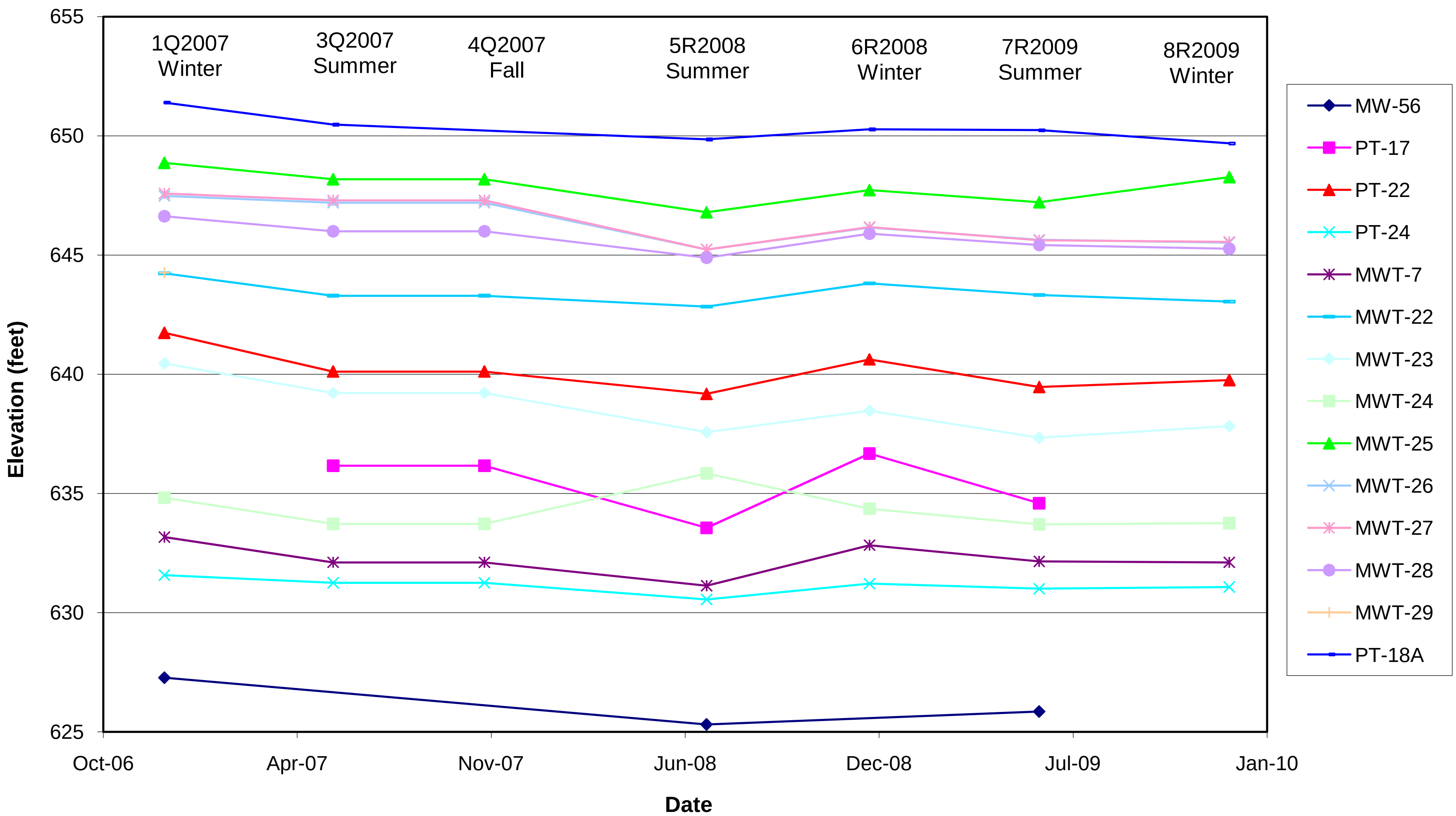
Figure 7
Groundwater Elevations
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity



Note: Groundwater levels were measured on: December 12-15, 2006; June 4, 2007; November 7, 2007; June 23, 2008; December 23, 2008; and December 14, 2009. Groundwater elevations were not measured at well MW-56 during 3Q2007, 4Q2007, 6R2008, and 8R2009; at PT-17 during 1Q2007 and 8R2008; and at PT-18A during 4Q2007. Groundwater levels were not recorded during 2Q2007.

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LEGEND:

- PAVED ROAD
- DIRT ROAD
- GROUND CONTOUR AND ELEVATION
- TREE
- WETLAND & DESIGNATION
- MONITORING WELL AND DESIGNATION
- RAILROAD TRACKS
- BRUSH
- CHAIN LINK FENCE
- UTILITY POLE
- APPROXIMATE LOCATION OF FIRE HYDRANT
- FUEL OR UNDERGROUND STORAGE TANK
- SURVEY MONUMENT
- ABANDONED MONITORING WELL
- APPROXIMATE LOCATION OF WATER MAIN
- PILOT STUDY BIOWALL (2005)
- SINGLE BIOWALL (2006)
- DOUBLE-WIDE BIOWALL (2006)
- ZERO VALENT IRON WALL (1998)
- GROUNDWATER CONTOUR
- GROUNDWATER FLOW DIRECTION
- SEDA PROPERTY BOUNDARY

PARSONS

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT

ASH LANDFILL

ASH LANDFILL ANNUAL REPORT

DEPT. ENVIRONMENTAL ENGINEERING | Dwg. No.

FIGURE 8

ASH LANDFILL GROUNDWATER CONTOURS & GROUNDWATER FLOW DIRECTION DEC. 2009

SCALE 1" = 150' | DATE AUGUST 2010 | REV -

Figure 9A
Concentrations of VOCs Along the Biowalls - Quarter 1, 2007
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

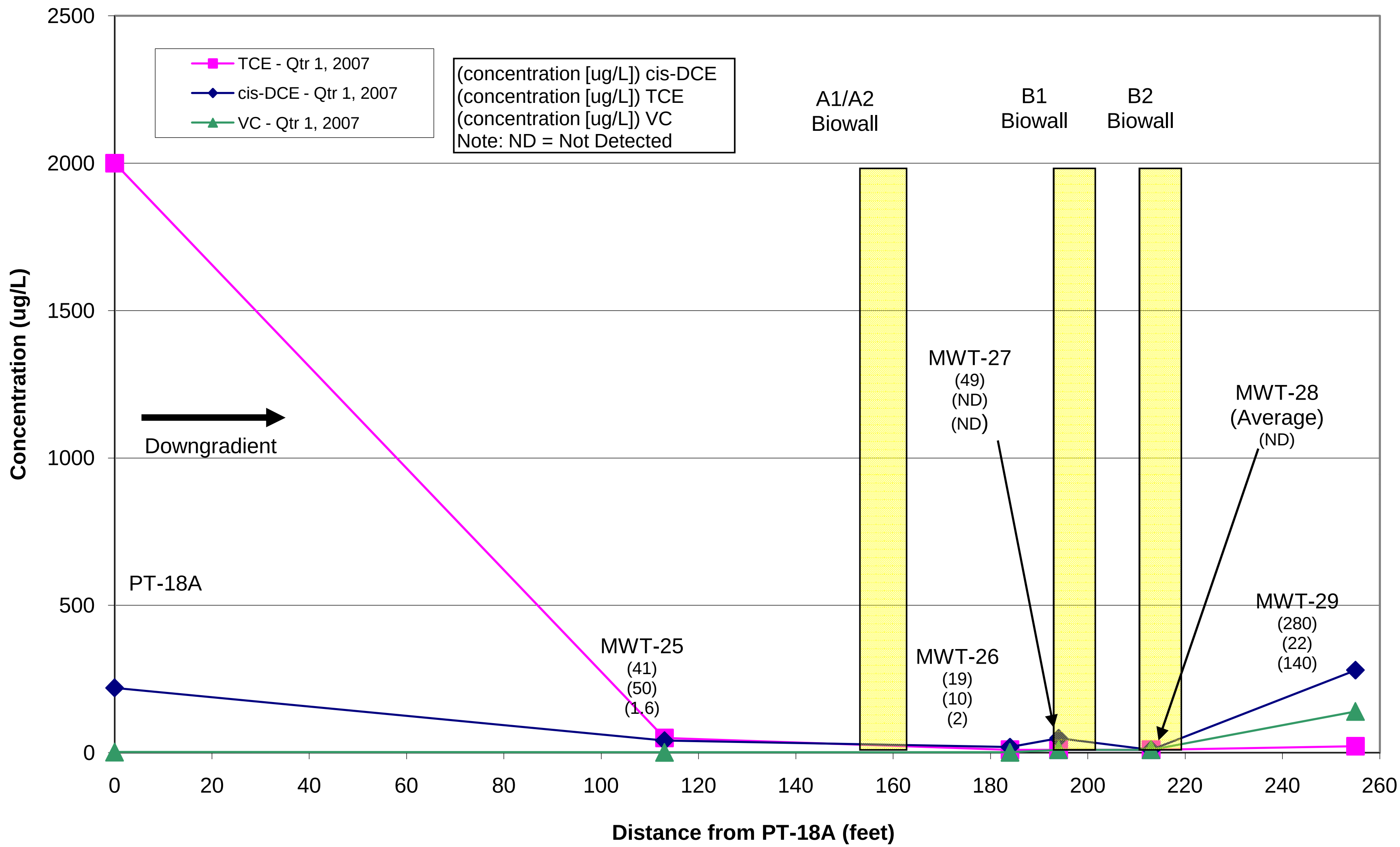
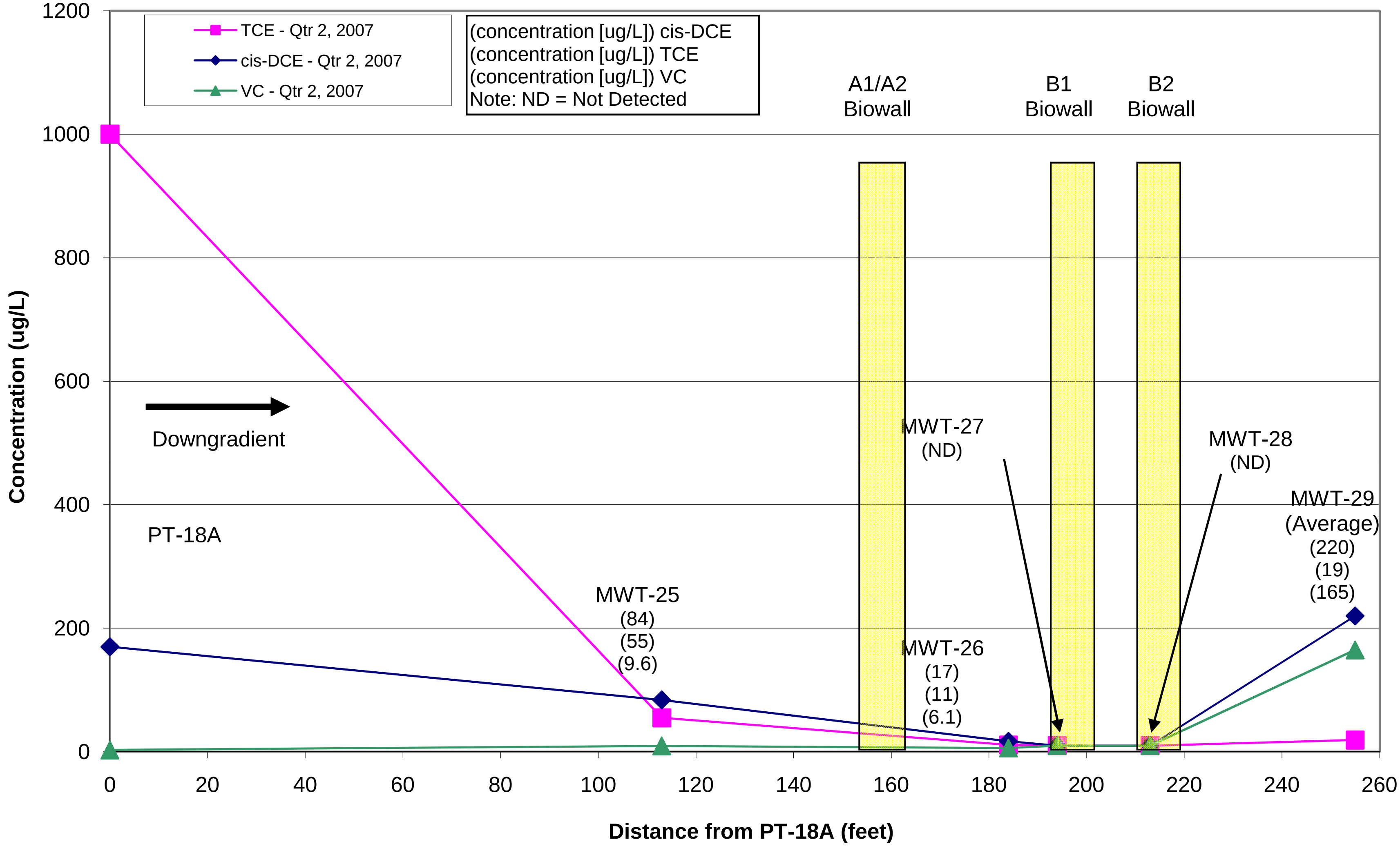


Figure 9B
Concentrations of VOCs Along the Biowalls - Quarter 2, 2007
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity



P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\TO#01 - LTM Ash Landfill\Annual Report Y3\Final\Figures\Figure 9 Biowall Conc.xls 8/6/2010

Figure 9C
Concentrations of VOCs Along the Biowalls - Quarter 3, 2007
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

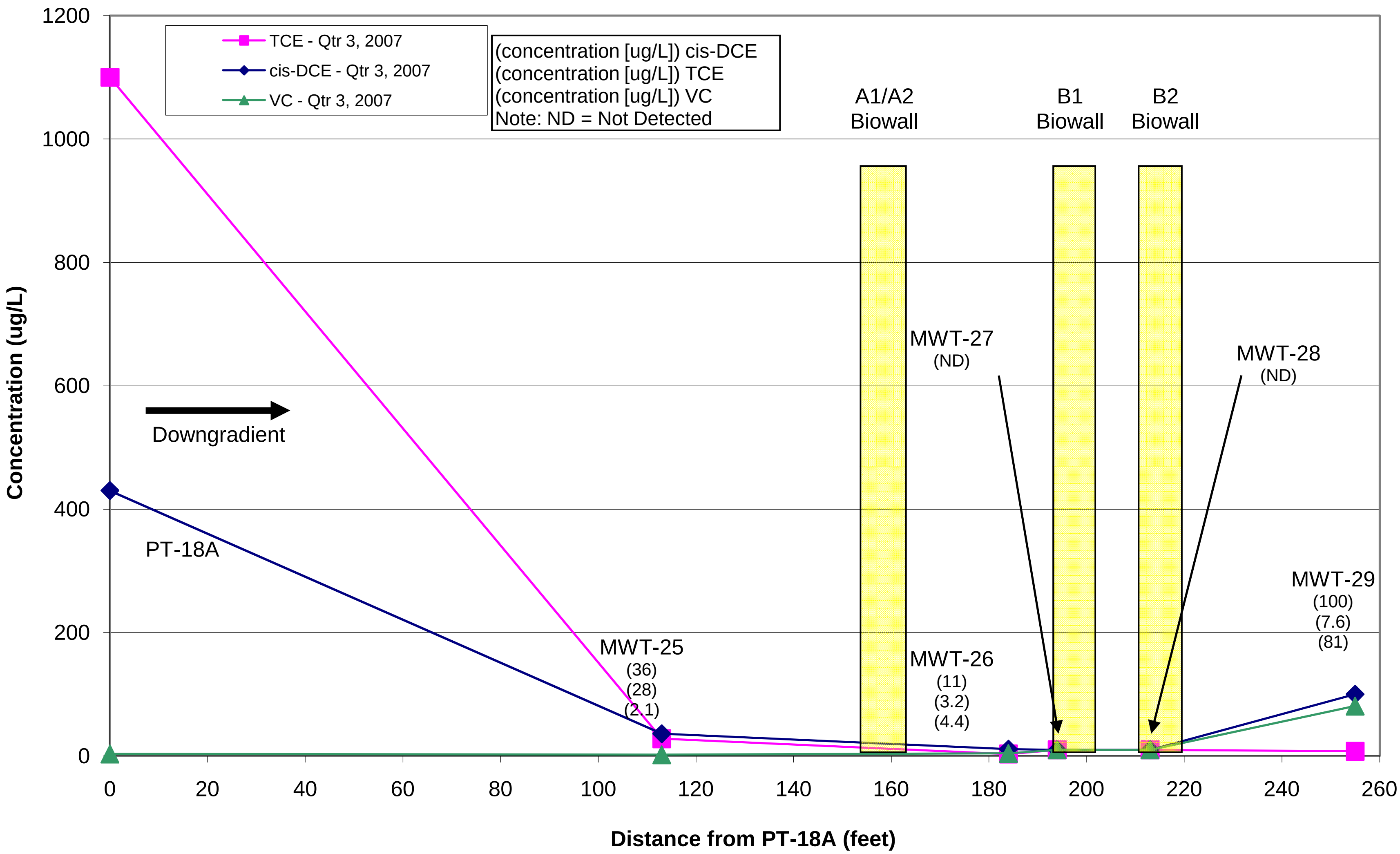


Figure 9D
Concentrations of VOCs Along the Biowalls - Quarter 4, 2007
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

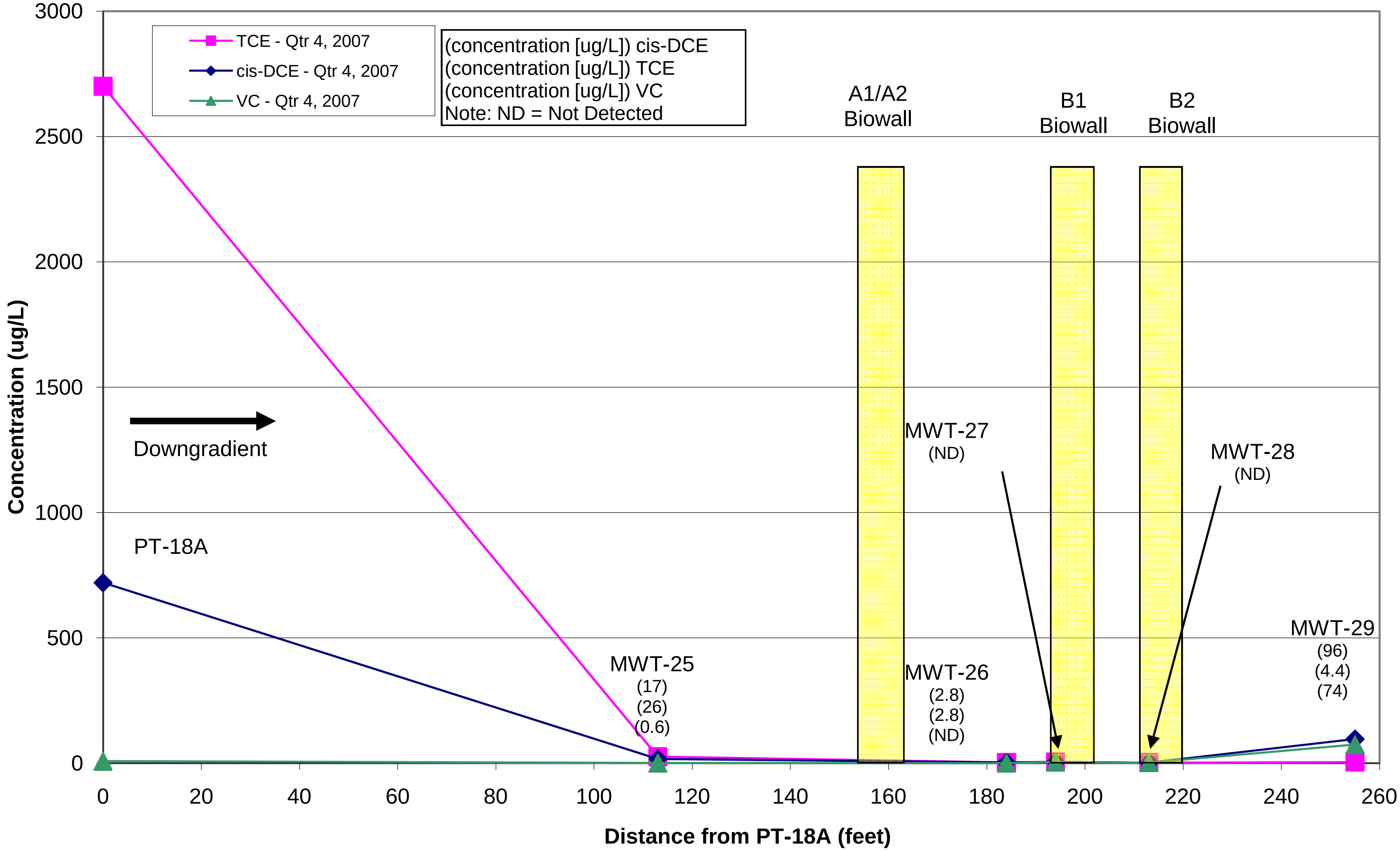


Figure 9E
Concentrations of VOCs Along the Biowalls - Round 5, 2008
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

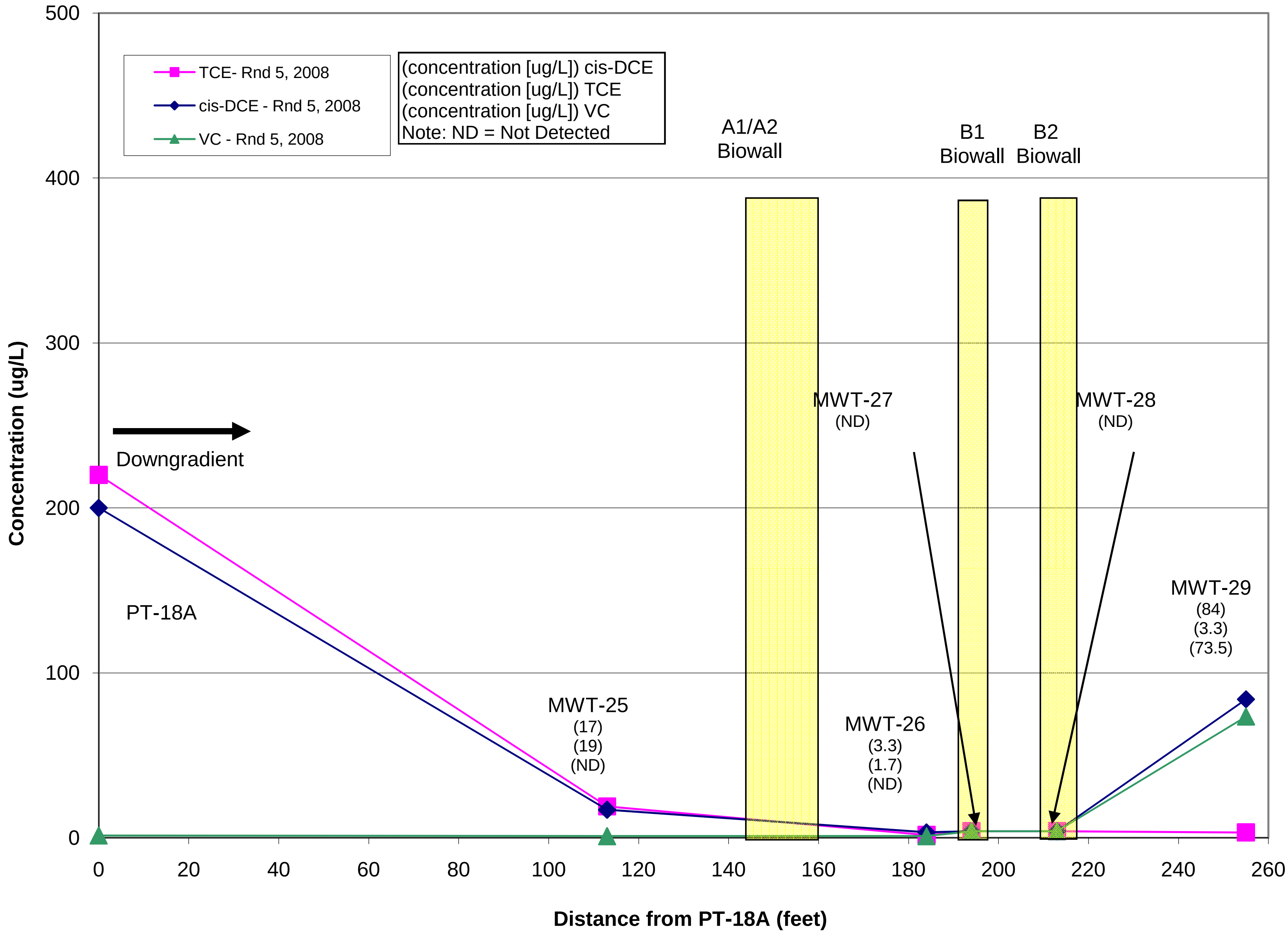


Figure 9F
Concentrations of VOCs Along the Biowalls - Round 6, 2008
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

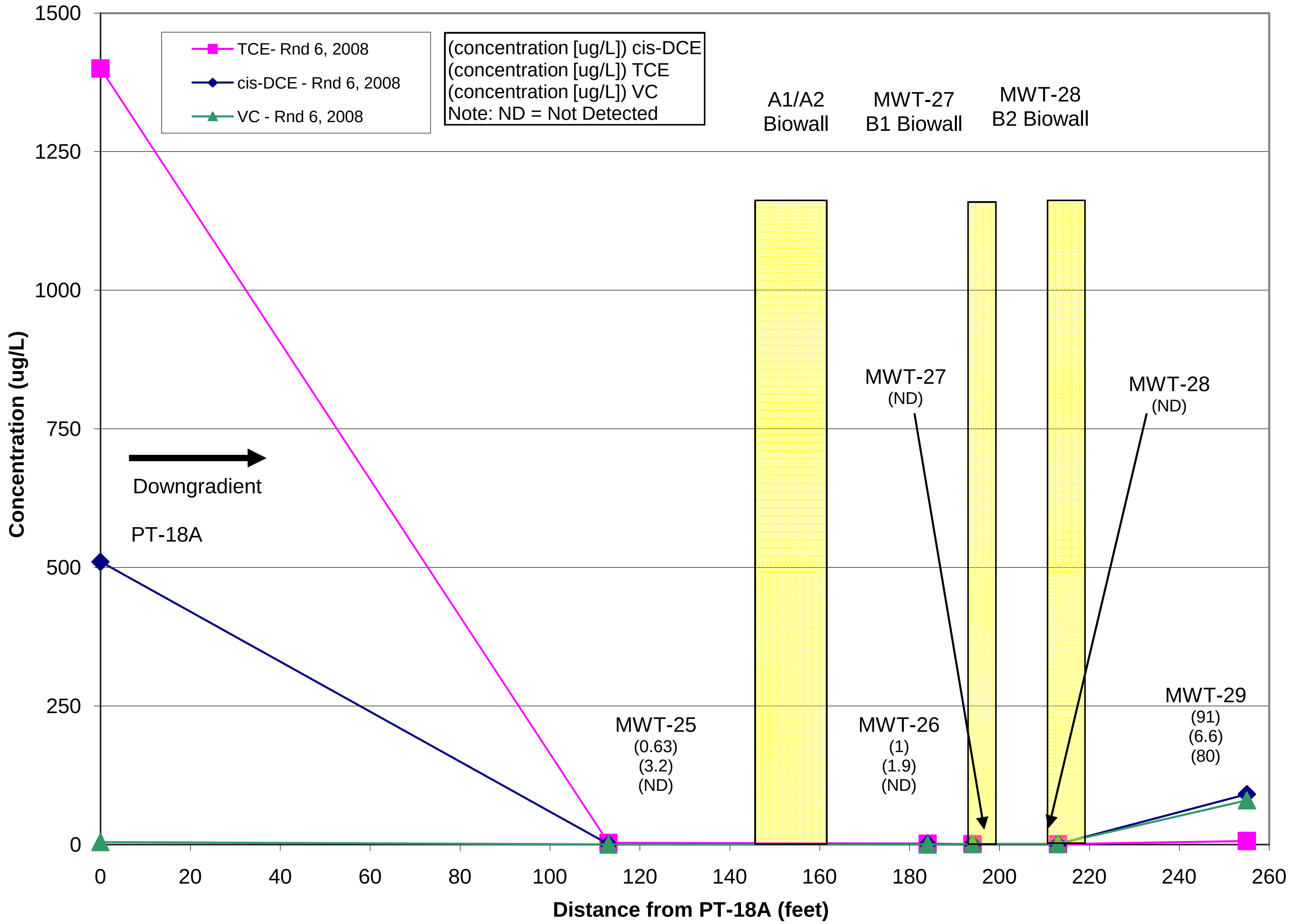


Figure 9G
Concentrations of VOCs Along the Biowalls - Round 7, 2009
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

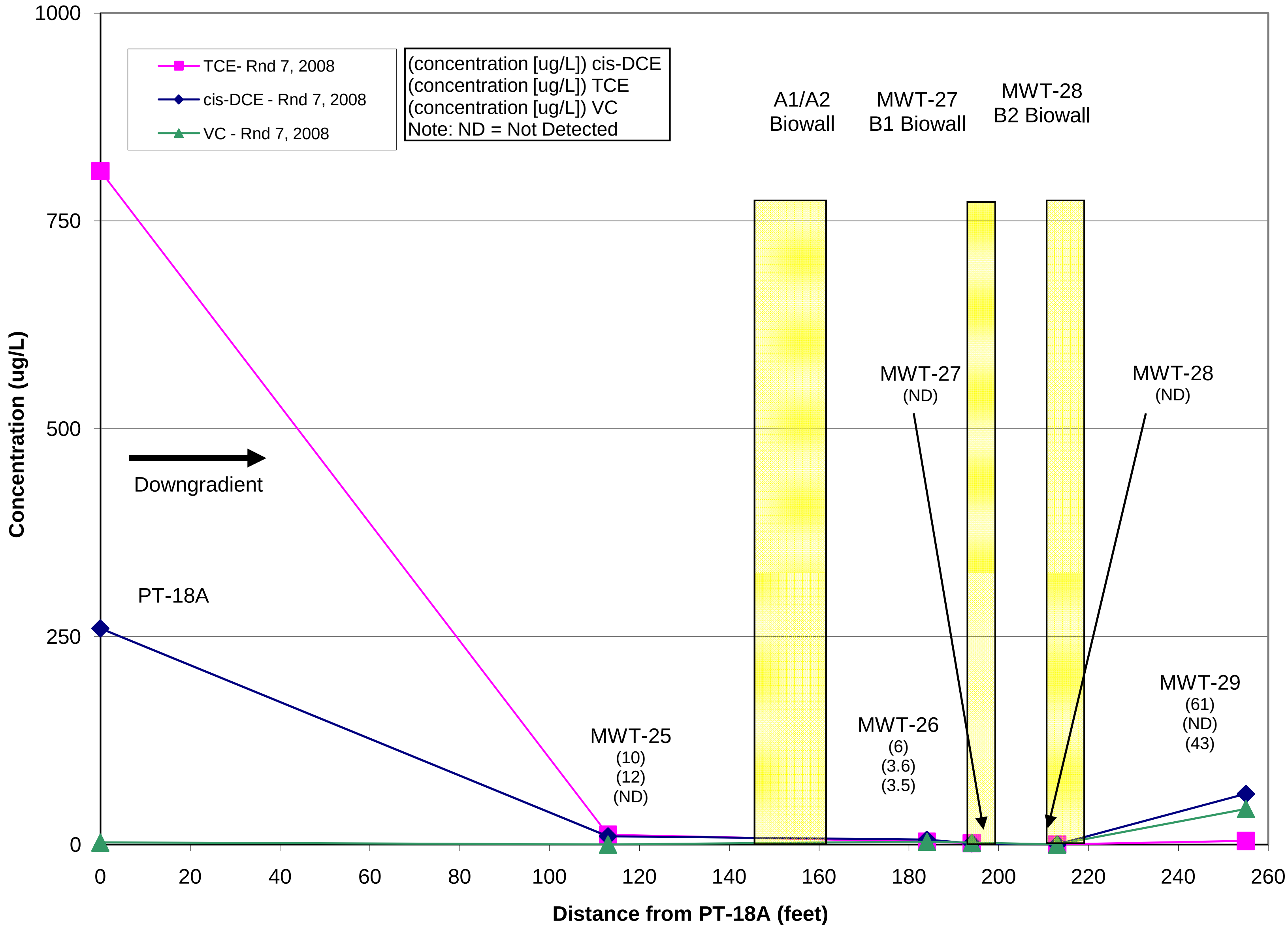


Figure 9H
Concentrations of VOCs Along the Biowalls - Round 8, 2009
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

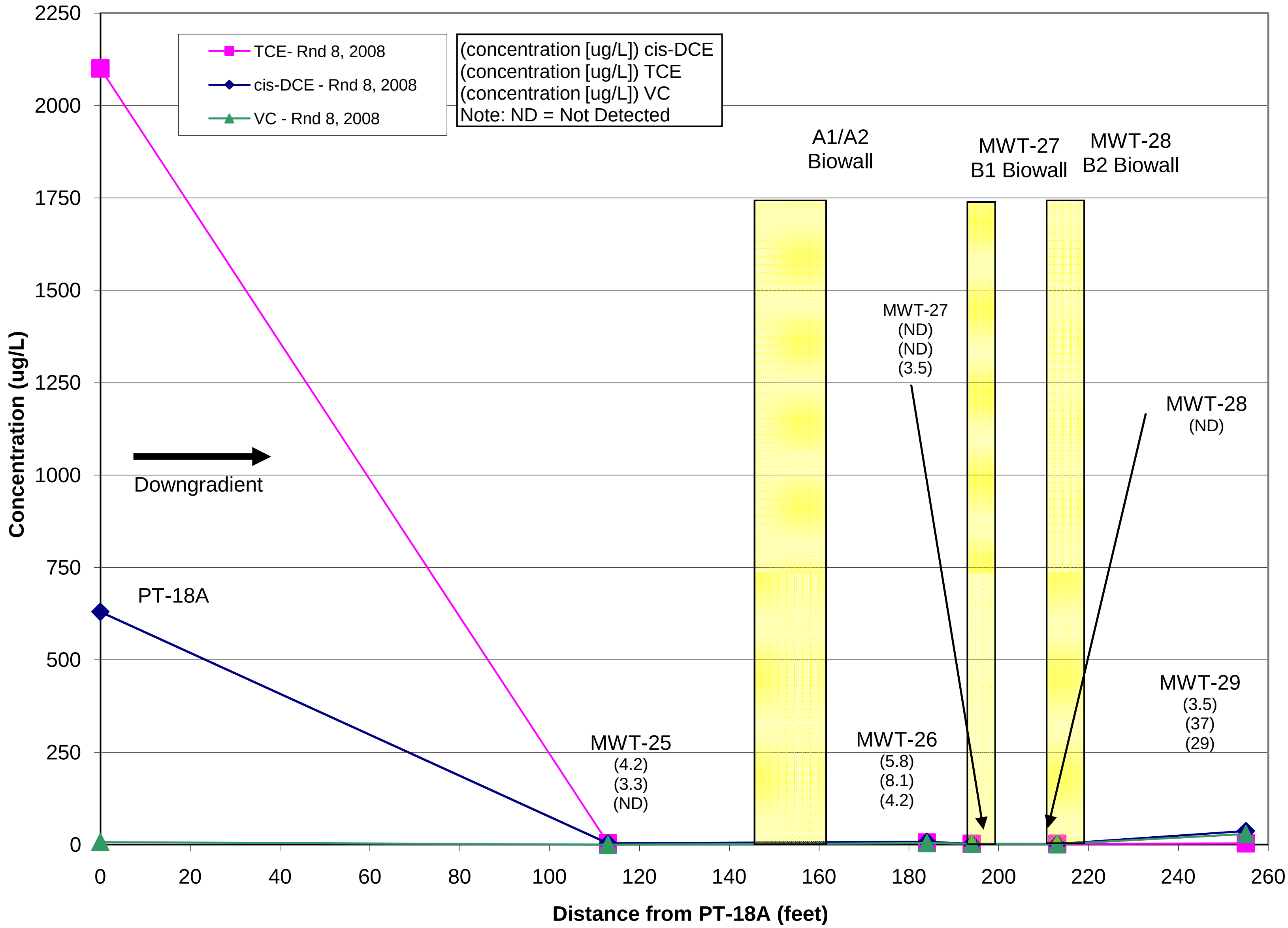


Figure 10A
Concentrations of Chlorinated Organics Over Time at MWT-25
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

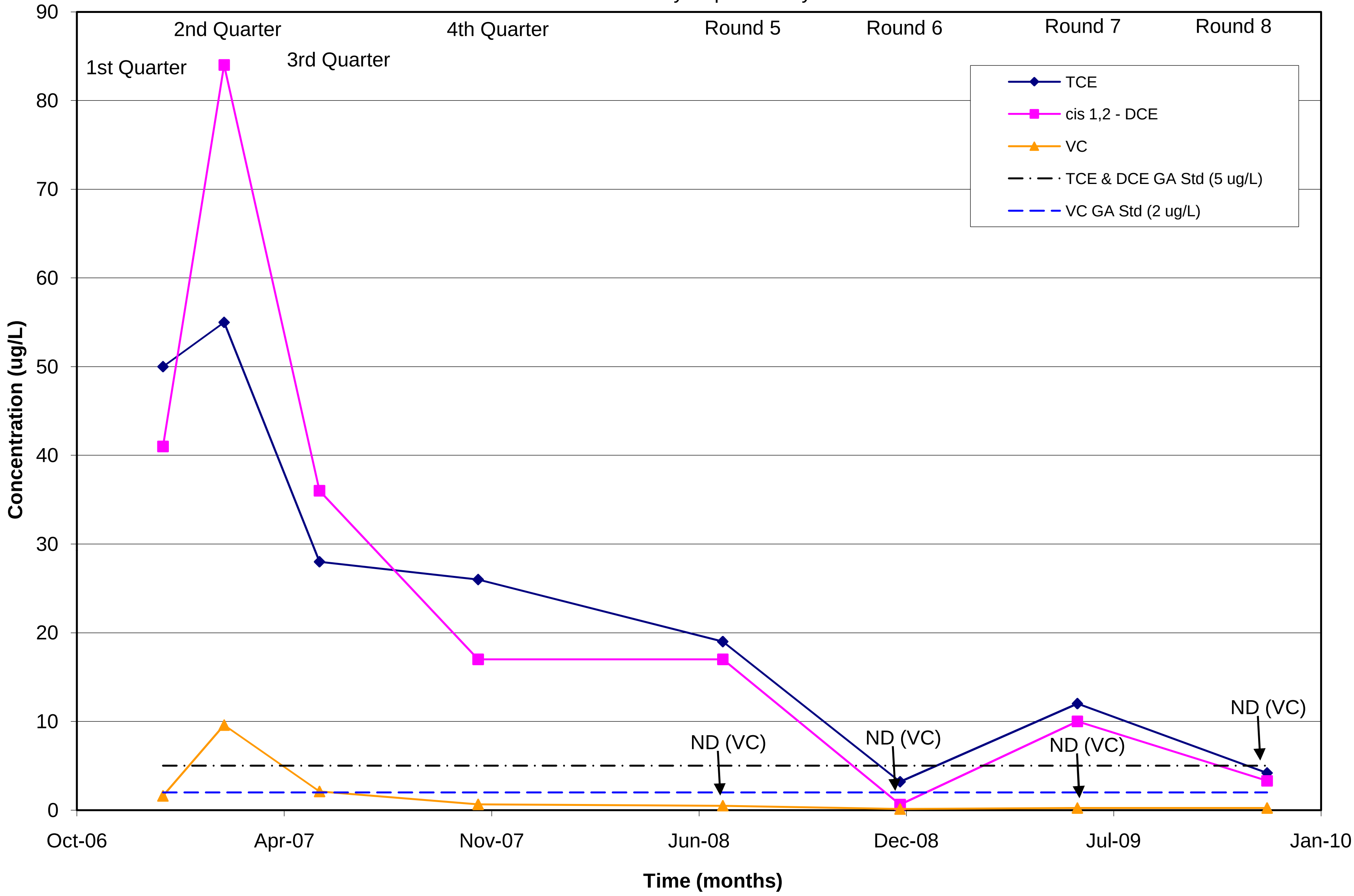
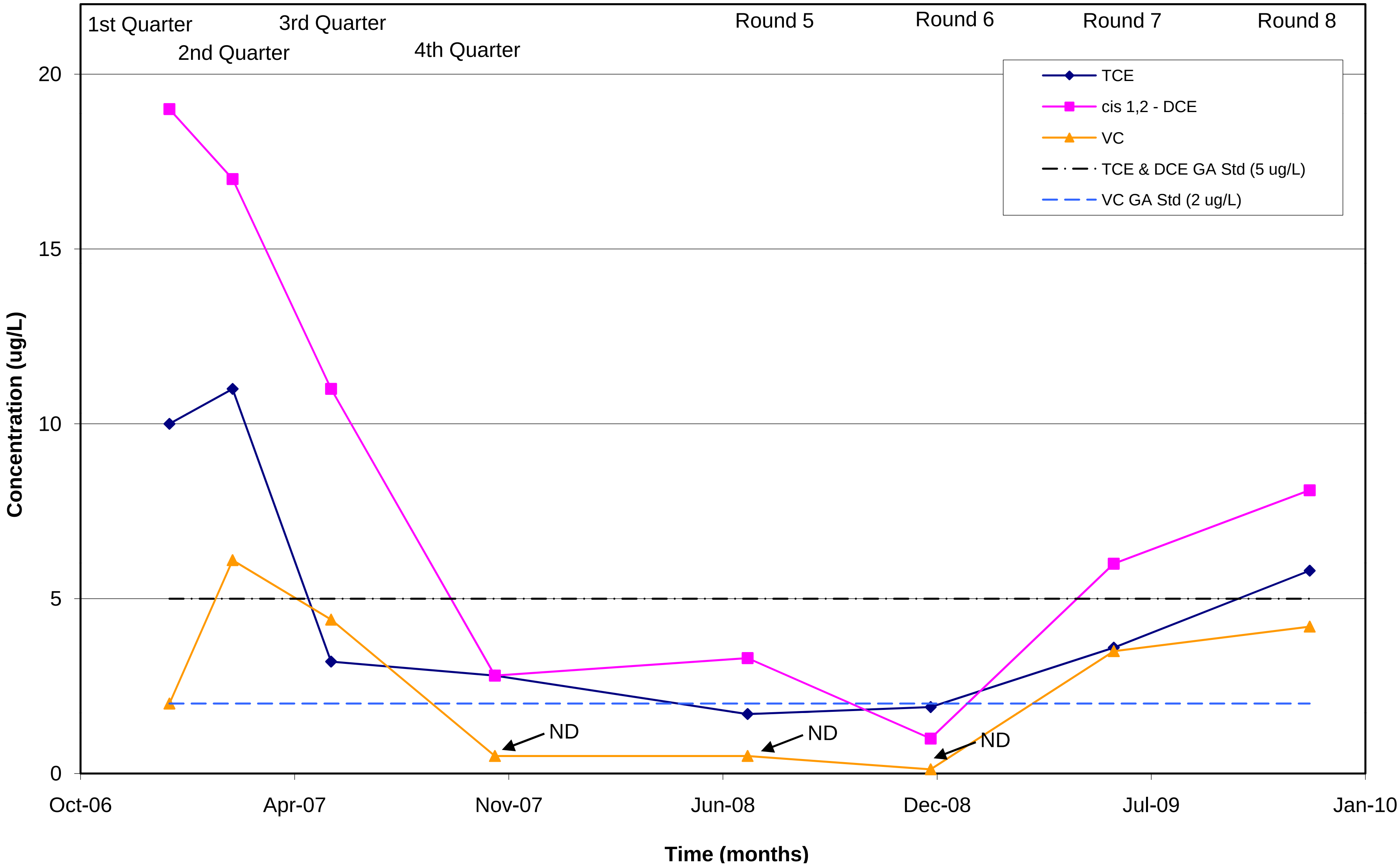


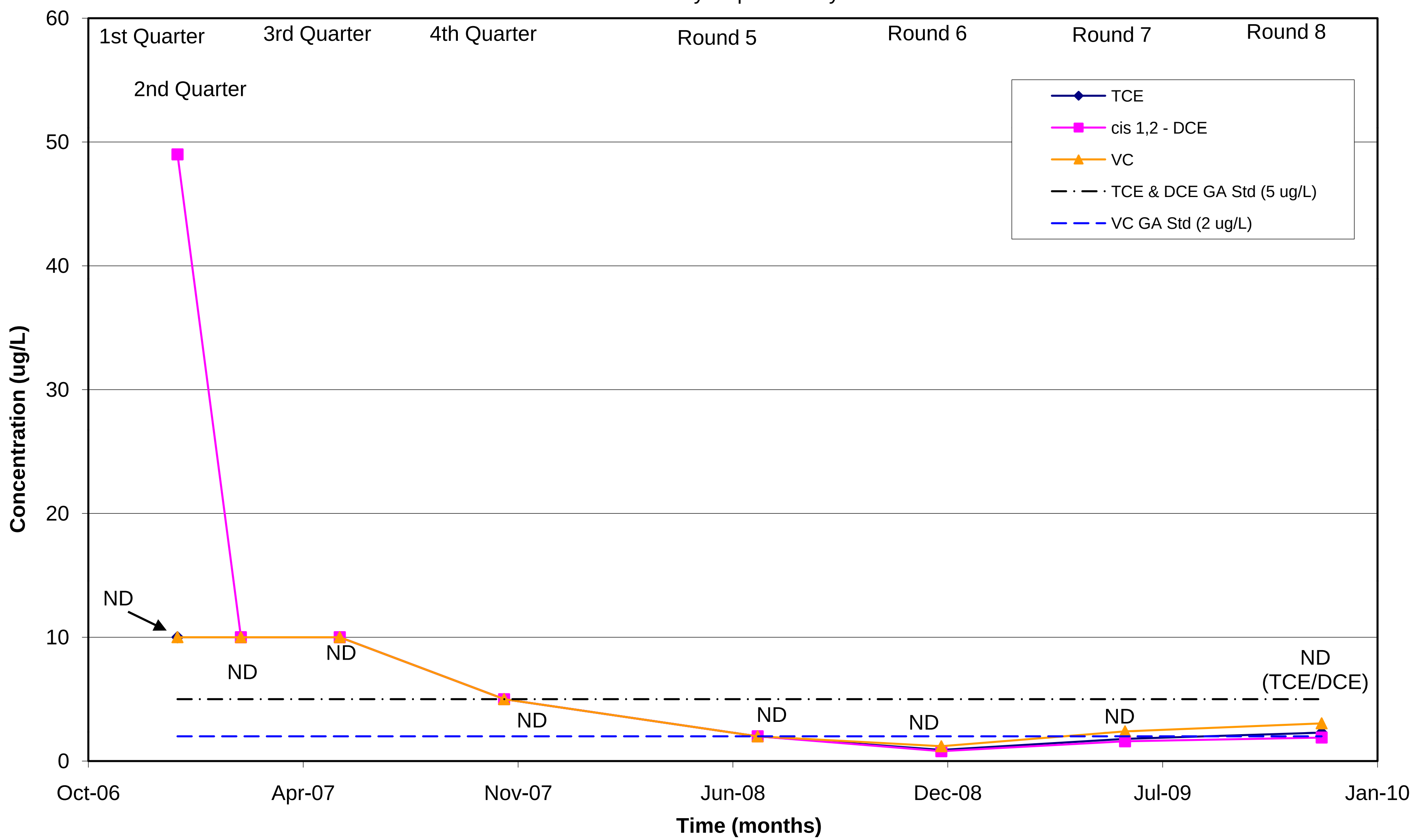
Figure 10B
Concentrations of Chlorinated Organics Over Time at MWT-26
Ash Landfill Annual Report, Year 2
Seneca Army Depot Activity



ND = not detected.

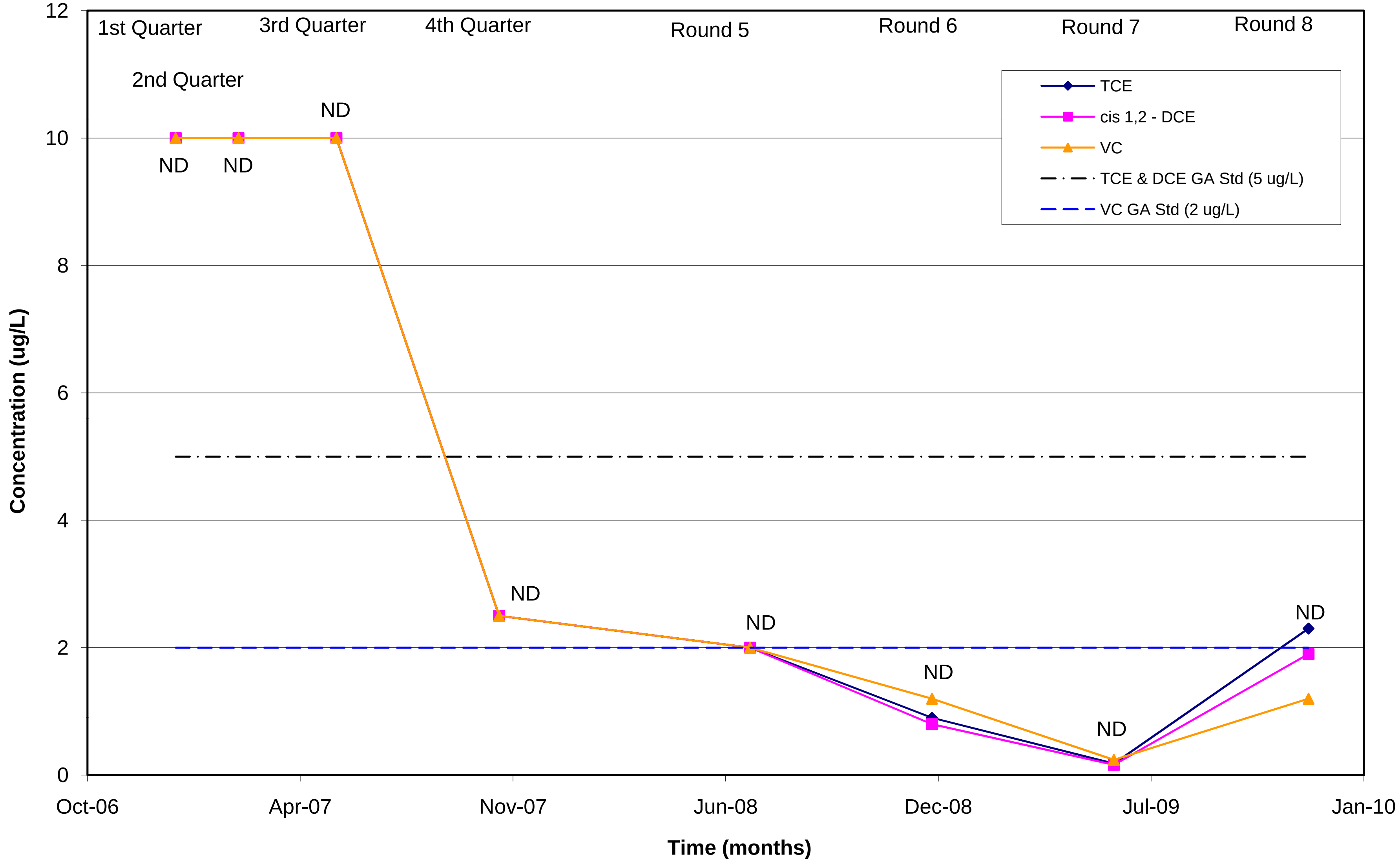
P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\TO#01 - LTM Ash Landfill\Annual Report Y3\Final\Figures\Figure 10 Well Conc vs Time.xls MWT-26 8/6/2010

Figure 10C
Concentrations of Chlorinated Organics Over Time at MWT-27
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity



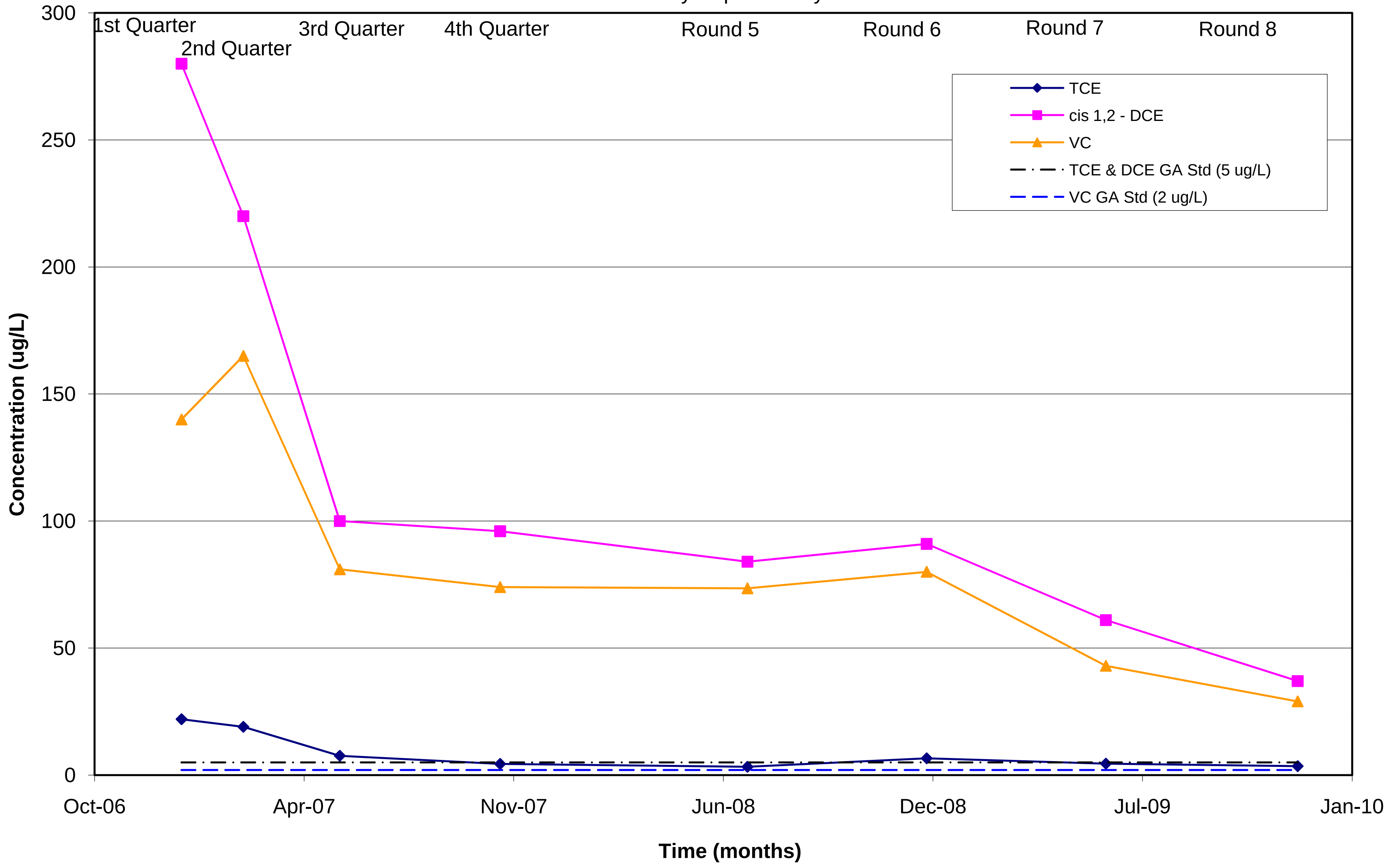
Note:
Round 3 and Round 6 data is the average of the sample and its duplicate.
ND = not detected.

Figure 10D
Concentrations of Chlorinated Organics Over Time at MWT-28
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity



Note:
Round 3 and Round 6 data is the average of the sample and its duplicate.
ND = not detected.

Figure 10E
Concentrations of Chlorinated Organics Over Time at MWT-29
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity



Note:
Round 2 and Round 5 data is the average of the sample and its duplicate.

Figure 10F
Concentrations of Chlorinated Organics Over Time at MWT-22
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

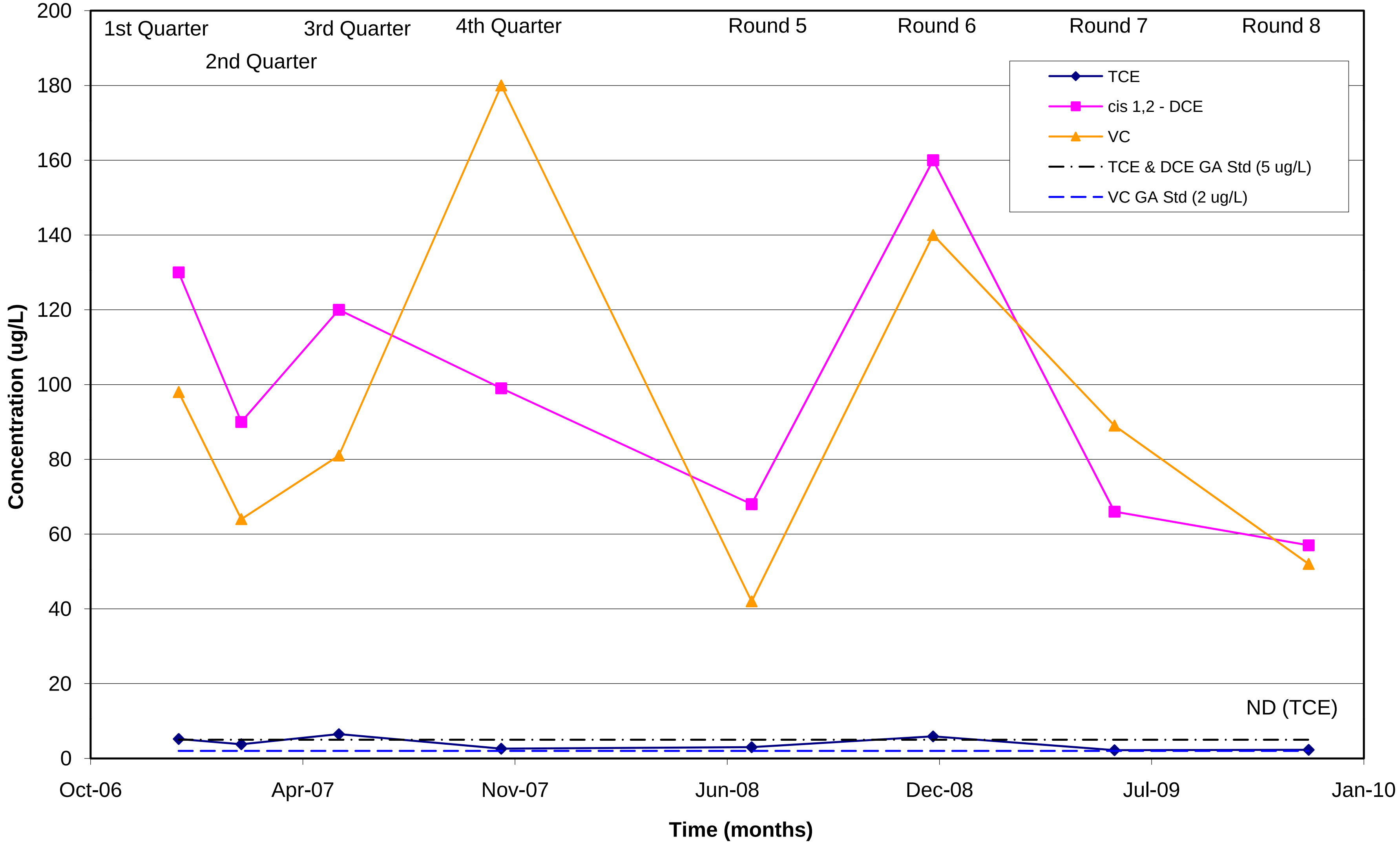


Figure 10G
Concentrations of Chlorinated Organics Over Time at PT-22
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

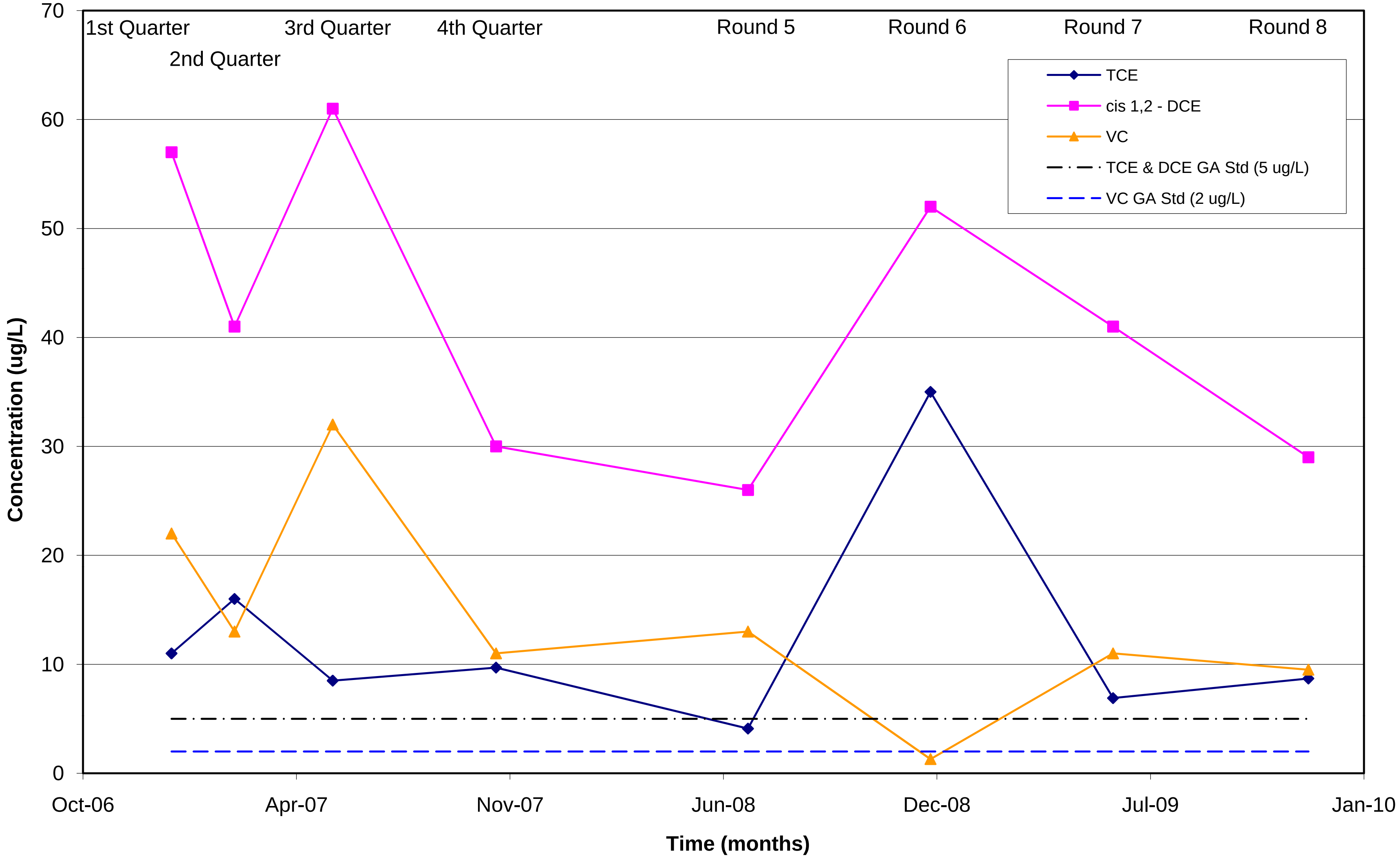
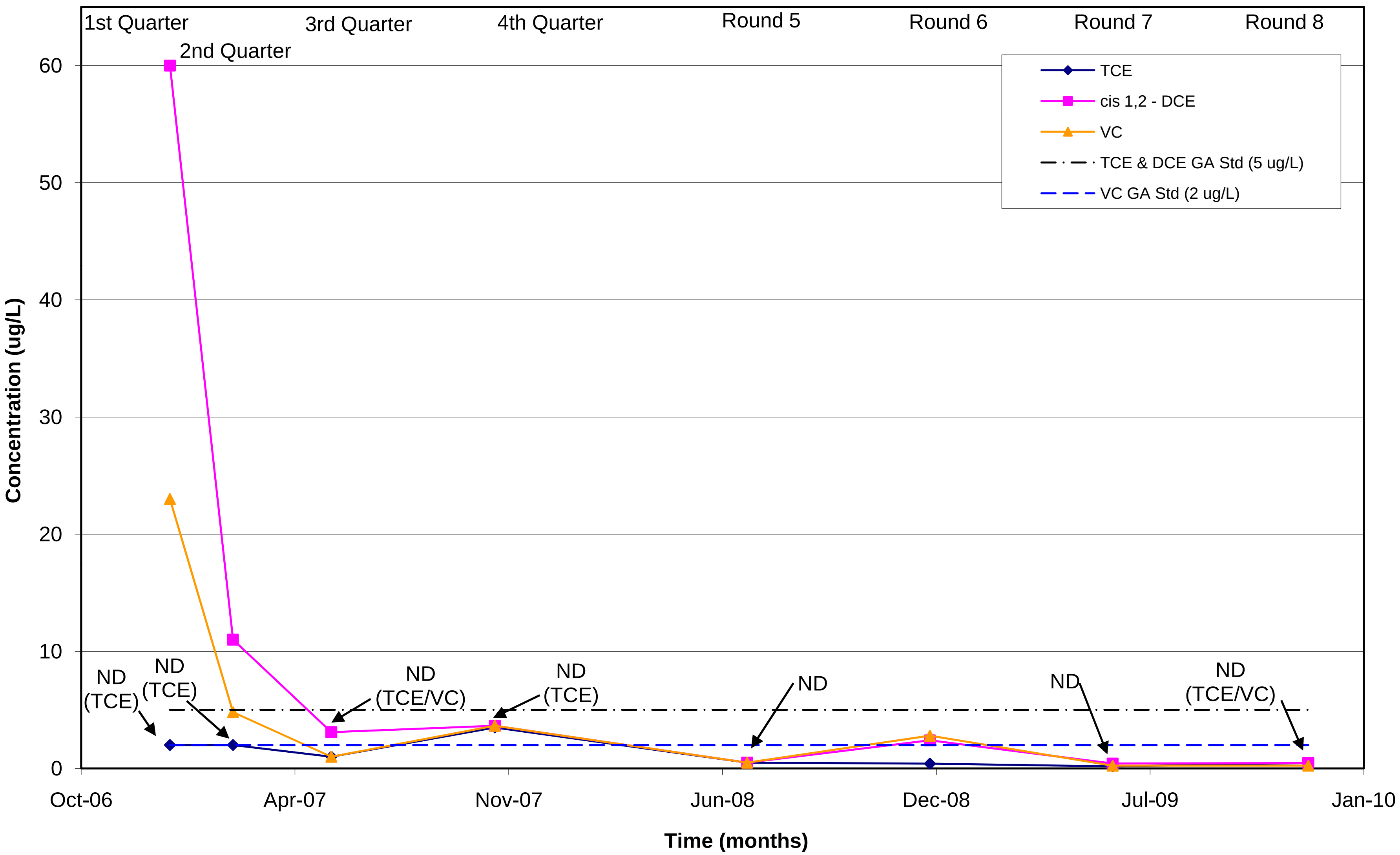


Figure 10H
Concentrations of Chlorinated Organics Over Time at MWT-23
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity



Note:
Round 4 data is the average of the sample and its duplicate.
ND = not detected.

P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\TO#01 - LTM Ash Landfill\Annual Report Y3\Final\Figures\Figure 10 Well Conc vs Time.xls MWT-23 8/6/2010

Figure 10I
Concentrations of Chlorinated Organics Over Time at MWT-24
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

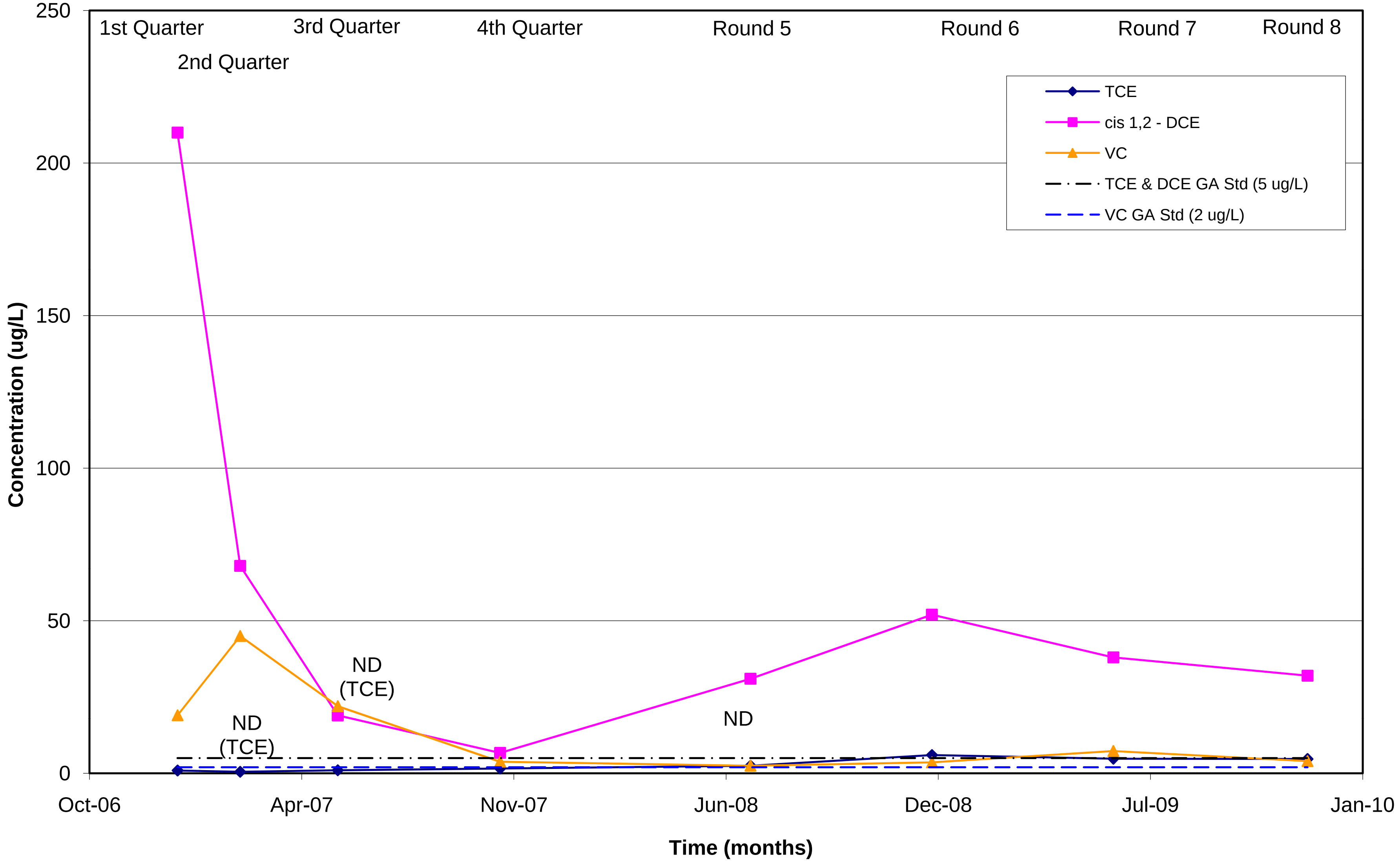
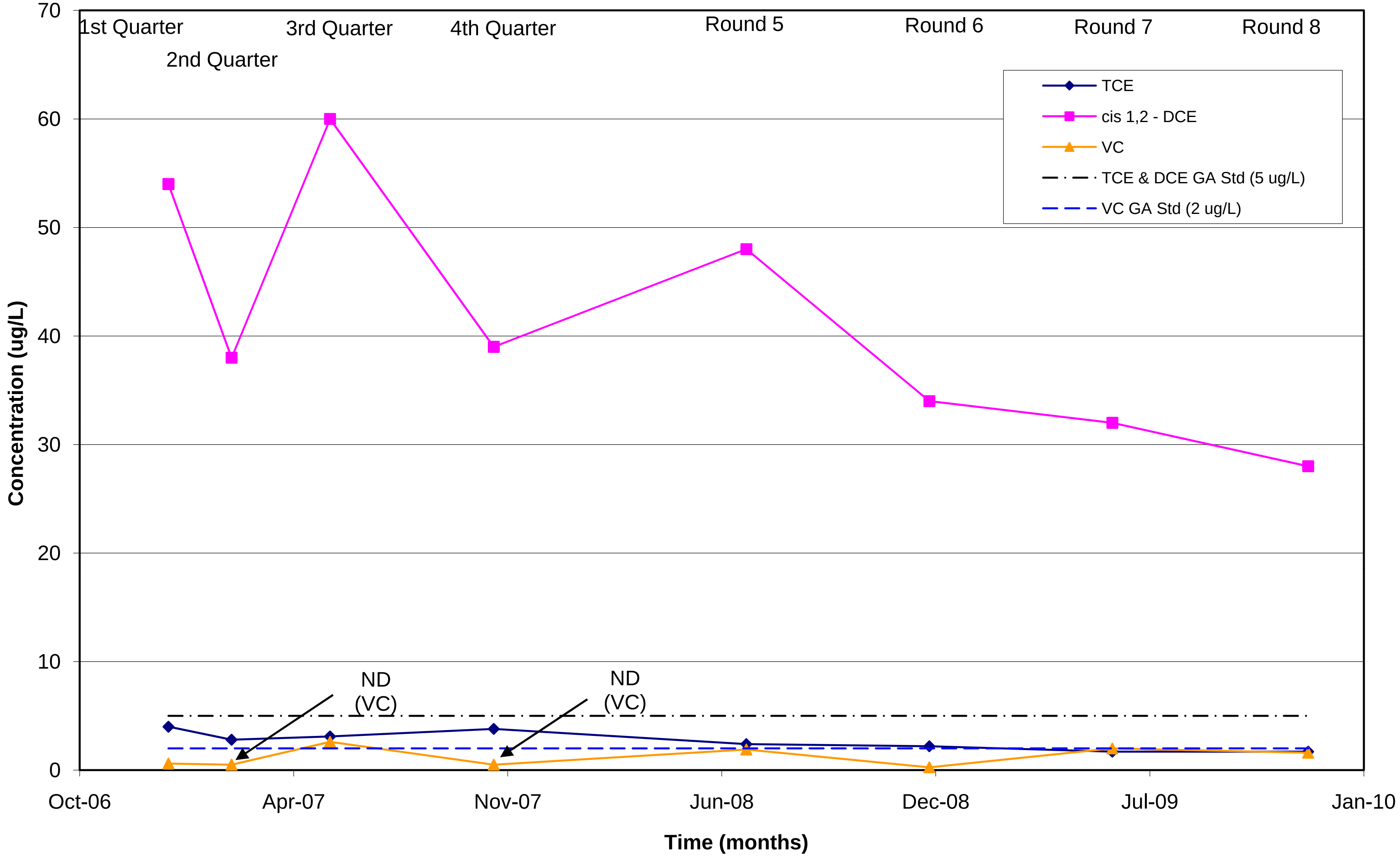


Figure 10J
Concentrations of Chlorinated Organics Over Time at PT-24
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity



ND = not detected.

P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\TO#01 - LTM Ash Landfill\Annual Report Y3\Final\Figures\Figure 10 Well Conc vs Time.xls PT-24 8/6/2010

Figure 11A
Historic Concentrations of Chlorinated Organics at PT-18A
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

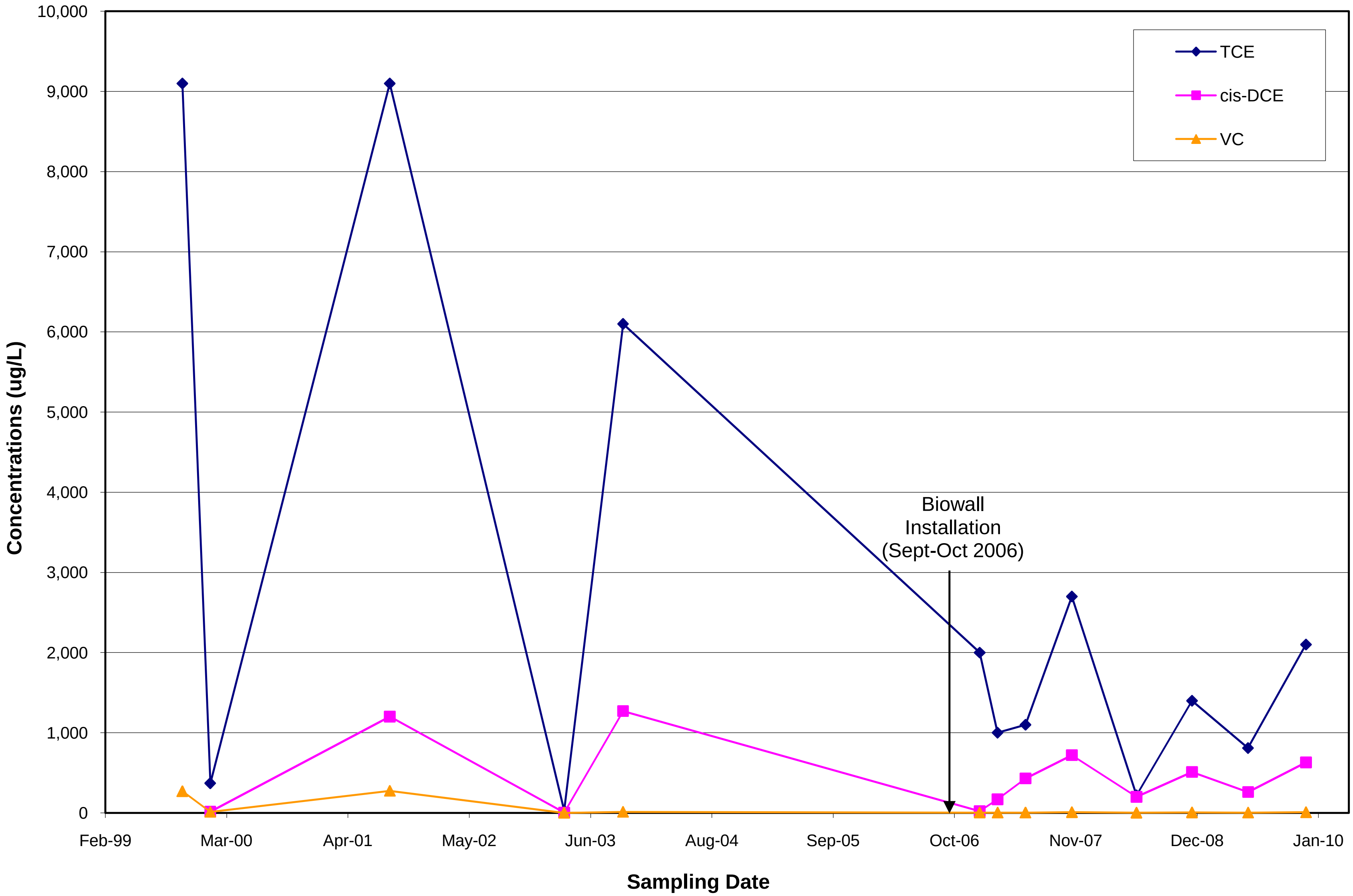


Figure 11B
Historic Concentrations of Chlorinated Organics at PT-17
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

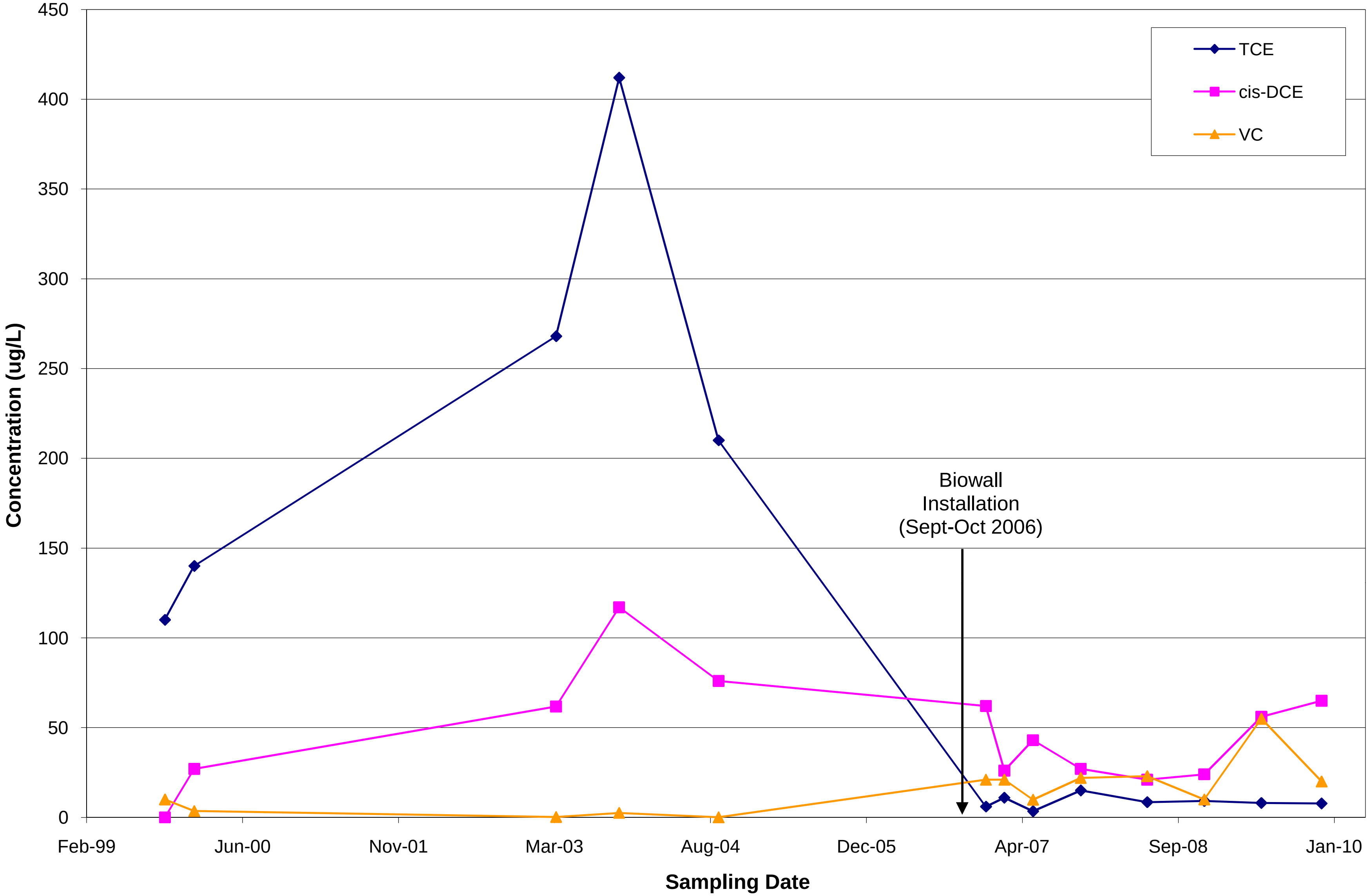
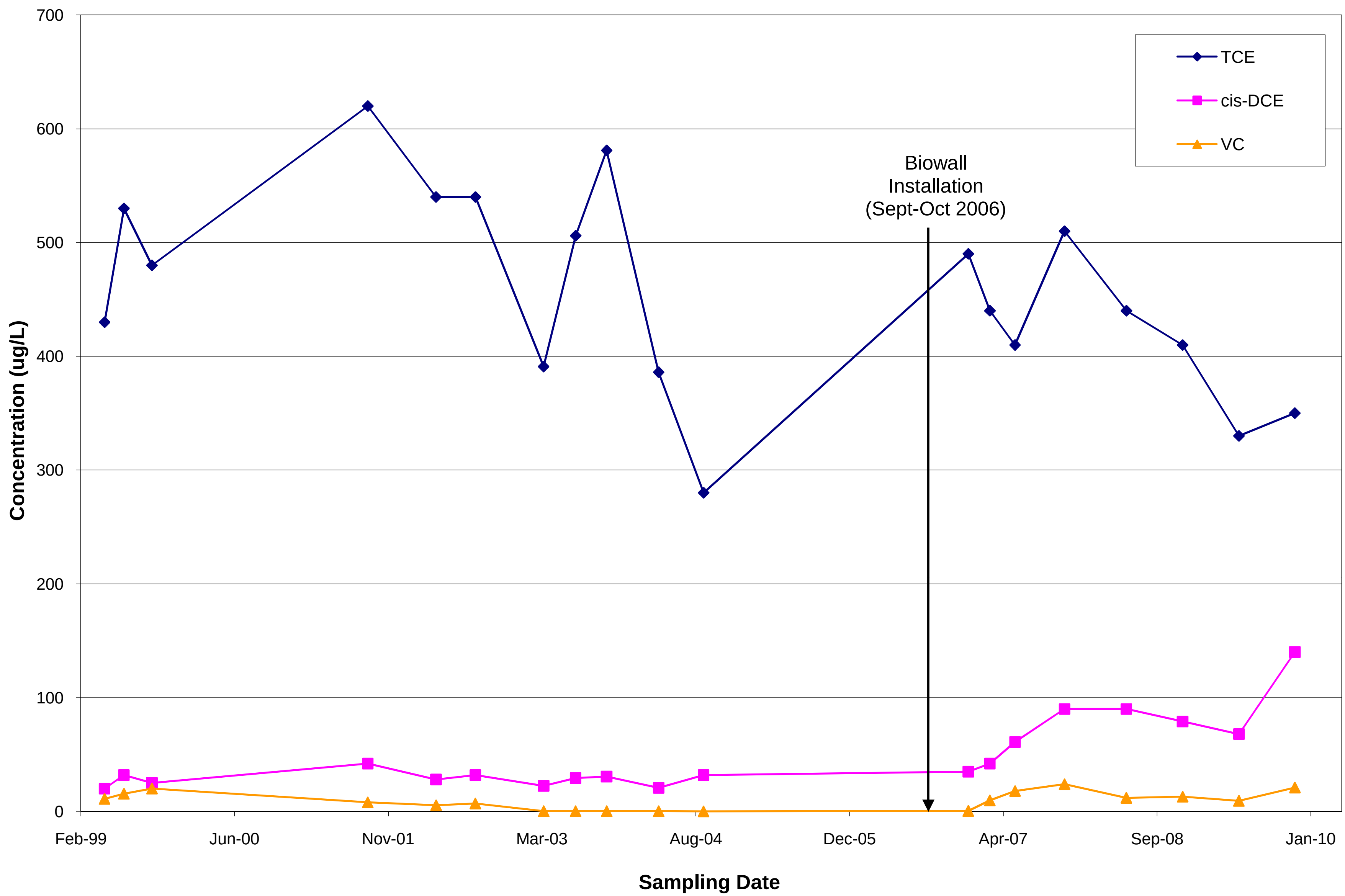
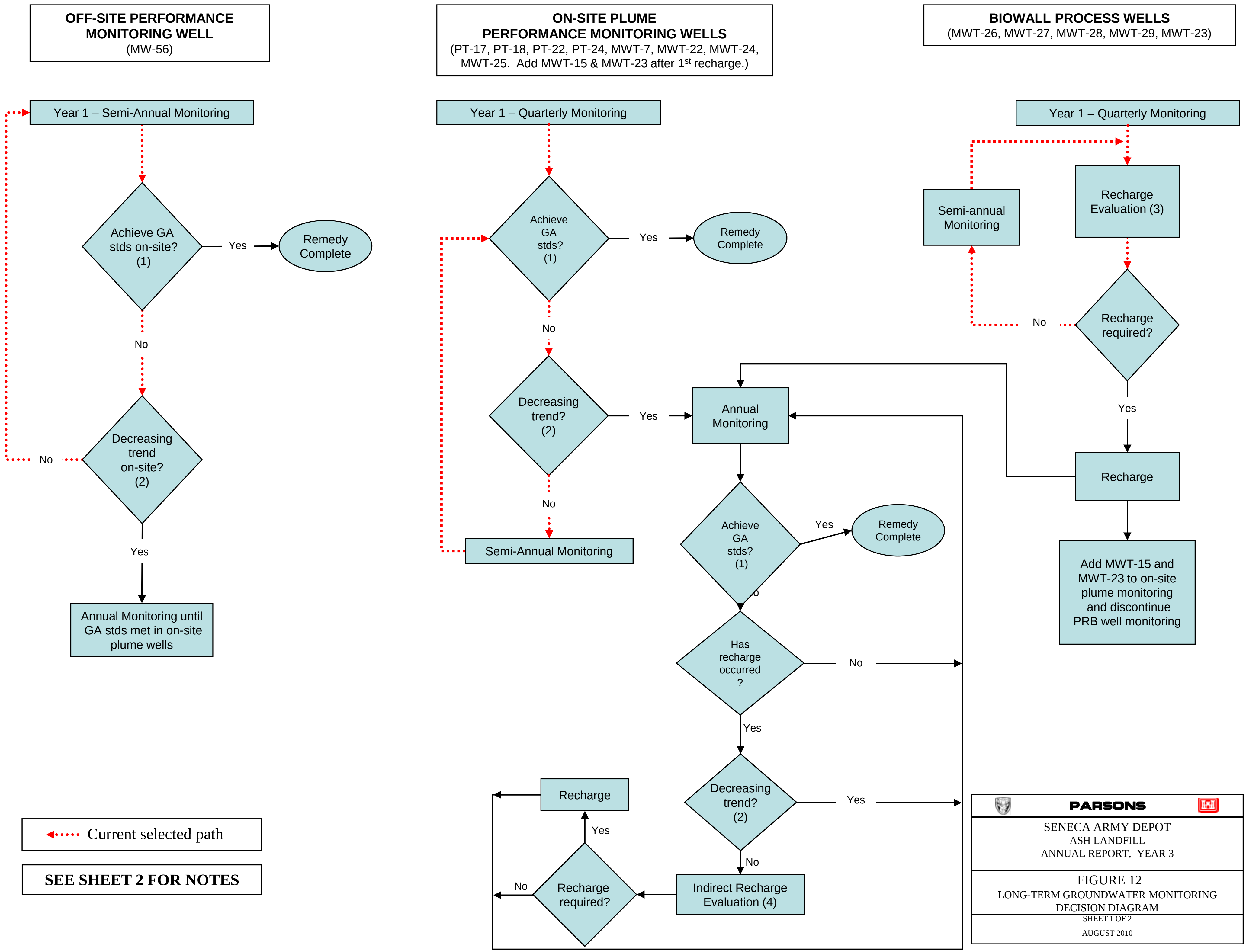


Figure 11C
Historic Concentrations of Chlorinated Organics at MWT-7
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity





Current selected path

SEE SHEET 2 FOR NOTES

PARSONS

SENECA ARMY DEPOT
ASH LANDFILL
ANNUAL REPORT, YEAR 3

FIGURE 12
LONG-TERM GROUNDWATER MONITORING DECISION DIAGRAM

SHEET 1 OF 2

AUGUST 2010

NOTES:

1. **Achieving GA Stds:** The condition of achieving GA standards applies to achieving groundwater standards for all COCs in all of the On-Site Plume Wells. If GA standards are achieved in the On-Site Plume Wells for two successive monitoring events, then the remedy is complete and no further monitoring is required at the site.

2. **Decreasing Trend:** After each year of sampling, the Army will review the results to determine if the chemical concentrations of the COCs are increasing, decreasing, or are unchanged. Graphical and statistical analyses will be used as the basis for this determination. For example, data points will be plotted and a best fit line (linear regression) will be graphed. The slope of the best fit line is representative of the trend in concentration; a negative slope indicates a decreasing trend in COC concentrations. A decreasing COC trend indicates that the potential for contaminants to migrate and negatively impact groundwater further downgradient is decreasing, and that the plume is being effectively managed by the remedy. Any evaluation of trends in contaminant concentrations will take into account that historic data at the Ash Landfill shows that there are seasonal fluctuations in contaminant concentrations. Semi-annual monitoring during wet and dry seasons is appropriate until it is established in which season maximum concentrations are observed. Annual monitoring would occur in the season of maximum concentrations.

3. **Recharge Evaluation:**
• Determining the need to recharge a biowall segment requires a review of chemical concentrations and geochemical parameters by an experienced professional. A specific, absolute set of conditions or parameter values are not appropriate to determine the need to recharge. Rather, a lines-of-evidence approach will be used that correlates a decrease in the efficiency of the system to degrade chloroethenes to geochemical evidence that indicates the cause is due to substrate depletion.

• The following parameters will be evaluated on an annual basis using at least two consecutive rounds of sampling data in order to determine if recharge of the biowalls is necessary:

a. COC concentrations in the wall. If COC concentrations have rebounded by greater than 50% for any single sampling event, this will indicate that recharge should be considered. Concentrations within the biowalls, not at downgradient locations, will be used to make this evaluation so that the effectiveness of the wall itself is being measured without the interference of effects such as desorption and mixing.

b. Geochemical parameters, specifically ORP, TOC, and DO, in the wall. Benchmark values will be used initially to evaluate anaerobic conditions in the groundwater. These benchmarks are:

- ORP < -100 Mv
- TOC > 20 mg/L
- DO < 1.0 mg/L

Parameters described in a and b above are intended to be used as guidelines and will be considered in the evaluation if, and when, a depletion of bioavailable organic substrate results in a rebound in geochemical redox conditions under which effective biodegradation does not occur.

4. **Indirect Recharge Evaluation**: Once the biowalls are recharged the first time, an indirect recharge evaluation will be conducted if an increasing trend in COC concentrations is observed in the plume performance monitoring wells. An increasing trend is a positive slope on the best-fit line, described in *Note 2* above. Two biowall monitoring wells, MWT-15 and MWT-23, will be added to the Plume Performance Monitoring program after the first recharge is completed. The evaluation will review the chemical and geochemical data and determine if the contaminant increase is a result of poor biowall performance or due to other issues, such as seasonal variations, recent precipitation events, desorption, etc. As stated in Note 2, a rebound in concentrations of COCs of 50% in MWT-15 and MWT-23 in two consecutive monitoring rounds is a major indication that recharge is needed. Once this COC rebound is observed, the geochemical parameter concentrations at MWT-15 and MWT-23 will be reviewed. In addition, conditions at the other plume performance wells will be reviewed and compared to the conditions observed at those wells at the time that the initial recharge was required. The Army will determine if similar conditions in the well provide further proof that carbon source recharge is needed again.

APPENDICES

APPENDIX A

FIELD FORMS FOR 8R2009 (CD)

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: PT-17
PROJECT: Ash Landfill LTM Groundwater Sampling - Round 8		DATE: 12/15/09
LOCATION: ROMULUS, NY		INSPECTORS: GDL
		PUMP #:
		SAMPLE ID #: ALBW20161

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
0920	40	overcast		15mph		

MONITORING INSTRUMENT	DETECTOR
OVM-580	PID

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)]

(7.55 - 4.15)(.163) = 0.165 gal [gdl 12/15] x3 = 1.66

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
	7.55					

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
		4.15'		= 7.55-1 = 6.55	0923

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 (mL)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (umhos)	pH	ORP (mV)	TURBIDITY (NTU)
	(ft)			YSI	YSI Horiba gdl 12/15 →				LaMotte 2020
0933	4.25	100 [illegible]	~ 1000	0.77	9.6	0.360	6.71	13	10
0938	4.25	100 gdl 12/15	gdl 12/15	0.71	9.7	0.359	6.71	10	10
0943	4.21	100	~ 2000	0.64	9.7	0.357	6.72	5	10
0948	4.21			0.73	9.8	0.354	6.73	-14	6
0953	4.21	100	~ 3000	0.88	9.7	0.352	6.74	-31	8.9
0958	4.21	100		0.77	9.8	0.348	6.74	-39	5.7
1008	4.21	100	~ 4000	0.71	9.8	0.345	6.74	-51	6.3
1012	4.21	100		0.67	9.9	0.347	6.75	-51	3.4
1015	4.21	100	~ 5000	0.63	9.9	0.347	6.75	-50	3.3
1020	4.21	100		.60	10	.345	6.74	-51	4.6
1023	4.21			.58	9.9	0.345	6.75	-52	4.0

Sample at 1025 Sulfide = 0.01 mg/L
Fe^{+} = 0.07 mg/L
Mn^{+} = 21 mg/L
3 VOAs for VOC analysis
2 VOAs for MEE analysis
2 VOAs for TOC analysis
1 HDPE bottle for Sulfate analysis

SAMPLING ORDER			PRESERVATIVES		BOTTLES COUNT/ VOLUME	BOTTLES TYPE	SAMPLE NUMBER	TIME	CHECKED BY/ DATE
1	VOC 8260B		4 deg C	HCL	3/ 40 ml	VOA			
2	MEE (AM20GAX)		4 deg C	HCL	2/ 40 ml	VOA			
3	TOC (9060A)		4 deg C	HCL	2/ 40 ml	VOA			
4	Sulfate (EPA 300.1)		4 deg C		1 x 250 mL	HDPE			
5	Fe+ (HACH)					field			
6	Mn+ (HACH)					field			

COMMENTS: (QA/QC?)

~~No QA/QC~~ gd 12/15

~~2 trip blanks sent to Test America~~ gd 12/15

1) VOC (8260B) 4° HCL 3/25 ml VOA

2) MEE (AM20GAX) 4°C HCL 2/25 ml "

3) TOC (9060A) " " 2/25 ml "

4) Sulfate (EPA 300.1) " " 1/250 ml HDPE

5) Mn+ (HACH) field

6) Fe+ (HACH) field

IDW INFORMATION:

Form # ____________

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	CONSULTANT: PARSONS ES	WELL #: PT-18A

PROJECT:	QUARTERLY SAMPLING -ASH LANDFILL	DATE: 12/17
LOCATION:	ROMULUS, NY	INSPECTORS: BJM
		PUMP #:
		SAMPLE ID #: ALBW20162

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	(FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS
1430	14°	Snowy	Med	0-5	NW	Snow

MONITORING INSTRUMENT	DETECTOR
OVM-580	PID
∅	∅

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)]

(12.80 - 9.34)(.163)(3) = 1.69

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
	12.80					
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**
		9.34				1435
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) YSI	TEMP (C)	SPEC. COND (umhos) HORIBA	pH	ORP (mV)	TURBIDITY (NTU) LAMOTTE
1500	10.2	150	1 gallon	1.63	11.5	2.11	6.70	141	2.3
1505	10.2	150		1.49	11.6	2.11	6.69	145	9.7
1510	10.4	150		1.14	11.8	2.10	6.71	149	0.0
1515	10.4	150		0.91	11.8	2.11	6.76	151	0.0
1520	10.4	150 ml/m		0.80	11.8	2.11	6.74	152	0.0
1525	10.4	150 ml	2 gallons	0.75	11.8	2.11	6.71	154	0.0
1530	10.4	150		0.68	11.8	2.09	6.71	154	0.0
1535	10.4	150 ml		0.65	11.8	2.06	6.71	154	0.0
1540	10.4	150 ml		0.63	11.8	2.05	6.71	154	0.0
1545	10.4	150 ml		0.61	11.8	2.04	6.70	154	0.0
1550	10.4	150 ml	3 gal	0.62	11.8	2.04	6.71	154	0.0

Sample collected 1550 ALBW 20162

3 VOAs

Form # ____________

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY			CONSULTANT: PARSONS ES		WELL #:	
SAMPLING ORDER		PRESERVATIVES	BOTTLES COUNT/ VOLUME	BOTTLES TYPE	SAMPLE NUMBER	TIME	CHECKED BY/ DATE
1	~~VOC CLP(Low Level) or 524.2~~	~~4 deg. C HCL~~	~~3/ 40 ml~~	~~VOA~~			
1	~~DOC~~	~~4 deg. C H_2SO_4~~	~~3/ 40 ml~~	~~VOA~~	GR 12/15		
2	~~Nitrate/Nitrogen 352.1~~	~~4 deg. C~~	~~1 x 500 ml~~	~~HDPE~~			
3	~~Ferrous Iron~~	~~Field Analysis~~					
4	~~Sulfide~~	~~Field Analysis~~					
5	~~Alkalinity/Sulfate/Chlorides~~	~~4 deg. C~~	~~1 x 1L~~	~~HDPE~~			
6							
7	DOC						
8	~~Hardness 130.2~~	4 deg. C HNO3	1 x 500 mL with #4	HDPE	GR 12/15		
9	~~Total Dissolved Solids 160.1~~	4 deg. C	1 x 1L	HDPE			
10	Chemical Oxygen Demand 410.1	4 deg. C H2SO4	1 x 50 mL with #7	HDPE			

COMMENTS: (QA/QC?)

1) VOC (8260B) 4°C HCL 3/25 ml VOA
2) MEE (AM20GX) " " 2/25 ml "
3) TOC (9060A) " " 2/25 ml "
4) Sulfate (EPA 300.1) " " 1/250 ml HDPE
5) Mn+ (HACH) field
6) Fe+ " field

IDW INFORMATION:

Form # ____________

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	CONSULTANT: PARSONS ES	WELL #: PT-22

PROJECT: QUARTERLY SAMPLING -ASH LANDFILL
LOCATION: ROMULUS, NY

DATE: 12/16
INSPECTORS: BJM
PUMP #: ALBW
SAMPLE ID #: 20163

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	(FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	DETECTOR
1045	22°	Sun	low	5-15	NW	Snow	OVM-580	PID
							ø	ø

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)]

3.14 × .163 = 0.51 × 3 = 1.54

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
	11.95					
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**
		8.81			10.95	1100
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) YSI	TEMP (C)	SPEC. COND (mmhos)	pH	ORP (mV)	TURBIDITY (NTU)
11:15	9.05			2.69	12.5	1.55	6.78	10	44
11:20	9.07	80ml		2.68	12.6	1.49	6.78	20	66
11:25	9.15	80ml		2.59	12.6	1.50	6.80	30	54.4
1130			Do is 4.68 Replace a tu line tubing.						
1145	9.30	80ml		2.23	12.3	1.54	6.80	40	35
1156	9.80	80ml		1.67	12.5	1.54	6.77	19	57
1200	9.80	80ml		1.32	12.6	1.54	6.74	10	49
1210	9.90	80ml		1.10	12.6	1.54	6.74	3	40
1220	9.90	80ml		1.05	12.7	1.45	6.74	-41	10
1230	9.90	80ml		1.00	12.8	1.45	6.74	-61	8.3
1235	9.90	80ml		1.01	12.8	1.45	6.74	-70	7.6
1240	9.90	80ml		1.00	12.8	1.45	6.74	-73	6.3
			Sample Collected			ALBW 20163 @ 1240			
			3 VOA's						

Form # ____________

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY				CONSULTANT: PARSONS ES		WELL #:		
	SAMPLING ORDER	PRESERVATIVES	BOTTLES COUNT/ VOLUME	BOTTLES TYPE	SAMPLE NUMBER	TIME	CHECKED BY/ DATE
1	~~VOC-CLP(Low Level) or 524.2~~	~~4 deg. C HCL~~	~~3/ 40 ml~~	~~VOA~~	gd 12/16		
1	~~DOC~~	~~4 deg. C H_2SO_4~~	3/ 40 ml	VOA			
2	~~Nitrate/Nitrogen 352.1~~	~~4 deg. C~~	~~1 x 500 ml~~	~~HDPE~~			
3	~~Ferrous Iron~~	~~Field Analysis~~					
4	~~Sulfide~~	~~Field Analysis~~					
5	~~Alkalinity/Sulfate/Chlorides~~	~~4 deg. C~~	~~1 x 1L~~	~~HDPE~~			
6							
7	DOC						
8	~~Hardness 130.2~~	~~4 deg. C HNO3~~	~~1 x 500 mL with #4~~	~~HDPE~~	gd 12/16		
9	~~Total Dissolved Solids 160.1~~	~~4 deg. C~~	~~1 x 1L~~	~~HDPE~~			
10	~~Chemical Oxygen Demand 410.1~~	~~4 deg. C H2SO4~~	~~1 x 50 mL with #7~~	~~HDPE~~			

COMMENTS: (QA/QC?)

1) VOC (8260B) 4°C HCL 3/25mL VOA

~~2) Hct (AM120K) " " 2/25 mL "~~ gd 12/16

~~3) TOC (9060A) " " 2/25 mL "~~ gd 12/16

~~4) Sulfide (EPA 300.1) " " 1/250 mL HDPE~~ gd 12/16

~~5) Mn+ (HACH)~~ field gd 12/16

~~6) Fe+ "~~ field gd 12/16

IDW INFORMATION:

Form # ________

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY | **CONSULTANT: PARSONS ES** | **WELL #:** PT-24

PROJECT: QUARTERLY SAMPLING -ASH LANDFILL | **DATE:** 12/15
LOCATION: ROMULUS, NY | **INSPECTORS:** BJM
PUMP #:
SAMPLE ID #: ~~[illegible]~~ 0164

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	(FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	DETECTOR
1200	44°	Overcast	high	0-10	SW	Wet	OVM-580	PID
							Ø	Ø

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)]

(12.0 - 5.25)(.163)(3) = 1.1 ~~6.60 → 1.08×3=3.2~~ 1gal 12/15

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
	12.00					

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
		5.25			1210

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) YSI →	TEMP (C)	SPEC. COND (umhos) ← HORIBA	pH →	ORP (mV)	TURBIDITY (NTU)	
1220	5.4	250		0.62	12.0	.425	7.07	-200	22	
1225	5.4	250	1gal	0.49	12.1	.410	7.26	-216	16.2	
1230	5.4	250		0.46	12.0	.409	7.28	-210	14.7	
1235	5.4	250		0.47	12.0	.410	7.30	-208	11.8	
1240	5.4	250		0.40	11.9	.410	7.30	-202	8.6	
1245	5.4	250	2gal	0.36	11.9	.410	7.30	-200	7.3	
1250	5.4	250		0.34	11.9	.411	7.30	-201	10.1	
1255	5.4	250		0.33	11.9	.409	7.31	-198	5.3	
1300	5.4	250		0.32	11.9	.410	7.31	-196	4.3	20/20
1305	5.4	250		0.33	11.9	.409	7.32	-194	3.2	20/20
1310	5.4	250		0.34	11.9	.410	7.32	-192	1.0	20/20
1315			Sample	ALBW 20164 collected						

Fe = 0.20 mg/L
Mn = 1.9 mg/L
Sulf =

3 VOAs for VOC analysis
2 VOAs for MEE "
2 " " TOC "
1 HDPE bottle for sulfate analysis

Form # ___________

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY		CONSULTANT: PARSONS ES		WELL #:		
SAMPLING ORDER	PRESERVATIVES	BOTTLES COUNT/ VOLUME	TYPE	SAMPLE NUMBER	TIME	CHECKED BY/ DATE
1 ~~VOC CLP(Low Level) or 524.2~~	4 deg. C HCL	3/ 40 ml	VOA	gd 12/15		
1 ~~DOC~~	~~4 deg. C H2SO4~~	~~3/ 40 ml~~	VOA			
2 ~~Nitrate/Nitrogen 352.1~~	~~4 deg. C~~	~~1 x 500 ml~~	~~HDPE~~			
3 ~~Ferrous Iron~~	~~Field Analysis~~					
4 ~~Sulfide~~	~~Field Analysis~~					
5 ~~Alkalinity/Sulfate/Chlorides~~	~~4 deg. C~~	~~1 x 1L~~	~~HDPE~~			
6						
7 DOC						
8 ~~Hardness 130.2~~	~~4 deg. C HNO3~~	~~1 x 500 mL with #4~~	~~HDPE~~	gd 12/15		
9 ~~Total Dissolved Solids 160.1~~	~~4 deg. C~~	~~1 x 1L~~	~~HDPE~~			
10 ~~Chemical Oxygen Demand 410.1~~	~~4 deg. C H2SO4~~	~~1 x 50 mL with #7~~	~~HDPE~~			

COMMENTS: (QA/QC?)

1) VOC (8260B)	4°c	HCL	3/25ml	VOA
2) MEES (AM20GAX)	4°c	HCL	2/25ml	VOA
3) TOC (9060A)	4°c	HCL	2/25ml	VOA
4) Sulfate (EPA 300.1)	4°c		1/250ml	HDPE
5) Mn+ (HACH)				(field)
6) Fe+ (HACH)				(field)

~~NO QA/QC, 2 Test blanks sent to Test America~~ gd 12/15

IDW INFORMATION:

Form # ________

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY | **CONSULTANT: PARSONS ES** | **WELL #:** MW-7

PROJECT: QUARTERLY SAMPLING -ASH LANDFILL | **DATE:** 12/15
LOCATION: ROMULUS, NY | **INSPECTORS:** BJM
PUMP #:
SAMPLE ID #: ALGW-20165

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	(FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	DETECTOR
930	40°	overcast	low	10-15	SW	wet	OVM-580	PID
							0	0

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)]

7.53 x .163 = 1.23 x 3 = 3.68

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
	12/15 6.17 - 13.7		5			

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
		6.17	6.38	12.7	1000

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) YSI →	TEMP (C)	SPEC. COND (umhos) ← HORIBA	pH →	ORP (mV)	TURBIDITY (NTU)	
1010	6.38	150		1.48	12.2	.641	7.06	57	8	
1015	6.38	150		0.92	12.6	.714	7.10	47	5.3	
1020				0.80	12.7	.689	7.10	42	4.1	
1025	6.38	150	1 gallon	0.68	12.8	.653	7.11	35	3.6	
1030	6.38	150		0.66	12.9	.630	7.11	34	2.1	
1035	6.38	150		0.64	12.9	.614	7.11	33	2.4	
1040	6.38	150		0.66	12.9	.612	7.11	34	2.0	
1045	6.38	150		0.59	12.9	.601	7.11	36	1.8	
1050	6.38	150	2 gallons	0.47	13.0	.587	7.11	35	2.2	
1055	6.38	150		0.50	13.0	.570	7.12	34	1.7	20/20
1100	6.38	150		0.48	13.0	.569	7.12	33	1.8	20/20
1105	6.38	150		0.47	13.0	.569	7.12	33	1.5	20/20
1110	6.38	150		0.45	13.0	.568	7.12	32	1.2	20/20
1115	6.38	150		0.48	13.0	.559	7.12	33	1.1	20/20
1120	6.38	150		0.47	13.0	.557	7.12	33	1.0	20/20
1125	6.38	150	3 gallons	0.46	13.0	.555	7.12	32	0.9	20/20

Sample ALGW 20165 collected at 1130

Mn = .01 — 3 VOAs for VOC analysis
Fe^{2+} = 0.14 — 2 VOAs for MEE "
Sulf = 0.05 — 2 " " TOC "
1 HDPE Bottle for sulfate analysis

ver. 2 / 11/12/2009 — SEE MASTER ACRONYM LIST FOR COMPLETE LISTING OF ABBREVIATIONS — Gwsamprd.xls/TYPE1

Form # ____________

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY | **CONSULTANT: PARSONS ES** | **WELL #:**

SAMPLING ORDER		PRESERVATIVES		BOTTLES COUNT/ VOLUME	TYPE	SAMPLE NUMBER	TIME	CHECKED BY/ DATE
X	~~VOC CLP(Low Level) or 524.2~~	~~4 deg. C~~	~~HCL~~	~~3/ 40 ml~~	~~VOA~~	gR 12/15		
X	~~DOC~~	~~4 deg. C~~	~~H_2SO_4~~	~~3/ 40 ml~~	~~VOA~~			
X	~~Nitrate/Nitrogen 352.1~~	~~4 deg. C~~		~~1 x 500 ml~~	~~HDPE~~			
X	~~Ferrous Iron~~	~~Field Analysis~~						
X	~~Sulfide~~	Field Analysis						
X	~~Alkalinity/Sulfate/Chlorides~~	~~4 deg. C~~		~~1 x 1L~~	~~HDPE~~			
X						gR 12/15		
X	~~DOC~~							
X	~~Hardness 130.2~~	~~4 deg. C~~	~~HNO3~~	~~1 x 500 mL with #4~~	~~HDPE~~			
X	~~Total Dissolved Solids 160.1~~	~~4 deg. C~~		~~1 x 1L~~	~~HDPE~~			
10	~~Chemical Oxygen Demand 410.1~~	~~4 deg. C~~	~~H2SO4~~	~~1 x 50 mL with #7~~	~~HDPE~~			
1	VOC (8260B)	4°c	HCL	3/25ml	VOA			
2	MEE (AM20GAX)	4°c	HCL	2/25ml	VOA			

COMMENTS: (QA/QC?)

3 TOC (9060A) 4°C HCL 2/25ml VOA

4 Sulfate (EPA 300.1) 4°C 1/250mL HDPE

5 Mn+ (HACH) field

6 Fe+ (HACH) field

~~NO QA/QC; 2 trip blanks sent to Test America~~ gR 12/15

IDW INFORMATION:

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MWT-22

PROJECT:	Ash Landfill LTM Groundwater Sampling - Round 8	DATE:	12/16/09
LOCATION:	ROMULUS, NY	INSPECTORS:	GDL
		PUMP #:	
		SAMPLE ID #:	ALBW20166

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
1320	20	overcast	20 mph				OVM-580	PID

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)]

(14.9 - 7.62)(0.163)(3) = 3.56 gal

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
	14.9					

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
		7.62			1335

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~~) (mL)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (umhos)	pH	ORP (mV)	TURBIDITY (NTU)
~~[illegible]~~	Start Pumping 1335			YSI	YSI	(mS/cm)			Lamotte
1345	10.0			0.20	11.0	0.908	6.54	-34	110.0
1352	10.2			0.38	11.1	0.943	6.56	-32	87.0
1357	10.3			0.40	11.1	0.941	6.55	-34	72.4
1402	10.3	~150		0.39	11.2	0.929	6.53	-37	71.0
1408	10.4			0.35	11.3	0.863	6.51	-47	53.6
1416	11.0			0.22	11.4	0.961	6.53	-61	20.6
1425	11.3			0.33	11.5	0.960	6.50	-62	15.0
1433	11.8	~90		0.30	11.6	0.933	6.49	-62	18.0
1441	11.45			0.33	11.6	0.899	6.49	-63	14.0
1447	11.80		~3.0 gal	0.34	11.6	0.898	6.50	-65	15.0
1450	11.8	collect 3 VOAs for VOC Analysis ALBW20166							

GDL 12/16

Ash GW SAMPLING RECORD (2)

SAMPLING ORDER			PRESERVATIVES		BOTTLES COUNT/ VOLUME	BOTTLES TYPE	SAMPLE NUMBER	TIME	CHECKED BY/ DATE
1	VOC 8260B		4 deg. C	HCL	25 lgd 3/ ~~40~~ ml	12/16 VOA			
2	~~MEE (AM20GAX)~~		~~4 deg. C~~	~~HCL~~	~~2/ 40 ml~~	~~VOA~~	lgd 12/16		
3	~~TOC (9060A)~~		~~4 deg. C~~	~~HCL~~	~~2/ 40 ml~~	~~VOA~~			
4	~~Sulfate (EPA 300.1)~~		~~4 deg. C~~		~~1 x 250 mL~~	~~HDPE~~			
5	~~Fe+ (HACH)~~					~~field~~	lgR 12/16		
6	~~Mn+ (HACH)~~					~~field~~			
7									

COMMENTS: (QA/QC?)

IDW INFORMATION:

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY | PARSONS | WELL #: MWT-24

PROJECT: Ash Landfill LTM Groundwater Sampling - Round 8
LOCATION: ROMULUS, NY

DATE: 12/15/09
INSPECTORS: GDL
PUMP #:
SAMPLE ID #: ~~ALBW20164~~ ALBW20167 (gd 12/15)

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
1154	40	overcast		15 mph		

MONITORING INSTRUMENT	DETECTOR
OVM-580	PID

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)]

(12.9 - 7.84)(0.163) = 3.26 gal

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
	12.9'					

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
		7.84'			1154

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

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

TIME (min)	WATER LEVEL (ft)	PUMPING RATE (ml/min)	CUMULATIVE VOL ~~(GALLONS)~~ (mL)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (umhos)	pH	ORP (mV)	TURBIDITY (NTU)
Start pumping at 1154				YSI	YSI	Horiba			Lamotte
1202	7.9			0.50	10.5	6.555	6.66	18	2.36
1207	7.9	150	~750	0.38	10.6	0.563	6.67	17	165
1212	7.9			0.37	10.6	0.566	6.67	20	165
1217	7.9			0.42	10.6	0.573	6.66	24	151
1223	7.9	150	~1250	0.49	10.7	0.562	6.66	28	145
1229	7.9			0.68	10.6	0.572	6.65	32	60
1233	7.9	200		0.80	10.5	0.572	6.63	38	
1238	8.15		~3150	1.33	10.4	0.573	6.64	42	
1243	8.2			1.39	10.5	0.571	6.63	57	57
1248	8.19	200	~5150	1.64	10.5	0.569	6.62	65	39
1253	8.2			1.69	10.6	0.567	6.62	66	32
1257	8.2		~7150	1.57	10.6	0.565	6.62	66	30
1304	8.21			1.39	10.5	0.562	6.61	64	24
1311	8.2	200	~9150	1.23	10.5	0.559	6.61	61	23
1317	8.2		10350	1.31	10.5	0.558	6.61	59	23
1320	Start sampling								
				S^{2-} = 0.0 mg/L		3 VOAs for VOC analysis			
				Fe^{+} = 0.25 mg/L					
				Mn^{2+} = 3.5 mg/L					

Ash GW SAMPLING RECORD (2)

SAMPLING ORDER			PRESERVATIVES		BOTTLES COUNT/ VOLUME	BOTTLES TYPE	SAMPLE NUMBER	TIME	CHECKED BY/ DATE
1	VOC 8260B		4 deg. C	HCL	3/ 40 ml	VOA			
X	~~MEE (AM20GAX)~~		~~4 deg. C~~	~~HCL~~	~~2/ 40 ml~~	~~VOA~~			
X	~~TOC (9060A)~~		~~4 deg. C~~	~~HCL~~	~~2/ 40 ml~~	~~VOA~~			
X	~~Sulfate (EPA 300.1)~~		~~4 deg. C~~		~~1 x 250 mL~~	~~HDPE~~			
X	~~Fe+ (HACH)~~					~~field~~			
X	~~Mn+ (HACH)~~					field			
X									

COMMENTS: (QA/QC?)

~~NO QA/QC~~ lgx 12/15

~~2 trip blanks sent to TestAmerica~~ lgx 12/15

IDW INFORMATION:

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MWT-25
PROJECT: Ash Landfill LTM Groundwater Sampling - Round 8		DATE: 12/17/09
LOCATION: ROMULUS, NY		INSPECTORS: GDL
		PUMP #:
		SAMPLE ID #: ALBW20168

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
1405	15F	overcast + Snow	Mid	20mph	NW	Snow (1-2")

MONITORING INSTRUMENT	DETECTOR
OVM-580	PID

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)]

(13.24 - 7.95)(0.163) = 0.86 gal × 3 = 3 gal

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
	13.24'					

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
		7.95'			1405

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)
1405 START PUMPING				YSI	YSI	Horiba			→ sample
~~1417~~				~~6.05~~	~~9.2~~	~~0~~	~~3.90~~	~~no water in bucket yet~~	
1436	8.20		gdl 12/17	6.30	9.8	0.765	6.77	123	43.2
1443	8.5			6.27	9.3	0.764	7.11	112	
1448	8.5	0.035 gal/min	~1.5 gal	5.68	9.5	0.771	7.17	111	5.8
1454	8.8			4.80	9.6	0.775	7.20	109	4.5
1458	9.0			3.92	9.7	0.781	7.22	107	4.3
1503	9.0			3.45	9.8	0.776	7.21	101	0.4
1504	9.2			3.15	9.9	0.775	7.20	92	0.2
1512	9.4	0.019 gal/min	~2 gal	3.17	10.0	0.780	7.20	88	0
1516	9.4			3.30	10.0	0.792	7.22	89	
1520	9.4			3.35	10.1	0.796	7.22	92	
1524	9.4			3.35	10.1	0.820	7.22	93	0
1528	9.3			3.32	10.1	0.788	7.21	96	
1532	9.3			3.35	10.1	0.792	7.21	98	0
1536 Sample time. 3 VOAs for VOCs only									

SAMPLING ORDER			PRESERVATIVES		BOTTLES COUNT/ VOLUME	BOTTLES TYPE	SAMPLE NUMBER	TIME	CHECKED BY/ DATE
1	VOC 8260B		4 deg. C	HCL	3/ 40 ml	VOA			
~~2~~	~~MEE (AM20GAX)~~		~~4 deg. C~~	~~HCL~~	~~2/ 40 ml~~	~~VOA~~	lgL 12/17		
~~3~~	~~TOC (9060A)~~		~~4 deg. C~~	~~HCL~~	~~2/ 40 ml~~	~~VOA~~	lgL 12/17		
~~4~~	~~Sulfate (EPA 300.1)~~		~~4 deg. C~~		~~1 x 250 mL~~	~~HDPE~~	lgL 12/17		
~~5~~	~~Fe+ (HACH)~~					~~field~~	lgL 12/17		
~~6~~	~~Mn+ (HACH)~~					~~field~~	lgL 12/17		
7									

COMMENTS: (QA/QC?)

IDW INFORMATION:

Form # ____________

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	CONSULTANT: PARSONS ES	WELL #: MW-56

PROJECT: QUARTERLY SAMPLING -ASH LANDFILL
LOCATION: ROMULUS, NY

DATE: 12/18
INSPECTORS: BTM
PUMP #: -
SAMPLE ID #: ALBW20169

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	(FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS
920	18°	Snowy	low	0-5	NW	Snow

MONITORING INSTRUMENT	DETECTOR
OVM-580	PID

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)]

2.55 x .163 = .4075 x 3 = 1.23 gal

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
	6.5					

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
		3.95			940

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) YSI →	TEMP (C)	SPEC. COND (umhos) ← HORIBA	pH	→ ORP (mV)	TURBIDITY (NTU)	
945	4.2	300		1.79	4.1	0.211	6.31	-63	100	
950	4.3	300		2.40	4.0	.250	6.49	-129	76	
955	4.4	280	1 gallon	3.32	3.9	.319	6.53	-137	52	
1000	4.4	250		2.71	3.8	.308	6.54	-136	38	
1005	4.4	250		1.75	4.0	.355	6.53	-147	27	
1010	4.41	250		1.51	4.4	.302	6.56	-153	13	
1015	4.4	250	2 gallons	1.63	4.5	.286	6.60	-154	12	
1020	4.4	250		1.94	4.4	.290	6.61	-152	11	
1025	4.4	250		1.86	4.5	.301	6.59	-152	13.1	2020
1030	4.4	250		1.85	4.5	.311	6.59	-151	9.8	2020
1035	4.4	250		1.84	4.5	.312	6.59	-150	7.8	2020
1040	4.4	250		1.86	4.4	.311	6.59	-149	7.5	2020
1045				Sample collected ALBW20169 @ 1045						
				3 VOAs collected						

ver. 2 / 11/12/2009. SEE MASTER ACRONYM LIST FOR COMPLETE LISTING OF ABBREVIATIONS Gwsamprd.xls/TYPE1

Form # ____________

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY			CONSULTANT: PARSONS ES			WELL #:	
SAMPLING ORDER		PRESERVATIVES	BOTTLES COUNT/ VOLUME	BOTTLES TYPE	SAMPLE NUMBER	TIME	CHECKED BY/ DATE
1	~~VOC-CLP(Low Level) or 524.2~~	~~4 deg. C HCL~~	~~3/40 ml~~	~~VOA~~	lgR 12/18		
1	~~DOC~~	4 deg. C H_2SO_4	3/ 40 ml	VOA			
2	~~Nitrate/Nitrogen 352.1~~	~~4 deg. C~~	~~1 x 500 ml~~	~~HDPE~~	lgd 12/18		
3	~~Ferrous Iron~~	~~Field Analysis~~					
4	~~Sulfide~~	~~Field Analysis~~					
5	~~Alkalinity/Sulfate/Chlorides~~	~~4 deg. C~~	1 x 1L	HDPE			
6							
7	DOC						
8	~~Hardness 130.2~~	~~4 deg. C HNO3~~	~~1 x 500 mL with #4~~	~~HDPE~~	lgd 12/18		
9	~~Total Dissolved Solids 160.1~~	~~4 deg. C~~	~~1 x 1L~~	~~HDPE~~			
10	~~Chemical Oxygen Demand 410.1~~	~~4 deg. C H2SO4~~	~~1 x 50 mL with #7~~	~~HDPE~~			

COMMENTS: (QA/QC?)

1) VOC (8260B) 4°C HCL 3/25 mL VOA

IDW INFORMATION:

Form # ____________

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	CONSULTANT: PARSONS ES	WELL #: MWT-23

PROJECT: QUARTERLY SAMPLING -ASH LANDFILL
LOCATION: ROMULUS, NY

DATE: 12/15
INSPECTORS: BJM
PUMP #:
SAMPLE ID #: ~~MW~~20170

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	(FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS
1400	45°	Overcast	high	5-10	NW	wet

MONITORING INSTRUMENT	DETECTOR
OVM-580	PID
Ø	Ø

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)]

4.69 × .163 = 0.76 × 3 = 2.29

	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	13.74					

	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		9.05			1350

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) YSI	TEMP (C)	SPEC. COND (umhos) ← HORIBA →	pH	ORP (mV)	TURBIDITY (NTU)
1400	9.4	200		0.87	13.3	2.11	6.71	-102	200
1405	9.5	200		0.79	13.3	2.09	6.74	-105	196
1410	9.5	200		0.70	13.4	2.09	6.76	-101	98
1415	9.5	200	1 gallon	0.68	13.4	2.08	6.79	-100	89
1420	9.5	200		0.67	13.4	2.10	6.80	-96	70
1425	9.5	200		0.67	13.4	2.11	6.80	-94	63.2
1430	9.5	200		0.65	13.4	2.11	6.80	-93	53.7
1435	9.5	200	2 gallon	0.64	13.5	2.10	6.80	-92	44.6
1440	9.5	200		0.63	13.5	2.10	6.80	-91	49.4
1445	9.5	200		0.63	13.5	2.11	6.79	-90	47.9
1450	9.5	200		0.62	13.5	2.11	6.79	-91	50.1
1455	9.5	200		0.62	13.5	2.10	6.78	-90	16.8 2020
1500	9.5	200	3 gallons	0.63	13.5	2.10	6.78	-90	11.4 2020
1505	9.5	200		0.63	13.5	2.10	6.78	-90	10.0
1510			Sample	Collected	ALBW 20170				

Fe = 3.30 over Limit
Mn = 7.20 mg/L
Sulf =

3 VOAs for VOC analysis
2 VOAs for MEE "
2 " " TOC "
1 HDPE bottle for sulfate analysis

Form # ____________

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY		CONSULTANT: PARSONS ES			WELL #:		
	SAMPLING ORDER	PRESERVATIVES	BOTTLES COUNT/ VOLUME	BOTTLES TYPE	SAMPLE NUMBER	TIME	CHECKED BY/ DATE
1	~~VOC -CLP(Low Level) or 524.2~~ MEE	4 deg. C HCL	~~3/40 ml~~	~~VOA~~	gx 12/15		
1	~~DOC~~	4 deg. C H$_2$SO$_4$	3/40 ml	VOA			
2	~~Nitrate/Nitrogen 352.1~~	4 deg. C	1 x 500 ml	HDPE			
3	~~Ferrous Iron~~	Field Analysis					
4	~~Sulfide~~	Field Analysis					
5	~~Alkalinity/Sulfate/Chlorides~~	4 deg. C	1 x 1L	HDPE			
6							
7	~~DOC~~				gx 12/15		
8	~~Hardness 130.2~~	~~4 deg. C HNO3~~	~~1 x 500 mL with #4~~	HDPE			
9	~~Total Dissolved Solids 160.1~~	4 deg. C	1 x 1L	HDPE			
10	~~Chemical Oxygen Demand 410.1~~	4 deg. C H2SO4	1 x 50 mL with #7	HDPE			

COMMENTS: (QA/QC?)

1) VOC (8260B) 4°C HCL 3/25ml VOA
2) MEE (RSK 20G AX) 4°C HCL 2/25ml VOA
3) TOC (9060A) 4°C HCL 2/25ml VOA
4) sulfate (EPA 300.1) 4°C HCL 1/250ml HDPE
5) Mn+ (HACH) (field)
6) Fe+ (HACH) (field)

~~NO QA/QC~~; 2 trip blanks sent to TestAmerica – gx 12/15

IDW INFORMATION:

ver. 2 / 11/12/2009 SEE MASTER ACRONYM LIST FOR COMPLETE LISTING OF ABBREVIATIONS Gwsamprd.xls/TYPE1

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MWT-26

PROJECT: Ash Landfill LTM
LOCATION:

DATE: 12/17
INSPECTORS: BJM
PUMP #:
SAMPLE ID #: ALBW20171

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND (FROM) VELOCITY (APPRX)	WIND (FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	MONITORING DETECTOR
1104	14°	snowy	mid	05	NW	snow	OVM-580	PID

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)]

6.73 x .163 x 3 = 3.29

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
	13.19					

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
		6.46		12.19	1100

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) YSI	TEMP (C)	SPEC. COND (umhos)	pH	ORP (mV)	TURBIDITY (NTU)
1130	7.3	80		5.33	9.8	HORIBA 244	7.06	125	24.4
1135	7.3	80		5.35	9.8	247	7.07	124	23.7
1140	7.4	80		5.51	9.8	247	7.10	124	16.8
1145	7.4	80		5.21	10.1	2.48	7.10	126	16.2
1150	7.4	80		5.27	10.3	247	7.10	129	15.1
1155	7.45	80		5.13	10.3	247	7.11	131	13.6
1200	7.5	80	1 gal	5.03	10.2	247	7.11	133	11.4
1205	7.5	80		5.13	10.1	2.48	7.11	134	8.1
1210	7.55	80		5.13	10.1	248	7.11	136	8.7
1215	Pull pump & replace all O rings to make sure air is not leaking into the well.								
1245	Reassemble & remove ice from line.								
1250	7.6	80	2 gal	5.09		2.46	7.02	54	50.0
1255				5.09	10.1	2.46	7.03	59	
1300	7.7	80		5.10	10.1	2.46	7.04	61	30.0
1305				4.82	10.1	2.46	7.03	70	20.0
1310	7.8	80		4.72		2.45	7.02	71	
1355	7.9	80	3 gal	4.66		2.45	7.01	71	10.0
1400	Sample ALBW20171								
				Fe^{2+} = 0.18 mg/L		Mn^{+} = 0.7 mg/L			

SAMPLING ORDER		PRESERVATIVES		BOTTLES COUNT/ VOLUME	BOTTLES TYPE	SAMPLE NUMBER	TIME	CHECKED BY/ DATE
1	VOC -CLP(Low Level) 8260B	4 deg C	HCL	3/ ~~40~~ ml (25 ygx 12/17)	VOA			
2	TOC	4 deg C	HCl	2 x ~~40~~ mL (25 ygx 12/17)	VOA			
3	MEEs	4 deg C	HCL	1 x ~~40 mL~~ (25mL ygx 12/17)	VOA			
4	Sulfate/Chloride	4 deg C	HCL	1 x ~~4 oz~~ (250mL ygx 12/17)	HDPE			
5	Fe+	Field						
6	Mn+	Field						

COMMENTS: (QA/QC?)

IDW INFORMATION:

Form # ___________

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	CONSULTANT: PARSONS ES	WELL #: MWT-27

PROJECT: QUARTERLY SAMPLING -ASH LANDFILL
LOCATION: ROMULUS, NY

DATE: 12/16
INSPECTORS: BJM
PUMP #:
SAMPLE ID #: ALBW20172

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	(FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS
1300	20°	Overcast	low	5-15	NW	Snow

MONITORING INSTRUMENT	DETECTOR
OVM-580	PID

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)]

5.4 ft × 0.163 × 3 = 2.64

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
	12.7					

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
		7.31			13:15

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) YSI	TEMP (C)	SPEC. COND (umhos)	pH (HORIBA)	ORP (mV)	TURBIDITY (NTU)
1448	7.9	200	5 gal	0.79	13.2	2.38	6.30	-104	10
1452	7.9	200		0.78	13.2	2.39	6.32	-105	9
1457	7.9	200		0.92	13.2	2.39	6.32	-105	8
1502	7.9	200		0.98	13.2	2.40	6.32	-106	8
			Change out DO meter						
1507	7.9	200	6 gal	0.24	10.7	2.39	6.32	-107	8.2
1512	7.9	200		0.23	10.7	2.38	6.32	-108	7.3
1517	7.9	200		0.18	10.8	2.39	6.32	-106	6.2
1523	7.9	200		0.16	10.8	2.38	6.32	-104	7.3
1528	7.9	200	7 gal	0.15	10.8	2.38	6.32	-102	5.1
1531	~~7.9~~	~~200~~	Sample collected.	ALBW20172					
		gjm 12/16		ALBW 20172 MS					
				ALBW 20172 MSD					
				ALBW20173 Duplicate					

Mn: 9.3 mg/L
~~Mn~~ gjm 12/16
Fe: 1.26 mg/L

VOA's, TOC, SO4, TOC

ver. 2 / 11/12/2009 SEE MASTER ACRONYM LIST FOR COMPLETE LISTING OF ABBREVIATIONS Gwsamprd.xls/TYPE1

12.7
7.31
5.4

Form # ____________

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY				CONSULTANT: PARSONS ES		WELL #:
SAMPLING ORDER	PRESERVATIVES	BOTTLES COUNT/ VOLUME	BOTTLES TYPE	SAMPLE NUMBER	TIME	CHECKED BY/ DATE
1 ~~VOC -CLP(Low Level) or 524.2~~	~~4 deg. C HCL~~	~~3/ 40 ml~~	~~VOA~~			
1 ~~DOC~~	4 deg. C H_2SO_4	3/ 40 ml	~~VOA~~			
2 ~~Nitrate/Nitrogen 352.1~~	~~4 deg. C~~	~~1 x 500 ml~~	~~HDPE~~			
3 ~~Ferrous Iron~~	~~Field Analysis~~					
4 ~~Sulfide~~	~~Field Analysis~~					
5 ~~Alkalinity/Sulfate/Chlorides~~	~~4 deg. C~~	~~1 x 1L~~	~~HDPE~~			
6						
7 ~~DOC~~						
8 ~~Hardness 130.2~~	~~4 deg. C~~ HNO3	1 x 500 mL with #4	HDPE			
9 ~~Total Dissolved Solids 160.1~~	4 deg. C	1 x 1L	HDPE			
10 ~~Chemical Oxygen Demand 410.1~~	4 deg. C H2SO4	1 x 50 mL with #7	HDPE			

COMMENTS: (QA/QC?)

1) VOC	(8260B)	4°C	HCL	3/25 mL	VOA
2) MEE	(AM20GAX)	"	"	2/25 mL	VOA
3) TOC	(9060A)	"	"	2/25 ml	VOA
4) Sulfate	(EPA 300.1)	"	"	1/250 mL	HDPE
5) Mn+	(HACH)				field
6) Fe+	(HACH)				field

IDW INFORMATION:

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MWT-28
PROJECT: Ash Landfill LTM Groundwater Sampling - Round 8		DATE: 12/18/09
LOCATION: ROMULUS, NY		INSPECTORS: GDL
		PUMP #:
		SAMPLE ID #: ALBW2074

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
0900	10F	calm, cloudy		0	—	3" snow

MONITORING INSTRUMENT	DETECTOR
OVM-580	PID

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)]

(12.85-7.40)(0.163) = 0.88×3= 2.66 gal

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
	7.40'					

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
		12.85'			0900

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)
0900 Start pumping				YSI	YSI	Horiba →			LaM.
0918	8.1	~250		0.52	10.7	1.85	6.37	-127	55
0924	8.1			0.46	10.8	1.87	6.38	-130	49
0929	8.1		~750 mL	0.40	11.0	1.85	6.39	-134	32.9
0934	8.1	~250		0.31	11.1	1.89	6.40	-140	20.7
0940	8.1	~300	~2 gal	0.28	11.2	1.91	6.39	-142	16.1
0948	8.1			0.27	11.3	1.90	6.40	-146	11.8
0956	~~8.2~~ 8.1		~3.25 gal	0.28	11.2	1.88	6.40	-148	12.3
1000	8.1			0.27	11.3	1.89	6.40	-148	11.2
1004	8.1			0.29	11.2	1.88	6.40	-148	16.8

1004 Collect Samples
Fe + = 2.15
Mn + = 6.50
2 ~~MEE~~ in VOAs
2 TOC in VOAs
1 sulfate in HDPE
3 VOCs in VOAs

- Note: well previously purged on 12/15/09

- Moderate organic odor coming from well.

Ash GW SAMPLING RECORD (2)

SAMPLING ORDER			PRESERVATIVES		BOTTLES COUNT/ VOLUME	BOTTLES TYPE	SAMPLE NUMBER	TIME	CHECKED BY/ DATE
1	VOC 8260B		4 deg. C	HCL	25 9/1 12/18 3/ 40 ml	VOA			
2	MEE (AM20GAX)		4 deg. C	HCL	25 12/18 2/ 40 ml	VOA			
3	TOC (9060A)		4 deg. C	HCL	25 12/18 2/ 40 ml	VOA			
4	Sulfate (EPA 300.1)		4 deg. C		1 x 250 mL	HDPE			
5	Fe+ (HACH)					field			
6	Mn+ (HACH)					field			
7									

COMMENTS: (QA/QC?)

IDW INFORMATION:

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY | PARSONS | WELL #: MWT-29

PROJECT: Ash Landfill LTM Groundwater Sampling - Round 8
LOCATION: ROMULUS, NY

DATE: 12/16/09
INSPECTORS: GDL
PUMP #:
SAMPLE ID #: ALBW20175

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	(FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS
1100	25	sunny; windy	20mph			

MONITORING

INSTRUMENT	DETECTOR
OVM-580	PID

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)]

(12.83-7.56)(0.163) = 0.258 x 3 ≈ .75

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
	12.83					

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
		7.56			1100

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)~~ (mL)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (umhos)	pH	ORP (mV)	TURBIDITY (NTU)
1100	Start Pumping			YSI	YSI	Horiba			LaMotte
1106	7.70			2.86	8.9	1.87	6.65	-51	90.0
1111	7.70			3.35	8.9	1.93	6.71	-45	74.5
1116	7.98	~90	~1440	3.21	9.0	1.94	6.86	-31	33.9
1121	8.09			2.81	9.1	1.95	6.90	-29	25.0
1129	8.25			2.59	9.5	1.97	6.96	-40	1.0
1134	8.25	~90	~3060	1.95	9.3	2.00	6.91	-47	0.0
1139	8.25	~90	~~3600~~	1.19	9.4	1.97	6.90	-55	0.0
1145	8.60		3600	0.66	9.5	1.99	6.90	-65	0.0
1150	8.60	~80		0.60	9.5	2.04	6.92	-72	0.0
1154	8.65			0.54	9.5	2.05	6.92	-73	0
1159	8.65	80	~4320	0.58	9.7	2.05	6.87	-75	0
1200	Collect sample								

Fe+ = 0.96 mg/L
Mn+ = 6.3 mg/L
3 VOAs for VOC
2 " " TOC
2 " " MEE
1 plastic for sulfate

Ash GW SAMPLING RECORD (2)

SAMPLING ORDER			PRESERVATIVES		BOTTLES COUNT/ VOLUME	BOTTLES TYPE	SAMPLE NUMBER	TIME	CHECKED BY/ DATE
1	VOC 8260B		4 deg. C	HCL	25 [illegible] 12/16 3/40 ml	VOA			
2	MEE (AM20GAX)		4 deg. C	HCL	25 12/16 [illegible] 2/40 ml	VOA			
3	TOC (9060A)		4 deg. C	HCL	25 [illegible] 12/16 2/40 ml	VOA			
4	Sulfate (EPA 300.1)		4 deg. C		1 x 250 mL	HDPE			
5	Fe+ (HACH)					field			
6	Mn+ (HACH)					field			
7									

COMMENTS: (QA/QC?)

IDW INFORMATION:

APPENDIX B

COMPLETE GROUNDWATER DATA

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Cleanup Goals [1]	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								PT-18A	PT-18A	PT-18A	PT-18A	PT-18A	PT-18A
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20059	ALBW20074	ALBW20088	ALBW20103	ALBW20117	ALBW20132
Sample Date								1/3/2007	3/17/2007	6/5/2007	11/15/2007	6/24/2008	12/12/2008
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								1	2	3	4	5	6
Volatile Organic Compounds													
1,1,1-Trichloroethane	UG/L	0.76	3%	5	0	4	118	1 U	1 U	1 U	1 U	1 U	0.26 UJ
1,1,2,2-Tetrachloroethane	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	1 U	1 U	0.21 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/L	0	0%	5	0	0	118	1 U	1 U	1 UJ	1 U	1 UJ	0.31 U
1,1,2-Trichloroethane	UG/L	0	0%	1	0	0	118	1 U	1 U	1 U	1 U	1 U	0.23 U
1,1-Dichloroethane	UG/L	1.1	7%	5	0	8	118	1 U	1 U	1 U	1 U	1 U	0.75 U
1,1-Dichloroethene	UG/L	2.1	7%	5	0	8	118	0.64 J	0.73 J	1.4	2.1	1 U	1.3
1,2,4-Trichlorobenzene	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	1 U	1 U	0.41 U
1,2-Dibromo-3-chloropropane	UG/L	0	0%	0.04	0	0	118	1 U	1 U	1 U	1 U	1 UJ	1 UJ
1,2-Dibromoethane	UG/L	0	0%	0.0006	0	0	118	1 U	1 U	1 U	1 U	1 U	0.17 U
1,2-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1 U	1 U	1 U	1 U	1 U	0.2 U
1,2-Dichloroethane	UG/L	5.6	11%	0.6	11	13	118	1 U	1 U	1 U	1 U	1 U	0.21 U
1,2-Dichloropropane	UG/L	0	0%	1	0	0	118	1 U	1 U	1 U	1 U	1 U	0.14 U
1,3-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1 U	1 U	1 U	1 U	1 U	0.16 U
1,4-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1 U	1 U	1 U	1 U	1 U	0.16 U
Acetone	UG/L	2600	29%		0	34	118	5 U	2 J	7	5 U	5 U	1.3 U
Benzene	UG/L	0	0%	1	0	0	118	1 U	1 U	1 U	1 U	1 U	0.16 U
Bromodichloromethane	UG/L	0	0%	80 [b]	0	0	118	1 U	1 U	1 U	1 U	1 U	0.38 U
Bromoform	UG/L	0	0%	80 [b]	0	0	118	1 U	1 U	1 U	1 U	1 U	0.26 U
Carbon disulfide	UG/L	0	0%		0	0	118	1 U	1 U	1 U	1 U	1 U	0.19 U
Carbon tetrachloride	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	1 U	1 U	0.27 UJ
Chlorobenzene	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	1 U	1 U	0.18 U
Chlorodibromomethane	UG/L	0	0%	80 [b]	0	0	118	1 U	1 U	1 U	1 U	1 U	0.32 U
Chloroethane	UG/L	1.1	6%	5	0	7	118	1 U	1 U	1 U	1 U	1 U	0.32 U
Chloroform	UG/L	27	5%	7	4	6	118	27	13 U	14	8.7	1 U	2.2
Cis-1,2-Dichloroethene	UG/L	720	81%	5	80	96	118	220	170	430	720	200	510
Cis-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	1 U	1 U	1 U	1 U	1 U	0.36 U
Cyclohexane	UG/L	0	0%		0	0	118	1 U	1 U	1 U	1 U	1 U	0.22 U
Dichlorodifluoromethane	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	1 U	1 U	0.28 UJ
Ethyl benzene	UG/L	1.3	3%	5	0	4	118	1 U	1 U	1 U	1 U	1 U	0.18 U
Isopropylbenzene	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	1 U	1 U	0.19 U
Methyl Acetate	UG/L	6	2%		0	2	118	1 U	1 UJ	1 U	1 UJ	1 UJ	0.17 U
Methyl Tertbutyl Ether	UG/L	0	0%		0	0	118	1 U	1 U	1 U	1 U	1 U	0.16 U
Methyl bromide	UG/L	0	0%	5	0	0	117	1 U	1 U	1 U	1 U	1 UJ	0.28 U
Methyl butyl ketone	UG/L	0	0%		0	0	118	5 U	5 U	5 U	5 UJ	5 UJ	1.2 U
Methyl chloride	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	1 U	1 UJ	0.34 U
Methyl cyclohexane	UG/L	0	0%		0	0	118	1 U	1 U	1 U	1 U	1 U	0.22 U
Methyl ethyl ketone	UG/L	4900	18%		0	21	118	5 U	5 U	5 U	5 U	5 UJ	1.3 U
Methyl isobutyl ketone	UG/L	0	0%		0	0	118	5 U	5 U	5 U	5 U	5 UJ	0.91 U
Methylene chloride	UG/L	18	10%	5	7	12	118	1 UJ	1 U	1 U	1 U	1 U	0.44 UJ
Styrene	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	1 U	1 U	0.18 U
Tetrachloroethene	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	1 U	1 U	0.36 U
Toluene	UG/L	590	19%	5	16	23	118	1 U	1 U	1 U	1 U	1 U	0.51 U
Total Xylenes	UG/L	0	0%	5	0	0	118	3 U	3 U	3 U	3 U	3 U	0.93 U
Trans-1,2-Dichloroethene	UG/L	8	42%	5	3	50	118	1.6	1.4	3.3	3.4	0.9 J	2.4
Trans-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	1 U	1 U	1 U	1 U	1 U	0.37 U
Trichloroethene	UG/L	2700	68%	5	48	80	118	2000	1000	1100	2700	220	1400
Trichlorofluoromethane	UG/L	0	0%	5	0	0	118	1 U	1 U	1 UJ	1 U	1 UJ	0.15 UJ
Vinyl chloride	UG/L	180	66%	2	67	78	118	2.4	2.9	3.3	8.2	1.4	4.6

Appendix B

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								PT-18A	PT-18A	PT-18A	PT-18A	PT-18A	PT-18A
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20059	ALBW20074	ALBW20088	ALBW20103	ALBW20117	ALBW20132
Sample Date								1/3/2007	3/17/2007	6/5/2007	11/15/2007	6/24/2008	12/12/2008
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								1	2	3	4	5	6
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Other													
Iron	UG/L	296000	100%		11	12	12						
Iron+Manganese	UG/L	352900	100%		12	12	12						
Manganese	UG/L	56900	100%		12	12	12						
Ethane	UG/L	98	88%		0	49	56						
Ethene	UG/L	200	88%		0	49	56						
Methane	UG/L	23000	95%		0	53	56						
Sulfate	MG/L	1060	70%		0	39	56						
Total Organic Carbon	MG/L	2050	100%		0	56	56						

Notes:
1. The cleanup goal values are NYSDEC Class GA Groundwater Standards unless noted otherwise.
a. NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998).
b. Federal Maximum Contaminant Level (http://www.epa.gov/safewater/contaminants/index.html)
2. Shading indicates a concentration above the GA Groundwater standard.

U = compound was not detected
J = the reported value is and estimated concentration
UJ= the compound was not detected; the associated reporting limit is approximate.

Appendix B

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Cleanup Goals [1]	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								PT-18A	PT-18A	MWT-25	MWT-25	MWT-25	MWT-25
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20147	ALBW20162	ALBW20064	ALBW20079	ALBW20093	ALBW20108
Sample Date								6/4/2009	12/17/2009	1/3/2007	3/17/2007	6/6/2007	11/15/2007
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								7	8	1	2	3	4
Volatile Organic Compounds													
1,1,1-Trichloroethane	UG/L	0.76	3%	5	0	4	118	0.26 U	1.1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	5	0	0	118	0.21 U	0.85 U	1 U	1 U	1 U	1 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/L	0	0%	5	0	0	118	0.31 U	1.2 UJ	1 U	1 U	1 UJ	1 U
1,1,2-Trichloroethane	UG/L	0	0%	1	0	0	118	0.23 U	0.92 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	UG/L	1.1	7%	5	0	8	118	0.75 U	1.5 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	UG/L	2.1	7%	5	0	8	118	0.8 J	2 J	1 U	1 U	1 U	1 U
1,2,4-Trichlorobenzene	UG/L	0	0%	5	0	0	118	0.41 U	1.6 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	UG/L	0	0%	0.04	0	0	118	1 U	1.6 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	UG/L	0	0%	0.0006	0	0	118	0.17 U	0.66 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	UG/L	0	0%	3	0	0	118	0.2 U	0.81 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	UG/L	5.6	11%	0.6	11	13	118	0.21 U	0.86 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	UG/L	0	0%	1	0	0	118	0.14 U	1.3 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	UG/L	0	0%	3	0	0	118	0.16 U	1.4 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	UG/L	0	0%	3	0	0	118	0.16 U	1.6 U	1 U	1 U	1 U	1 U
Acetone	UG/L	2600	29%		0	34	118	1.3 UJ	5.4 U	5 U	5 U	4.5 J	5 U
Benzene	UG/L	0	0%	1	0	0	118	0.16 U	1.6 U	1 U	1 U	1 U	1 U
Bromodichloromethane	UG/L	0	0%	80 [b]	0	0	118	0.39 U	1.5 U	1 U	1 U	1 U	1 U
Bromoform	UG/L	0	0%	80 [b]	0	0	118	0.26 U	1 U	1 U	1 U	1 U	1 U
Carbon disulfide	UG/L	0	0%		0	0	118	0.19 U	0.78 U	1 U	1 U	1 U	1 U
Carbon tetrachloride	UG/L	0	0%	5	0	0	118	0.27 U	1.1 U	1 U	1 U	1 U	1 U
Chlorobenzene	UG/L	0	0%	5	0	0	118	0.32 U	1.3 U	1 U	1 U	1 U	1 U
Chlorodibromomethane	UG/L	0	0%	80 [b]	0	0	118	0.32 U	1.3 U	1 U	1 U	1 U	1 U
Chloroethane	UG/L	1.1	6%	5	0	7	118	0.32 U	1.3 UJ	1 U	1 U	1 U	1 U
Chloroform	UG/L	27	5%	7	4	6	118	9	3.1 J	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethene	UG/L	720	81%	5	80	96	118	260	630	41	84	36	17
Cis-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	0.36 U	1.4 U	1 U	1 U	1 U	1 U
Cyclohexane	UG/L	0	0%		0	0	118	0.53 U	2.1 U	1 U	1 U	1 U	1 U
Dichlorodifluoromethane	UG/L	0	0%	5	0	0	118	0.29 U	1.1 U	1 U	1 U	1 U	1 U
Ethyl benzene	UG/L	1.3	3%	5	0	4	118	0.18 U	0.74 U	1 U	1 U	1 U	1 U
Isopropylbenzene	UG/L	0	0%	5	0	0	118	0.19 U	0.77 U	1 U	1 U	1 U	1 U
Methyl Acetate	UG/L	6	2%		0	2	118	0.17 U	2 U	1 U	1 UJ	1 U	1 UJ
Methyl Tertbutyl Ether	UG/L	0	0%		0	0	118	0.16 U	0.64 U	1 U	1 U	1 U	1 U
Methyl bromide	UG/L	0	0%	5	0	0	117	0.28 U	1.1 UJ	1 U	1 U	1 U	1 U
Methyl butyl ketone	UG/L	0	0%		0	0	118	1.2 U	5 U	5 U	5 U	5 U	5 UJ
Methyl chloride	UG/L	0	0%	5	0	0	118	0.35 U	1.4 U	1 U	1 U	1 U	1 U
Methyl cyclohexane	UG/L	0	0%		0	0	118	0.5 U	2 U	1 U	1 U	1 U	1 U
Methyl ethyl ketone	UG/L	4900	18%		0	21	118	1.3 U	5.3 U	5 U	5 U	5 U	5 U
Methyl isobutyl ketone	UG/L	0	0%		0	0	118	0.91 U	3.6 U	5 U	5 U	5 U	5 U
Methylene chloride	UG/L	18	10%	5	7	12	118	0.44 U	1.8 U	1 U	1 U	1 U	1 U
Styrene	UG/L	0	0%	5	0	0	118	0.18 U	0.74 U	1 U	1 U	1 U	1 U
Tetrachloroethene	UG/L	0	0%	5	0	0	118	0.36 U	1.5 U	1 U	1 U	1 U	1 U
Toluene	UG/L	590	19%	5	16	23	118	0.51 U	2 U	1 U	1 U	4.6	1 U
Total Xylenes	UG/L	0	0%	5	0	0	118	0.66 U	2.6 U	3 U	3 U	3 U	3 U
Trans-1,2-Dichloroethene	UG/L	8	42%	5	3	50	118	1.8	3.5 J	0.56 J	1.2	0.5 J	1 U
Trans-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	0.37 U	1.5 U	1 U	1 U	1 U	1 U
Trichloroethene	UG/L	2700	68%	5	48	80	118	810 J	2100	50	55	28	26
Trichlorofluoromethane	UG/L	0	0%	5	0	0	118	0.15 U	0.61 UJ	1 U	1 U	1 UJ	1 U
Vinyl chloride	UG/L	180	66%	2	67	78	118	2.6	7.1	1.6	9.6	2.1	0.64 J

Appendix B

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								PT-18A	PT-18A	MWT-25	MWT-25	MWT-25	MWT-25
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20147	ALBW20162	ALBW20064	ALBW20079	ALBW20093	ALBW20108
Sample Date								6/4/2009	12/17/2009	1/3/2007	3/17/2007	6/6/2007	11/15/2007
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								7	8	1	2	3	4
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Other													
Iron	UG/L	296000	100%		11	12	12						
Iron+Manganese	UG/L	352900	100%		12	12	12						
Manganese	UG/L	56900	100%		12	12	12						
Ethane	UG/L	98	88%		0	49	56						
Ethene	UG/L	200	88%		0	49	56						
Methane	UG/L	23000	95%		0	53	56						
Sulfate	MG/L	1060	70%		0	39	56						
Total Organic Carbon	MG/L	2050	100%		0	56	56						

Notes:
1. The cleanup goal values are NYSDEC Class GA Groundwater Standards unless noted otherwise.
 a. NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998).
 b. Federal Maximum Contaminant Level (http://www.epa.gov/safewater/contaminants/index.html)
2. Shading indicates a concentration above the GA Groundwater standard.

U = compound was not detected
J = the reported value is and estimated concentration
UJ= the compound was not detected; the associated reporting limit is approximate.

Appendix B

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-25	MWT-25	MWT-25	MWT-25	MWT-26	MWT-26
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20123	ALBW20138	ALBW20153	ALBW20168	ALBW20066	ALBW20081
Sample Date								6/24/2008	12/15/2008	6/3/2009	12/17/2009	1/3/2007	3/17/2007
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								5	6	7	8	1	2
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds													
1,1,1-Trichloroethane	UG/L	0.76	3%	5	0	4	118	1 U	0.26 U	0.26 U	0.26 U	1 U	1 U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	5	0	0	118	1 U	0.21 U	0.21 U	0.21 U	1 U	1 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/L	0	0%	5	0	0	118	1 UJ	0.31 U	0.31 U	0.31 U	1 U	1 U
1,1,2-Trichloroethane	UG/L	0	0%	1	0	0	118	1 U	0.23 U	0.23 U	0.23 U	1 U	1 U
1,1-Dichloroethane	UG/L	1.1	7%	5	0	8	118	1 U	0.75 U	0.75 U	0.38 U	1 U	1 U
1,1-Dichloroethene	UG/L	2.1	7%	5	0	8	118	1 U	0.29 U	0.29 U	0.29 U	1 U	1 U
1,2,4-Trichlorobenzene	UG/L	0	0%	5	0	0	118	1 U	0.41 U	0.41 U	0.41 U	1 U	1 U
1,2-Dibromo-3-chloropropane	UG/L	0	0%	0.04	0	0	118	1 UJ	1 UJ	1 UJ	0.39 U	1 U	1 U
1,2-Dibromoethane	UG/L	0	0%	0.0006	0	0	118	1 U	0.17 U	0.17 U	0.17 U	1 U	1 U
1,2-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U
1,2-Dichloroethane	UG/L	5.6	11%	0.6	11	13	118	1 U	0.21 U	0.21 U	0.21 U	1 U	1 U
1,2-Dichloropropane	UG/L	0	0%	1	0	0	118	1 U	0.14 U	0.14 U	0.32 U	1 U	1 U
1,3-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1 U	0.16 U	0.16 U	0.36 U	1 U	1 U
1,4-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1 U	0.16 U	0.16 U	0.39 U	1 U	1 U
Acetone	UG/L	2600	29%		0	34	118	5 U	1.3 U	1.3 U	1.3 U	5 U	17
Benzene	UG/L	0	0%	1	0	0	118	1 U	0.16 U	0.16 U	0.41 U	1 U	1 U
Bromodichloromethane	UG/L	0	0%	80 [b]	0	0	118	1 U	0.38 U	0.39 U	0.39 U	1 U	1 U
Bromoform	UG/L	0	0%	80 [b]	0	0	118	1 U	0.26 U	0.26 UJ	0.26 U	1 U	1 U
Carbon disulfide	UG/L	0	0%		0	0	118	1 U	0.19 U	0.19 UJ	0.19 U	1 U	1 U
Carbon tetrachloride	UG/L	0	0%	5	0	0	118	1 U	0.27 U	0.27 U	0.27 U	1 U	1 U
Chlorobenzene	UG/L	0	0%	5	0	0	118	1 U	0.18 U	0.32 U	0.32 U	1 U	1 U
Chlorodibromomethane	UG/L	0	0%	80 [b]	0	0	118	1 U	0.32 U	0.32 U	0.32 U	1 U	1 U
Chloroethane	UG/L	1.1	6%	5	0	7	118	1 UJ	0.32 U	0.32 U	0.32 U	1 U	1 U
Chloroform	UG/L	27	5%	7	4	6	118	1 U	0.34 U	0.34 U	0.34 U	1 U	1 U
Cis-1,2-Dichloroethene	UG/L	720	81%	5	80	96	118	17	0.63 J	10	3.3	19	17
Cis-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	1 U	0.36 U	0.36 U	0.36 U	1 U	1 U
Cyclohexane	UG/L	0	0%		0	0	118	1 U	0.22 U	0.53 U	0.53 U	1 U	1 U
Dichlorodifluoromethane	UG/L	0	0%	5	0	0	118	1 U	0.28 U	0.29 U	0.29 U	1 U	1 U
Ethyl benzene	UG/L	1.3	3%	5	0	4	118	1 U	0.18 U	0.18 U	0.18 U	1 U	1 U
Isopropylbenzene	UG/L	0	0%	5	0	0	118	1 U	0.19 U	0.19 U	0.19 U	1 U	1 U
Methyl Acetate	UG/L	6	2%		0	2	118	1 UJ	0.17 U	0.17 UJ	0.5 U	1 U	1 UJ
Methyl Tertbutyl Ether	UG/L	0	0%		0	0	118	1 U	0.16 U	0.16 U	0.16 U	1 U	1 U
Methyl bromide	UG/L	0	0%	5	0	0	117	1 UJ	0.28 U	0.28 U	0.28 UR	1 U	1 U
Methyl butyl ketone	UG/L	0	0%		0	0	118	5 UJ	1.2 U	1.2 U	1.2 U	5 U	5 U
Methyl chloride	UG/L	0	0%	5	0	0	118	1 UJ	0.34 U	0.35 U	0.35 U	1 U	1 U
Methyl cyclohexane	UG/L	0	0%		0	0	118	1 U	0.22 U	0.5 U	0.5 U	1 U	1 U
Methyl ethyl ketone	UG/L	4900	18%		0	21	118	5 UJ	1.3 U	1.3 U	1.3 U	5 U	15
Methyl isobutyl ketone	UG/L	0	0%		0	0	118	5 UJ	0.91 U	0.91 U	0.91 U	5 U	5 U
Methylene chloride	UG/L	18	10%	5	7	12	118	1 U	0.44 UJ	0.44 U	0.44 U	1 U	1 U
Styrene	UG/L	0	0%	5	0	0	118	1 U	0.18 U	0.18 U	0.18 U	1 U	1 U
Tetrachloroethene	UG/L	0	0%	5	0	0	118	1 U	0.36 U	0.36 U	0.36 U	1 U	1 U
Toluene	UG/L	590	19%	5	16	23	118	1 U	0.51 U	0.51 U	0.51 U	1 U	1 U
Total Xylenes	UG/L	0	0%	5	0	0	118	3 U	0.93 U	0.66 U	0.66 U	3 U	3 U
Trans-1,2-Dichloroethene	UG/L	8	42%	5	3	50	118	1 U	0.13 U	0.13 U	0.42 U	0.6 J	1
Trans-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	1 U	0.37 U	0.37 U	0.37 U	1 U	1 U
Trichloroethene	UG/L	2700	68%	5	48	80	118	19	3.2	12	4.2	10	11
Trichlorofluoromethane	UG/L	0	0%	5	0	0	118	1 UJ	0.15 U	0.15 U	0.15 UJ	1 U	1 U
Vinyl chloride	UG/L	180	66%	2	67	78	118	1 U	0.24 U	0.24 U	0.24 U	2	6.1

Table B-1
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Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-25	MWT-25	MWT-25	MWT-25	MWT-26	MWT-26
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20123	ALBW20138	ALBW20153	ALBW20168	ALBW20066	ALBW20081
Sample Date								6/24/2008	12/15/2008	6/3/2009	12/17/2009	1/3/2007	3/17/2007
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								5	6	7	8	1	2
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Other													
Iron	UG/L	296000	100%		11	12	12					275 J	844
Iron+Manganese	UG/L	352900	100%		12	12	12					1043 J	2464
Manganese	UG/L	56900	100%		12	12	12					768	1620
Ethane	UG/L	98	88%		0	49	56					2 U	0.4
Ethene	UG/L	200	88%		0	49	56					2 U	7.8
Methane	UG/L	23000	95%		0	53	56					2 U	210
Sulfate	MG/L	1060	70%		0	39	56					958	738
Total Organic Carbon	MG/L	2050	100%		0	56	56					3.9 J	15.2

Notes:
1. The cleanup goal values are NYSDEC Class GA Groundwater Standards unless noted otherwise.
a. NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998).
b. Federal Maximum Contaminant Level (http://www.epa.gov/safewater/contaminants/index.html)
2. Shading indicates a concentration above the GA Groundwater standard.

U = compound was not detected
J = the reported value is and estimated concentration
UJ= the compound was not detected; the associated reporting limit is approximate.

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Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
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Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-26	MWT-26	MWT-26	MWT-26	MWT-26	MWT-26
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20095	ALBW20111	ALBW20126	ALBW20141	ALBW20156	ALBW20171
Sample Date								6/5/2007	11/15/2007	6/24/2008	12/15/2008	6/3/2009	12/17/2009
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								3	4	5	6	7	8
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds													
1,1,1-Trichloroethane	UG/L	0.76	3%	5	0	4	118	1 U	1 U	1 U	0.26 U	0.26 U	0.26 U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	0.21 U	0.21 U	0.21 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/L	0	0%	5	0	0	118	1 UJ	1 U	1 U	0.31 U	0.31 U	0.31 UJ
1,1,2-Trichloroethane	UG/L	0	0%	1	0	0	118	1 U	1 U	1 U	0.23 U	0.23 U	0.23 U
1,1-Dichloroethane	UG/L	1.1	7%	5	0	8	118	1 U	1 U	1 U	0.75 U	0.75 U	0.38 U
1,1-Dichloroethene	UG/L	2.1	7%	5	0	8	118	1 U	1 U	1 U	0.29 U	0.29 U	0.29 U
1,2,4-Trichlorobenzene	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	0.41 U	0.41 U	0.41 U
1,2-Dibromo-3-chloropropane	UG/L	0	0%	0.04	0	0	118	1 U	1 U	1 U	1 UJ	1 UJ	0.39 U
1,2-Dibromoethane	UG/L	0	0%	0.0006	0	0	118	1 U	1 U	1 U	0.17 U	0.17 U	0.17 U
1,2-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1 U	1 U	1 U	0.2 U	0.2 U	0.2 U
1,2-Dichloroethane	UG/L	5.6	11%	0.6	11	13	118	1 U	1 U	1 U	0.21 U	0.21 U	0.21 U
1,2-Dichloropropane	UG/L	0	0%	1	0	0	118	1 U	1 U	1 U	0.14 U	0.14 U	0.32 U
1,3-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1 U	1 U	1 U	0.16 U	0.16 U	0.36 U
1,4-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1 U	1 U	1 U	0.16 U	0.16 U	0.39 U
Acetone	UG/L	2600	29%		0	34	118	5 U	5 U	5 U	1.3 U	1.3 U	1.3 U
Benzene	UG/L	0	0%	1	0	0	118	1 U	1 U	1 U	0.16 U	0.16 U	0.41 U
Bromodichloromethane	UG/L	0	0%	80[b]	0	0	118	1 U	1 U	1 U	0.38 U	0.39 U	0.39 U
Bromoform	UG/L	0	0%	80[b]	0	0	118	1 U	1 U	1 U	0.26 U	0.26 UJ	0.26 U
Carbon disulfide	UG/L	0	0%		0	0	118	1 U	1 U	1 U	0.19 U	0.19 UJ	0.19 U
Carbon tetrachloride	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	0.27 U	0.27 U	0.27 U
Chlorobenzene	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	0.18 U	0.32 U	0.32 U
Chlorodibromomethane	UG/L	0	0%	80[b]	0	0	118	1 U	1 U	1 U	0.32 U	0.32 U	0.32 U
Chloroethane	UG/L	1.1	6%	5	0	7	118	1 U	1 U	1 UJ	0.32 U	0.32 U	0.32 UJ
Chloroform	UG/L	27	5%	7	4	6	118	1 U	1 U	1 U	0.34 U	0.34 U	0.34 U
Cis-1,2-Dichloroethene	UG/L	720	81%	5	80	96	118	11	2.8	3.3	1	6	8.1
Cis-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	1 U	1 U	1 U	0.36 U	0.36 U	0.36 U
Cyclohexane	UG/L	0	0%		0	0	118	1 U	1 U	1 U	0.22 U	0.53 U	0.53 U
Dichlorodifluoromethane	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	0.28 U	0.29 U	0.29 U
Ethyl benzene	UG/L	1.3	3%	5	0	4	118	1 U	1 U	1 U	0.18 U	0.18 U	0.18 U
Isopropylbenzene	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	0.19 U	0.19 U	0.19 U
Methyl Acetate	UG/L	6	2%		0	2	118	1 U	1 UJ	1 UJ	0.17 U	0.17 UJ	0.5 U
Methyl Tertbutyl Ether	UG/L	0	0%		0	0	118	1 U	1 U	1 U	0.16 U	0.16 U	0.16 U
Methyl bromide	UG/L	0	0%	5	0	0	117	1 U	1 U	1 UJ	0.28 U	0.28 U	0.28 UJ
Methyl butyl ketone	UG/L	0	0%		0	0	118	5 U	5 UJ	5 UJ	1.2 U	1.2 U	1.2 U
Methyl chloride	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	0.34 U	0.35 U	0.35 U
Methyl cyclohexane	UG/L	0	0%		0	0	118	1 U	1 U	1 U	0.22 U	0.5 U	0.5 U
Methyl ethyl ketone	UG/L	4900	18%		0	21	118	5 U	5 U	5 U	1.3 U	1.3 U	1.3 U
Methyl isobutyl ketone	UG/L	0	0%		0	0	118	5 U	5 U	5 U	0.91 U	0.91 U	0.91 U
Methylene chloride	UG/L	18	10%	5	7	12	118	1 U	1 U	1 U	0.44 UJ	0.44 U	0.44 U
Styrene	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	0.18 U	0.18 U	0.18 U
Tetrachloroethene	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	0.36 U	0.36 U	0.36 U
Toluene	UG/L	590	19%	5	16	23	118	1 U	1 U	1 U	0.51 U	0.51 U	0.51 U
Total Xylenes	UG/L	0	0%	5	0	0	118	3 U	3 U	3 U	0.93 U	0.66 U	0.66 U
Trans-1,2-Dichloroethene	UG/L	8	42%	5	3	50	118	0.7 J	1 U	1 U	0.13 U	0.13 U	0.42 U
Trans-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	1 U	1 U	1 U	0.37 U	0.37 U	0.37 U
Trichloroethene	UG/L	2700	68%	5	48	80	118	3.2	2.8	1.7	1.9	3.6	5.8
Trichlorofluoromethane	UG/L	0	0%	5	0	0	118	1 UJ	1 U	1 UJ	0.15 U	0.15 U	0.15 UJ
Vinyl chloride	UG/L	180	66%	2	67	78	118	4.4	1 U	1 U	0.24 U	3.5	4.2

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Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-26	MWT-26	MWT-26	MWT-26	MWT-26	MWT-26
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20095	ALBW20111	ALBW20126	ALBW20141	ALBW20156	ALBW20171
Sample Date								6/5/2007	11/15/2007	6/24/2008	12/15/2008	6/3/2009	12/17/2009
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								3	4	5	6	7	8
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Other													
Iron	UG/L	296000	100%		11	12	12						
Iron+Manganese	UG/L	352900	100%		12	12	12						
Manganese	UG/L	56900	100%		12	12	12						
Ethane	UG/L	98	88%		0	49	56	1	0.16	0.82	0.046	3.2	2.2
Ethene	UG/L	200	88%		0	49	56	13	0.4	2.9	0.028	2.7	1.8
Methane	UG/L	23000	95%		0	53	56	390	44	210	10	1100	610
Sulfate	MG/L	1060	70%		0	39	56	473	1060	600	541	570	912
Total Organic Carbon	MG/L	2050	100%		0	56	56	10.3	6.1	5.6	4.4	6.9	5.6

Notes:
1. The cleanup goal values are NYSDEC Class GA Groundwater Standards unless noted otherwise.
 a. NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998).
 b. Federal Maximum Contaminant Level (http://www.epa.gov/safewater/contaminants/index.html)
2. Shading indicates a concentration above the GA Groundwater standard.

U = compound was not detected
J = the reported value is and estimated concentration
UJ= the compound was not detected; the associated reporting limit is approximate.

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
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Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Cleanup Goals [1]	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-27	MWT-27	MWT-27	MWT-27	MWT-27	MWT-27
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20067	ALBW20082	ALBW20097	ALBW20096	ALBW20112	ALBW20127
Sample Date								1/3/2007	3/16/2007	6/5/2007	6/5/2007	11/15/2007	6/24/2008
QC Code								SA	SA	DU	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								1	2	3	3	4	5
Volatile Organic Compounds													
1,1,1-Trichloroethane	UG/L	0.76	3%	5	0	4	118	20 UJ	20 U	20 U	20 U	10 U	4 U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	5	0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/L	0	0%	5	0	0	118	20 UJ	20 U	20 UJ	20 UJ	10 U	4 U
1,1,2-Trichloroethane	UG/L	0	0%	1	0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
1,1-Dichloroethane	UG/L	1.1	7%	5	0	8	118	20 UJ	20 U	20 U	20 U	10 U	4 U
1,1-Dichloroethene	UG/L	2.1	7%	5	0	8	118	20 UJ	20 U	20 U	20 U	10 U	4 U
1,2,4-Trichlorobenzene	UG/L	0	0%	5	0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
1,2-Dibromo-3-chloropropane	UG/L	0	0%	0.04	0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
1,2-Dibromoethane	UG/L	0	0%	0.0006	0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
1,2-Dichlorobenzene	UG/L	0	0%	3	0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
1,2-Dichloroethane	UG/L	5.6	11%	0.6	11	13	118	20 UJ	20 U	20 U	20 U	10 U	4 U
1,2-Dichloropropane	UG/L	0	0%	1	0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
1,3-Dichlorobenzene	UG/L	0	0%	3	0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
1,4-Dichlorobenzene	UG/L	0	0%	3	0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
Acetone	UG/L	2600	29%		0	34	118	2000 J	1300	1300	1300	30 J	20 U
Benzene	UG/L	0	0%	1	0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
Bromodichloromethane	UG/L	0	0%	80 [b]	0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
Bromoform	UG/L	0	0%	80 [b]	0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
Carbon disulfide	UG/L	0	0%		0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
Carbon tetrachloride	UG/L	0	0%	5	0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
Chlorobenzene	UG/L	0	0%	5	0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
Chlorodibromomethane	UG/L	0	0%	80 [b]	0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
Chloroethane	UG/L	1.1	6%	5	0	7	118	20 UJ	20 U	20 U	20 U	10 U	4 UJ
Chloroform	UG/L	27	5%	7	4	6	118	20 UJ	20 U	20 U	20 U	10 U	4 U
Cis-1,2-Dichloroethene	UG/L	720	81%	5	80	96	118	49 J	20 U	20 U	20 U	10 U	4 U
Cis-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
Cyclohexane	UG/L	0	0%		0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
Dichlorodifluoromethane	UG/L	0	0%	5	0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
Ethyl benzene	UG/L	1.3	3%	5	0	4	118	20 UJ	20 U	20 U	20 U	10 U	4 U
Isopropylbenzene	UG/L	0	0%	5	0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
Methyl Acetate	UG/L	6	2%		0	2	118	20 UJ	20 UJ	20 U	20 U	10 UJ	4 UJ
Methyl Tertbutyl Ether	UG/L	0	0%		0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
Methyl bromide	UG/L	0	0%	5	0	0	117	20 UJ	20 U	20 U	20 U	10 U	4 UJ
Methyl butyl ketone	UG/L	0	0%		0	0	118	100 UJ	100 U	100 U	100 U	50 UJ	20 UJ
Methyl chloride	UG/L	0	0%	5	0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
Methyl cyclohexane	UG/L	0	0%		0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
Methyl ethyl ketone	UG/L	4900	18%		0	21	118	4100 J	2200	1700	1800	50 U	20 U
Methyl isobutyl ketone	UG/L	0	0%		0	0	118	100 UJ	100 U	100 U	100 U	50 U	20 U
Methylene chloride	UG/L	18	10%	5	7	12	118	18 J	20 U	13 J	11 J	10 U	4 U
Styrene	UG/L	0	0%	5	0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
Tetrachloroethene	UG/L	0	0%	5	0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
Toluene	UG/L	590	19%	5	16	23	118	20 UJ	20 U	20 U	20 U	7.3 J	5.9
Total Xylenes	UG/L	0	0%	5	0	0	118	60 UJ	60 U	60 U	60 U	30 U	12 U
Trans-1,2-Dichloroethene	UG/L	8	42%	5	3	50	118	20 UJ	20 U	20 U	20 U	10 U	4 U
Trans-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	20 UJ	20 U	20 U	20 U	10 U	4 U
Trichloroethene	UG/L	2700	68%	5	48	80	118	20 UJ	20 U	20 U	20 U	10 U	4 U
Trichlorofluoromethane	UG/L	0	0%	5	0	0	118	20 UJ	20 U	20 UJ	20 UJ	10 U	4 UJ
Vinyl chloride	UG/L	180	66%	2	67	78	118	20 UJ	20 U	20 U	20 U	10 U	4 U

Appendix B

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
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Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-27	MWT-27	MWT-27	MWT-27	MWT-27	MWT-27
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20067	ALBW20082	ALBW20097	ALBW20096	ALBW20112	ALBW20127
Sample Date								1/3/2007	3/16/2007	6/5/2007	6/5/2007	11/15/2007	6/24/2008
QC Code								SA	SA	DU	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								1	2	3	3	4	5
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Other													
Iron	UG/L	296000	100%		11	12	12	296000 J	229000				
Iron+Manganese	UG/L	352900	100%		12	12	12	352900 J	273500				
Manganese	UG/L	56900	100%		12	12	12	56900	44500				
Ethane	UG/L	98	88%		0	49	56	10000 UJ	0.15	0.079	0.082	0.025 U	2.3
Ethene	UG/L	200	88%		0	49	56	10000 UJ	2.7	0.32	0.34	0.014 J	0.049
Methane	UG/L	23000	95%		0	53	56	10000 UJ	15000	13000	14000	13000	13000
Sulfate	MG/L	1060	70%		0	39	56	10 U	10 U	2.7	2 U	31.7	2 U
Total Organic Carbon	MG/L	2050	100%		0	56	56	2050 J	1350	771	738	167	88.9

Notes:
1. The cleanup goal values are NYSDEC Class GA Groundwater Standards unless noted otherwise.
a. NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998).
b. Federal Maximum Contaminant Level (http://www.epa.gov/safewater/contaminants/index.html)
2. Shading indicates a concentration above the GA Groundwater standard.

U = compound was not detected
J = the reported value is and estimated concentration
UJ= the compound was not detected; the associated reporting limit is approximate.

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-27	MWT-27	MWT-27	MWT-27	MWT-27	MWT-28
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20143	ALBW20142	ALBW20157	ALBW20173	ALBW20172	ALBW20069
Sample Date								12/15/2008	12/15/2008	6/3/2009	12/16/2009	12/16/2009	1/3/2007
QC Code								DU	SA	SA	DU	SA	DU
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								6	6	7	8	8	1
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds													
1,1,1-Trichloroethane	UG/L	0.76	3%	5	0	4	118	2.6 UJ	2.6 UJ	2.6 U	1.3 U	1.3 U	20 UJ
1,1,2,2-Tetrachloroethane	UG/L	0	0%	5	0	0	118	2.1 UJ	2.1 UJ	2.1 U	1.1 U	1.1 U	20 UJ
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/L	0	0%	5	0	0	118	3.1 UJ	3.1 UJ	3.1 U	1.5 U	1.5 U	20 UJ
1,1,2-Trichloroethane	UG/L	0	0%	1	0	0	118	2.3 UJ	2.3 UJ	2.3 U	1.2 U	1.2 U	20 UJ
1,1-Dichloroethane	UG/L	1.1	7%	5	0	8	118	7.5 U	7.5 U	7.5 U	1.9 U	1.9 U	20 UJ
1,1-Dichloroethene	UG/L	2.1	7%	5	0	8	118	2.9 U	2.9 U	2.9 U	1.5 U	1.5 U	20 UJ
1,2,4-Trichlorobenzene	UG/L	0	0%	5	0	0	118	4.1 UJ	4.1 UJ	4.1 U	2 U	2 U	20 UJ
1,2-Dibromo-3-chloropropane	UG/L	0	0%	0.04	0	0	118	10 UJ	10 UJ	10 UJ	2 U	2 U	20 UJ
1,2-Dibromoethane	UG/L	0	0%	0.0006	0	0	118	1.7 UJ	1.7 UJ	1.7 U	0.83 U	0.83 U	20 UJ
1,2-Dichlorobenzene	UG/L	0	0%	3	0	0	118	2 U	2 U	2 U	1 U	1 U	20 UJ
1,2-Dichloroethane	UG/L	5.6	11%	0.6	11	13	118	2.1 U	2.1 U	2.1 U	1.1 U	1.1 U	20 UJ
1,2-Dichloropropane	UG/L	0	0%	1	0	0	118	1.4 U	1.4 U	1.4 U	1.6 U	1.6 U	20 UJ
1,3-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1.6 U	1.6 U	1.6 U	1.8 U	1.8 U	20 UJ
1,4-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1.6 U	1.6 U	1.6 U	2 U	2 U	20 UJ
Acetone	UG/L	2600	29%		0	34	118	13 UJ	26 J	13 U	6.7 U	6.7 U	2600 J
Benzene	UG/L	0	0%	1	0	0	118	1.6 U	1.6 U	1.6 U	2 U	2 U	20 UJ
Bromodichloromethane	UG/L	0	0%	80 [b]	0	0	118	3.8 U	3.8 U	3.9 U	1.9 U	1.9 U	20 UJ
Bromoform	UG/L	0	0%	80 [b]	0	0	118	2.6 UJ	2.6 UJ	2.6 UJ	1.3 U	1.3 U	20 UJ
Carbon disulfide	UG/L	0	0%		0	0	118	1.9 U	1.9 U	1.9 UJ	0.97 U	0.97 U	20 UJ
Carbon tetrachloride	UG/L	0	0%	5	0	0	118	2.7 UJ	2.7 UJ	2.7 U	1.3 U	1.3 U	20 UJ
Chlorobenzene	UG/L	0	0%	5	0	0	118	1.8 U	1.8 U	3.2 U	1.6 U	1.6 U	20 UJ
Chlorodibromomethane	UG/L	0	0%	80 [b]	0	0	118	3.2 U	3.2 U	3.2 U	1.6 U	1.6 U	20 UJ
Chloroethane	UG/L	1.1	6%	5	0	7	118	3.2 U	3.2 U	3.2 U	1.6 U	1.6 U	20 UJ
Chloroform	UG/L	27	5%	7	4	6	118	3.4 U	3.4 U	3.4 U	1.7 U	1.7 U	20 UJ
Cis-1,2-Dichloroethene	UG/L	720	81%	5	80	96	118	1.6 U	1.6 U	1.6 U	1.9 U	1.9 U	20 UJ
Cis-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	3.6 U	3.6 U	3.6 U	1.8 U	1.8 U	20 UJ
Cyclohexane	UG/L	0	0%		0	0	118	2.2 UJ	2.2 UJ	5.3 U	2.7 U	2.7 U	20 UJ
Dichlorodifluoromethane	UG/L	0	0%	5	0	0	118	2.8 U	2.8 U	2.9 U	1.4 U	1.4 U	20 UJ
Ethyl benzene	UG/L	1.3	3%	5	0	4	118	1.8 U	1.8 U	1.8 U	0.92 U	0.92 U	20 UJ
Isopropylbenzene	UG/L	0	0%	5	0	0	118	1.9 U	1.9 U	1.9 U	0.96 U	0.96 U	20 UJ
Methyl Acetate	UG/L	6	2%		0	2	118	1.7 UJ	1.7 UJ	1.7 UJ	2.5 U	2.5 U	20 UJ
Methyl Tertbutyl Ether	UG/L	0	0%		0	0	118	1.6 UJ	1.6 UJ	1.6 U	0.8 U	0.8 U	20 UJ
Methyl bromide	UG/L	0	0%	5	0	0	117	2.8 U	2.8 U	2.8 U	1.4 U	1.4 U	20 UJ
Methyl butyl ketone	UG/L	0	0%		0	0	118	12 U	12 U	12 U	6.2 U	6.2 U	100 UJ
Methyl chloride	UG/L	0	0%	5	0	0	118	3.4 U	3.4 U	3.5 U	1.7 U	1.7 U	20 UJ
Methyl cyclohexane	UG/L	0	0%		0	0	118	2.2 UJ	2.2 UJ	5 U	2.5 U	2.5 U	20 UJ
Methyl ethyl ketone	UG/L	4900	18%		0	21	118	13 UJ	13 UJ	13 U	6.6 U	6.6 U	4900 J
Methyl isobutyl ketone	UG/L	0	0%		0	0	118	9.1 UJ	9.1 UJ	9.1 U	4.5 U	4.5 U	100 UJ
Methylene chloride	UG/L	18	10%	5	7	12	118	4.4 UJ	4.4 UJ	4.4 U	2.2 U	2.2 U	14 J
Styrene	UG/L	0	0%	5	0	0	118	1.8 U	1.8 U	1.8 U	0.92 U	0.92 U	20 UJ
Tetrachloroethene	UG/L	0	0%	5	0	0	118	3.6 U	3.6 U	3.6 U	1.8 U	1.8 U	20 UJ
Toluene	UG/L	590	19%	5	16	23	118	7.2 J	6.9 J	5.1 U	2.6 U	2.6 U	350 J
Total Xylenes	UG/L	0	0%	5	0	0	118	9.3 U	9.3 U	6.6 U	3.3 U	3.3 U	60 UJ
Trans-1,2-Dichloroethene	UG/L	8	42%	5	3	50	118	1.3 U	1.3 U	1.3 U	2.1 U	2.1 U	20 UJ
Trans-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	3.7 U	3.7 U	3.7 U	1.8 U	1.8 U	20 UJ
Trichloroethene	UG/L	2700	68%	5	48	80	118	1.8 U	1.8 U	1.8 U	2.3 U	2.3 U	20 UJ
Trichlorofluoromethane	UG/L	0	0%	5	0	0	118	1.5 UJ	1.5 UJ	1.5 U	0.76 U	0.76 U	20 UJ
Vinyl chloride	UG/L	180	66%	2	67	78	118	2.4 U	2.4 U	2.4 U	2.9 J	3.2 J	20 UJ

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Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-27	MWT-27	MWT-27	MWT-27	MWT-27	MWT-28
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20143	ALBW20142	ALBW20157	ALBW20173	ALBW20172	ALBW20069
Sample Date								12/15/2008	12/15/2008	6/3/2009	12/16/2009	12/16/2009	1/3/2007
QC Code								DU	SA	SA	DU	SA	DU
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								6	6	7	8	8	1
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Other													
Iron	UG/L	296000	100%		11	12	12						271000 J
Iron+Manganese	UG/L	352900	100%		12	12	12						301800 J
Manganese	UG/L	56900	100%		12	12	12						30800
Ethane	UG/L	98	88%		0	49	56	1.6	1.6	5.1	4.3	4.4	10000 UJ
Ethene	UG/L	200	88%		0	49	56	0.12	0.13	0.15	1.1	1.2	10000 UJ
Methane	UG/L	23000	95%		0	53	56	15000	15000	14000	16000	15000	13000 J
Sulfate	MG/L	1060	70%		0	39	56	23.8	24.2	0.93 J	14 J	13.9 J	2.3
Total Organic Carbon	MG/L	2050	100%		0	56	56	53.1	53.8	81.7	50.9	49	1730 J

Notes:
1. The cleanup goal values are NYSDEC Class GA Groundwater Standards unless noted otherwise.
 a. NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998).
 b. Federal Maximum Contaminant Level (http://www.epa.gov/safewater/contaminants/index.html)
2. Shading indicates a concentration above the GA Groundwater standard.

U = compound was not detected
J = the reported value is and estimated concentration
UJ= the compound was not detected; the associated reporting limit is approximate.

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
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Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Cleanup Goals [1]	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-28	MWT-28	MWT-28	MWT-28	MWT-28	MWT-28
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20068	ALBW20083	ALBW20098	ALBW20113	ALBW20128	ALBW20144
Sample Date								1/3/2007	3/16/2007	6/5/2007	11/15/2007	6/25/2008	12/15/2008
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								1	2	3	4	5	6
Volatile Organic Compounds													
1,1,1-Trichloroethane	UG/L	0.76	3%	5	0	4	118	20 UJ	20 U	20 U	5 U	4 U	2.6 U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	5	0	0	118	20 UJ	20 U	20 U	5 U	4 U	2.1 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/L	0	0%	5	0	0	118	20 UJ	20 U	20 UJ	5 U	4 U	3.1 U
1,1,2-Trichloroethane	UG/L	0	0%	1	0	0	118	20 UJ	20 U	20 U	5 U	4 U	2.3 U
1,1-Dichloroethane	UG/L	1.1	7%	5	0	8	118	20 UJ	20 U	20 U	5 U	4 U	7.5 U
1,1-Dichloroethene	UG/L	2.1	7%	5	0	8	118	20 UJ	20 U	20 U	5 U	4 U	2.9 U
1,2,4-Trichlorobenzene	UG/L	0	0%	5	0	0	118	20 UJ	20 U	20 U	5 U	4 U	4.1 U
1,2-Dibromo-3-chloropropane	UG/L	0	0%	0.04	0	0	118	20 UJ	20 U	20 U	5 U	4 U	10 UJ
1,2-Dibromoethane	UG/L	0	0%	0.0006	0	0	118	20 UJ	20 U	20 U	5 U	4 U	1.7 U
1,2-Dichlorobenzene	UG/L	0	0%	3	0	0	118	20 UJ	20 U	20 U	5 U	4 U	2 U
1,2-Dichloroethane	UG/L	5.6	11%	0.6	11	13	118	20 UJ	20 U	20 U	5 U	4 U	2.1 U
1,2-Dichloropropane	UG/L	0	0%	1	0	0	118	20 UJ	20 U	20 U	5 U	4 U	1.4 U
1,3-Dichlorobenzene	UG/L	0	0%	3	0	0	118	20 UJ	20 U	20 U	5 U	4 U	1.6 U
1,4-Dichlorobenzene	UG/L	0	0%	3	0	0	118	20 UJ	20 U	20 U	5 U	4 U	1.6 U
Acetone	UG/L	2600	29%		0	34	118	2500 J	170	520	25 U	20 U	13 U
Benzene	UG/L	0	0%	1	0	0	118	20 UJ	20 U	20 U	5 U	4 U	1.6 U
Bromodichloromethane	UG/L	0	0%	80 [b]	0	0	118	20 UJ	20 U	20 U	5 U	4 U	3.8 U
Bromoform	UG/L	0	0%	80 [b]	0	0	118	20 UJ	20 U	20 U	5 U	4 U	2.6 U
Carbon disulfide	UG/L	0	0%		0	0	118	20 UJ	20 U	20 U	5 U	4 U	1.9 U
Carbon tetrachloride	UG/L	0	0%	5	0	0	118	20 UJ	20 U	20 U	5 U	4 U	2.7 U
Chlorobenzene	UG/L	0	0%	5	0	0	118	20 UJ	20 U	20 U	5 U	4 U	1.8 U
Chlorodibromomethane	UG/L	0	0%	80 [b]	0	0	118	20 UJ	20 U	20 U	5 U	4 U	3.2 U
Chloroethane	UG/L	1.1	6%	5	0	7	118	20 UJ	20 U	20 U	5 U	4 UJ	3.2 U
Chloroform	UG/L	27	5%	7	4	6	118	20 UJ	20 U	20 U	5 U	4 U	3.4 U
Cis-1,2-Dichloroethene	UG/L	720	81%	5	80	96	118	20 UJ	20 U	20 U	5 U	4 U	1.6 U
Cis-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	20 UJ	20 U	20 U	5 U	4 U	3.6 U
Cyclohexane	UG/L	0	0%		0	0	118	20 UJ	20 U	20 U	5 U	4 U	2.2 U
Dichlorodifluoromethane	UG/L	0	0%	5	0	0	118	20 UJ	20 U	20 U	5 U	4 U	2.8 U
Ethyl benzene	UG/L	1.3	3%	5	0	4	118	20 UJ	20 U	20 U	5 U	4 U	1.8 U
Isopropylbenzene	UG/L	0	0%	5	0	0	118	20 UJ	20 U	20 U	5 U	4 U	1.9 U
Methyl Acetate	UG/L	6	2%		0	2	118	20 UJ	20 UJ	20 U	5 UJ	4 UJ	1.7 U
Methyl Tertbutyl Ether	UG/L	0	0%		0	0	118	20 UJ	20 U	20 U	5 U	4 U	1.6 U
Methyl bromide	UG/L	0	0%	5	0	0	117	20 UJ	20 U	20 U	5 U	4 UJ	2.8 U
Methyl butyl ketone	UG/L	0	0%		0	0	118	100 UJ	100 U	100 U	25 UJ	20 UJ	12 U
Methyl chloride	UG/L	0	0%	5	0	0	118	20 UJ	20 U	20 U	5 U	4 U	3.4 U
Methyl cyclohexane	UG/L	0	0%		0	0	118	20 UJ	20 U	20 U	5 U	4 U	2.2 U
Methyl ethyl ketone	UG/L	4900	18%		0	21	118	4900 J	180	510	25 U	20 U	13 U
Methyl isobutyl ketone	UG/L	0	0%		0	0	118	100 UJ	100 U	100 U	25 U	20 U	9.1 U
Methylene chloride	UG/L	18	10%	5	7	12	118	**13** J	20 U	**9.3** J	5 U	4 U	4.4 UJ
Styrene	UG/L	0	0%	5	0	0	118	20 UJ	20 U	20 U	5 U	4 U	1.8 U
Tetrachloroethene	UG/L	0	0%	5	0	0	118	20 UJ	20 U	20 U	5 U	4 U	3.6 U
Toluene	UG/L	590	19%	5	16	23	118	**330** J	**160**	**500**	**210**	**53**	5.1 U
Total Xylenes	UG/L	0	0%	5	0	0	118	60 UJ	60 U	60 U	15 U	12 U	9.3 U
Trans-1,2-Dichloroethene	UG/L	8	42%	5	3	50	118	20 UJ	20 U	20 U	5 U	4 U	1.3 U
Trans-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	20 UJ	20 U	20 U	5 U	4 U	3.7 U
Trichloroethene	UG/L	2700	68%	5	48	80	118	20 UJ	20 U	20 U	5 U	4 U	1.8 U
Trichlorofluoromethane	UG/L	0	0%	5	0	0	118	20 UJ	20 U	20 UJ	5 U	4 UJ	1.5 U
Vinyl chloride	UG/L	180	66%	2	67	78	118	20 UJ	20 U	20 U	5 U	4 U	2.4 U

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Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
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Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-28	MWT-28	MWT-28	MWT-28	MWT-28	MWT-28
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20068	ALBW20083	ALBW20098	ALBW20113	ALBW20128	ALBW20144
Sample Date								1/3/2007	3/16/2007	6/5/2007	11/15/2007	6/25/2008	12/15/2008
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								1	2	3	4	5	6
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Other													
Iron	UG/L	296000	100%		11	12	12	278000 J	33000				
Iron+Manganese	UG/L	352900	100%		12	12	12	309800 J	37450				
Manganese	UG/L	56900	100%		12	12	12	31800	4450				
Ethane	UG/L	98	88%		0	49	56	10000 UJ	0.67	0.01 J	0.014 J	0.65	2
Ethene	UG/L	200	88%		0	49	56	10000 UJ	0.48	0.057	0.025 U	0.044	0.12
Methane	UG/L	23000	95%		0	53	56	12000 J	19000	11000	11000	12000	19000
Sulfate	MG/L	1060	70%		0	39	56	2 U	2 U	2 U	2 U	2 U	48.3
Total Organic Carbon	MG/L	2050	100%		0	56	56	1820 J	171	309	92	49.2	27.9

Notes:
1. The cleanup goal values are NYSDEC Class GA Groundwater Standards unless noted otherwise.
 a. NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998).
 b. Federal Maximum Contaminant Level (http://www.epa.gov/safewater/contaminants/index.html)
2. Shading indicates a concentration above the GA Groundwater standard.

U = compound was not detected
J = the reported value is and estimated concentration
UJ= the compound was not detected; the associated reporting limit is approximate.

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Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
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Parameter	Units	Maximum Value	Frequency of Detection	Cleanup Goals [1]	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-28	MWT-28	MWT-28	MWT-29	MWT-29	MWT-29
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20159	ALBW20158	ALBW20174	ALBW20070	ALBW20085	ALBW20084
Sample Date								6/3/2009	6/3/2009	12/18/2009	1/3/2007	3/16/2007	3/16/2007
QC Code								DU	SA	SA	SA	DU	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								7	7	8	1	2	2
Volatile Organic Compounds													
1,1,1-Trichloroethane	UG/L	0.76	3%	5	0	4	118	0.26 U	0.26 U	1.3 U	2 U	4 U	5 U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	5	0	0	118	0.21 U	0.21 U	1.1 U	2 U	4 U	5 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/L	0	0%	5	0	0	118	0.31 U	0.31 U	1.5 UJ	2 U	4 U	5 U
1,1,2-Trichloroethane	UG/L	0	0%	1	0	0	118	0.23 U	0.23 U	1.2 U	2 U	4 U	5 U
1,1-Dichloroethane	UG/L	1.1	7%	5	0	8	118	0.75 U	0.75 U	1.9 U	2 U	4 U	5 U
1,1-Dichloroethene	UG/L	2.1	7%	5	0	8	118	0.29 U	0.29 U	1.5 U	2 U	4 U	5 U
1,2,4-Trichlorobenzene	UG/L	0	0%	5	0	0	118	0.41 U	0.41 U	2 U	2 U	4 U	5 U
1,2-Dibromo-3-chloropropane	UG/L	0	0%	0.04	0	0	118	1 UJ	1 UJ	2 U	2 U	4 U	5 U
1,2-Dibromoethane	UG/L	0	0%	0.0006	0	0	118	0.17 U	0.17 U	0.83 U	2 U	4 U	5 U
1,2-Dichlorobenzene	UG/L	0	0%	3	0	0	118	0.2 U	0.2 U	1 U	2 U	4 U	5 U
1,2-Dichloroethane	UG/L	5.6	11%	0.6	11	13	118	0.21 U	0.21 U	1.1 U	2 U	4 U	5 U
1,2-Dichloropropane	UG/L	0	0%	1	0	0	118	0.14 U	0.14 U	1.6 U	2 U	4 U	5 U
1,3-Dichlorobenzene	UG/L	0	0%	3	0	0	118	0.16 U	0.16 U	1.8 U	2 U	4 U	5 U
1,4-Dichlorobenzene	UG/L	0	0%	3	0	0	118	0.16 U	0.16 U	2 U	2 U	4 U	5 U
Acetone	UG/L	2600	29%		0	34	118	1.9 J	1.9 J	6.7 U	10 U	14 J	15 J
Benzene	UG/L	0	0%	1	0	0	118	0.16 U	0.16 U	2 U	2 U	4 U	5 U
Bromodichloromethane	UG/L	0	0%	80[b]	0	0	118	0.39 U	0.39 U	1.9 U	2 U	4 U	5 U
Bromoform	UG/L	0	0%	80[b]	0	0	118	0.26 UJ	0.26 UJ	1.3 U	2 U	4 U	5 U
Carbon disulfide	UG/L	0	0%		0	0	118	0.19 UJ	0.19 UJ	0.97 U	2 U	4 U	5 U
Carbon tetrachloride	UG/L	0	0%	5	0	0	118	0.27 U	0.27 U	1.3 U	2 U	4 U	5 U
Chlorobenzene	UG/L	0	0%	5	0	0	118	0.32 U	0.32 U	1.6 U	2 U	4 U	5 U
Chlorodibromomethane	UG/L	0	0%	80[b]	0	0	118	0.32 U	0.32 U	1.6 U	2 U	4 U	5 U
Chloroethane	UG/L	1.1	6%	5	0	7	118	0.32 U	0.32 U	1.6 UJ	2 U	4 U	5 U
Chloroform	UG/L	27	5%	7	4	6	118	0.34 U	0.34 U	1.7 U	2 U	4 U	5 U
Cis-1,2-Dichloroethene	UG/L	720	81%	5	80	96	118	0.16 U	0.16 U	1.9 U	280	220	220
Cis-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	0.36 U	0.36 U	1.8 U	2 U	4 U	5 U
Cyclohexane	UG/L	0	0%		0	0	118	0.53 U	0.53 U	2.7 U	2 U	4 U	5 U
Dichlorodifluoromethane	UG/L	0	0%	5	0	0	118	0.29 U	0.29 U	1.4 U	2 U	4 U	5 U
Ethyl benzene	UG/L	1.3	3%	5	0	4	118	0.18 U	0.18 U	0.92 U	2 U	4 U	5 U
Isopropylbenzene	UG/L	0	0%	5	0	0	118	0.19 U	0.19 U	0.96 U	2 U	4 U	5 U
Methyl Acetate	UG/L	6	2%		0	2	118	0.17 UJ	0.17 UJ	2.5 U	2 U	4 UJ	5 UJ
Methyl Tertbutyl Ether	UG/L	0	0%		0	0	118	0.16 U	0.16 U	0.8 U	2 U	4 U	5 U
Methyl bromide	UG/L	0	0%	5	0	0	117	0.28 U	0.28 U	1.4 UJ	2 U	4 U	5 U
Methyl butyl ketone	UG/L	0	0%		0	0	118	1.2 U	1.2 U	6.2 U	10 U	20 U	25 U
Methyl chloride	UG/L	0	0%	5	0	0	118	0.35 U	0.35 U	1.7 U	2 U	4 U	5 U
Methyl cyclohexane	UG/L	0	0%		0	0	118	0.5 U	0.5 U	2.5 U	2 U	4 U	5 U
Methyl ethyl ketone	UG/L	4900	18%		0	21	118	1.3 U	1.3 U	6.6 U	10 U	20 U	25 U
Methyl isobutyl ketone	UG/L	0	0%		0	0	118	0.91 U	0.91 U	4.5 U	10 U	20 U	25 U
Methylene chloride	UG/L	18	10%	5	7	12	118	0.44 U	0.44 U	2.2 U	2 U	4 U	2.5 J
Styrene	UG/L	0	0%	5	0	0	118	0.18 U	0.18 U	0.92 U	2 U	4 U	5 U
Tetrachloroethene	UG/L	0	0%	5	0	0	118	0.36 U	0.36 U	1.8 U	2 U	4 U	5 U
Toluene	UG/L	590	19%	5	16	23	118	0.6 J	0.57 J	2.6 U	2.6	2.2 J	5 U
Total Xylenes	UG/L	0	0%	5	0	0	118	0.66 U	0.66 U	3.3 U	6 U	12 U	15 U
Trans-1,2-Dichloroethene	UG/L	8	42%	5	3	50	118	0.13 U	0.13 U	2.1 U	6.5	8	7.5
Trans-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	0.37 U	0.37 U	1.8 U	2 U	4 U	5 U
Trichloroethene	UG/L	2700	68%	5	48	80	118	0.18 U	0.18 U	2.3 U	22	19	19
Trichlorofluoromethane	UG/L	0	0%	5	0	0	118	0.15 U	0.15 U	0.76 UJ	2 U	4 U	5 U
Vinyl chloride	UG/L	180	66%	2	67	78	118	0.24 U	0.24 U	1.2 U	140	170	160

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Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-28	MWT-28	MWT-28	MWT-29	MWT-29	MWT-29
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20159	ALBW20158	ALBW20174	ALBW20070	ALBW20085	ALBW20084
Sample Date								6/3/2009	6/3/2009	12/18/2009	1/3/2007	3/16/2007	3/16/2007
QC Code								DU	SA	SA	SA	DU	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								7	7	8	1	2	2
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Other													
Iron	UG/L	296000	100%		11	12	12				1370 J	2550	2470
Iron+Manganese	UG/L	352900	100%		12	12	12				8620 J	9050	8750
Manganese	UG/L	56900	100%		12	12	12				7250	6500	6280
Ethane	UG/L	98	88%		0	49	56	1.7	1.9	1.6	2000 U	25	20
Ethene	UG/L	200	88%		0	49	56	0.066	0.062	0.12	2000 U	150	120
Methane	UG/L	23000	95%		0	53	56	12000	14000	15000	2000 U	8100	6500
Sulfate	MG/L	1060	70%		0	39	56	0.35 U	0.35 U	3.16	113	173	179
Total Organic Carbon	MG/L	2050	100%		0	56	56	27.6	28.7	25.5	25.1 J	36.7	35

Notes:
1. The cleanup goal values are NYSDEC Class GA Groundwater Standards unless noted otherwise.
a. NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998).
b. Federal Maximum Contaminant Level (http://www.epa.gov/safewater/contaminants/index.html)
2. Shading indicates a concentration above the GA Groundwater standard.

U = compound was not detected
J = the reported value is and estimated concentration
UJ= the compound was not detected; the associated reporting limit is approximate.

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
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Parameter	Units	Maximum Value	Frequency of Detection	Cleanup Goals [1]	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed						
Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-29	MWT-29	MWT-29	MWT-29	MWT-29	MWT-29
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20099	ALBW20114	ALBW20130	ALBW20129	ALBW20145	ALBW20160
Sample Date								6/5/2007	11/14/2007	6/25/2008	6/25/2008	12/15/2008	6/3/2009
QC Code								SA	SA	DU	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								3	4	5	5	6	7
								Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds													
1,1,1-Trichloroethane	UG/L	0.76	3%	5	0	4	118	2 U	1 U	1 U	1 U	0.26 UJ	0.26 U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	5	0	0	118	2 U	1 U	1 U	1 U	0.21 UJ	0.21 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/L	0	0%	5	0	0	118	2 UJ	1 U	1 U	1 U	0.31 UJ	0.31 U
1,1,2-Trichloroethane	UG/L	0	0%	1	0	0	118	2 U	1 U	1 U	1 U	0.23 UJ	0.23 U
1,1-Dichloroethane	UG/L	1.1	7%	5	0	8	118	2 U	1 U	1 U	1 U	0.75 U	0.75 U
1,1-Dichloroethene	UG/L	2.1	7%	5	0	8	118	2 U	1 U	1 U	1 U	0.29 U	0.29 U
1,2,4-Trichlorobenzene	UG/L	0	0%	5	0	0	118	2 U	1 U	1 U	1 U	0.41 UJ	0.41 U
1,2-Dibromo-3-chloropropane	UG/L	0	0%	0.04	0	0	118	2 U	1 U	1 U	1 U	1 UJ	1 UJ
1,2-Dibromoethane	UG/L	0	0%	0.0006	0	0	118	2 U	1 U	1 U	1 U	0.17 UJ	0.17 U
1,2-Dichlorobenzene	UG/L	0	0%	3	0	0	118	2 U	1 U	1 U	1 U	0.2 U	0.2 U
1,2-Dichloroethane	UG/L	5.6	11%	0.6	11	13	118	2 U	1 U	1 U	1 U	0.21 U	0.21 U
1,2-Dichloropropane	UG/L	0	0%	1	0	0	118	2 U	1 U	1 U	1 U	0.14 U	0.14 U
1,3-Dichlorobenzene	UG/L	0	0%	3	0	0	118	2 U	1 U	1 U	1 U	0.16 U	0.16 U
1,4-Dichlorobenzene	UG/L	0	0%	3	0	0	118	2 U	1 U	1 U	1 U	0.16 U	0.16 U
Acetone	UG/L	2600	29%		0	34	118	5.7 J	5 U	5 U	5 U	1.3 UJ	1.3 U
Benzene	UG/L	0	0%	1	0	0	118	2 U	1 U	1 U	1 U	0.16 U	0.16 U
Bromodichloromethane	UG/L	0	0%	80 [b]	0	0	118	2 U	1 U	1 U	1 U	0.38 U	0.39 U
Bromoform	UG/L	0	0%	80 [b]	0	0	118	2 U	1 U	1 U	1 U	0.26 UJ	0.26 UJ
Carbon disulfide	UG/L	0	0%		0	0	118	2 U	1 U	1 U	1 U	0.19 U	0.19 UJ
Carbon tetrachloride	UG/L	0	0%	5	0	0	118	2 U	1 U	1 U	1 U	0.27 UJ	0.27 U
Chlorobenzene	UG/L	0	0%	5	0	0	118	2 U	1 U	1 U	1 U	0.18 U	0.32 U
Chlorodibromomethane	UG/L	0	0%	80 [b]	0	0	118	2 U	1 U	1 U	1 U	0.32 U	0.32 U
Chloroethane	UG/L	1.1	6%	5	0	7	118	2 U	1 U	1 UJ	1 UJ	0.32 U	0.32 U
Chloroform	UG/L	27	5%	7	4	6	118	2 U	1 U	1 U	1 U	0.34 U	0.34 U
Cis-1,2-Dichloroethene	UG/L	720	81%	5	80	96	118	100	96	85	83	91	61
Cis-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	2 U	1 U	1 U	1 U	0.36 U	0.36 U
Cyclohexane	UG/L	0	0%		0	0	118	2 U	1 U	1 U	1 U	0.22 UJ	0.53 U
Dichlorodifluoromethane	UG/L	0	0%	5	0	0	118	2 U	1 U	1 U	1 U	0.28 U	0.29 U
Ethyl benzene	UG/L	1.3	3%	5	0	4	118	2 U	1 U	1 U	1 U	0.18 U	0.18 U
Isopropylbenzene	UG/L	0	0%	5	0	0	118	2 U	1 U	1 U	1 U	0.19 U	0.19 U
Methyl Acetate	UG/L	6	2%		0	2	118	2 U	1 UJ	1 UJ	1 UJ	0.17 UJ	0.17 UJ
Methyl Tertbutyl Ether	UG/L	0	0%		0	0	118	2 U	1 U	1 U	1 U	0.16 UJ	0.16 U
Methyl bromide	UG/L	0	0%	5	0	0	117	2 U	1 U	1 UJ	1 UJ	0.28 U	0.28 U
Methyl butyl ketone	UG/L	0	0%		0	0	118	10 U	5 UJ	5 UJ	5 UJ	1.2 U	1.2 U
Methyl chloride	UG/L	0	0%	5	0	0	118	2 U	1 U	1 U	1 U	0.34 U	0.35 U
Methyl cyclohexane	UG/L	0	0%		0	0	118	2 U	1 U	1 U	1 U	0.22 UJ	0.5 U
Methyl ethyl ketone	UG/L	4900	18%		0	21	118	10 U	5 U	5 U	5 U	1.3 UJ	1.3 U
Methyl isobutyl ketone	UG/L	0	0%		0	0	118	10 U	5 U	5 U	5 U	0.91 UJ	0.91 U
Methylene chloride	UG/L	18	10%	5	7	12	118	2 U	1 U	1 U	1 U	0.44 UJ	0.44 U
Styrene	UG/L	0	0%	5	0	0	118	2 U	1 U	1 U	1 U	0.18 U	0.18 U
Tetrachloroethene	UG/L	0	0%	5	0	0	118	2 U	1 U	1 U	1 U	0.36 U	0.36 U
Toluene	UG/L	590	19%	5	16	23	118	2 U	2.1	1 U	1 U	0.51 U	0.51 U
Total Xylenes	UG/L	0	0%	5	0	0	118	6 U	3 U	3 U	3 U	0.93 U	0.66 U
Trans-1,2-Dichloroethene	UG/L	8	42%	5	3	50	118	2.1	0.83 J	0.68 J	0.62 J	0.6 J	0.67 J
Trans-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	2 U	1 U	1 U	1 U	0.37 U	0.37 U
Trichloroethene	UG/L	2700	68%	5	48	80	118	7.6	4.4	3.3	3.2	6.6	4.5
Trichlorofluoromethane	UG/L	0	0%	5	0	0	118	2 UJ	1 U	1 UJ	1 UJ	0.15 UJ	0.15 U
Vinyl chloride	UG/L	180	66%	2	67	78	118	81	74	74	73	80	43

Appendix B

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
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Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-29	MWT-29	MWT-29	MWT-29	MWT-29	MWT-29
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20099	ALBW20114	ALBW20130	ALBW20129	ALBW20145	ALBW20160
Sample Date								6/5/2007	11/14/2007	6/25/2008	6/25/2008	12/15/2008	6/3/2009
QC Code								SA	SA	DU	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								3	4	5	5	6	7
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Other													
Iron	UG/L	296000	100%		11	12	12						
Iron+Manganese	UG/L	352900	100%		12	12	12						
Manganese	UG/L	56900	100%		12	12	12						
Ethane	UG/L	98	88%		0	49	56	13	19	14	15	14	10
Ethene	UG/L	200	88%		0	49	56	160	200	140	140	19	47
Methane	UG/L	23000	95%		0	53	56	2800	2600	3000	3200	2700	3000
Sulfate	MG/L	1060	70%		0	39	56	151	289	174	173	312	300
Total Organic Carbon	MG/L	2050	100%		0	56	56	15.7	20.9	14	14.2	13.6	11.8

Notes:
1. The cleanup goal values are NYSDEC Class GA Groundwater Standards unless noted otherwise.
 a. NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998).
 b. Federal Maximum Contaminant Level (http://www.epa.gov/safewater/contaminants/index.html)
2. Shading indicates a concentration above the GA Groundwater standard.

U = compound was not detected
J = the reported value is and estimated concentration
UJ= the compound was not detected; the associated reporting limit is approximate.

Appendix B

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
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Parameter	Units	Maximum Value	Frequency of Detection	Cleanup Goals [1]	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed						
Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-29	MWT-22	MWT-22	MWT-22	MWT-22	MWT-22
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20175	ALBW20071	ALBW20075	ALBW20100	ALBW20115	ALBW20121
Sample Date								12/16/2009	1/4/2007	3/17/2007	6/6/2007	11/14/2007	6/25/2008
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								8	1	2	3	4	5
								Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds													
1,1,1-Trichloroethane	UG/L	0.76	3%	5	0	4	118	0.26 U	2 U	4 U	1 U	1 U	5 U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	5	0	0	118	0.21 U	2 U	4 U	1 U	1 U	5 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/L	0	0%	5	0	0	118	0.31 U	2 U	4 U	1 UJ	1 U	5 UJ
1,1,2-Trichloroethane	UG/L	0	0%	1	0	0	118	0.23 U	2 U	4 U	1 U	1 U	5 U
1,1-Dichloroethane	UG/L	1.1	7%	5	0	8	118	0.38 U	2 U	4 U	1 U	1 U	5 U
1,1-Dichloroethene	UG/L	2.1	7%	5	0	8	118	0.29 U	2 U	4 U	1 U	1 U	5 U
1,2,4-Trichlorobenzene	UG/L	0	0%	5	0	0	118	0.41 U	2 U	4 U	1 U	1 U	5 U
1,2-Dibromo-3-chloropropane	UG/L	0	0%	0.04	0	0	118	0.39 U	2 U	4 U	1 U	1 U	5 UJ
1,2-Dibromoethane	UG/L	0	0%	0.0006	0	0	118	0.17 U	2 U	4 U	1 U	1 U	5 U
1,2-Dichlorobenzene	UG/L	0	0%	3	0	0	118	0.2 U	2 U	4 U	1 U	1 U	5 U
1,2-Dichloroethane	UG/L	5.6	11%	0.6	11	13	118	0.21 U	2 U	4 U	1 U	1 U	5 U
1,2-Dichloropropane	UG/L	0	0%	1	0	0	118	0.32 U	2 U	4 U	1 U	1 U	5 U
1,3-Dichlorobenzene	UG/L	0	0%	3	0	0	118	0.36 U	2 U	4 U	1 U	1 U	5 U
1,4-Dichlorobenzene	UG/L	0	0%	3	0	0	118	0.39 U	2 U	4 U	1 U	1 U	5 U
Acetone	UG/L	2600	29%		0	34	118	1.3 U	10 U	18 J	38	5 U	25 U
Benzene	UG/L	0	0%	1	0	0	118	0.41 U	2 U	4 U	1 U	1 U	5 U
Bromodichloromethane	UG/L	0	0%	80 [b]	0	0	118	0.39 U	2 U	4 U	1 U	1 U	5 U
Bromoform	UG/L	0	0%	80 [b]	0	0	118	0.26 U	2 U	4 U	1 U	1 U	5 U
Carbon disulfide	UG/L	0	0%		0	0	118	0.19 U	2 U	4 U	1 U	1 U	5 U
Carbon tetrachloride	UG/L	0	0%	5	0	0	118	0.27 U	2 U	4 U	1 U	1 U	5 U
Chlorobenzene	UG/L	0	0%	5	0	0	118	0.32 U	2 U	4 U	1 U	1 U	5 U
Chlorodibromomethane	UG/L	0	0%	80 [b]	0	0	118	0.32 U	2 U	4 U	1 U	1 U	5 U
Chloroethane	UG/L	1.1	6%	5	0	7	118	0.32 U	2 UJ	4 U	1 U	1 U	5 UJ
Chloroform	UG/L	27	5%	7	4	6	118	0.34 U	2 U	4 U	1 U	1 U	5 U
Cis-1,2-Dichloroethene	UG/L	720	81%	5	80	96	118	37	130	90	120	99	68
Cis-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	0.36 U	2 U	4 U	1 U	1 U	5 U
Cyclohexane	UG/L	0	0%		0	0	118	0.53 U	2 U	4 U	1 U	1 U	5 U
Dichlorodifluoromethane	UG/L	0	0%	5	0	0	118	0.29 U	2 U	4 U	1 U	1 U	5 U
Ethyl benzene	UG/L	1.3	3%	5	0	4	118	0.18 U	2 U	4 U	1 U	1 U	5 U
Isopropylbenzene	UG/L	0	0%	5	0	0	118	0.19 U	2 U	4 U	1 U	1 U	5 U
Methyl Acetate	UG/L	6	2%		0	2	118	0.5 U	2 U	4 UJ	1 U	1 UJ	5 UJ
Methyl Tertbutyl Ether	UG/L	0	0%		0	0	118	0.16 U	2 U	4 U	1 U	1 U	5 U
Methyl bromide	UG/L	0	0%	5	0	0	117	0.28 U	2 U	4 U	1 U	1 U	5 UJ
Methyl butyl ketone	UG/L	0	0%		0	0	118	1.2 U	10 U	20 U	5 U	5 UJ	25 UJ
Methyl chloride	UG/L	0	0%	5	0	0	118	0.35 U	2 U	4 U	1 U	1 U	5 UJ
Methyl cyclohexane	UG/L	0	0%		0	0	118	0.5 U	2 U	4 U	1 U	1 U	5 U
Methyl ethyl ketone	UG/L	4900	18%		0	21	118	1.3 U	6 J	20 U	5 U	5 U	25 UJ
Methyl isobutyl ketone	UG/L	0	0%		0	0	118	0.91 U	10 U	20 U	5 U	5 U	25 UJ
Methylene chloride	UG/L	18	10%	5	7	12	118	0.44 U	1.2 J	4 U	1 U	1 U	5 U
Styrene	UG/L	0	0%	5	0	0	118	0.18 U	2 U	4 U	1 U	1 U	5 U
Tetrachloroethene	UG/L	0	0%	5	0	0	118	0.36 U	2 U	4 U	1 U	1 U	5 U
Toluene	UG/L	590	19%	5	16	23	118	0.51 U	2 U	4 U	1 U	1 U	5 U
Total Xylenes	UG/L	0	0%	5	0	0	118	0.66 U	6 U	12 U	3 U	3 U	15 U
Trans-1,2-Dichloroethene	UG/L	8	42%	5	3	50	118	0.65 J	2.7	4 U	3.2	0.85 J	5 U
Trans-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	0.37 U	2 U	4 U	1 U	1 U	5 U
Trichloroethene	UG/L	2700	68%	5	48	80	118	3.5	5.2	3.8 J	6.5	2.6	3 J
Trichlorofluoromethane	UG/L	0	0%	5	0	0	118	0.15 U	2 U	4 U	1 UJ	1 U	5 UJ
Vinyl chloride	UG/L	180	66%	2	67	78	118	29	98	64	81	180	42

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Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
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Parameter	Units	Maximum Value	Frequency of Detection	Cleanup Goals [1]	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-29	MWT-22	MWT-22	MWT-22	MWT-22	MWT-22
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20175	ALBW20071	ALBW20075	ALBW20100	ALBW20115	ALBW20121
Sample Date								12/16/2009	1/4/2007	3/17/2007	6/6/2007	11/14/2007	6/25/2008
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								8	1	2	3	4	5
Other													
Iron	UG/L	296000	100%		11	12	12						
Iron+Manganese	UG/L	352900	100%		12	12	12						
Manganese	UG/L	56900	100%		12	12	12						
Ethane	UG/L	98	88%		0	49	56	6.7					
Ethene	UG/L	200	88%		0	49	56	12					
Methane	UG/L	23000	95%		0	53	56	1500					
Sulfate	MG/L	1060	70%		0	39	56	644 J					
Total Organic Carbon	MG/L	2050	100%		0	56	56	8.2					

Notes:
1. The cleanup goal values are NYSDEC Class GA Groundwater Standards unless noted otherwise.
 a. NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998).
 b. Federal Maximum Contaminant Level (http://www.epa.gov/safewater/contaminants/index.html)
2. Shading indicates a concentration above the GA Groundwater standard.

U = compound was not detected
J = the reported value is and estimated concentration
UJ= the compound was not detected; the associated reporting limit is approximate.

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
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Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Cleanup Goals [1]	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-22	MWT-22	MWT-22	PT-22	PT-22	PT-22
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20136	ALBW20151	ALBW20166	ALBW20060	ALBW20086	ALBW20089
Sample Date								12/15/2008	6/3/2009	12/16/2009	1/3/2007	3/15/2007	6/5/2007
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								6	7	8	1	2	3
Volatile Organic Compounds													
1,1,1-Trichloroethane	UG/L	0.76	3%	5	0	4	118	1.3 UJ	0.26 U	1.3 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	5	0	0	118	1 UJ	0.21 U	1.1 U	1 U	1 U	1 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/L	0	0%	5	0	0	118	1.6 UJ	0.31 U	1.5 U	1 U	1 U	1 U
1,1,2-Trichloroethane	UG/L	0	0%	1	0	0	118	1.2 UJ	0.23 U	1.2 U	1 U	1 U	1 U
1,1-Dichloroethane	UG/L	1.1	7%	5	0	8	118	3.8 U	0.75 U	1.9 U	1 U	1 U	1 U
1,1-Dichloroethene	UG/L	2.1	7%	5	0	8	118	1.4 U	0.29 U	1.5 U	1 U	1 U	1 U
1,2,4-Trichlorobenzene	UG/L	0	0%	5	0	0	118	2 UJ	0.41 U	2 U	1 U	1 U	1 UJ
1,2-Dibromo-3-chloropropane	UG/L	0	0%	0.04	0	0	118	5 UJ	1 UJ	2 U	1 U	1 U	1 U
1,2-Dibromoethane	UG/L	0	0%	0.0006	0	0	118	0.85 UJ	0.17 U	0.83 U	1 U	1 U	1 U
1,2-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1 U	0.2 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	UG/L	5.6	11%	0.6	11	13	118	1 U	0.21 U	1.1 U	3.3	2.4	5.6
1,2-Dichloropropane	UG/L	0	0%	1	0	0	118	0.7 U	0.14 U	1.6 U	1 U	1 U	1 U
1,3-Dichlorobenzene	UG/L	0	0%	3	0	0	118	0.8 U	0.16 U	1.8 U	1 U	1 U	1 U
1,4-Dichlorobenzene	UG/L	0	0%	3	0	0	118	0.8 U	0.16 U	2 U	1 U	1 U	1 U
Acetone	UG/L	2600	29%		0	34	118	6.5 UJ	2.5 J	6.7 U	5 U	5 U	3.8 J
Benzene	UG/L	0	0%	1	0	0	118	0.8 U	0.16 U	2 U	1 U	1 U	1 U
Bromodichloromethane	UG/L	0	0%	80 [b]	0	0	118	1.9 U	0.39 U	1.9 U	1 U	1 U	1 U
Bromoform	UG/L	0	0%	80 [b]	0	0	118	1.3 UJ	0.26 UJ	1.3 U	1 U	1 U	1 U
Carbon disulfide	UG/L	0	0%		0	0	118	0.95 U	0.19 UJ	0.97 U	1 U	1 U	1 U
Carbon tetrachloride	UG/L	0	0%	5	0	0	118	1.4 UJ	0.27 U	1.3 U	1 U	1 U	1 U
Chlorobenzene	UG/L	0	0%	5	0	0	118	0.9 U	0.32 U	1.6 U	1 U	1 U	1 U
Chlorodibromomethane	UG/L	0	0%	80 [b]	0	0	118	1.6 U	0.32 U	1.6 U	1 U	1 U	1 U
Chloroethane	UG/L	1.1	6%	5	0	7	118	1.6 U	0.32 U	1.6 U	1 UJ	1 U	1.1 J
Chloroform	UG/L	27	5%	7	4	6	118	1.7 U	0.34 U	1.7 U	1 U	1 U	1 U
Cis-1,2-Dichloroethene	UG/L	720	81%	5	80	96	118	160	66	57	57	41	61
Cis-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	1.8 U	0.36 U	1.8 U	1 U	1 U	1 U
Cyclohexane	UG/L	0	0%		0	0	118	1.1 UJ	0.53 U	2.7 U	1 U	1 U	1 U
Dichlorodifluoromethane	UG/L	0	0%	5	0	0	118	1.4 U	0.29 U	1.4 U	1 U	1 U	1 UJ
Ethyl benzene	UG/L	1.3	3%	5	0	4	118	0.9 U	0.18 U	0.92 U	1 U	1 U	1 U
Isopropylbenzene	UG/L	0	0%	5	0	0	118	0.95 U	0.19 U	0.96 U	1 U	1 U	1 U
Methyl Acetate	UG/L	6	2%		0	2	118	0.85 UJ	0.17 UJ	2.5 U	1 U	1 UJ	1 UJ
Methyl Tertbutyl Ether	UG/L	0	0%		0	0	118	0.8 UJ	0.16 U	0.8 U	1 U	1 U	1 U
Methyl bromide	UG/L	0	0%	5	0	0	117	1.4 U	0.28 U	1.4 U	1 U	1 U	1 UJ
Methyl butyl ketone	UG/L	0	0%		0	0	118	6 U	1.2 U	6.2 U	5 U	5 U	5 U
Methyl chloride	UG/L	0	0%	5	0	0	118	1.7 U	0.35 U	1.7 U	1 U	1 U	1 U
Methyl cyclohexane	UG/L	0	0%		0	0	118	1.1 UJ	0.5 U	2.5 U	1 U	1 U	1 UJ
Methyl ethyl ketone	UG/L	4900	18%		0	21	118	6.5 UJ	1.3 U	6.6 U	5 U	5 U	5 U
Methyl isobutyl ketone	UG/L	0	0%		0	0	118	4.6 UJ	0.91 U	4.5 U	5 U	5 U	5 U
Methylene chloride	UG/L	18	10%	5	7	12	118	2.2 UJ	0.44 U	2.2 U	1 UJ	1 U	1 U
Styrene	UG/L	0	0%	5	0	0	118	0.9 U	0.18 U	0.92 U	1 U	1 U	1 U
Tetrachloroethene	UG/L	0	0%	5	0	0	118	1.8 U	0.36 U	1.8 U	1 U	1 U	1 U
Toluene	UG/L	590	19%	5	16	23	118	2.6 U	0.51 U	2.6 U	1 U	1 U	1 U
Total Xylenes	UG/L	0	0%	5	0	0	118	4.6 U	0.66 U	3.3 U	3 U	3 U	3 U
Trans-1,2-Dichloroethene	UG/L	8	42%	5	3	50	118	0.65 U	0.77 J	2.1 U	0.86 J	0.51 J	0.72 J
Trans-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	1.8 U	0.37 U	1.8 U	1 U	1 U	1 U
Trichloroethene	UG/L	2700	68%	5	48	80	118	5.9	2.2	2.3 U	11	16	8.5
Trichlorofluoromethane	UG/L	0	0%	5	0	0	118	0.75 UJ	0.15 U	0.76 U	1 U	1 U	1 U
Vinyl chloride	UG/L	180	66%	2	67	78	118	140	89	52	22	13	32

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Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
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Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-22	MWT-22	MWT-22	PT-22	PT-22	PT-22
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20136	ALBW20151	ALBW20166	ALBW20060	ALBW20086	ALBW20089
Sample Date								12/15/2008	6/3/2009	12/16/2009	1/3/2007	3/15/2007	6/5/2007
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								6	7	8	1	2	3
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Other													
Iron	UG/L	296000	100%		11	12	12						
Iron+Manganese	UG/L	352900	100%		12	12	12						
Manganese	UG/L	56900	100%		12	12	12						
Ethane	UG/L	98	88%		0	49	56						
Ethene	UG/L	200	88%		0	49	56						
Methane	UG/L	23000	95%		0	53	56						
Sulfate	MG/L	1060	70%		0	39	56						
Total Organic Carbon	MG/L	2050	100%		0	56	56						

Notes:
1. The cleanup goal values are NYSDEC Class GA Groundwater Standards unless noted otherwise.
a. NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998).
b. Federal Maximum Contaminant Level (http://www.epa.gov/safewater/contaminants/index.html)
2. Shading indicates a concentration above the GA Groundwater standard.

U = compound was not detected
J = the reported value is and estimated concentration
UJ= the compound was not detected; the associated reporting limit is approximate.

Appendix B

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								PT-22	PT-22	PT-22	PT-22	PT-22	MWT-23
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20104	ALBW20118	ALBW20133	ALBW20148	ALBW20163	ALBW20065
Sample Date								11/14/2007	6/26/2008	12/15/2008	6/2/2009	12/16/2009	1/3/2007
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								4	5	6	7	8	1
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds													
1,1,1-Trichloroethane	UG/L	0.76	3%	5	0	4	118	1 U	1 U	0.26 U	0.26 U	0.26 U	4 U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	5	0	0	118	1 U	1 U	0.21 U	0.21 U	0.21 U	4 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/L	0	0%	5	0	0	118	1 U	1 UJ	0.31 U	0.31 U	0.31 U	4 U
1,1,2-Trichloroethane	UG/L	0	0%	1	0	0	118	1 U	1 U	0.23 U	0.23 U	0.23 U	4 U
1,1-Dichloroethane	UG/L	1.1	7%	5	0	8	118	1 U	1 U	0.75 U	0.75 U	0.38 U	4 U
1,1-Dichloroethene	UG/L	2.1	7%	5	0	8	118	1 U	1 U	0.29 U	0.29 U	0.29 U	4 U
1,2,4-Trichlorobenzene	UG/L	0	0%	5	0	0	118	1 U	1 U	0.41 U	0.41 U	0.41 U	4 U
1,2-Dibromo-3-chloropropane	UG/L	0	0%	0.04	0	0	118	1 U	1 UJ	1 UJ	1 UJ	0.39 U	4 U
1,2-Dibromoethane	UG/L	0	0%	0.0006	0	0	118	1 U	1 U	0.17 U	0.17 U	0.17 U	4 U
1,2-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1 U	1 U	0.2 U	0.2 U	0.2 U	4 U
1,2-Dichloroethane	UG/L	5.6	11%	0.6	11	13	118	5	3.9	2.8	4	3	2.3 J
1,2-Dichloropropane	UG/L	0	0%	1	0	0	118	1 U	1 U	0.14 U	0.14 U	0.32 U	4 U
1,3-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1 U	1 U	0.16 U	0.16 U	0.36 U	4 U
1,4-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1 U	1 U	0.16 U	0.16 U	0.39 U	4 U
Acetone	UG/L	2600	29%		0	34	118	5.3	5 U	1.3 U	1.3 U	1.3 U	180
Benzene	UG/L	0	0%	1	0	0	118	1 U	1 U	0.16 U	0.16 U	0.41 U	4 U
Bromodichloromethane	UG/L	0	0%	80 [b]	0	0	118	1 U	1 U	0.38 U	0.39 U	0.39 U	4 U
Bromoform	UG/L	0	0%	80 [b]	0	0	118	1 U	1 U	0.26 U	0.26 UJ	0.26 U	4 U
Carbon disulfide	UG/L	0	0%		0	0	118	1 U	1 U	0.19 U	0.19 UJ	0.19 U	4 U
Carbon tetrachloride	UG/L	0	0%	5	0	0	118	1 U	1 U	0.27 U	0.27 U	0.27 U	4 U
Chlorobenzene	UG/L	0	0%	5	0	0	118	1 U	1 U	0.18 U	0.32 U	0.32 U	4 U
Chlorodibromomethane	UG/L	0	0%	80 [b]	0	0	118	1 U	1 U	0.32 U	0.32 U	0.32 U	4 U
Chloroethane	UG/L	1.1	6%	5	0	7	118	0.82 J	1 UJ	0.32 U	0.32 U	0.32 U	4 U
Chloroform	UG/L	27	5%	7	4	6	118	1 U	1 U	0.34 U	0.34 U	0.34 U	4 U
Cis-1,2-Dichloroethene	UG/L	720	81%	5	80	96	118	30	26	52	41	29	60
Cis-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	1 U	1 U	0.36 U	0.36 U	0.36 U	4 U
Cyclohexane	UG/L	0	0%		0	0	118	1 U	1 U	0.22 U	0.53 U	0.53 U	4 U
Dichlorodifluoromethane	UG/L	0	0%	5	0	0	118	1 U	1 U	0.28 U	0.29 U	0.29 U	4 U
Ethyl benzene	UG/L	1.3	3%	5	0	4	118	1 U	1 U	0.18 U	0.18 U	0.18 U	4 U
Isopropylbenzene	UG/L	0	0%	5	0	0	118	1 U	1 U	0.19 U	0.19 U	0.19 U	4 U
Methyl Acetate	UG/L	6	2%		0	2	118	1 U	1 UJ	0.17 U	0.17 UJ	0.5 U	4 U
Methyl Tertbutyl Ether	UG/L	0	0%		0	0	118	1 U	1 U	0.16 U	0.16 U	0.16 U	4 U
Methyl bromide	UG/L	0	0%	5	0	0	117	1 U	1 UJ	0.28 U	0.28 U	0.28 U	4 U
Methyl butyl ketone	UG/L	0	0%		0	0	118	5 U	5 UJ	1.2 U	1.2 U	1.2 U	20 U
Methyl chloride	UG/L	0	0%	5	0	0	118	1 U	1 UJ	0.34 U	0.35 U	0.35 U	4 U
Methyl cyclohexane	UG/L	0	0%		0	0	118	1 U	1 U	0.22 U	0.5 U	0.5 U	4 U
Methyl ethyl ketone	UG/L	4900	18%		0	21	118	5 U	5 UJ	1.3 U	1.3 U	1.3 U	250
Methyl isobutyl ketone	UG/L	0	0%		0	0	118	5 U	5 UJ	0.91 U	0.91 U	0.91 U	20 U
Methylene chloride	UG/L	18	10%	5	7	12	118	1 U	1 U	0.44 UJ	0.44 U	0.44 U	2.8 J
Styrene	UG/L	0	0%	5	0	0	118	1 U	1 U	0.18 U	0.18 U	0.18 U	4 U
Tetrachloroethene	UG/L	0	0%	5	0	0	118	1 U	1 U	0.36 U	0.36 U	0.36 U	4 U
Toluene	UG/L	590	19%	5	16	23	118	1 U	1 U	0.51 U	0.51 U	0.51 U	4 U
Total Xylenes	UG/L	0	0%	5	0	0	118	3 U	3 U	0.93 U	0.66 U	0.66 U	12 U
Trans-1,2-Dichloroethene	UG/L	8	42%	5	3	50	118	0.67 J	0.57 J	0.41 J	0.81 J	0.42 U	4 U
Trans-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	1 U	1 U	0.37 U	0.37 U	0.37 U	4 U
Trichloroethene	UG/L	2700	68%	5	48	80	118	9.7	4.1	35	6.9	8.7	4 U
Trichlorofluoromethane	UG/L	0	0%	5	0	0	118	1 U	1 UJ	0.15 U	0.15 U	0.15 U	4 U
Vinyl chloride	UG/L	180	66%	2	67	78	118	11	13	1.3	11	9.5	23

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
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Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								PT-22	PT-22	PT-22	PT-22	PT-22	MWT-23
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20104	ALBW20118	ALBW20133	ALBW20148	ALBW20163	ALBW20065
Sample Date								11/14/2007	6/26/2008	12/15/2008	6/2/2009	12/16/2009	1/3/2007
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								4	5	6	7	8	1
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Other													
Iron	UG/L	296000	100%		11	12	12						122000 J
Iron+Manganese	UG/L	352900	100%		12	12	12						141500 J
Manganese	UG/L	56900	100%		12	12	12						19500
Ethane	UG/L	98	88%		0	49	56						10000 U
Ethene	UG/L	200	88%		0	49	56						10000 U
Methane	UG/L	23000	95%		0	53	56						12000
Sulfate	MG/L	1060	70%		0	39	56						2 U
Total Organic Carbon	MG/L	2050	100%		0	56	56						260 J

Notes:
1. The cleanup goal values are NYSDEC Class GA Groundwater Standards unless noted otherwise.
 a. NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998).
 b. Federal Maximum Contaminant Level (http://www.epa.gov/safewater/contaminants/index.html)
2. Shading indicates a concentration above the GA Groundwater standard.

U = compound was not detected
J = the reported value is and estimated concentration
UJ= the compound was not detected; the associated reporting limit is approximate.

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-23	MWT-23	MWT-23	MWT-23	MWT-23	MWT-23
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20080	ALBW20094	ALBW20110	ALBW20109	ALBW20125	ALBW20140
Sample Date								3/16/2007	6/6/2007	11/16/2007	11/16/2007	6/25/2008	12/12/2008
QC Code								SA	SA	DU	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round			Frequency		Number	Number	Number	2	3	4	4	5	6
		Maximum	of	Cleanup	of	of Times	of Samples						
Parameter	**Units**	**Value**	**Detection**	**Goals [1]**	**Exceedances**	**Detected**	**Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds													
1,1,1-Trichloroethane	UG/L	0.76	3%	5	0	4	118	4 U	2 U	4 U	10 U	1 U	0.26 UJ
1,1,2,2-Tetrachloroethane	UG/L	0	0%	5	0	0	118	4 U	2 U	4 U	10 U	1 U	0.21 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/L	0	0%	5	0	0	118	4 U	2 UJ	4 U	10 U	1 U	0.31 U
1,1,2-Trichloroethane	UG/L	0	0%	1	0	0	118	4 U	2 U	4 U	10 U	1 U	0.23 U
1,1-Dichloroethane	UG/L	1.1	7%	5	0	8	118	4 U	2 U	4 U	10 U	1 U	0.75 U
1,1-Dichloroethene	UG/L	2.1	7%	5	0	8	118	4 U	2 U	4 U	10 U	1 U	0.29 U
1,2,4-Trichlorobenzene	UG/L	0	0%	5	0	0	118	4 U	2 U	4 U	10 U	1 U	0.41 U
1,2-Dibromo-3-chloropropane	UG/L	0	0%	0.04	0	0	118	4 U	2 U	4 U	10 U	1 U	1 UJ
1,2-Dibromoethane	UG/L	0	0%	0.0006	0	0	118	4 U	2 U	4 U	10 U	1 U	0.17 U
1,2-Dichlorobenzene	UG/L	0	0%	3	0	0	118	4 U	2 U	4 U	10 U	1 U	0.2 U
1,2-Dichloroethane	UG/L	5.6	11%	0.6	11	13	118	4 U	1.6 J	4 U	10 U	0.6 J	0.6 J
1,2-Dichloropropane	UG/L	0	0%	1	0	0	118	4 U	2 U	4 U	10 U	1 U	0.14 U
1,3-Dichlorobenzene	UG/L	0	0%	3	0	0	118	4 U	2 U	4 U	10 U	1 U	0.16 U
1,4-Dichlorobenzene	UG/L	0	0%	3	0	0	118	4 U	2 U	4 U	10 U	1 U	0.16 U
Acetone	UG/L	2600	29%		0	34	118	190	190	62	64	4 J	1.3 U
Benzene	UG/L	0	0%	1	0	0	118	4 U	2 U	4 U	10 U	1 U	0.16 U
Bromodichloromethane	UG/L	0	0%	80 [b]	0	0	118	4 U	2 U	4 U	10 U	1 U	0.38 U
Bromoform	UG/L	0	0%	80 [b]	0	0	118	4 U	2 U	4 U	10 U	1 U	0.26 U
Carbon disulfide	UG/L	0	0%		0	0	118	4 U	2 U	4 U	10 U	1 U	0.19 U
Carbon tetrachloride	UG/L	0	0%	5	0	0	118	4 U	2 U	4 U	10 U	1 U	0.27 UJ
Chlorobenzene	UG/L	0	0%	5	0	0	118	4 U	2 U	4 U	10 U	1 U	0.18 U
Chlorodibromomethane	UG/L	0	0%	80 [b]	0	0	118	4 U	2 U	4 U	10 U	1 U	0.32 U
Chloroethane	UG/L	1.1	6%	5	0	7	118	4 U	2 U	4 U	10 U	1 UJ	0.32 U
Chloroform	UG/L	27	5%	7	4	6	118	4 U	2 U	4 U	10 U	1 U	0.34 U
Cis-1,2-Dichloroethene	UG/L	720	81%	5	80	96	118	11	3.1	2.1 J	10 U	1 U	2.4
Cis-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	4 U	2 U	4 U	10 U	1 U	0.36 U
Cyclohexane	UG/L	0	0%		0	0	118	4 U	2 U	4 U	10 U	1 U	0.22 U
Dichlorodifluoromethane	UG/L	0	0%	5	0	0	118	4 U	2 U	4 U	10 U	1 U	0.28 UJ
Ethyl benzene	UG/L	1.3	3%	5	0	4	118	4 U	1.3 J	4 U	10 U	0.85 J	0.71 J
Isopropylbenzene	UG/L	0	0%	5	0	0	118	4 U	2 U	4 U	10 U	1 U	0.19 U
Methyl Acetate	UG/L	6	2%		0	2	118	4 UJ	5.1	4 UJ	10 U	1 UJ	0.17 U
Methyl Tertbutyl Ether	UG/L	0	0%		0	0	118	4 U	2 U	4 U	10 U	1 U	0.16 U
Methyl bromide	UG/L	0	0%	5	0	0	117	4 U	2 U	4 U	10 U	1 UJ	0.28 U
Methyl butyl ketone	UG/L	0	0%		0	0	118	20 U	10 U	20 UJ	50 U	5 UJ	1.2 U
Methyl chloride	UG/L	0	0%	5	0	0	118	4 U	2 U	4 U	10 U	1 U	0.34 U
Methyl cyclohexane	UG/L	0	0%		0	0	118	4 U	2 U	4 U	10 U	1 U	0.22 U
Methyl ethyl ketone	UG/L	4900	18%		0	21	118	130	73	25	26 J	12	1.3 U
Methyl isobutyl ketone	UG/L	0	0%		0	0	118	20 U	10 U	20 U	50 U	5 U	0.91 U
Methylene chloride	UG/L	18	10%	5	7	12	118	4 U	2 U	4 U	12	1 U	0.44 UJ
Styrene	UG/L	0	0%	5	0	0	118	4 U	2 U	4 U	10 U	1 U	0.18 U
Tetrachloroethene	UG/L	0	0%	5	0	0	118	4 U	2 U	4 U	10 U	1 U	0.36 U
Toluene	UG/L	590	19%	5	16	23	118	7.4	37	590	570	300	43
Total Xylenes	UG/L	0	0%	5	0	0	118	12 U	6 U	12 U	30 U	3 U	0.93 U
Trans-1,2-Dichloroethene	UG/L	8	42%	5	3	50	118	4 U	2 U	4 U	10 U	1 U	0.13 U
Trans-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	4 U	2 U	4 U	10 U	1 U	0.37 U
Trichloroethene	UG/L	2700	68%	5	48	80	118	4 U	2 U	4 U	10 U	1 U	0.41 J
Trichlorofluoromethane	UG/L	0	0%	5	0	0	118	4 U	2 UJ	4 U	10 U	1 UJ	0.15 UJ
Vinyl chloride	UG/L	180	66%	2	67	78	118	4.8	2 U	2.3 J	10 U	1 U	2.8

Appendix B

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
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Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-23	MWT-23	MWT-23	MWT-23	MWT-23	MWT-23
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20080	ALBW20094	ALBW20110	ALBW20109	ALBW20125	ALBW20140
Sample Date								3/16/2007	6/6/2007	11/16/2007	11/16/2007	6/25/2008	12/12/2008
QC Code								SA	SA	DU	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								2	3	4	4	5	6
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Other													
Iron	UG/L	296000	100%		11	12	12	120000					
Iron+Manganese	UG/L	352900	100%		12	12	12	139500					
Manganese	UG/L	56900	100%		12	12	12	19500					
Ethane	UG/L	98	88%		0	49	56	45	4.1	0.66	0.49	0.53	4.6
Ethene	UG/L	200	88%		0	49	56	5.9	0.28	0.39	0.3	0.048	1.2
Methane	UG/L	23000	95%		0	53	56	23000	18000	17000	15000	18000	19000
Sulfate	MG/L	1060	70%		0	39	56	2 U	2 U	2.7	2.8	2 U	6.3
Total Organic Carbon	MG/L	2050	100%		0	56	56	210	303	155	147	28.4	20.1

Notes:
1. The cleanup goal values are NYSDEC Class GA Groundwater Standards unless noted otherwise.
 a. NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998).
 b. Federal Maximum Contaminant Level (http://www.epa.gov/safewater/contaminants/index.html)
2. Shading indicates a concentration above the GA Groundwater standard.

U = compound was not detected
J = the reported value is and estimated concentration
UJ= the compound was not detected; the associated reporting limit is approximate.

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
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Seneca Army Depot Activity

Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-23	MWT-23	MWT-24	MWT-24	MWT-24	MWT-24
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20155	ALBW20170	ALBW20063	ALBW20078	ALBW20092	ALBW20107
Sample Date								6/2/2009	12/15/2009	1/3/2007	3/15/2007	6/5/2007	11/13/2007
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								7	8	1	2	3	4
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds													
1,1,1-Trichloroethane	UG/L	0.76	3%	5	0	4	118	0.26 U	0.26 U	0.71 J	0.58 J	2 U	1 U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	5	0	0	118	0.21 U	0.21 U	1 U	1 U	2 U	1 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/L	0	0%	5	0	0	118	0.31 U	0.31 U	1 U	1 U	2 UJ	1 U
1,1,2-Trichloroethane	UG/L	0	0%	1	0	0	118	0.23 U	0.23 U	1 U	1 U	2 U	1 U
1,1-Dichloroethane	UG/L	1.1	7%	5	0	8	118	0.75 U	0.38 U	0.81 J	0.83 J	1.1 J	1 U
1,1-Dichloroethene	UG/L	2.1	7%	5	0	8	118	0.29 U	0.29 U	1 U	1 U	2 U	1 U
1,2,4-Trichlorobenzene	UG/L	0	0%	5	0	0	118	0.41 U	0.41 U	1 U	1 U	2 U	1 U
1,2-Dibromo-3-chloropropane	UG/L	0	0%	0.04	0	0	118	1 UJ	0.39 U	1 U	1 U	2 U	1 U
1,2-Dibromoethane	UG/L	0	0%	0.0006	0	0	118	0.17 U	0.17 U	1 U	1 U	2 U	1 U
1,2-Dichlorobenzene	UG/L	0	0%	3	0	0	118	0.2 U	0.2 U	1 U	1 U	2 U	1 U
1,2-Dichloroethane	UG/L	5.6	11%	0.6	11	13	118	0.64 J	0.21 U	1 U	1 U	2 U	1 U
1,2-Dichloropropane	UG/L	0	0%	1	0	0	118	0.14 U	0.32 U	1 U	1 U	2 U	1 U
1,3-Dichlorobenzene	UG/L	0	0%	3	0	0	118	0.16 U	0.36 U	1 U	1 U	2 U	1 U
1,4-Dichlorobenzene	UG/L	0	0%	3	0	0	118	0.16 U	0.39 U	1 U	1 U	2 U	1 U
Acetone	UG/L	2600	29%		0	34	118	1.6 J	1.3 U	42 U	54	73	5 U
Benzene	UG/L	0	0%	1	0	0	118	0.16 U	0.41 U	1 U	1 U	2 U	1 U
Bromodichloromethane	UG/L	0	0%	80 [b]	0	0	118	0.39 U	0.39 U	1 U	1 U	2 U	1 U
Bromoform	UG/L	0	0%	80 [b]	0	0	118	0.26 UJ	0.26 UJ	1 U	1 U	2 U	1 U
Carbon disulfide	UG/L	0	0%		0	0	118	0.19 UJ	0.19 UJ	1 U	1 U	2 U	1 U
Carbon tetrachloride	UG/L	0	0%	5	0	0	118	0.27 U	0.27 U	1 U	1 U	2 U	1 U
Chlorobenzene	UG/L	0	0%	5	0	0	118	0.32 U	0.32 U	1 U	1 U	2 U	1 U
Chlorodibromomethane	UG/L	0	0%	80 [b]	0	0	118	0.32 U	0.32 U	1 U	1 U	2 U	1 U
Chloroethane	UG/L	1.1	6%	5	0	7	118	0.32 U	0.32 UJ	1 U	1 U	2 U	1 U
Chloroform	UG/L	27	5%	7	4	6	118	0.34 U	0.34 U	1 U	1 U	2 U	1 U
Cis-1,2-Dichloroethene	UG/L	720	81%	5	80	96	118	0.42 J	0.47 J	210	68	19	6.7
Cis-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	0.36 U	0.36 U	1 U	1 U	2 U	1 U
Cyclohexane	UG/L	0	0%		0	0	118	0.53 U	0.53 U	1 U	1 U	2 U	1 U
Dichlorodifluoromethane	UG/L	0	0%	5	0	0	118	0.29 U	0.29 U	1 U	1 U	2 U	1 U
Ethyl benzene	UG/L	1.3	3%	5	0	4	118	0.49 J	0.18 U	1 U	1 U	2 U	1 U
Isopropylbenzene	UG/L	0	0%	5	0	0	118	0.19 U	0.19 U	1 U	1 U	2 U	1 U
Methyl Acetate	UG/L	6	2%		0	2	118	0.17 UJ	0.5 U	1 U	1 UJ	6	1 UJ
Methyl Tertbutyl Ether	UG/L	0	0%		0	0	118	0.16 U	0.16 U	1 U	1 U	2 U	1 U
Methyl bromide	UG/L	0	0%	5	0	0	117	0.28 U	0.28 U	1 U	1 U	2 U	1 U
Methyl butyl ketone	UG/L	0	0%		0	0	118	1.2 U	1.2 U	5 U	5 U	10 U	5 UJ
Methyl chloride	UG/L	0	0%	5	0	0	118	0.35 U	0.35 UJ	1 U	1 U	2 U	1 U
Methyl cyclohexane	UG/L	0	0%		0	0	118	0.5 U	0.5 U	1 U	1 U	2 U	1 U
Methyl ethyl ketone	UG/L	4900	18%		0	21	118	1.3 U	1.3 U	24	36	40	5 U
Methyl isobutyl ketone	UG/L	0	0%		0	0	118	0.91 U	0.91 U	5 U	5 U	10 U	5 U
Methylene chloride	UG/L	18	10%	5	7	12	118	0.44 U	0.44 U	1 U	1 U	1 J	1 U
Styrene	UG/L	0	0%	5	0	0	118	0.18 U	0.18 U	1 U	1 U	2 U	1 U
Tetrachloroethene	UG/L	0	0%	5	0	0	118	0.36 U	0.36 U	1 U	1 U	2 U	1 U
Toluene	UG/L	590	19%	5	16	23	118	1.5	0.51 U	1 U	1 U	2 U	1 U
Total Xylenes	UG/L	0	0%	5	0	0	118	0.66 U	0.66 U	3 U	3 U	6 U	3 U
Trans-1,2-Dichloroethene	UG/L	8	42%	5	3	50	118	0.13 U	0.42 U	2.1	0.88 J	2 U	1 U
Trans-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	0.37 U	0.37 U	1 U	1 U	2 U	1 U
Trichloroethene	UG/L	2700	68%	5	48	80	118	0.18 U	0.46 U	0.94 J	1 U	2 U	1.6
Trichlorofluoromethane	UG/L	0	0%	5	0	0	118	0.15 U	0.15 U	1 U	1 U	2 UJ	1 U
Vinyl chloride	UG/L	180	66%	2	67	78	118	0.24 U	0.24 U	19	45	22	3.8

Appendix B

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-23	MWT-23	MWT-24	MWT-24	MWT-24	MWT-24
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20155	ALBW20170	ALBW20063	ALBW20078	ALBW20092	ALBW20107
Sample Date								6/2/2009	12/15/2009	1/3/2007	3/15/2007	6/5/2007	11/13/2007
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								7	8	1	2	3	4
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Other													
Iron	UG/L	296000	100%		11	12	12						
Iron+Manganese	UG/L	352900	100%		12	12	12						
Manganese	UG/L	56900	100%		12	12	12						
Ethane	UG/L	98	88%		0	49	56	1.6	1				
Ethene	UG/L	200	88%		0	49	56	0.16	0.058				
Methane	UG/L	23000	95%		0	53	56	21000	18000				
Sulfate	MG/L	1060	70%		0	39	56	0.35 U	0.35 U				
Total Organic Carbon	MG/L	2050	100%		0	56	56	15.6	17.4				

Notes:
1. The cleanup goal values are NYSDEC Class GA Groundwater Standards unless noted otherwise.
 a. NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998).
 b. Federal Maximum Contaminant Level (http://www.epa.gov/safewater/contaminants/index.html)
2. Shading indicates a concentration above the GA Groundwater standard.

U = compound was not detected
J = the reported value is and estimated concentration
UJ= the compound was not detected; the associated reporting limit is approximate.

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-24	MWT-24	MWT-24	MWT-24	PT-17	PT-17
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20122	ALBW20137	ALBW20152	ALBW20167	ALBW20058	ALBW20073
Sample Date								6/26/2008	12/12/2008	6/2/2009	12/15/2009	1/2/2007	3/15/2007
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								5	6	7	8	1	2
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds													
1,1,1-Trichloroethane	UG/L	0.76	3%	5	0	4	118	5 U	0.76 J	0.26 U	0.4 J	1 U	2 U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	5	0	0	118	5 U	0.21 U	0.21 U	0.21 U	1 U	2 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/L	0	0%	5	0	0	118	5 UJ	0.31 U	0.31 U	0.31 U	1 U	2 U
1,1,2-Trichloroethane	UG/L	0	0%	1	0	0	118	5 U	0.23 U	0.23 U	0.23 U	1 U	2 U
1,1-Dichloroethane	UG/L	1.1	7%	5	0	8	118	5 U	0.75 U	0.75 U	0.7 J	1 U	2 U
1,1-Dichloroethene	UG/L	2.1	7%	5	0	8	118	5 U	0.29 U	0.29 U	0.29 U	1 U	2 U
1,2,4-Trichlorobenzene	UG/L	0	0%	5	0	0	118	5 U	0.41 U	0.41 U	0.41 U	1 U	2 U
1,2-Dibromo-3-chloropropane	UG/L	0	0%	0.04	0	0	118	5 UJ	1 UJ	1 UJ	0.39 U	1 U	2 U
1,2-Dibromoethane	UG/L	0	0%	0.0006	0	0	118	5 U	0.17 U	0.17 U	0.17 U	1 U	2 U
1,2-Dichlorobenzene	UG/L	0	0%	3	0	0	118	5 U	0.2 U	0.2 U	0.2 U	1 U	2 U
1,2-Dichloroethane	UG/L	5.6	11%	0.6	11	13	118	5 U	0.21 U	0.21 U	0.21 U	1 U	2 U
1,2-Dichloropropane	UG/L	0	0%	1	0	0	118	5 U	0.14 U	0.14 U	0.32 U	1 U	2 U
1,3-Dichlorobenzene	UG/L	0	0%	3	0	0	118	5 U	0.16 U	0.16 U	0.36 U	1 U	2 U
1,4-Dichlorobenzene	UG/L	0	0%	3	0	0	118	5 U	0.16 U	0.16 U	0.39 U	1 U	2 U
Acetone	UG/L	2600	29%		0	34	118	25 U	1.3 U	1.3 U	1.3 U	9.3 U	22
Benzene	UG/L	0	0%	1	0	0	118	5 U	0.16 U	0.16 U	0.41 U	1 U	2 U
Bromodichloromethane	UG/L	0	0%	80 [b]	0	0	118	5 U	0.38 U	0.39 U	0.39 U	1 U	2 U
Bromoform	UG/L	0	0%	80 [b]	0	0	118	5 U	0.26 U	0.26 UJ	0.26 UJ	1 U	2 U
Carbon disulfide	UG/L	0	0%		0	0	118	5 U	0.19 U	0.19 UJ	0.19 UJ	1 U	2 U
Carbon tetrachloride	UG/L	0	0%	5	0	0	118	5 U	0.27 UJ	0.27 U	0.27 U	1 U	2 U
Chlorobenzene	UG/L	0	0%	5	0	0	118	5 U	0.18 U	0.32 U	0.32 U	1 U	2 U
Chlorodibromomethane	UG/L	0	0%	80 [b]	0	0	118	5 U	0.32 U	0.32 U	0.32 U	1 U	2 U
Chloroethane	UG/L	1.1	6%	5	0	7	118	5 UJ	0.32 U	0.47 J	0.32 UJ	1 U	2 U
Chloroform	UG/L	27	5%	7	4	6	118	5 U	0.34 U	0.34 U	0.34 U	1 U	2 U
Cis-1,2-Dichloroethene	UG/L	720	81%	5	80	96	118	31	52	38	32	62	26
Cis-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	5 U	0.36 U	0.36 U	0.36 U	1 U	2 U
Cyclohexane	UG/L	0	0%		0	0	118	5 U	0.22 U	0.53 U	0.53 U	1 U	2 U
Dichlorodifluoromethane	UG/L	0	0%	5	0	0	118	5 U	0.28 UJ	0.29 U	0.29 U	1 U	2 U
Ethyl benzene	UG/L	1.3	3%	5	0	4	118	5 U	0.18 U	0.18 U	0.18 U	1 U	2 U
Isopropylbenzene	UG/L	0	0%	5	0	0	118	5 U	0.19 U	0.19 U	0.19 U	1 U	2 U
Methyl Acetate	UG/L	6	2%		0	2	118	5 UJ	0.17 U	0.17 UJ	0.5 U	1 U	2 UJ
Methyl Tertbutyl Ether	UG/L	0	0%		0	0	118	5 U	0.16 U	0.16 U	0.16 U	1 U	2 U
Methyl bromide	UG/L	0	0%	5	0	0	117	5 UJ	0.28 U	0.28 U	0.28 U	1 U	2 U
Methyl butyl ketone	UG/L	0	0%		0	0	118	25 UJ	1.2 U	1.2 U	1.2 U	5 U	10 U
Methyl chloride	UG/L	0	0%	5	0	0	118	5 UJ	0.34 U	0.35 U	0.35 UJ	1 U	2 U
Methyl cyclohexane	UG/L	0	0%		0	0	118	5 U	0.22 U	0.5 U	0.5 U	1 U	2 U
Methyl ethyl ketone	UG/L	4900	18%		0	21	118	25 UJ	1.3 U	1.3 U	1.3 U	5.4	11
Methyl isobutyl ketone	UG/L	0	0%		0	0	118	25 UJ	0.91 U	0.91 U	0.91 U	5 U	10 U
Methylene chloride	UG/L	18	10%	5	7	12	118	5 U	0.44 UJ	0.44 U	0.44 U	1 U	1.2 J
Styrene	UG/L	0	0%	5	0	0	118	5 U	0.18 U	0.18 U	0.18 U	1 U	2 U
Tetrachloroethene	UG/L	0	0%	5	0	0	118	5 U	0.36 U	0.36 U	0.36 U	1 U	2 U
Toluene	UG/L	590	19%	5	16	23	118	5 U	0.51 U	0.51 U	0.51 U	1 U	2 U
Total Xylenes	UG/L	0	0%	5	0	0	118	15 U	0.93 U	0.66 U	0.66 U	3 U	6 U
Trans-1,2-Dichloroethene	UG/L	8	42%	5	3	50	118	5 U	0.13 U	0.13 U	0.42 U	1 U	2 U
Trans-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	5 U	0.37 U	0.37 U	0.37 U	1 U	2 U
Trichloroethene	UG/L	2700	68%	5	48	80	118	5 U	6	4.8	4.7	6	11
Trichlorofluoromethane	UG/L	0	0%	5	0	0	118	5 UJ	0.15 UJ	0.15 U	0.15 U	1 U	2 U
Vinyl chloride	UG/L	180	66%	2	67	78	118	5 U	3.6	7.3	4	21	21

Appendix B

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
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Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-24	MWT-24	MWT-24	MWT-24	PT-17	PT-17
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20122	ALBW20137	ALBW20152	ALBW20167	ALBW20058	ALBW20073
Sample Date								6/26/2008	12/12/2008	6/2/2009	12/15/2009	1/2/2007	3/15/2007
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								5	6	7	8	1	2
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Other													
Iron	UG/L	296000	100%		11	12	12						
Iron+Manganese	UG/L	352900	100%		12	12	12						
Manganese	UG/L	56900	100%		12	12	12						
Ethane	UG/L	98	88%		0	49	56						
Ethene	UG/L	200	88%		0	49	56						
Methane	UG/L	23000	95%		0	53	56						
Sulfate	MG/L	1060	70%		0	39	56						
Total Organic Carbon	MG/L	2050	100%		0	56	56						

Notes:
1. The cleanup goal values are NYSDEC Class GA Groundwater Standards unless noted otherwise.
 a. NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998).
 b. Federal Maximum Contaminant Level (http://www.epa.gov/safewater/contaminants/index.html)
2. Shading indicates a concentration above the GA Groundwater standard.

U = compound was not detected
J = the reported value is and estimated concentration
UJ= the compound was not detected; the associated reporting limit is approximate.

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								PT-17	PT-17	PT-17	PT-17	PT-17	PT-17
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20087	ALBW20102	ALBW20116	ALBW20131	ALBW20146	ALBW20161
Sample Date								6/5/2007	11/13/2007	6/26/2008	12/11/2008	6/2/2009	12/15/2009
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								3	4	5	6	7	8
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds													
1,1,1-Trichloroethane	UG/L	0.76	3%	5	0	4	118	1 U	1 U	1 U	0.26 UJ	0.26 U	0.26 U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	0.21 U	0.21 U	0.21 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/L	0	0%	5	0	0	118	1 UJ	1 U	1 UJ	0.31 U	0.31 U	0.31 U
1,1,2-Trichloroethane	UG/L	0	0%	1	0	0	118	1 U	1 U	1 U	0.23 U	0.23 U	0.23 U
1,1-Dichloroethane	UG/L	1.1	7%	5	0	8	118	1 U	1 U	1 U	0.75 U	0.75 U	0.38 U
1,1-Dichloroethene	UG/L	2.1	7%	5	0	8	118	1 U	1 U	1 U	0.29 U	0.29 U	0.29 U
1,2,4-Trichlorobenzene	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	0.41 U	0.41 U	0.41 U
1,2-Dibromo-3-chloropropane	UG/L	0	0%	0.04	0	0	118	1 U	1 U	1 UJ	1 UJ	1 UJ	0.39 U
1,2-Dibromoethane	UG/L	0	0%	0.0006	0	0	118	1 U	1 U	1 U	0.17 U	0.17 U	0.17 U
1,2-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1 U	1 U	1 U	0.2 U	0.2 U	0.2 U
1,2-Dichloroethane	UG/L	5.6	11%	0.6	11	13	118	1 U	1 U	1 U	0.21 U	0.21 U	0.21 U
1,2-Dichloropropane	UG/L	0	0%	1	0	0	118	1 U	1 U	1 U	0.14 U	0.14 U	0.32 U
1,3-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1 U	1 U	1 U	0.16 U	0.16 U	0.36 U
1,4-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1 U	1 U	1 U	0.16 U	0.16 U	0.39 U
Acetone	UG/L	2600	29%		0	34	118	5 U	5 U	5 U	1.3 U	1.3 U	1.3 U
Benzene	UG/L	0	0%	1	0	0	118	1 U	1 U	1 U	0.16 U	0.16 U	0.41 U
Bromodichloromethane	UG/L	0	0%	80 [b]	0	0	118	1 U	1 U	1 U	0.38 U	0.39 U	0.39 U
Bromoform	UG/L	0	0%	80 [b]	0	0	118	1 U	1 U	1 U	0.26 U	0.26 UJ	0.26 UJ
Carbon disulfide	UG/L	0	0%		0	0	118	1 U	1 U	1 U	0.19 U	0.19 UJ	0.19 UJ
Carbon tetrachloride	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	0.27 UJ	0.27 U	0.27 U
Chlorobenzene	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	0.18 U	0.32 U	0.32 U
Chlorodibromomethane	UG/L	0	0%	80 [b]	0	0	118	1 U	1 U	1 U	0.32 U	0.32 U	0.32 U
Chloroethane	UG/L	1.1	6%	5	0	7	118	1 U	1 U	1 UJ	0.32 U	0.49 J	0.32 UJ
Chloroform	UG/L	27	5%	7	4	6	118	1 U	1 U	1 U	0.34 U	0.34 U	0.34 U
Cis-1,2-Dichloroethene	UG/L	720	81%	5	80	96	118	43	27	21	24	56	65
Cis-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	1 U	1 U	1 U	0.36 U	0.36 U	0.36 U
Cyclohexane	UG/L	0	0%		0	0	118	1 U	1 U	1 U	0.22 U	0.53 U	0.53 U
Dichlorodifluoromethane	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	0.28 UJ	0.29 U	0.29 U
Ethyl benzene	UG/L	1.3	3%	5	0	4	118	1 U	1 U	1 U	0.18 U	0.18 U	0.18 U
Isopropylbenzene	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	0.19 U	0.19 U	0.19 U
Methyl Acetate	UG/L	6	2%		0	2	118	1 U	1 UJ	1 UJ	0.17 U	0.17 UJ	0.5 U
Methyl Tertbutyl Ether	UG/L	0	0%		0	0	118	1 U	1 U	1 U	0.16 U	0.16 U	0.16 U
Methyl bromide	UG/L	0	0%	5	0	0	117	1 U	1 U	1 UJ	0.28 U	0.28 U	0.28 U
Methyl butyl ketone	UG/L	0	0%		0	0	118	5 U	5 UJ	5 UJ	1.2 U	1.2 U	1.2 U
Methyl chloride	UG/L	0	0%	5	0	0	118	1 U	1 U	1 UJ	0.34 U	0.35 U	0.35 UJ
Methyl cyclohexane	UG/L	0	0%		0	0	118	1 U	1 U	1 U	0.22 U	0.5 U	0.5 U
Methyl ethyl ketone	UG/L	4900	18%		0	21	118	5 U	5 U	5 UJ	1.3 U	1.3 U	1.3 U
Methyl isobutyl ketone	UG/L	0	0%		0	0	118	5 U	5 U	5 UJ	0.91 U	0.91 U	0.91 U
Methylene chloride	UG/L	18	10%	5	7	12	118	1 U	1 U	1 U	0.44 UJ	0.44 U	0.44 U
Styrene	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	0.18 U	0.18 U	0.18 U
Tetrachloroethene	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	0.36 U	0.36 U	0.36 U
Toluene	UG/L	590	19%	5	16	23	118	1 U	1 U	1 U	0.51 U	0.51 U	0.51 U
Total Xylenes	UG/L	0	0%	5	0	0	118	3 U	3 U	3 U	0.93 U	0.66 U	0.66 U
Trans-1,2-Dichloroethene	UG/L	8	42%	5	3	50	118	0.77 J	0.54 J	1 U	0.46 J	1.1	1.8
Trans-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	1 U	1 U	1 U	0.37 U	0.37 U	0.37 U
Trichloroethene	UG/L	2700	68%	5	48	80	118	3.4	15	8.5	9.2	8	7.8
Trichlorofluoromethane	UG/L	0	0%	5	0	0	118	1 UJ	1 U	1 UJ	0.15 UJ	0.15 U	0.15 U
Vinyl chloride	UG/L	180	66%	2	67	78	118	9.9	22	23	10	55	20

Appendix B

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Cleanup Goals [1]	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								PT-17	PT-17	PT-17	PT-17	PT-17	PT-17
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20087	ALBW20102	ALBW20116	ALBW20131	ALBW20146	ALBW20161
Sample Date								6/5/2007	11/13/2007	6/26/2008	12/11/2008	6/2/2009	12/15/2009
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								3	4	5	6	7	8
Other													
Iron	UG/L	296000	100%		11	12	12						
Iron+Manganese	UG/L	352900	100%		12	12	12						
Manganese	UG/L	56900	100%		12	12	12						
Ethane	UG/L	98	88%		0	49	56			98	6.9	50	9.9
Ethene	UG/L	200	88%		0	49	56			66	6.6	56	5
Methane	UG/L	23000	95%		0	53	56			5700	380	8300	1500
Sulfate	MG/L	1060	70%		0	39	56			15.2	45.8	28	46.2 J
Total Organic Carbon	MG/L	2050	100%		0	56	56			6	2.6	4.9	2.4

Notes:
1. The cleanup goal values are NYSDEC Class GA Groundwater Standards unless noted otherwise.
 a. NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998).
 b. Federal Maximum Contaminant Level (http://www.epa.gov/safewater/contaminants/index.html)
2. Shading indicates a concentration above the GA Groundwater standard.

U = compound was not detected
J = the reported value is and estimated concentration
UJ= the compound was not detected; the associated reporting limit is approximate.

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Cleanup Goals [1]	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-7	MWT-7	MWT-7	MWT-7	MWT-7	MWT-7
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20062	ALBW20077	ALBW20091	ALBW20106	ALBW20120	ALBW20135
Sample Date								1/4/2007	3/15/2007	6/5/2007	11/13/2007	6/25/2008	12/15/2008
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								1	2	3	4	5	6
Volatile Organic Compounds													
1,1,1-Trichloroethane	UG/L	0.76	3%	5	0	4	118	1 U	1 U	1 U	1 U	1 U	0.26 U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	1 U	1 U	0.21 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/L	0	0%	5	0	0	118	1 U	1 U	1 UJ	1 U	1 UJ	0.31 U
1,1,2-Trichloroethane	UG/L	0	0%	1	0	0	118	1 U	1 U	1 U	1 U	1 U	0.23 U
1,1-Dichloroethane	UG/L	1.1	7%	5	0	8	118	1 U	1 U	1 U	1 U	1 U	0.75 U
1,1-Dichloroethene	UG/L	2.1	7%	5	0	8	118	1 U	1 U	1 U	1 U	1 U	0.29 U
1,2,4-Trichlorobenzene	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	1 U	1 U	0.41 U
1,2-Dibromo-3-chloropropane	UG/L	0	0%	0.04	0	0	118	1 U	1 U	1 U	1 U	1 UJ	1 UJ
1,2-Dibromoethane	UG/L	0	0%	0.0006	0	0	118	1 U	1 U	1 U	1 U	1 U	0.17 U
1,2-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1 U	1 U	1 U	1 U	1 U	0.2 U
1,2-Dichloroethane	UG/L	5.6	11%	0.6	11	13	118	1 U	1 U	1 U	1 U	1 U	0.21 U
1,2-Dichloropropane	UG/L	0	0%	1	0	0	118	1 U	1 U	1 U	1 U	1 U	0.14 U
1,3-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1 U	1 U	1 U	1 U	1 U	0.16 U
1,4-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1 U	1 U	1 U	1 U	1 U	0.16 U
Acetone	UG/L	2600	29%		0	34	118	5 U	5 U	5 U	5 U	5 U	1.3 U
Benzene	UG/L	0	0%	1	0	0	118	1 U	1 U	1 U	1 U	1 U	0.16 U
Bromodichloromethane	UG/L	0	0%	80 [b]	0	0	118	1 U	1 U	1 U	1 U	1 U	0.38 U
Bromoform	UG/L	0	0%	80 [b]	0	0	118	1 U	1 U	1 U	1 U	1 U	0.26 U
Carbon disulfide	UG/L	0	0%		0	0	118	1 U	1 U	1 U	1 U	1 U	0.19 U
Carbon tetrachloride	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	1 U	1 U	0.27 U
Chlorobenzene	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	1 U	1 U	0.18 U
Chlorodibromomethane	UG/L	0	0%	80 [b]	0	0	118	1 U	1 U	1 U	1 U	1 U	0.32 U
Chloroethane	UG/L	1.1	6%	5	0	7	118	1 U	1 U	1 U	0.65 J	1 UJ	0.93 J
Chloroform	UG/L	27	5%	7	4	6	118	1 U	1 U	1 U	1 U	1 U	0.34 U
Cis-1,2-Dichloroethene	UG/L	720	81%	5	80	96	118	35	42	61	90	90	79
Cis-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	1 U	1 U	1 U	1 U	1 U	0.36 U
Cyclohexane	UG/L	0	0%		0	0	118	1 U	1 U	1 U	1 U	1 U	0.22 U
Dichlorodifluoromethane	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	1 U	1 U	0.28 U
Ethyl benzene	UG/L	1.3	3%	5	0	4	118	1 U	1 U	1 U	1 U	1 U	0.18 U
Isopropylbenzene	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	1 U	1 U	0.19 U
Methyl Acetate	UG/L	6	2%		0	2	118	1 U	1 UJ	1 U	1 UJ	1 UJ	0.17 U
Methyl Tertbutyl Ether	UG/L	0	0%		0	0	118	1 U	1 U	1 U	1 U	1 U	0.16 U
Methyl bromide	UG/L	0	0%	5	0	0	117	1 U	1 U	1 U	1 U	1 UJ	0.28 U
Methyl butyl ketone	UG/L	0	0%		0	0	118	5 U	5 U	5 U	5 UJ	5 UJ	1.2 U
Methyl chloride	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	1 U	1 UJ	0.34 U
Methyl cyclohexane	UG/L	0	0%		0	0	118	1 U	1 U	1 U	1 U	1 U	0.22 U
Methyl ethyl ketone	UG/L	4900	18%		0	21	118	5 U	5 U	5 U	5 U	5 UJ	1.3 U
Methyl isobutyl ketone	UG/L	0	0%		0	0	118	5 U	5 U	5 U	5 U	5 UJ	0.91 U
Methylene chloride	UG/L	18	10%	5	7	12	118	1 U	1 U	1 U	1 U	1 U	0.44 UJ
Styrene	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	1 U	1 U	0.18 U
Tetrachloroethene	UG/L	0	0%	5	0	0	118	1 U	1 U	1 U	1 U	1 U	0.36 U
Toluene	UG/L	590	19%	5	16	23	118	1 U	1 U	1 U	1 U	1 U	0.51 U
Total Xylenes	UG/L	0	0%	5	0	0	118	3 U	3 U	3 U	3 U	3 U	0.93 U
Trans-1,2-Dichloroethene	UG/L	8	42%	5	3	50	118	1 U	1 U	1 U	1 U	1 U	0.13 U
Trans-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	1 U	1 U	1 U	1 U	1 U	0.37 U
Trichloroethene	UG/L	2700	68%	5	48	80	118	490	440	410	510	440	410
Trichlorofluoromethane	UG/L	0	0%	5	0	0	118	1 U	1 U	1 UJ	1 U	1 UJ	0.15 U
Vinyl chloride	UG/L	180	66%	2	67	78	118	0.51 J	9.7	18	24	12	13

Appendix B

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
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Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-7	MWT-7	MWT-7	MWT-7	MWT-7	MWT-7
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20062	ALBW20077	ALBW20091	ALBW20106	ALBW20120	ALBW20135
Sample Date								1/4/2007	3/15/2007	6/5/2007	11/13/2007	6/25/2008	12/15/2008
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								1	2	3	4	5	6
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Other													
Iron	UG/L	296000	100%		11	12	12						
Iron+Manganese	UG/L	352900	100%		12	12	12						
Manganese	UG/L	56900	100%		12	12	12						
Ethane	UG/L	98	88%		0	49	56					6.7	11
Ethene	UG/L	200	88%		0	49	56					2	0.27
Methane	UG/L	23000	95%		0	53	56					400	670
Sulfate	MG/L	1060	70%		0	39	56					29.1	29.1
Total Organic Carbon	MG/L	2050	100%		0	56	56					2.3	3

Notes:
1. The cleanup goal values are NYSDEC Class GA Groundwater Standards unless noted otherwise.
 a. NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998).
 b. Federal Maximum Contaminant Level (http://www.epa.gov/safewater/contaminants/index.html)
2. Shading indicates a concentration above the GA Groundwater standard.

U = compound was not detected
J = the reported value is and estimated concentration
UJ= the compound was not detected; the associated reporting limit is approximate.

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
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Seneca Army Depot Activity

Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-7	MWT-7	PT-24	PT-24	PT-24	PT-24
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20150	ALBW20165	ALBW20061	ALBW20076	ALBW20090	ALBW20105
Sample Date								6/2/2009	12/15/2009	1/2/2007	3/15/2007	6/5/2007	11/13/2007
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								7	8	1	2	3	4
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds													
1,1,1-Trichloroethane	UG/L	0.76	3%	5	0	4	118	0.26 U	0.26 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	5	0	0	118	0.21 U	0.21 U	1 U	1 U	1 U	1 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/L	0	0%	5	0	0	118	0.31 U	0.31 U	1 U	1 U	1 UJ	1 U
1,1,2-Trichloroethane	UG/L	0	0%	1	0	0	118	0.23 U	0.23 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	UG/L	1.1	7%	5	0	8	118	0.75 U	0.38 U	0.68 J	1 U	0.75 J	0.56 J
1,1-Dichloroethene	UG/L	2.1	7%	5	0	8	118	0.29 U	0.48 J	1 U	1 U	1 U	1 U
1,2,4-Trichlorobenzene	UG/L	0	0%	5	0	0	118	0.41 U	0.41 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	UG/L	0	0%	0.04	0	0	118	1 UJ	0.39 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	UG/L	0	0%	0.0006	0	0	118	0.17 U	0.17 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	UG/L	0	0%	3	0	0	118	0.2 U	0.2 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	UG/L	5.6	11%	0.6	11	13	118	0.21 U	0.21 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	UG/L	0	0%	1	0	0	118	0.14 U	0.32 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	UG/L	0	0%	3	0	0	118	0.16 U	0.36 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	UG/L	0	0%	3	0	0	118	0.16 U	0.39 U	1 U	1 U	1 U	1 U
Acetone	UG/L	2600	29%		0	34	118	1.3 U	1.3 U	5 U	5 U	5 U	5 U
Benzene	UG/L	0	0%	1	0	0	118	0.16 U	0.41 U	1 U	1 U	1 U	1 U
Bromodichloromethane	UG/L	0	0%	80 [b]	0	0	118	0.39 U	0.39 U	1 U	1 U	1 U	1 U
Bromoform	UG/L	0	0%	80 [b]	0	0	118	0.26 UJ	0.26 UJ	1 U	1 U	1 U	1 U
Carbon disulfide	UG/L	0	0%		0	0	118	0.19 UJ	0.19 UJ	1 U	1 U	1 U	1 U
Carbon tetrachloride	UG/L	0	0%	5	0	0	118	0.27 U	0.27 U	1 U	1 U	1 U	1 U
Chlorobenzene	UG/L	0	0%	5	0	0	118	0.32 U	0.32 U	1 U	1 U	1 U	1 U
Chlorodibromomethane	UG/L	0	0%	80 [b]	0	0	118	0.32 U	0.32 U	1 U	1 U	1 U	1 U
Chloroethane	UG/L	1.1	6%	5	0	7	118	0.61 J	0.32 UJ	1 U	1 U	1 U	1 U
Chloroform	UG/L	27	5%	7	4	6	118	0.34 U	0.34 U	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethene	UG/L	720	81%	5	80	96	118	68	140	54	38	60	39
Cis-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	0.36 U	0.36 U	1 U	1 U	1 U	1 U
Cyclohexane	UG/L	0	0%		0	0	118	0.53 U	0.53 U	1 U	1 U	1 U	1 U
Dichlorodifluoromethane	UG/L	0	0%	5	0	0	118	0.29 U	0.29 U	1 U	1 U	1 U	1 U
Ethyl benzene	UG/L	1.3	3%	5	0	4	118	0.18 U	0.18 U	1 U	1 U	1 U	1 U
Isopropylbenzene	UG/L	0	0%	5	0	0	118	0.19 U	0.19 U	1 U	1 U	1 U	1 U
Methyl Acetate	UG/L	6	2%		0	2	118	0.17 UJ	0.5 U	1 U	1 UJ	1 U	1 UJ
Methyl Tertbutyl Ether	UG/L	0	0%		0	0	118	0.16 U	0.16 U	1 U	1 U	1 U	1 U
Methyl bromide	UG/L	0	0%	5	0	0	117	0.28 U	0.28 U	1 U	1 U	1 U	1 U
Methyl butyl ketone	UG/L	0	0%		0	0	118	1.2 U	1.2 U	5 U	5 U	5 U	5 UJ
Methyl chloride	UG/L	0	0%	5	0	0	118	0.35 U	0.35 UJ	1 U	1 U	1 U	1 U
Methyl cyclohexane	UG/L	0	0%		0	0	118	0.5 U	0.5 U	1 U	1 U	1 U	1 U
Methyl ethyl ketone	UG/L	4900	18%		0	21	118	1.3 U	1.3 U	5 U	5 U	5 U	5 U
Methyl isobutyl ketone	UG/L	0	0%		0	0	118	0.91 U	0.91 U	5 U	5 U	5 U	5 U
Methylene chloride	UG/L	18	10%	5	7	12	118	0.44 U	0.44 U	1 U	1 U	1 U	1 U
Styrene	UG/L	0	0%	5	0	0	118	0.18 U	0.18 U	1 U	1 U	1 U	1 U
Tetrachloroethene	UG/L	0	0%	5	0	0	118	0.36 U	0.36 U	1 U	1 U	1 U	1 U
Toluene	UG/L	590	19%	5	16	23	118	0.51 U	0.51 U	1 U	1 U	1 U	1 U
Total Xylenes	UG/L	0	0%	5	0	0	118	0.66 U	0.66 U	3 U	3 U	3 U	3 U
Trans-1,2-Dichloroethene	UG/L	8	42%	5	3	50	118	0.13 U	0.55 J	0.86 J	0.81 J	1.6	1 U
Trans-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	0.37 U	0.37 U	1 U	1 U	1 U	1 U
Trichloroethene	UG/L	2700	68%	5	48	80	118	330	350	4	2.8	3.1	3.8
Trichlorofluoromethane	UG/L	0	0%	5	0	0	118	0.15 U	0.15 U	1 U	1 U	1 UJ	1 U
Vinyl chloride	UG/L	180	66%	2	67	78	118	9.3	21	0.6 J	1 U	2.6	1 U

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Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MWT-7	MWT-7	PT-24	PT-24	PT-24	PT-24
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								ALBW20150	ALBW20165	ALBW20061	ALBW20076	ALBW20090	ALBW20105
Sample Date								6/2/2009	12/15/2009	1/2/2007	3/15/2007	6/5/2007	11/13/2007
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								7	8	1	2	3	4
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Other													
Iron	UG/L	296000	100%		11	12	12						
Iron+Manganese	UG/L	352900	100%		12	12	12						
Manganese	UG/L	56900	100%		12	12	12						
Ethane	UG/L	98	88%		0	49	56	7.8	17				
Ethene	UG/L	200	88%		0	49	56	0.76	0.52				
Methane	UG/L	23000	95%		0	53	56	1100	2900				
Sulfate	MG/L	1060	70%		0	39	56	27	29.3 J				
Total Organic Carbon	MG/L	2050	100%		0	56	56	3.1	4.5 J				

Notes:
1. The cleanup goal values are NYSDEC Class GA Groundwater Standards unless noted otherwise.
  a. NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998).
  b. Federal Maximum Contaminant Level (http://www.epa.gov/safewater/contaminants/index.html)
2. Shading indicates a concentration above the GA Groundwater standard.

U = compound was not detected
J = the reported value is and estimated concentration
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Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Cleanup Goals [1]	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								PT-24	PT-24	PT-24	PT-24	MW-56
Matrix								GW	GW	GW	GW	GW
Sample ID								ALBW20119	ALBW20134	ALBW20149	ALBW20164	ALBW20072
Sample Date								6/26/2008	12/12/2008	6/2/2009	12/15/2009	1/4/2007
QC Code								SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM
Sampling Round								5	6	7	8	1
Volatile Organic Compounds												
1,1,1-Trichloroethane	UG/L	0.76	3%	5	0	4	118	1 U	0.26 U	0.26 U	0.26 U	1 U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	5	0	0	118	1 U	0.21 U	0.21 U	0.21 U	1 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/L	0	0%	5	0	0	118	1 UJ	0.31 U	0.31 U	0.31 U	1 U
1,1,2-Trichloroethane	UG/L	0	0%	1	0	0	118	1 U	0.23 U	0.23 U	0.23 U	1 U
1,1-Dichloroethane	UG/L	1.1	7%	5	0	8	118	0.69 J	0.75 U	0.75 U	0.38 U	1 U
1,1-Dichloroethene	UG/L	2.1	7%	5	0	8	118	1 U	0.29 U	0.29 U	0.29 U	1 U
1,2,4-Trichlorobenzene	UG/L	0	0%	5	0	0	118	1 U	0.41 U	0.41 U	0.41 U	1 U
1,2-Dibromo-3-chloropropane	UG/L	0	0%	0.04	0	0	118	1 UJ	1 UJ	1 UJ	0.39 U	1 U
1,2-Dibromoethane	UG/L	0	0%	0.0006	0	0	118	1 U	0.17 U	0.17 U	0.17 U	1 U
1,2-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1 U	0.2 U	0.2 U	0.2 U	1 U
1,2-Dichloroethane	UG/L	5.6	11%	0.6	11	13	118	1 U	0.21 U	0.21 U	0.21 U	1 U
1,2-Dichloropropane	UG/L	0	0%	1	0	0	118	1 U	0.14 U	0.14 U	0.32 U	1 U
1,3-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1 U	0.16 U	0.16 U	0.36 U	1 U
1,4-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1 U	0.16 U	0.16 U	0.39 U	1 U
Acetone	UG/L	2600	29%		0	34	118	5 U	1.3 U	1.3 U	1.3 U	5 U
Benzene	UG/L	0	0%	1	0	0	118	1 U	0.16 U	0.16 U	0.41 U	1 U
Bromodichloromethane	UG/L	0	0%	80 [b]	0	0	118	1 U	0.38 U	0.39 U	0.39 U	1 U
Bromoform	UG/L	0	0%	80 [b]	0	0	118	1 U	0.26 U	0.26 UJ	0.26 UJ	1 U
Carbon disulfide	UG/L	0	0%		0	0	118	1 U	0.19 U	0.19 UJ	0.19 UJ	1 U
Carbon tetrachloride	UG/L	0	0%	5	0	0	118	1 U	0.27 U	0.27 U	0.27 U	1 U
Chlorobenzene	UG/L	0	0%	5	0	0	118	1 U	0.18 U	0.32 U	0.32 U	1 U
Chlorodibromomethane	UG/L	0	0%	80 [b]	0	0	118	1 U	0.32 U	0.32 U	0.32 U	1 U
Chloroethane	UG/L	1.1	6%	5	0	7	118	1 UJ	0.32 U	0.32 U	0.32 UJ	1 U
Chloroform	UG/L	27	5%	7	4	6	118	1 U	0.34 U	0.34 U	0.34 U	1 U
Cis-1,2-Dichloroethene	UG/L	720	81%	5	80	96	118	48	34	32	28	1.2
Cis-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	1 U	0.36 U	0.36 U	0.36 U	1 U
Cyclohexane	UG/L	0	0%		0	0	118	1 U	0.22 U	0.53 U	0.53 U	1 U
Dichlorodifluoromethane	UG/L	0	0%	5	0	0	118	1 U	0.28 U	0.29 U	0.29 U	1 U
Ethyl benzene	UG/L	1.3	3%	5	0	4	118	1 U	0.18 U	0.18 U	0.18 U	1 U
Isopropylbenzene	UG/L	0	0%	5	0	0	118	1 U	0.19 U	0.19 U	0.19 U	1 U
Methyl Acetate	UG/L	6	2%		0	2	118	1 UJ	0.17 U	0.17 UJ	0.5 U	1 U
Methyl Tertbutyl Ether	UG/L	0	0%		0	0	118	1 U	0.16 U	0.16 U	0.16 U	1 U
Methyl bromide	UG/L	0	0%	5	0	0	117	1 UJ	0.28 U	0.28 U	0.28 U	1 U
Methyl butyl ketone	UG/L	0	0%		0	0	118	5 UJ	1.2 U	1.2 U	1.2 U	5 U
Methyl chloride	UG/L	0	0%	5	0	0	118	1 UJ	0.34 U	0.35 U	0.35 UJ	1 U
Methyl cyclohexane	UG/L	0	0%		0	0	118	1 U	0.22 U	0.5 U	0.5 U	1 U
Methyl ethyl ketone	UG/L	4900	18%		0	21	118	5 UJ	1.3 U	1.3 U	1.3 U	5 U
Methyl isobutyl ketone	UG/L	0	0%		0	0	118	5 UJ	0.91 U	0.91 U	0.91 U	5 U
Methylene chloride	UG/L	18	10%	5	7	12	118	1 U	0.44 UJ	0.44 U	0.44 U	1 U
Styrene	UG/L	0	0%	5	0	0	118	1 U	0.18 U	0.18 U	0.18 U	1 U
Tetrachloroethene	UG/L	0	0%	5	0	0	118	1 U	0.36 U	0.36 U	0.36 U	1 U
Toluene	UG/L	590	19%	5	16	23	118	1 U	0.51 U	0.51 U	0.51 U	1 U
Total Xylenes	UG/L	0	0%	5	0	0	118	3 U	0.93 U	0.66 U	0.66 U	3 U
Trans-1,2-Dichloroethene	UG/L	8	42%	5	3	50	118	1.1	0.36 J	0.83 J	0.61 J	1 U
Trans-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	1 U	0.37 U	0.37 U	0.37 U	1 U
Trichloroethene	UG/L	2700	68%	5	48	80	118	2.4	2.2	1.7	1.7	1 U
Trichlorofluoromethane	UG/L	0	0%	5	0	0	118	1 UJ	0.15 U	0.15 U	0.15 U	1 U
Vinyl chloride	UG/L	180	66%	2	67	78	118	1.9	0.26 J	2	1.6	1 U

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								PT-24	PT-24	PT-24	PT-24	MW-56
Matrix								GW	GW	GW	GW	GW
Sample ID								ALBW20119	ALBW20134	ALBW20149	ALBW20164	ALBW20072
Sample Date								6/26/2008	12/12/2008	6/2/2009	12/15/2009	1/4/2007
QC Code								SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM
Sampling Round								5	6	7	8	1
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Other												
Iron	UG/L	296000	100%		11	12	12					
Iron+Manganese	UG/L	352900	100%		12	12	12					
Manganese	UG/L	56900	100%		12	12	12					
Ethane	UG/L	98	88%		0	49	56					
Ethene	UG/L	200	88%		0	49	56					
Methane	UG/L	23000	95%		0	53	56					
Sulfate	MG/L	1060	70%		0	39	56					
Total Organic Carbon	MG/L	2050	100%		0	56	56					

Notes:
1. The cleanup goal values are NYSDEC Class GA Groundwater Standards unless noted otherwise.
 a. NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998).
 b. Federal Maximum Contaminant Level (http://www.epa.gov/safewater/contaminants/index.html)
2. Shading indicates a concentration above the GA Groundwater standard.

U = compound was not detected
J = the reported value is and estimated concentration
UJ= the compound was not detected; the associated reporting limit is approximate.

Appendix B

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MW-56	MW-56	MW-56	MW-56	MW-56
Matrix								GW	GW	GW	GW	GW
Sample ID								ALBW20101	ALBW20124	ALBW20139	ALBW20154	ALBW20169
Sample Date								6/6/2007	6/26/2008	12/11/2008	6/4/2009	12/18/2009
QC Code								SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM
Sampling Round								3	5	6	7	8
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Volatile Organic Compounds												
1,1,1-Trichloroethane	UG/L	0.76	3%	5	0	4	118	1 U	1 U	0.26 UJ	0.26 U	0.26 U
1,1,2,2-Tetrachloroethane	UG/L	0	0%	5	0	0	118	1 U	1 U	0.21 U	0.21 U	0.21 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/L	0	0%	5	0	0	118	1 UJ	1 UJ	0.31 U	0.31 U	0.31 UJ
1,1,2-Trichloroethane	UG/L	0	0%	1	0	0	118	1 U	1 U	0.23 U	0.23 U	0.23 U
1,1-Dichloroethane	UG/L	1.1	7%	5	0	8	118	1 U	1 U	0.75 U	0.75 U	0.38 U
1,1-Dichloroethene	UG/L	2.1	7%	5	0	8	118	1 U	1 U	0.29 U	0.29 U	0.29 U
1,2,4-Trichlorobenzene	UG/L	0	0%	5	0	0	118	1 U	1 U	0.41 U	0.41 U	0.41 U
1,2-Dibromo-3-chloropropane	UG/L	0	0%	0.04	0	0	118	1 U	1 UJ	1 UJ	1 U	0.39 U
1,2-Dibromoethane	UG/L	0	0%	0.0006	0	0	118	1 U	1 U	0.17 U	0.17 U	0.17 U
1,2-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1 U	1 U	0.2 U	0.2 U	0.2 U
1,2-Dichloroethane	UG/L	5.6	11%	0.6	11	13	118	1 U	1 U	0.21 U	0.21 U	0.21 U
1,2-Dichloropropane	UG/L	0	0%	1	0	0	118	1 U	1 U	0.14 U	0.14 U	0.32 U
1,3-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1 U	1 U	0.16 U	0.16 U	0.36 U
1,4-Dichlorobenzene	UG/L	0	0%	3	0	0	118	1 U	1 U	0.16 U	0.16 U	0.39 U
Acetone	UG/L	2600	29%		0	34	118	5 U	5 U	1.3 U	1.3 UJ	1.3 U
Benzene	UG/L	0	0%	1	0	0	118	1 U	1 U	0.16 U	0.16 U	0.41 U
Bromodichloromethane	UG/L	0	0%	80 [b]	0	0	118	1 U	1 U	0.38 U	0.39 U	0.39 U
Bromoform	UG/L	0	0%	80 [b]	0	0	118	1 U	1 U	0.26 U	0.26 U	0.26 U
Carbon disulfide	UG/L	0	0%		0	0	118	1 U	1 U	0.19 U	0.19 U	0.19 U
Carbon tetrachloride	UG/L	0	0%	5	0	0	118	1 U	1 U	0.27 UJ	0.27 U	0.27 U
Chlorobenzene	UG/L	0	0%	5	0	0	118	1 U	1 U	0.18 U	0.32 U	0.32 U
Chlorodibromomethane	UG/L	0	0%	80 [b]	0	0	118	1 U	1 U	0.32 U	0.32 U	0.32 U
Chloroethane	UG/L	1.1	6%	5	0	7	118	1 U	1 UJ	0.32 U	0.32 U	0.32 UJ
Chloroform	UG/L	27	5%	7	4	6	118	1 U	1 U	0.34 U	0.34 U	0.34 U
Cis-1,2-Dichloroethene	UG/L	720	81%	5	80	96	118	1.7	1.3	0.4 J	1	0.56 J
Cis-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	1 U	1 U	0.36 U	0.36 U	0.36 U
Cyclohexane	UG/L	0	0%		0	0	118	1 U	1 U	0.22 U	0.53 U	0.53 U
Dichlorodifluoromethane	UG/L	0	0%	5	0	0	118	1 U	1 U	0.28 UJ	0.29 U	0.29 U
Ethyl benzene	UG/L	1.3	3%	5	0	4	118	1 U	1 U	0.18 U	0.18 U	0.18 U
Isopropylbenzene	UG/L	0	0%	5	0	0	118	1 U	1 U	0.19 U	0.19 U	0.19 U
Methyl Acetate	UG/L	6	2%		0	2	118	1 U	1 UJ	0.17 U	0.17 U	0.5 U
Methyl Tertbutyl Ether	UG/L	0	0%		0	0	118	1 U	1 U	0.16 U	0.16 U	0.16 U
Methyl bromide	UG/L	0	0%	5	0	0	117	1 U	1 UJ	0.28 U	0.28 U	0.28 UJ
Methyl butyl ketone	UG/L	0	0%		0	0	118	5 U	5 UJ	1.2 U	1.2 U	1.2 U
Methyl chloride	UG/L	0	0%	5	0	0	118	1 U	1 UJ	0.34 U	0.35 U	0.35 U
Methyl cyclohexane	UG/L	0	0%		0	0	118	1 U	1 U	0.22 U	0.5 U	0.5 U
Methyl ethyl ketone	UG/L	4900	18%		0	21	118	5 U	5 UJ	1.3 U	1.3 U	1.3 U
Methyl isobutyl ketone	UG/L	0	0%		0	0	118	5 U	5 UJ	0.91 U	0.91 U	0.91 U
Methylene chloride	UG/L	18	10%	5	7	12	118	1 U	1 U	0.44 UJ	0.44 U	0.44 U
Styrene	UG/L	0	0%	5	0	0	118	1 U	1 U	0.18 U	0.18 U	0.18 U
Tetrachloroethene	UG/L	0	0%	5	0	0	118	1 U	1 U	0.36 U	0.36 U	0.36 U
Toluene	UG/L	590	19%	5	16	23	118	1 U	1 U	0.51 U	0.51 U	0.51 U
Total Xylenes	UG/L	0	0%	5	0	0	118	3 U	3 U	0.93 U	0.66 U	0.66 U
Trans-1,2-Dichloroethene	UG/L	8	42%	5	3	50	118	1 U	1 U	0.13 U	0.13 U	0.42 U
Trans-1,3-Dichloropropene	UG/L	0	0%	0.4	0	0	118	1 U	1 U	0.37 U	0.37 U	0.37 U
Trichloroethene	UG/L	2700	68%	5	48	80	118	1 U	1 U	0.33 J	0.18 U	0.46 U
Trichlorofluoromethane	UG/L	0	0%	5	0	0	118	1 UJ	1 UJ	0.15 UJ	0.15 U	0.15 UJ
Vinyl chloride	UG/L	180	66%	2	67	78	118	1 U	1 U	0.24 U	0.24 U	0.24 U

Appendix B

Table B-1
Complete Groundwater Data for Ash Landfill Long Term Monitoring
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

Facility								ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL	ASH LANDFILL
Location ID								MW-56	MW-56	MW-56	MW-56	MW-56
Matrix								GW	GW	GW	GW	GW
Sample ID								ALBW20101	ALBW20124	ALBW20139	ALBW20154	ALBW20169
Sample Date								6/6/2007	6/26/2008	12/11/2008	6/4/2009	12/18/2009
QC Code								SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM
Sampling Round								3	5	6	7	8
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Cleanup Goals [1]**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Other												
Iron	UG/L	296000	100%		11	12	12					
Iron+Manganese	UG/L	352900	100%		12	12	12					
Manganese	UG/L	56900	100%		12	12	12					
Ethane	UG/L	98	88%		0	49	56					
Ethene	UG/L	200	88%		0	49	56					
Methane	UG/L	23000	95%		0	53	56					
Sulfate	MG/L	1060	70%		0	39	56					
Total Organic Carbon	MG/L	2050	100%		0	56	56					

Notes:
1. The cleanup goal values are NYSDEC Class GA Groundwater Standards unless noted otherwise.
a. NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998).
b. Federal Maximum Contaminant Level (http://www.epa.gov/safewater/contaminants/index.html)
2. Shading indicates a concentration above the GA Groundwater standard.

U = compound was not detected
J = the reported value is and estimated concentration
UJ= the compound was not detected; the associated reporting limit is approximate.

APPENDIX C

REGRESSION PLOTS

Appendix C

Figure C-1
Regression Plot of Well Concentrations At MWT-25
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

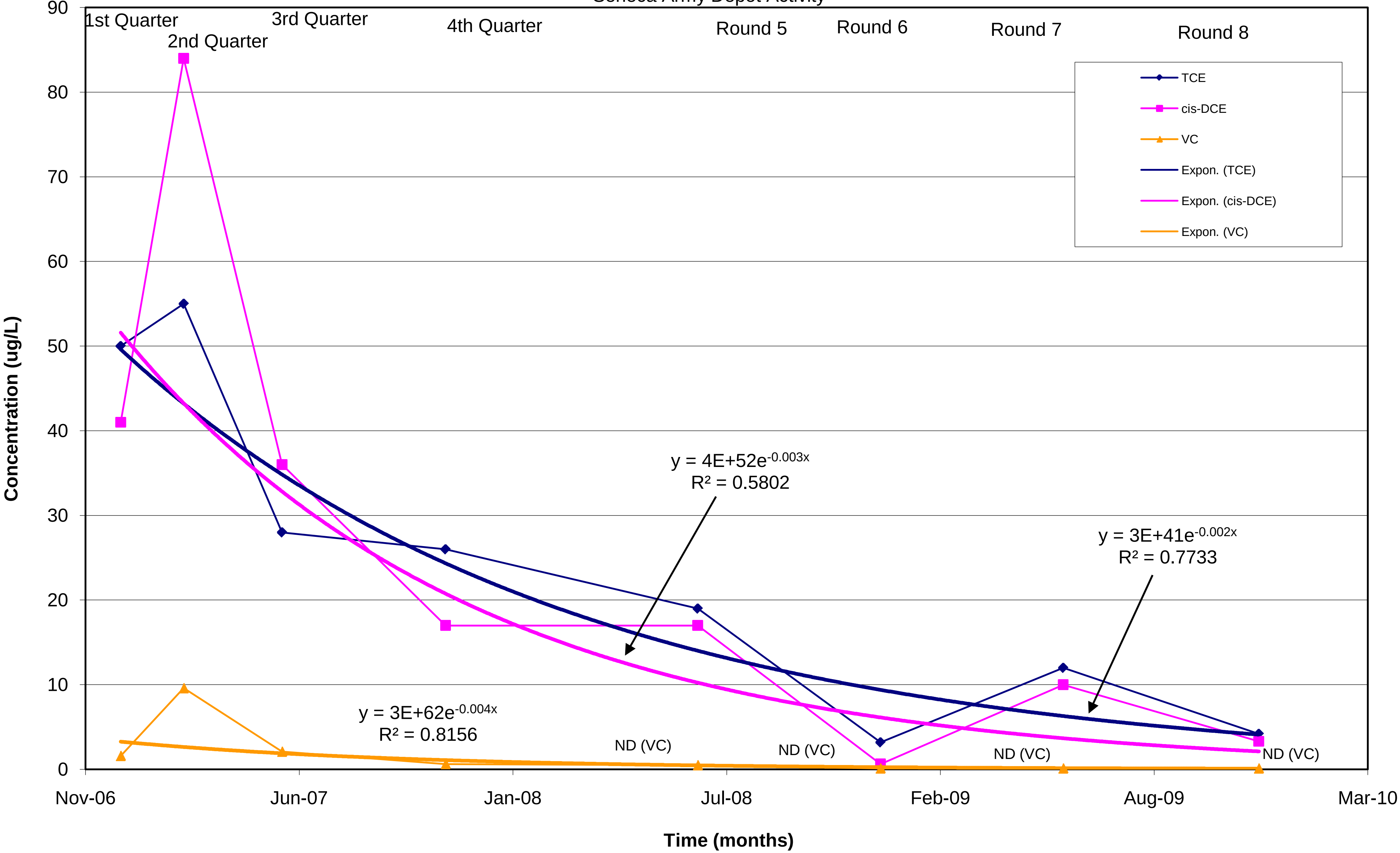

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Figure C-2
Regression Plot of Well Concentrations At MWT-26
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

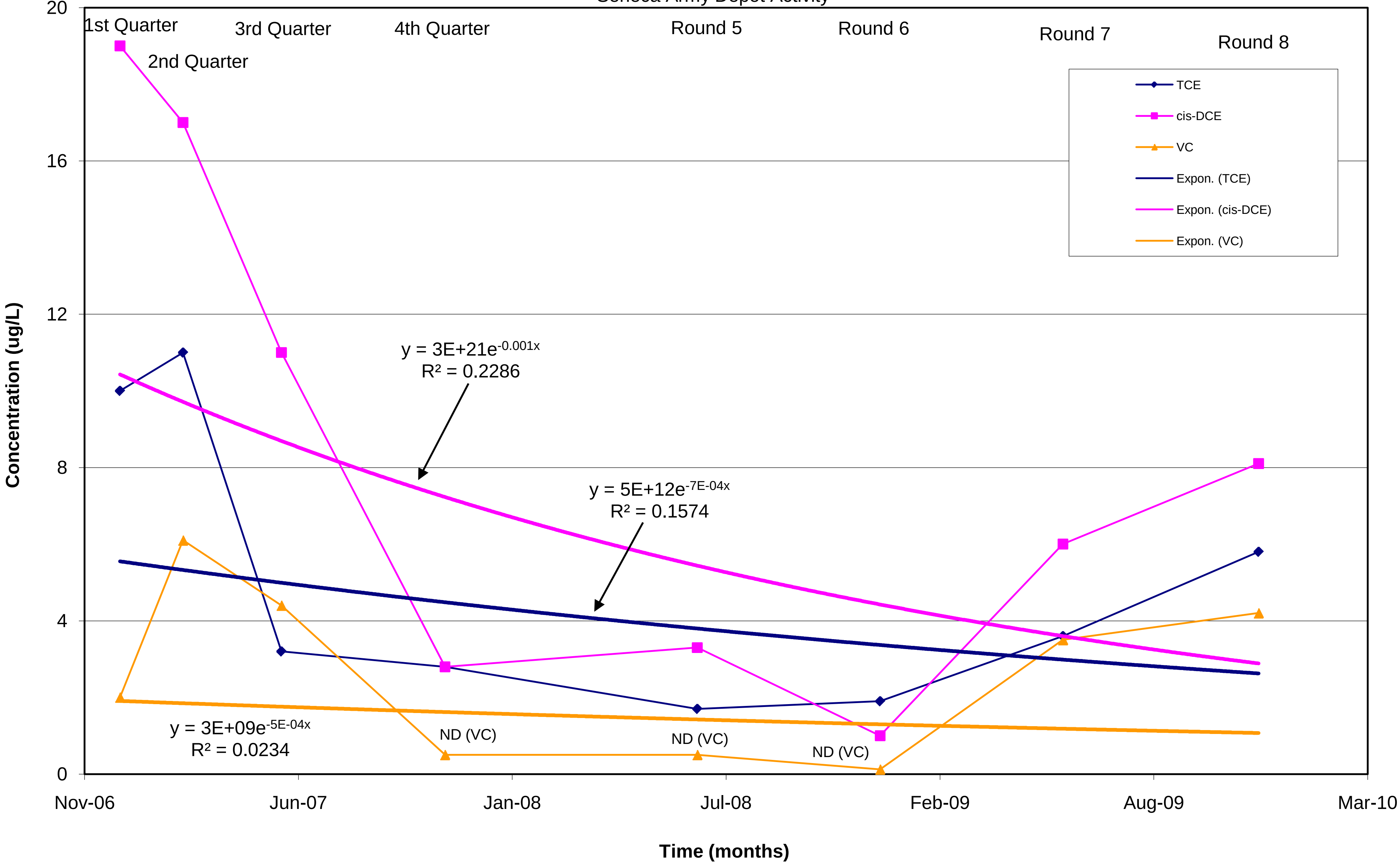

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Figure C-3
Regression Plot of Well Concentrations At MWT-27
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

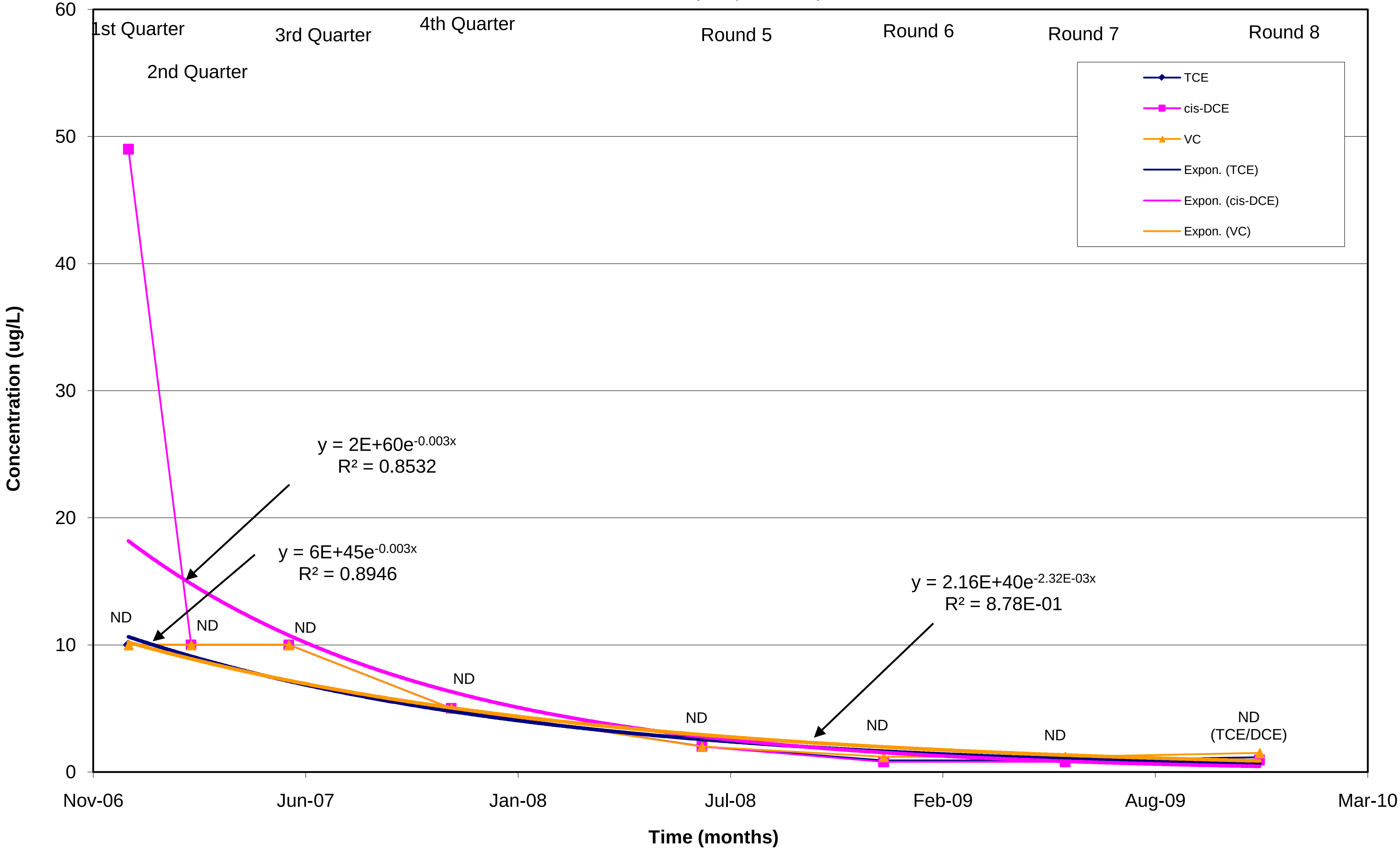

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Figure C-4
Regression Plot of Well Concentrations At MWT-28
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

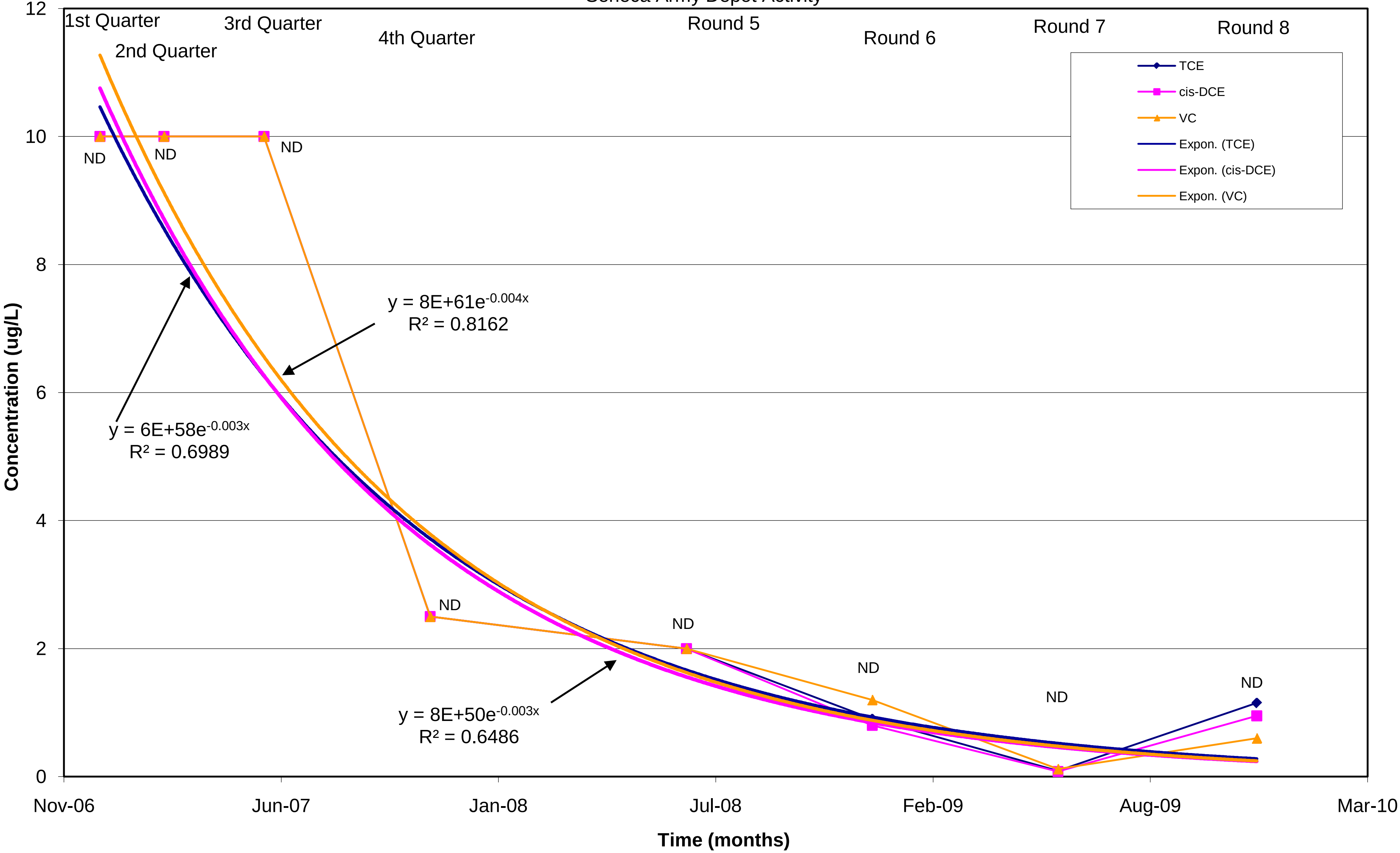

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Figure C-5
Regression Plot of Well Concentrations At MWT-29
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

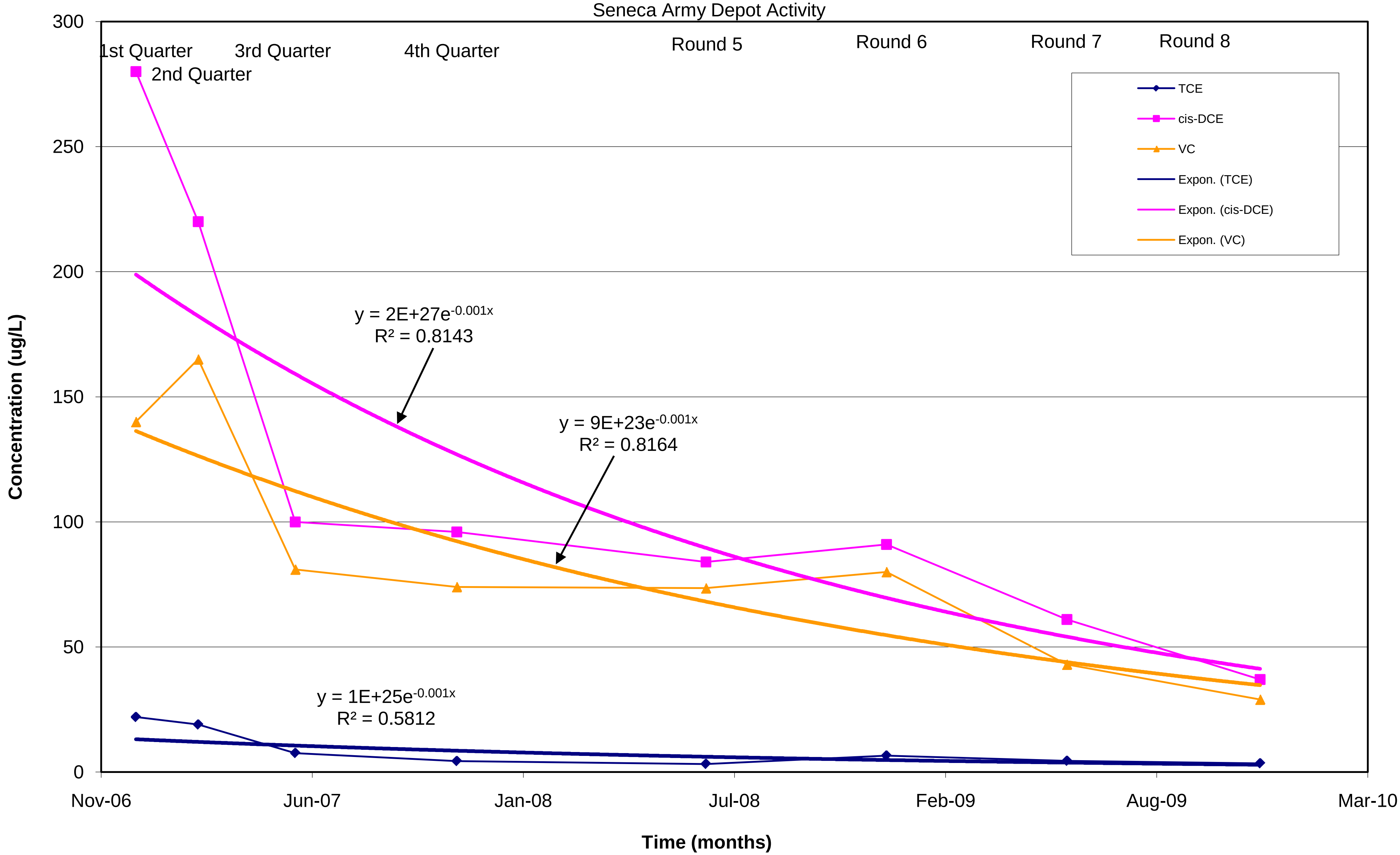

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Figure C-6
Regression Plot of Well Concentrations At MWT-22
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

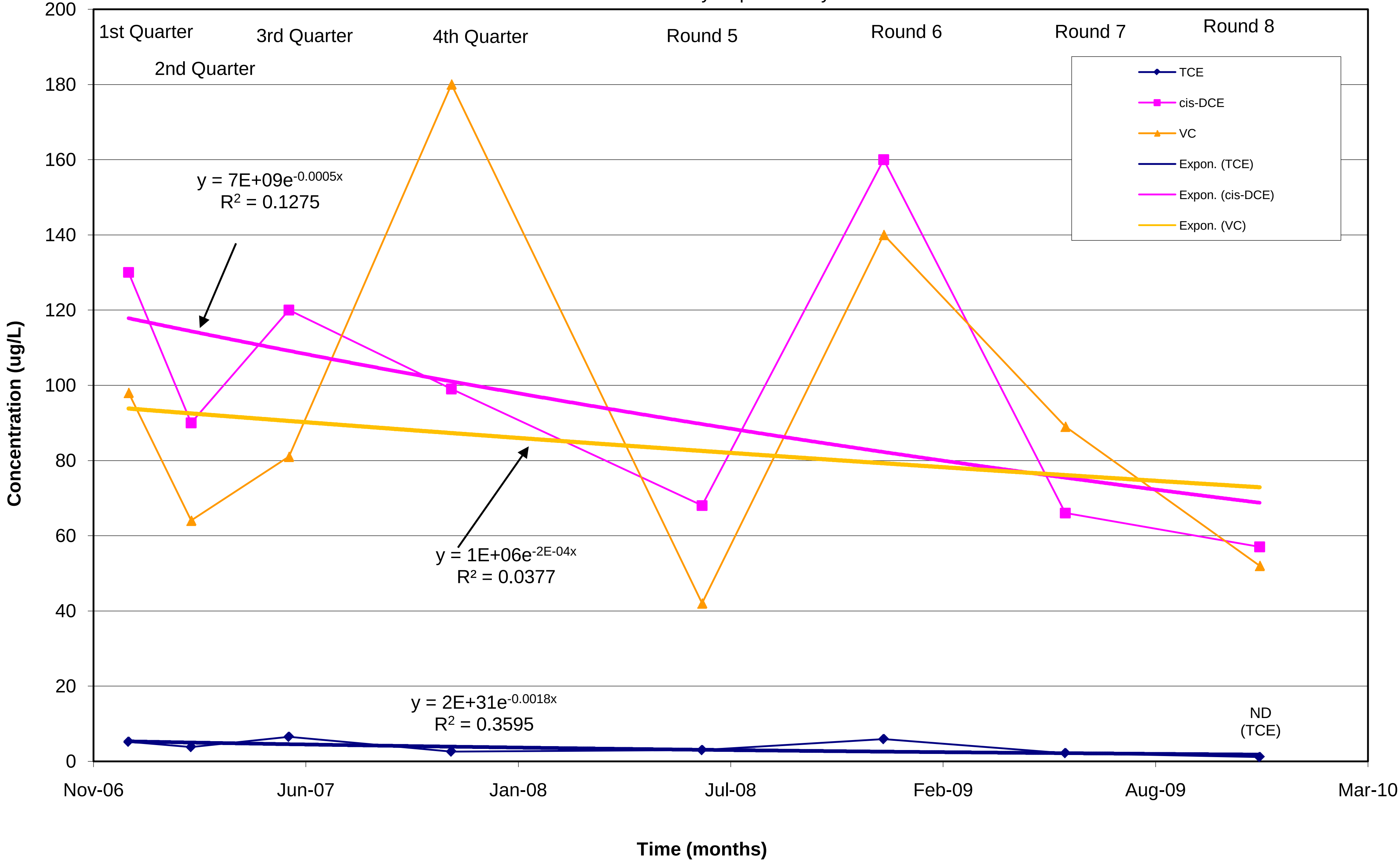

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Figure C-7
Regression Plot of Well Concentrations At PT-22
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

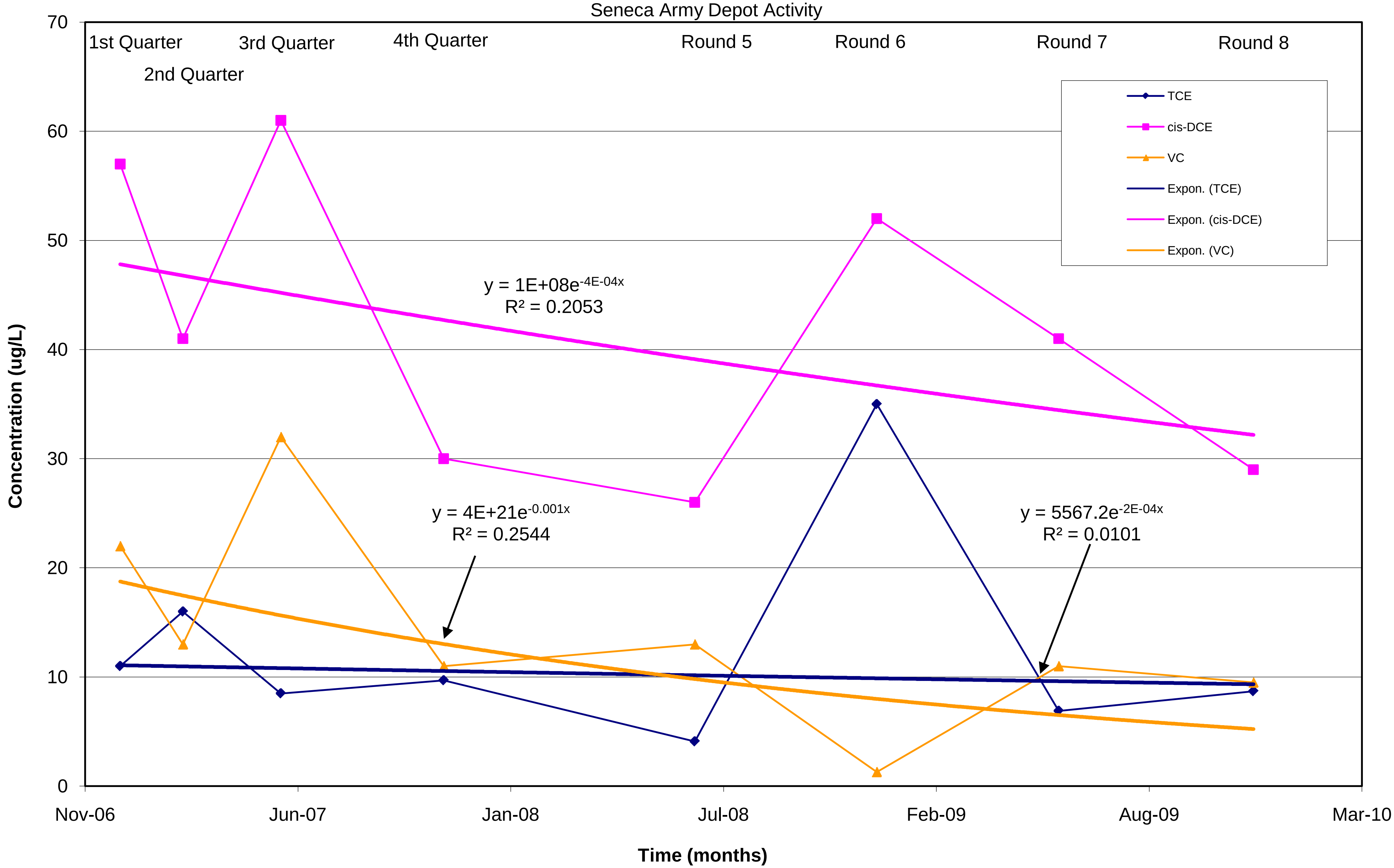

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Figure C-8
Regression Plot of Well Concentrations At MWT-23
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

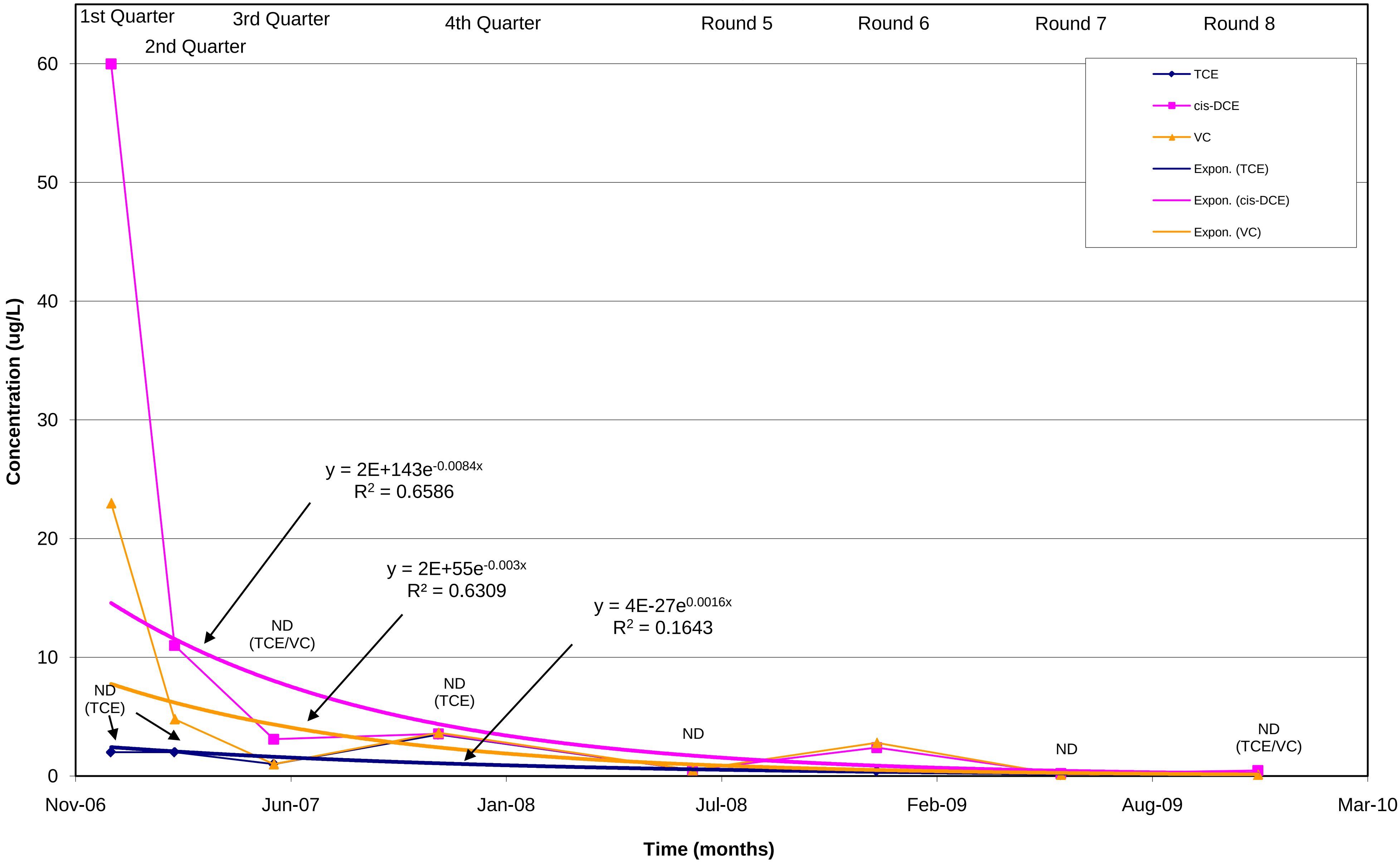

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Figure C-9
Regression Plot of Well Concentrations At MWT-24
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity

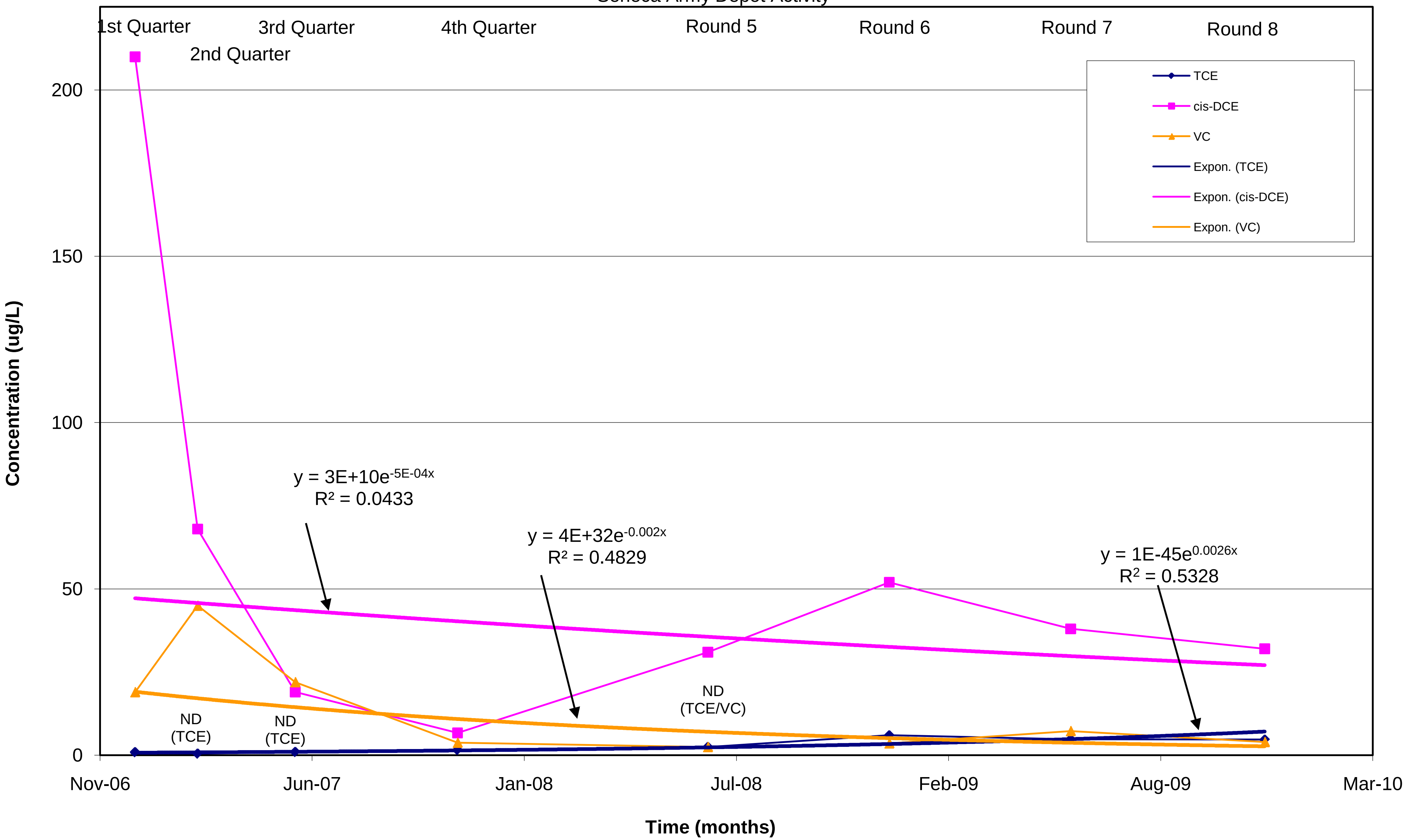

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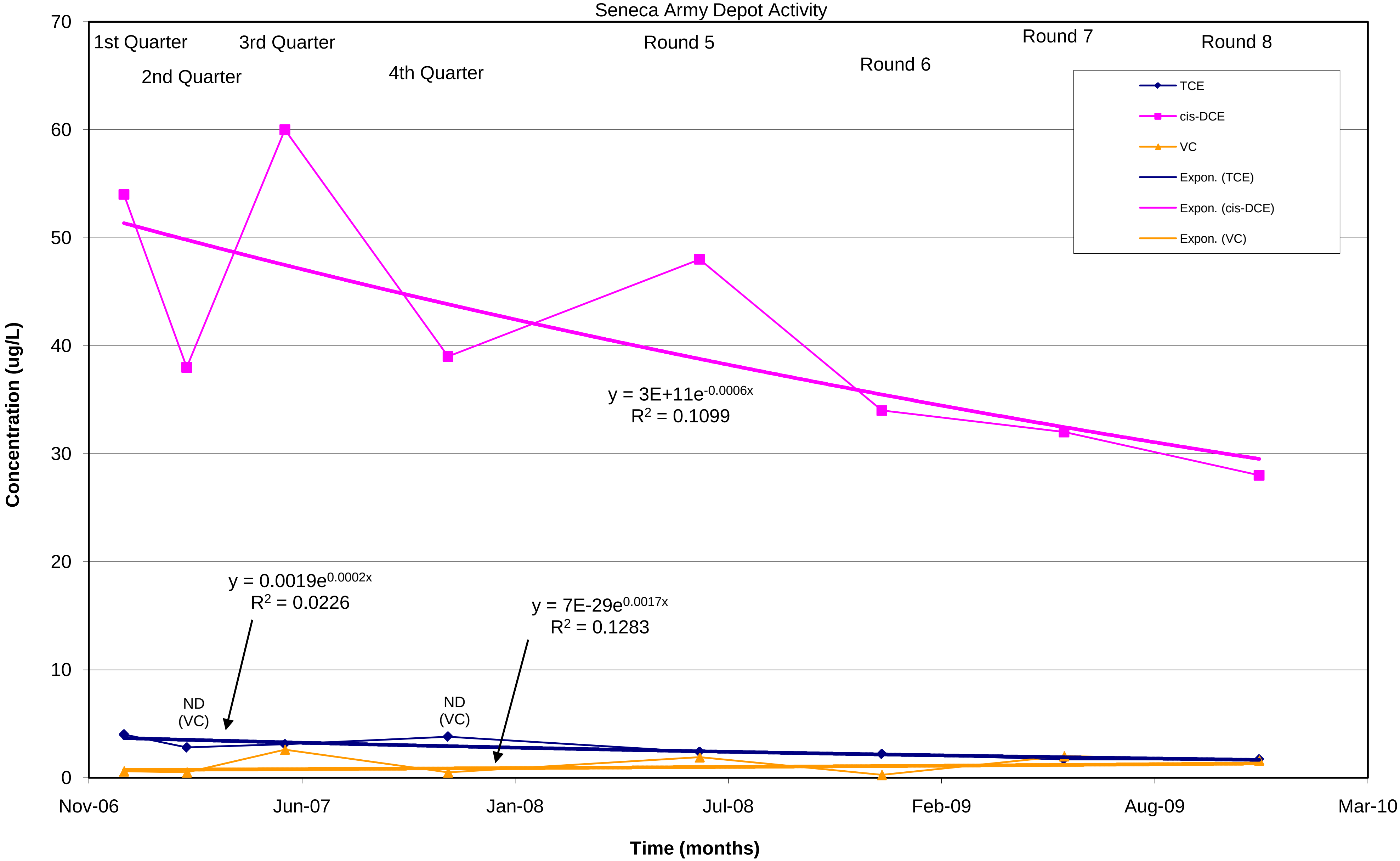
Figure C-10
Regression Plot of Well Concentrations At PT-24
Ash Landfill Annual Report, Year 3
Seneca Army Depot Activity



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APPENDIX D

RESPONSE TO COMMENTS

Army's Response to Comments from the United States Environmental Protection Agency

Subject: Draft Annual Report and Year 3 Review
Ash Landfill Operable Unit
Seneca Army Depot
Romulus, New York

Comments Dated: May 26, 2010

Date of Comment Response: August 12, 2010

Army's Response to Comments

GENERAL COMMENTS

The Annual Report presents biowall recharge assessment values that are relatively close, if not below benchmark values used to evaluate anaerobic conditions at the site, and vinyl chloride was detected in one of the biowall monitoring wells. However, the Annual Report does not allow for a mid-year assessment of groundwater parameters. In addition, it should be noted that well MWT-7, located downgradient of all of the biowalls yet just upgradient of the property boundary, reported increasing concentrations of trichloroethylene, cis-1,2-dichloroethene, and vinyl chloride during the last two sampling events.

Comment 1: The Annual Report states, on Page 17, that recharge of the biowalls "is not necessary at this time." However, the geochemical and chemical data presented within the Annual Report do not appear to fully support this conclusion. The criteria used for assessment of the need for replenishment of the Ash Landfill biowalls are presented in Section 3.5, Biowall Recharge Evaluation, on Page 17. The values presented as assessment points for recharge of the biowalls include a total organic carbon (TOC) value of greater than 20 mg/L. The two most recent TOC values presented for biowall well MWT-23 are less than the 20 mg/L benchmark, and the TOC values at MWT-28 are also approaching 20 mg/L. Further, oxidation reduction potential (ORP) is another assessment point for recharge of the biowall, with a trigger value of less than -100 mV. The ORP values presented indicate that conditions have not maintained the specified criterion of 100 mV at well MWT-23 during the last monitoring event. It is also important to note that vinyl chloride was detected in MWT-27 during the most recent sampling event. Although it is not possible to determine whether the detection of vinyl chloride represents a 50% increase, this breakthrough coupled with not meeting all of the geochemical parameter benchmarks suggests that recharge of the biowalls may be necessary. At a minimum, the need for recharge of the biowalls should be reassessed following the next sampling event in Summer 2010, and not "after the completion of the fourth year of LTM" as recommended in Section 4.2, Recommendations.

Response 1: As stated in the Report, the benchmark values are not an absolute set of conditions or parameters that can be used to determine the need to recharge. Through a lines-of-evidence approach, which includes consideration of geochemical parameters and chlorinated ethenes concentrations, a recharge is not necessary at this time. The text describes that the evaluation of geochemical parameters and the recharge evaluation focus on the levels present within the biowalls themselves compared to concentrations at upgradient locations. As such, the evaluation of the need to recharge is completed in accordance with the Remedial Design Report (RDR) (Parsons, 2006), and outlined in Section 3.5, is focused on the levels within the biowalls at monitoring wells MWT-27, 28, and 29.

As shown in Section 3.5 of the report, which discusses the geochemical parameters at the biowall process monitoring wells, TOC, DO, and ORP at MWT-27 and MWT-28 meet benchmark values. This indicates that highly reducing conditions are maintained in Biowalls B1/B2. Although TOC and ORP at MWT-23 do not meet the benchmark values, concentrations of chlorinated ethenes in the biowall process monitoring wells remain below GA standards or non-detect. The determination looks at both the geochemical parameters compared to benchmarks and the chlorinated ethene concentrations since both lines of evidence are critical evaluation factors. The review of both lines of evidence indicates that highly reducing conditions are maintained at Biowalls C1/C2.

The detection of an estimated 3.1 J ug/L of vinyl chloride at MWT-27 represents the first time a chlorinated ethene is detected above the standard at a biowall, and the concentrations will be monitored further to confirm that concentrations are actually rebounding. The reduction in the concentration of vinyl chloride across Biowalls B1/B2 from an estimated 3.1 J ug/L at Biowall B1 to 1.2 U ug/L at Biowall B2 demonstrates that the biowall pair is preventing contaminant breakthrough. The Army will continue to monitor vinyl chloride at this well and throughout the site as part of the regular sampling and evaluation schedule.

After each sampling event at the Ash Landfill OU, the Army evaluates both geochemical parameters and chlorinated ethene concentrations in the context of biowall process monitoring; a full discussion is included in each Annual Report. However, given the USEPA comment above, the Army will include a formal discussion of biowall recharge evaluation in the Round 9 Letter Report.

Comment 2: The Annual Report does not provide a general location map for the Seneca Army Depot Activity (SEAD). In addition, none of the figures included in the report show the SEDA site boundaries. As on-site and off-site wells are discussed in the Annual Report for the Ash Landfill Operable Unit (OU), it is important to show the site boundary lines so an evaluation of the detected concentrations in groundwater in relation to off-site areas can be conducted. Revise the Annual Report to include a general location map for SEDA. Further, clearly designate the SEDA site boundaries on all applicable figures, and ensure that the farmhouse wells reportedly located within 1,250 feet of the leading edge of the contaminant groundwater plume are shown on the figures.

Response 2: A figure showing the location of SEDA has been added as Figure 1. Subsequent figure numbers have been updated to reflect the addition of this figure. The SEDA site boundary has been added to all figures showing the site. The farmhouse wells are located at a significant distance from the center of the plume; including them on each figure would significantly alter the scale of each drawing so that the locations of the biowalls and the LTM monitoring wells would be difficult to view on the figure. As such, a new figure showing the location of the farmhouse in relation to the OU has been added as Figure 4.

Comment 3: Figure 4, Chlorinated Ethene Concentrations in Groundwater, shows groundwater isocontours, but it is unclear for what constituent(s) these contours apply (i.e., TCE, all chlorinated volatile organic compounds [VOCs], etc.) In addition, the legend of Figure 4 indicates that these isocontours are constructed using data from January 2000. Recent groundwater data should be used to show the current configuration of the groundwater plume. Revise the Annual Report to include a figure that shows the current configuration of the plume, with the constituents represented by the isocontours clearly defined, or alternatively, provide seasonally-based isocontours that could assist in the assessment of the plume's leading edge flow direction.

Response 3: Isocontours provided in former Figure 4, now referenced as Figure 6, were constructed using total chlorinated ethenes concentrations collected at the Ash Landfill from a January 2000 sampling event. The current biowall LTM program, as approved in the RDR, monitors groundwater conditions at wells located generally along the centerline of the historic plume. As a result, the current data from the biowall LTM program do not provide sufficient coverage to characterize the current shape of the plume, since information about the lateral extent of the plume is not available. The most recent round with sufficient data to develop isocontours is from the August 2004 sampling event completed prior to installation of the biowalls. The figure has been revised and the 2000 plume depiction is replaced with isocontours of total chlorinated ethenes based on August 2004.

Figures 6A – 6H, now referenced as Figures 9A – 9H, illustrate the current areal distribution of chlorinated ethene concentrations; likewise, former Figures 7A – 7J, now referred to as Figures 10A – 10J, provide insight into the temporal distribution of chlorinated ethene concentrations.

Comment 4: The Annual Report does not include a figure that plots groundwater elevations at the site by well location. Figure 4, Chlorinated Ethene Concentrations in Groundwater, includes a groundwater flow direction arrow, but the figure does not include any groundwater contours to support this groundwater flow direction. Revise the Annual Report to include a groundwater elevation map that is based on measurements collected during 2009.

Response 4: A figure showing the groundwater elevations at the Ash Landfill has been added as Figure 7, and a figure showing groundwater elevations during 8R2009 has been added as Figure 8. Subsequent figure numbers have been updated to reflect the addition of this figure.

Comment 5: The Annual Report does not indicate whether potential vapor intrusion concerns associated with the VOC plumes have been evaluated. The Annual Report indicates that two "farmhouse wells are located approximately 1,250 feet from the leading edge of the plume" but the document does not indicate whether any on or off-site buildings are located closer to the plumes which may be of concern for the vapor intrusion pathway. In addition, the Annual Report does not indicate whether these off-site wells have been sampled. Please revise the Annual Report to address these concerns, and provide reference to appropriate documents which may evaluate the vapor intrusion pathway and include sampling data for off-site residential wells.

Response 5: Vapor intrusion is not an issue that is addressed or discussed in the ROD for the Ash Landfill; therefore it is not an issue that needs to be discussed in the Annual Report. There are no existing buildings located at the Ash Landfill; the nearest building is the farmhouse. The Land Use Control Remedial Design (LUC RD) Addendum #3 includes restrictions that prevent construction at the AOC to address vapor intrusion concerns.

MW-56, the compliance monitoring well located off-site and downgradient of the SEDA property, has been sampled regularly since 1999, and VOCs were never detected above GA standards. Monitoring well MW-56 serves as an early warning for the migration of chlorinated ethenes moving towards the farmhouse.

Wells at the farmhouse, which is located approximately 1535 feet from the SEDA boundary, were sampled during six groundwater monitoring events conducted between 1999 and 2003; Chlorinated ethenes were never detected at the farmhouse wells during these events; these data were reported in monitoring reports submitted to the USEPA and NYSDEC. Based on the fact that chlorinated ethenes are not found in the compliance monitoring well, there is no evidence to indicate that the chlorinated ethene plume has migrated to the farmhouse; therefore, vapor intrusion does not pose a concern.

The approved Remedial Design Report (RDR) (Parsons, 2006) outlines the wells that are included in the current LTM program. The farmhouse wells are not part of the monitoring program since the constituents of concern were never detected at this location; MW-56 is included as an early warning method.

SPECIFIC COMMENTS

Comment 1: Section 1.1, Long-Term Groundwater Monitoring Objectives, Page 2. This section indicates that biowall process monitoring is conducted at two locations: within Biowall B1/B2 and within

Biowall C2. Biowall monitoring within the most upgradient biowall, Biowall A1/A2, is currently not conducted, but it is unclear how the effectiveness of Biowall A1/A2 can be evaluated and the need for maintenance determined if data from within the biowall are not collected. Revise the Annual Report to indicate how it will be determined if and when Biowall A1/A2 will require maintenance/regeneration. Additional data collected from within the biowall may be necessary to make this determination unless appropriate justification is provided.

Response 1: Section 7.2 of the RDR (Parsons, 2006), which was approved by the USEPA and NYSDEC, details the long-term monitoring plan for the Ash Landfill OU. The RDR specifies that the approved plume performance monitoring wells and biowall process monitoring wells are sufficient to provide biowall process monitoring.

The biowalls were constructed at the same time and share the same construction details; as such, conditions in the area of Biowalls A1/A2 closely resemble conditions at Biowalls B1/B2 and at Biowalls C1/C2. It is anticipated that Biowall A1/A2 will degrade at the same rate as the biowalls further downgradient. The effectiveness and possible need for maintenance of Biowalls A1/A2 can be evaluated by continuing to sample according to the LTM plan with consideration for geochemical parameters and chlorinated ethenes concentrations throughout the site. An indication of the need to recharge Biowalls B1/B2 would suggest that Biowall A1/A2 also requires recharge.

Comment 2: Section 2.3, Soil and Groundwater Impacts, Page 5. This section describes a Non-Time Critical Removal Action (NTCRA) conducted in an area northwest of the Ash Landfill. The Annual Report states that this area is believed to have been the source of the groundwater plume. The limits of this excavation are not shown on a site figure. However, the initial source area/excavation area should be presented on a site figure to show the relationship between the initial source area and the current extent of groundwater contamination, especially given the lack of definitive trends in some of the monitoring data. Revise the Annual Report to include the excavation limits from the NTCRA on a site figure in relation to the existing groundwater plume.

Response 2: Figure 3 shows the limits of the NTCRA, referenced as the "Approximate Extent of IRM Treatment." The legend on Figure 3 has been revised to indicate "Approximate Extent of NTCRA Excavation and IRM Treatment". The text on page 5 has been updated to reference Figure 3.

Comment 3: Section 2.3, Soil and Groundwater Impacts, Page 6. The top of this page indicates that the Remedial Investigation (RI) for this site, dated 1994, determined that the VOC plume is vertically restricted to the upper till/weathered shale aquifer and is not present in the deeper competent shale aquifer. The Annual Report does not indicate whether any of the monitoring wells included in the current long-term monitoring program monitor the deeper shale aquifer to determine whether the conclusion from more than 15 years ago is still valid and VOCs have not migrated vertically into the deeper aquifer.

Clarify whether any of the monitoring wells in the current long-term monitoring program monitor the deeper shale aquifer. If not wells currently monitor the deeper aquifer, it is recommended that sampling of a deeper well be considered, possibly as part of the comprehensive 5-year review process or sooner, to determine if the conclusion from the RI is still valid.

Response 3: A similar comment was provided by the USEPA on April 22, 2008 in response to the Annual Report, Year 1 (Parsons, 2008); the Army responded. The comment and response are provided below:

> **Comment 1: Section 2.3, Soil and Groundwater Impacts, Groundwater, Page 5.** Section 2.3 states that vertically the groundwater plume "is restricted to the upper till/weathered shale aquifer and is not present in the deeper competent shale aquifer." However, the Report does not provide the basis for this statement. It is suggested that the Report be revised to provide the locations and well construction information of deep monitoring wells that substantiate that the plume has not migrated to deeper aquifer intervals. Alternatively, the Report should provide a reference to other documents where this information can be found.
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> **Response 1:** This statement was derived from the discussion in Section 4.4 of the RI, which presents the extent of contamination of groundwater at the Ash Landfill. As part of the RI, plume profiles were constructed for geologic cross sections that included monitoring well pairs of wells screened in the till/weathered shale, shallow, competent shale, and deep competent shale. The plume profiles indicated that contamination was confined to the upper aquifer. A reference to the RI will be added to the subject document.

As part of the RI at the Ash Landfill, plume profiles were constructed that included monitoring well pairs screened in the till/weathered shale, shallow competent shale; and deep competent shale. The plume profiles documented the lack of connection between the upper and lower aquifers.

Existing geology at the Ash Landfill further supports the conclusion that it is unlikely that contaminants in the shallow aquifer could migrate to the deep aquifer. The Ash Landfill RI Report (Parsons, 1994) states:

> "The geologic study of the area [completed by] Mozola [in 1951] determined three reasons for the lack of hydrologic interconnection between the groundwater near the surface and the deeper aquifers. First, the shales in this region are relatively impermeable, i.e., absorbing, transmitting, and yielding water very slowly. Joints and other openings in the shales are generally very narrow or are filled with fine silt and clay. This impermeability tends to inhibit downward seepage of water from the surficial deposits. Second, the slope of the bedrock and the land surfaces toward the Finger Lakes favors rapid drainage of surface water. Third, the overlying glacial drift is considered too thin to hold large quantities of water for gradual recharge of the bedrock."

Lastly, Section 7.2 of the RDR (Parsons, 2006), which was approved by the USEPA and NYSDEC, details the long term monitoring plan for the Ash Landfill OU. The RDR and this subject document discuss only those wells that are being monitored currently; wells in the deeper aquifer are not included in the approved monitoring plan.

Based on the discussion above, the Army believes that sampling of the deeper aquifer is not necessary and not required by the Record of Decision.

Comment 4: Section 3.1, Sample Collection, Page 8. This section describes the groundwater sampling conducted during 2009 at the Ash Landfill OU. However, it does not appear that field sampling forms have been appended to the Annual Report. Field sampling forms should be provided as supporting documentation since they provide information that is not always included in the discussion section of the report, but may be applicable to the evaluation of the data (i.e., turbidity levels observed, well integrity, detected constituents during vapor monitoring, etc.). Revise the Annual Report to include field sampling forms/documentation.

Response 4: The field sampling forms are included as Appendix A for round 8R2009 and subsequent events in the revised report and in future Ash Landfill Annual Reports. (Former Appendices A and B are now referenced as Appendices B and C, respectively.)

Comment 5: Section 3.1, Sample Collection, Page 9. The third paragraph states, "As indicated in Table 1, samples from the wells in the biowall process monitoring group (MWT-23, MWT-16, MWT-27, MWT-28, and MWT-29)…" were submitted for laboratory analysis. Well MWT-16 could not be located within the figures and tables of the Annual Report. It appears that the correct well may be MWT-26, as this well is designated as a biowall process well on Table 1. Revise Section 3.1 to address this discrepancy.

Response 5: The wells in the biowall process monitoring are MWT-23, MWT-26, MWT-27, MWT-28, and MWT-29; the mention of "MWT-16" is a typographical error. The text on Page 9 has been changed to correctly read "MTW-26."

Comment 6: Section 3.2, Groundwater Elevations, Page 10. This section references Figure 5, Groundwater Elevations, for historical groundwater elevation measurements. A note at the bottom of Figure 5 identifies three wells (MW-56, PT-17, and PT-18A) at which groundwater level measurements were not collected during various monitoring events. The Annual Report does not elaborate on why groundwater level measurements were not collected from these wells. For clarity, revise the Annual Report to explain why data are not available from these wells on various dates. In addition, it would be helpful if groundwater elevation data were also presented in a table as supporting documentation. Lastly, given the potential concerns associated with the plume leading edge vinyl chloride concentrations, a solid understanding of groundwater flow at the plumes leading edge is crucial. The Army will ensure any future sampling includes water level measurements from MW-56 and PT-17 to assist in refining groundwater flow directions at the plume leading edge.

Response 6: The omission of MWT-56, PT-17, and PT-18A is a data gap in the field collection due to human error. In the future, the Army will be certain that all relevant the wells are gauged. The groundwater levels and fluctuations at the Ash Landfill are well characterized, since the wells have been measured since the RI in 1994. A table presenting the historic groundwater elevations has been added to the Annual Report as Table 2. Subsequent table numbers have been updated to reflect the addition of this table.

Comment 7: Section 3.3, Geochemical Data, Page 10. Under the Dissolved Oxygen (DO) subsection, the Annual Report states, "In all wells sampled downgradient of the B1/B2 Biowalls, DO levels are depleted (less than 2 milligrams per liter [mg/L] in both Year 3 events (see Table 2)." The Annual Report is using 2 mg/L as a benchmark to describe depleted oxygen concentrations. However, EPA's *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater* (September 1998), states on Page 38, that "[a]naerobic bacteria generally cannot function at dissolved oxygen concentrations greater than about 0.5 mg/L and, hence, reductive dechlorination will not occur." 0.5 mg/L appears to be a more appropriate benchmark for the site. In addition, only four of the long-term monitoring wells reported DO concentrations below 0.5 mg/L during the 8R2009 sample round, as shown on Table 2, Groundwater Geochemical Data. Further, it is important to note that all monitoring wells reported increases in DO concentrations between the 7R2009 and 8R2009 sample rounds. Revise the Annual Report to use 0.5 mg/L as a benchmark for the DO concentration discussion, or provide justification for continuing to use 2 mg/L. Revise the DO subsection to acknowledge the increases in DO concentrations between the 7R2009 and 8R2009 sample rounds and discuss what may be causing these increases.

Response 7: The benchmark value of 2.0 mg/L was used to demonstrate the relative depletion of DO compared to background. Section 7.4.4 of the approved RDR (Parsons, 2006) states that 1.0 mg/L is the benchmark value that will be used to evaluate anaerobic conditions in the groundwater. The discussion has been revised to update the evaluation by comparing to the value of 1.0 mg/L.

As stated throughout the Report, "an absolute set of conditions or parameter values are not appropriate to determine the need to recharge. Rather a lines-of-evidence approach will be used that correlates a decrease in the efficiency of the system to degrade chloroethenes to geochemical evidence that indicates the cause is due to substrate depletion. A review of the data shows that historically DO concentrations are higher in winter than in summer; the "increases in DO concentrations between 7R2009 and 8R2009" likely reflect seasonal variations and not an overall increase in DO. Furthermore, the statement that "only four of the long-term monitoring wells reported DO concentrations below 0.5 mg/L in 8R2009" is incorrect. Five of the fourteen wells (MWT-27, MWT-28, MWT-22, MWT-7, and PT-24) reported DO concentrations below 0.5 mg/L. Wells that comply with the benchmark value are within the immediate vicinity of the biowalls, the most anaerobic portions of the site. Outside of these five wells, four additional wells (PT-18A, MWT-29, MWT-23, and PT-17) are at or below 0.63 mg/L of DO, values which are within the realm of natural variation and still indicate anaerobic conditions. DO concentrations in the remaining five wells were recorded at locations outside of established treatment zones, where low DO values are not anticipated. The Army will continue to monitor DO concentrations at all wells in the LTM program during the 9R2010 event and beyond and compare the DO levels in the biowall process wells to the 1.0 mg/L benchmark.

The text has been modified to discuss the effect of seasonal variation on DO concentrations and now reads:

> DO is the most favored electron acceptor (yields the most energy) used by microbes during biodegradation of organic carbon, and its presence can inhibit the anaerobic degradation of chlorinated ethenes. In the wells sampled within Biowalls B1/B2 and Biowall C2, DO levels are depleted (less than 1.0 milligrams per liter [mg/L]) in both Year 3 events (see **Table 3**). DO is depleted due to the presence of organic substrate in the biowalls. The depletion of DO enhances the potential for anaerobic degradation of chlorinated ethenes in groundwater. The data also show that historically DO concentrations are higher in winter than in summer; the increase in DO concentrations between the two Year 3 sampling events, 7R2009 and 8R2009, likely reflect seasonal variations and not a systemic increase in DO.

Comment 8: Section 3.3, Geochemical Data, Page 11. In the Sulfate subsection, the last sentence states, "These conditions indicate that sulfate is being depleted and that sulfate should not inhibit anaerobic dechlorination within and downgradient of the biowalls." As noted in the same paragraph, "Sulfate levels lower than 20 mg/L are desired to prevent inhibition of reductive dechlorination of chlorinated ethenes (USEPA, 1998)." While the biowall wells reported concentrations below 20 mg/L, well MWT-29, located downgradient of Biowall B2, reported a concentration of 644 mg/L, its highest reported concentration since monitoring began in 2007 (Table 2). This concentration would appear to inhibit anaerobic dechlorination downgradient of the biowall. Revise the Annual Report to discuss the increasing concentrations of sulfate detected in MWT-29.

Response 8: The concentrations of sulfate within the biowalls are below 20 mg/L, which indicates that conditions within the biowalls are conducive to anaerobic dechlorination. The geochemical benchmark values are designed to evaluate ideal biowall operation and specifically conditions within the biowalls (MWT-27, 28, and 23). Section 3.3 details that the evaluation of geochemical parameters will be based on comparing background (or upgradient) conditions to concentrations in the biowall at MWT-28. The LTM program includes data collection of geochemical parameters at locations downgradient of the biowalls, e.g., MWT-29, but the evaluation of data at these locations is not part of the assessment of whether the biowalls are functioning as designed. The geochemical data indicate that this location is outside of the treatment zone. This is useful information to understand the overall system, but does not impact the direct evaluation of the effectiveness of the biowalls. Wells outside of biowall pairs, like MWT-29, are designed to monitor downgradient changes in water quality, that is, to compare downgradient chlorinated ethenes concentrations to those upgradient. The text has been revised and now states: "These conditions indicate that sulfate is being depleted within the walls and that sulfate should not inhibit anaerobic dechlorination within the biowalls." The Army will continue to monitor the sulfate concentration at all wells as part of the regular sampling and evaluation schedule.

Comment 9: Section 3.3, Geochemical Data, Page 12. The Summary subsection briefly summarizes the evaluation of total organic carbon (TOC), oxidation reduction potential (ORP), sulfate and methane concentrations, but is does not include a summary of the DO concentrations. Since this geochemical parameter is also discussed in Section 3.3, it should be included in the Summary. In addition, it appears that ferrous iron and manganese were also evaluated, but results of these analyses are not discussed within the geochemical data section. Revise the Summary of Section 3.3 to include dissolved oxygen. Further, revise Section 3.3 to include an evaluation of ferrous iron and manganese concentrations.

Response 9: A bullet summarizing DO and a discussion of ferrous iron and manganese has been added to Section 3.3. The text on Page 12 now reads:

> *Ferrous Iron and Manganese*
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> As described in USEPA (1998), iron III (ferric iron) is an electron acceptor used by iron-reducing bacteria under anaerobic conditions; Iron II (ferrous iron) is the product. Iron III is relatively insoluble in groundwater relative to Iron II. Therefore, an increase in concentrations of Iron II in groundwater is a clear indication that anaerobic iron reduction is occurring. Similarly, USEPA (1998) states that manganese (IV) is an electron acceptor used by manganese-reducing bacteria under anaerobic environments; soluble manganese (II) is the product. Under anaerobic conditions like those at the Ash Landfill, the presence of manganese and ferrous iron in groundwater at concentrations above the natural background concentrations demonstrates that manganese reduction and iron reduction are occurring at the site. These data support the conclusion that conditions within the biowalls are anaerobic and conducive to the degradation of chlorinated ethenes.
>
> <u>Summary</u>
> Monitoring data for wells within the biowalls during the third year of LTM indicate the following:
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> - DO remains below 1.0 mg/L in Biowalls B1/B2 and Biowall C2;
> - Concentrations of TOC remain elevated, ranging from 15.6 mg/L to 81.7 mg/L;
> - ORP remains low, ranging from -148 mV to -90 mV;
> - Sulfate remains below 20 mg/L;
> - Methane concentrations are 13 mg/L or higher; and
> - Ferrous iron and manganese concentrations are increasing in the biowalls, indicating that conditions are conducive to the degradation of chlorinated ethenes.

Comment 10: Section 3.4, Chemical Data Analysis and Groundwater Remedy Evaluation, Page 15. In the evaluation of the third performance objective, to confirm that groundwater concentrations throughout the plume are decreasing to eventually meet GA standards, it is noted that three wells (PT-18A, PT-17, and MWT-7) are not included in the list of wells expected to comply with their respective standards by 2051. Well PT-18A is located upgradient of Biowall A1/A2, but wells PT-17 and MWT-7 are both located downgradient of all of the biowalls, and may be relocated beyond any influence of the biowalls. Of additional concern is that well MWT-7, which reported increasing concentrations of TCE, cis-1,2-dichloroethene, and vinyl chloride, during the last two sampling event, is located just east and upgradient of the site boundary (although specific boundaries have not been shown on Figure 4). If the performance objectives are not being met, specifically at the two downgradient, plume-leading-edge wells, additional measures to meet the performance objectives need to be considered. The Annual Report indicates that additional monitoring of these wells is necessary to determine long term trends; however, the Annual Report needs to describe the decision process for when conditions would warrant implementation of additional measures should concentrations continue to increase.

In addition, it is not apparent from the plume configuration presented on Figure 4, Chlorinated Ethenes Concentrations in Groundwater, that the off-site sentry well, MW-56, will be appropriate to detect concentrations of contaminants migrating from MWT-7 at which vinyl chloride was detected at 21 ug/l, (and order of magnitude above the NYSDEC Class GA Groundwater Standard of 2 ug/l). A well located downgradient the leading edge of the plume, in a trajectory that is consistent with the highest concentrations detected, should be considered to ensure that contaminants detected above the remedial goals are not bypassing the existing monitoring network to the south of well MW-56, and migrating off-site at potentially unacceptable levels.

Response 10: The third performance objective, as stated in Section 1.1, is to "confirm that groundwater concentrations throughout the plume are decreasing to eventually meet NYSDEC Class GA groundwater standards." The Army is aware of the current absence of a trend at PT-18A, PT-17, and MWT-7, and the Army is continuing to monitor these wells. At this time, conclusions cannot be made regarding the Class GA standard. There is a groundwater use restriction at the site, and the Army plans to continue groundwater monitoring. Additional years of groundwater monitoring data will be gathered, and this additional time does not impact the future use of the groundwater due to the LUC.

A figure showing the groundwater flow direction has been added to the report as Figure 8. The figure continues to show that groundwater from the plume flows through the area immediately surrounding MW-56. As such, MW-56 is appropriately designated as the compliance well, and an additional well is not required.

Comment 11: Section 3.5, Biowall Recharge Evaluation, Page 17. The first bulleted item notes, "If COC concentrations have rebounded by greater than 50% for any single sampling event, this will indicate that recharge should be considered." However, if a COC was non-detect in the sampling event prior to being detected, a determination of a 50% increase cannot be made. However, it should be noted that the detection limits for some VOCs during the most recent sampling event appear elevated over prior sampling events. Table 3, Chlorinated Organics in Groundwater, shows detection limits for VOCs at biowall monitoring well MWT-28 were much higher during the December 2009 than the previous sampling event in June 2009. The Annual Report needs to acknowledge the changes in detection limits when concluding that VOCs are non-detect, particularly with respect to evaluating increases during sampling events. Revise the Annual Report to address this concern.

Response 11: Vinyl chloride was not detected in 7R2009 or 8R2009 at MWT-25, MWT-28, MWT-28, MWT-23, and MWT-56. At MWT-27 and MWT-28 the detection limit for VC increased from 7R2009 to 8R2009; though the detection limit was lower than earlier years, and the recent round was below the GA Standard. At the other three wells detection limits remained the same in both rounds. At MWT-28, detection limits for VC increased from 0.24 ug/L to 1.2 ug/L, both of which are below the Class GA standard for VC. Similarly, detection limits for cis-DCE and TCE at MWT-27 increased from 7R2009 to

8R2009, yet concentrations remain below Class GA Standards; the same is true for all wells for which detection limits for TCE and cis-DCE increased from 7R2009 to 8R2009. In summary, since detection limits are below the Class GA Standards it is not a concern that limits have changed over the last two rounds of sampling.

As stated in the response to General Comment 1, the Army will continue to monitor vinyl chloride at this well as part of the regular sampling and evaluation schedule; further, the Army will continue to monitor VC detection limits.

Comment 12: Section 3.6, Soil Remedy Evaluation, Page 19. This section indicates that visual observations noted a small amount of soil erosion and the presence of rodent trails, cutting less than 6 inches into the soil cover of the Non-Combustible Fill Landfill (NCFL). The Annual Report does not, however, indicate whether the soil cover in these areas underwent corrective repairs to ensure that the full thickness of the 12-inch cover was maintained. Revise the Annual Report to describe what corrective action was implemented to maintain the full 12-inch soil cover at the NCFL.

Response 12: Soil cover in the areas of the "small amount of soil erosion and…rodent trails" was not repaired since the trails are in active use by animals at the Depot, and the depths of the trails have been maintained despite past corrective action to repair the thickness. As stated on Page 19 of the subject document "the erosion and the [animal] trails cut less than 6 inches into the cover. Therefore, underlying soil has not been exposed to the environment." As such, corrective action at the NCFL is unnecessary as the trails do not penetrate to depths that would expose underlying soil to vectors and the cover is still preventing environmental receptors from accessing the soil. Section 3.6 of the Report has been revised to discuss this:

> **3.6 Soil Remedy Evaluation**
>
> Part of the remedial action was installing a 12-inch vegetative cover over the Ash Landfill and the NCFL. The covers have been inspected and field observations from Year 3 note that the landfills are vegetated with grass and clover. At the NCFL, visual observations noted a small amount of soil erosion and the presence of rodent trails; however, the erosion and the trails cut less than 6 inches into the cover. Therefore, underlying soil has not been exposed to the environment and corrective action is unnecessary. The Army will continue to monitor the integrity of the covers and ensure that the vegetative covers have not been breached and that the underlying soil is not exposed.

Comment 13: Section 3.7, Land Use Controls (LUCs), Page 19. One of the LUCs is to maintain the integrity of any current or future remedial or monitoring system, such as monitoring wells and impermeable reactive barriers. The Annual Report does not comment on the integrity of the monitoring wells onsite. Revise the Annual Report to comment on the integrity of the monitoring wells at the site, and indicate whether any of them require maintenance.

Response 13: During every round of sampling at the Ash Landfill OU, the Army inspects each monitoring well. During 7R2009 and 8R2009 it was noted that all wells at the AOC are in good condition, all monitoring wells are viable for groundwater elevation readings, and the integrity of all wells in the LTM network is good. Section 3.7 of the Report has been revised to note the integrity of the wells and now reads:

> **3.7 Land Use Controls (LUCs)**
>
> During 7R2009 and 8R2009, groundwater monitoring wells were inspected by field personnel. The integrity of all wells at the Ash Landfill is intact and each well is viable for groundwater elevation readings and groundwater sampling, where approved.

Comment 14: Section 3.8, Operating Properly and Successfully, Page 20. In regards to whether the remedial action is "operating successfully," the Annual Report states, "The data presented in Section 3.3 demonstrate that concentrations of VOCs are decreasing and will eventually meet the Class GA groundwater standards." This section fails to mention the three wells (PT-18A, PT-17, and MWT-7) that are not included in the list of wells expected to comply with the Class GA standards. While additional data from these wells are necessary, it is important to note areas of the site (i.e., wells) at which deviations from an "operating successfully" designation could be applied. Revise Section 3.8 to acknowledge in the increasing contaminant concentrations at wells PT-18A, PT-17, and MWT-7.

Response 14: The subject document states that a remedial action may receive the USEPA's designation of "operating successfully" if "a system will achieve the cleanup levels or performance goals delineated in the decision document". An element of the remedy at the Ash Landfill, as documented in the approved ROD, is "migration control of the groundwater plume". The Annual Report for Year 3 shows that chlorinated ethene concentrations at the compliance well, MW-56, are below Class GA standards demonstrating that the plume has not migrated. Since the "migration control" component of the remedy is achieved, this is sufficient to demonstrate that the remedy is operating successfully. In addition, the Army provided an evaluation of well status that demonstrated that water quality in wells will eventually meet GA standards, which is an objective of the LTM program (not specified in the decision document).

It should be noted that at this time the data does not suggest, and a conclusion cannot be made, that wells PT-18A, PT-17, and MWT-7 will not eventually reach GA standards. At wells PT-18A, PT-17, and MWT-7, concentrations of TCE are generally decreasing, concentrations of cis-DCE are increasing, and concentrations of VC are neither decreasing nor increasing. Decreasing concentrations of TCE suggest that natural attenuation of chlorinated ethenes is occurring at the areas near these wells. Furthermore, increasing concentrations of cis-DCE suggest that sequential reductive dechlorination is occurring – as concentrations of TCE decrease, those of cis-DCE increase suggesting that TCE is being degraded into cis-DCE at these locations.

Comment 15: Table 3, Chlorinated Organics in Groundwater. The notes on this table state that grey shading indicates that the concentrations were detected above Class GA groundwater standards.

However, the applicable Class GA groundwater standards have not been included on Table 3. Revise Table 3 to include the applicable Class GA groundwater standard for each constituent.

Response 15: Table 3, now referenced as Table 4, has been revised to include the applicable Class GA Groundwater standard for PCE, TCE, and VC – the parameters that are evaluated in each annual report.

Army's Response to Comments from the New York State Department of Environmental Conservation

Subject: Annual Report and Year 3 Review
Ash Landfill Operable Unit
Seneca Army Depot
Romulus, New York

Comments Dated: June 17, 2010

Date of Comment Response: August 12, 2010

Army's Response to Comments

GENERAL COMMENTS:

Comment 1: State noted that labeling to identify the sample period is not consistent.

Response 1: The first year of sampling was quarterly. At that time, the sampling rounds were identified as xQyyyy, where "x" is the round number, and "yyyy" is the 4 digit year. After the first year, the sample frequency was modified to semiannual. The sampling events were no longer quarterly so the "Q" designation in the name was not appropriate. An "R" was used to replace the "Q" to denote the round. The round number has been used sequentially since the first quarterly round. The nomenclature for the first 4 rounds, or quarters, will not be changed since the historic reports identify those rounds as quarters. This explanation will be added to the text.

Comment 2: State is satisfied with results, but revise the sections in the report as necessary to include a statement on the numerical progress towards the groundwater remediation goal (current level relative to goal).

Response 2: Section 3.4, titled "Chemical Data Analysis and Groundwater Remedy Evaluation", provides a complete discussion of the numerical progress toward the groundwater remediation goals. This section specifically discusses that 1) contaminant concentrations at the off-site trigger monitoring well MW-56 remain below Class GA Standards; and 2) TCE, cis-DCE, and VC concentrations at wells throughout the site are compliant, or trending toward compliance, with Class GA Standards. Former Figures 6A through 6J, now Figures 8A through 8J, quantitatively present the data by showing TCE, cis-DCE, and VC concentrations over time, with a comparison to Class GA Standards for each compound at wells throughout the site. Former Table 4, now Table 5, presents groundwater trends and provides estimated dates that wells will achieve the groundwater standards. The Army does not believe text changes are required.

Comment 3: The Annual Report should include a figure to show groundwater elevations contours in the area of plume.

Response 3: A figure showing the groundwater elevations at the Ash Landfill has been added as Figure 8. Subsequent figure numbers have been updated to reflect the addition of this figure.

Comment 4: Revise the report to indicate what procedures were for groundwater monitoring (e.g. DER-10).

Response 4: Page 8 of the subject document describes the procedures that are used for groundwater monitoring at the Ash Landfill. The text reads:

> "Groundwater samples were collected using low flow sampling techniques during each of the 2009 sampling rounds. Bladder pumps were used to purge the wells and collect the samples during these rounds. Sampling procedures, sample handling and custody, holding times, and collection of field parameters were conducted in accordance with the "Final Sampling and Analysis Plan for Seneca Army Depot Activity (SAP)" (Parsons, 2006)."

The Final Sampling and Analysis Plan for Seneca Army Depot Activity (SAP) (Parsons, 2006) references DER-10 and states:

> "Groundwater sampling for monitoring wells and microwells will be performed according to the Ground Water Sampling Procedure Low Stress (Low Flow) Purging and Sampling (USEPA Region 2, 1998). Low flow methods will be used to ensure collected samples are representative of groundwater conditions at the site."

SPECIFIC COMMENTS:

Comment 1: Section 2.3, Page 5. The Non Time Critical Removal Action (NTCRA) conducted in this area and removed VOC contaminated soil which acted as source material for the TCE plume. Does any of the current groundwater sampling data indicate presence of residual soil contamination which should be investigated for possible removal?

Response 1: The remedy, described in the approved ROD (Parsons, 2003) addresses a remedy for groundwater which focuses on "management of the VOC plume, which includes improving the quality of the existing plume and managing the migration of the plume off-site". The selected soil remedy, approved in the ROD and implemented in the remedial action, consisted of installing vegetative covers on the NCFL and the Ash Landfill and removing the debris piles. Soil sampling, specifically with the intent of delineating a potential source, was not required in the approved ROD and has not been completed.

Comment 2: Section 3.1, Page 8. There is no consistency in labeling samples in "Quarters" or "Round" in a year.

Response 2: Please refer to the response to General Comment 1.

Comment 3: Section 3.5, Page 16. Biowall Recharge Evaluation should be done in summer of 2010 and not after completion of the fourth year round.

Response 3: After each sampling event at the Ash Landfill OU, the Army reviews lines of evidence for both geochemical parameters and chlorinated ethene concentrations and evaluates whether recharge is required. A formal evaluation and discussion is documented in each Annual Report. The Army agrees to include a discussion of biowall recharge evaluation in the Round 9 Letter Report (summer 2010).