ARCADIS
Infrastructure, environment, facilities

ARCADIS
Two Huntington Quadrangle
Suite 1S10
Melville
New York 11747
Tel 631 249 7600
Fax 631 249 7610
www.arcadis-us.com

Mr. George Jacob
United States Environmental Protection Agency – Region 2
290 Broadway, 20th Floor
New York, New York 10007-1866

ENVIRONMENT

Subject:
Operational Year 6 Quarter 3 Monitoring Report,
Colesville Landfill, Broome County, New York. (Site No. 704010).

Dear Mr. Jacob:

On behalf of Broome County, ARCADIS is providing the Operational Year 6 Quarter 3 Monitoring Report for the Colesville Landfill, Broome County, New York.

Please feel free to contact me if you have any questions or comments.

Sincerely,

ARCADIS

Steven M. Feldman
Project Manager

Date:
November 25, 2008

Contact:
Steven M. Feldman

Phone:
(631) 391-5244

Email:
sfeldman@arcadis-us.com

Our ref:
NY000949.0021.00004

Copies:
Payson Long, NYSDEC
David Donoghue, Broome County
Julia Kenney, NYSDOH
File

ARCADIS

Infrastructure, environment, facilities

Imagine the result

Broome County
Division of Solid Waste Management

Operational Year 6
Quarter Number 3
Monitoring Report

November 25, 2008

ARCADIS

Kenneth Zegel, P.E.
Senior Engineer

Steven M. Feldman
Project Director

Operational Year 6
Quarter Number 3
Monitoring Report

Colesville Landfill,
Broome County, New York
NYSDEC Site 704010

Prepared for:
Broome County Division of Solid Waste Management

Prepared by:
ARCADIS
Two Huntington Quadrangle
Suite 1S10
Melville
New York 11747
Tel 631.249.7600
Fax 631.249.7610

Our Ref.:
NY000949.0021.00004

Date:
November 25, 2008

Tables

Figures

Appendices

1. Introduction

This Monitoring Report (Report) was prepared on behalf of the Broome County Division of Solid Waste Management for the Colesville Landfill, located in Broome County, New York (site) to evaluate and document long-term monitoring (LTM) activities at the site. Remediation and monitoring activities are being conducted pursuant to the Record of Decision (ROD) and Explanation of Significant Difference (ESD) that were issued in March 1991 and September 2000, respectively. LTM activities (which include environmental effectiveness and remediation system performance monitoring) were performed in accordance with the LTM Plan (ARCADIS G&M, Inc. 2002), LTM Plan Addendum for Spring Water Remediation Systems (ARCADIS 2003), and Interim Remedial Action Report (ARCADIS 2004), which were approved by the United States Environmental Protection Agency (USEPA) and New York State Department of Environmental Conservation (NYSDEC). These documents provide a detailed description of the LTM program, methodology, and rationale. Where applicable these elements are either summarized or incorporated by reference herein.

This report describes the results of the June 2008 groundwater quality monitoring event conducted during Operational Year 6, Quarter Number 3. A description of the operation, maintenance, and monitoring (OM&M) associated with the Groundwater Remediation System from April 2008 through June 2008 has also been provided. Following the detailed data analysis and discussion is a summary of findings, conclusions, and recommendations.

2. Methodology

The following section provides a summary of the environmental effectiveness and remedial system performance monitoring methodology for Operational Year 6, Quarter Number 3. A site plan showing the environmental effectiveness monitoring locations is provided on Figure 1.

2.1 Environmental Effectiveness Monitoring

The environmental effectiveness monitoring performed during Operational Year 6, Quarter Number 3 included the following:

- Groundwater samples were collected from six monitoring wells (Year 6, Q3 list of wells plus alternate electron donor test well TW-1) during the week of June 23, 2008. The samples were selectively analyzed for volatile organic compounds

(VOCs), dissolved gases, and total organic carbon (TOC). Field parameters were also recorded at these monitoring locations.

- Samples (VOCs only) were collected at the SP-4 and F-6 surface water locations on June 25, 2008.

In accordance with the Proposed Modifications to the Long-Term Monitoring Program (ARCADIS 2005), groundwater samples were collected from monitoring wells utilizing passive diffusive bag (PDB) samplers.

2.2 Groundwater Remediation System Performance Monitoring

Groundwater Remediation System performance monitoring activities during Operational Year 6, Quarter Number 3, were as follows:

- Pump-and-treat (PT) system recovery well influent and effluent samples were collected on June 25, 2008. The samples were selectively analyzed for VOCs and total iron.

- One vapor sample from the PT system air stripper effluent was collected on June 26, 2008. The sample was analyzed for VOCs.

- PT system operating parameters were recorded during the quarterly OM&M site visit.

- Total organic carbon (TOC) samples were collected from select injection wells during the week of June 23, 2008.

- A TOC sample was collected from alternate electron donor monitoring well TW-1 on June 25, 2008.

- Automated reagent injection (ARI) system operating parameters were recorded during each injection event.

PT system groundwater samples were collected as grab samples directly from the individual recovery pipelines connected to recovery wells GMPW-3, GMPW-4, GMPW-5, the combined influent water to the low profile air stripper, and the combined effluent after the cartridge filters. The effluent air sample was collected as a grab sample directly from the designated point located on the low profile air stripper stack.

2.3 Spring Water Remediation System Performance Monitoring

Standard SP-5 Spring Water Remediation System performance monitoring could not be conducted during the current reporting period due to the presence of tailwater at the discharge monitoring location (i.e., outfall) as described previously in the Operational Year 6, Quarter Number 2 Monitoring Report. However, troubleshooting of the tailwater was completed during the reporting period and a resultant corrective measure is scheduled for completion during Year 6, Quarter Number 4.

3. Groundwater Flow

A synoptic round of water level measurements is conducted during Quarters 2 and 4 for evaluation of groundwater flow conditions.

4. Groundwater Quality

The following sections describe the analytical results for groundwater samples collected during the June 2008 monitoring round (Operational Year 6, Quarter Number 3). Groundwater analytical results are provided in Tables 1 and 2. Where applicable, the previous round of analytical results for the respective sampling location has been provided in the same table for comparative purposes.

4.1 Volatile Organic Compounds

As shown in Table 1, total VOC (TVOC) concentrations in all monitoring wells sampled during the reporting period remained generally consistent when compared to analytical results from the previous round. Specifically, the TVOC concentration in monitoring wells GMMW-2, GMMW-5, W-5, GMMW-6, and PW-4 were 323.0 ug/L, 138.6 ug/L, 399.3 ug/L, 63.8 ug/L, and 184.8 ug/L, respectively. TVOC concentrations in monitoring well TW-1 (136.8 ug/L) is also consistent with the previous round of monitoring data.

During the current reporting period, the TVOC concentration at recovery wells GMPW-3, GMPW-4, and GMPW-5 were consistent with prior rounds of data. Specifically, TVOC concentrations in recovery wells GMPW-3, GMPW-4, and GMPW-5 were 186.5 ug/L, 213.0 ug/L, and 0.0 ug/L, respectively. A complete evaluation of performance monitoring conducted on the PT system is provided in Section 7.1.2 of this report.

4.2 Indicators of Reducing Conditions

Groundwater analytical results for biogeochemical parameters and field parameters were collected in accordance with the LTM plan and are provided in Table 2. In summary, field and laboratory groundwater data for Wells TW-1, GMMW-5, and GMMW-6 indicate that reducing conditions are being maintained within the IRZ. This is evidenced by the presence of reduced forms of alternate electron acceptors (i.e., methane) at a concentration significantly higher than baseline conditions. Further details of the ARI system performance monitoring are provided in Section 7.2.2 of this report.

4.3 Evidence of Biodegradation

Table 2 provides the results of biodegradation end product concentrations in monitoring wells and indicates the continued occurrence of bioactivity and biodegradation of VOCs within the IRZ. Specifically, the concentrations of ethene at monitoring well GMMW-6 continue to be elevated when compared to baseline conditions. Similarly, the concentration of ethane remained elevated at monitoring wells GMMW-5 and GMMW-6 during the reporting period. Additional details on the results of biogeochemical monitoring as evidence of Groundwater Remediation System performance and effectiveness are discussed in Section 7.2.2 of this report.

5. Spring Water Quality

Spring water locations SP-2 and SP-3 were observed during the OM&M site visit on June 25, 2008. Springs were not observed at the SP-2 and SP-3 locations. A few small areas of stagnant water were observed between SP-2 and SP-3, but no flowing springs were present that could be sampled.

6. Surface Water Quality

Surface water quality analytical results for the Operational Year 6, Quarter Number 3 monitoring round are summarized in Table 1. As shown in Table 1, surface water quality at the SP-4 and F-6 sampling locations remained generally consistent when compared to analytical results from the previous round. Specifically, TVOC concentration at the SP-4 and F-6 sampling locations were 2.2 ug/L and 0.0 ug/L, respectively. The data indicate that surface water quality is not being adversely impacted.

7. Groundwater Remediation System Performance

The following sections describe the results of the Groundwater Remediation System performance monitoring conducted during Operational Year 6, Quarter Number 3.

7.1 PT System

The following section describes the results of the PT system performance monitoring conducted during Operational Year 6, Quarter Number 3.

7.1.1 Summary of Operation, Maintenance, and Monitoring

During Operational Year 6, Quarter Number 3, the PT system operated continuously with the exception of brief system shutdowns as a result of minor system alarms and routine OM&M activities.

PT system OM&M for Operational Year 6, Quarter Number 3 was conducted during the week of June 23, 2008 and included operation and maintenance of system equipment, the collection of system performance samples (water and vapor), and recording system operating parameters. Table 3 provides a summary of the recorded system operating parameters for the current operating period. As shown in Table 3, the total effluent groundwater recovery rate for Operational Year 6, Quarter Number 3 was approximately 0.63 gallons per minute (gpm), with individual recovery rates of 0.07 gpm, 0.25 gpm, and 0.13 gpm in GMPW-3, GMPW-4, and GMPW-5, respectively. The average individual recovery well pumping rates during Operational Year 6, Quarter Number 3 were consistent with previous data (i.e. Operational Year 6, Quarter Number 2) but were still slightly lower than baseline (startup) conditions. To further troubleshoot the performance of the recovery wells, all individual well flowmeters (i.e. totalizers) were replaced during the operation and maintenance site visit. In addition, a weekly site inspection program has been developed and will be implemented during Operational Year 6, Quarter Number 4 to monitor recovery well flow rate on a more frequent schedule.

A total of 84,097 gallons of groundwater was recovered during Operational Year 6, Quarter Number 3 and a total of 1,546,950 gallons of groundwater has been recovered since system startup. The low profile air stripper operated in accordance with the design specifications and had a blower flow rate of 217 standard cubic feet per minute (scfm).

7.1.2 Results of Performance Sampling

PT system performance sampling for Operational Year 6, Quarter Number 3 was conducted on June 25, 2008. As discussed previously, five groundwater samples and one vapor sample were collected. Groundwater samples included collection of individual recovery well samples (GMPW-3, GMPW-4, and GMPW-5), total influent, and total effluent after the cartridge filters. The vapor sample was collected from the effluent stack of the low profile air stripper.

Table 4 provides a summary of the PT system performance groundwater sampling analytical results. As shown in Table 4, all groundwater VOCs were treated to below their respective Best Professional Judgment (BPJ) limits via the low profile air stripper. The total iron concentration after the cartridge filter exceeded its respective recommended daily maximum and average BPJ limits. The cartridge filters were changed out immediately following the sampling event. Based on the total groundwater recovered during the reporting period and total influent groundwater concentration, an estimated 0.14 pounds (lbs) of VOC mass were removed from the subsurface during the quarterly reporting period, as shown in Table 5. A total of approximately 2.94 lbs of VOCs have been removed from the subsurface since system startup.

Table 6 provides a summary of the PT system performance vapor sampling analytical results. As shown in Table 6, VOCs were not detected above their respective detection limits. To be conservative, a NYSDEC DAR-1 air model was calculated using the actual analytical data for detected constituents and the detection limit of all constituents that were not detected but have historically been detected in the influent groundwater. All COCs were below their respective short-term guideline concentrations (SGCs) and annual guideline concentrations (AGCs). Appendix B contains the NYSDEC DAR-1 AGC screening simulation based on the hand calculations provided in the NYSDEC DAR-1 AGC/SGC tables dated September 10, 2007.

7.2 ARI System

The following section describes the results of the ARI system performance monitoring conducted during Operational Year 6, Quarter Number 3.

7.2.1 Summary of Operation, Maintenance, and Monitoring

ARI system OM&M was conducted during the Operational Year 6, Quarter Number 3 OM&M site visit during the week of June 23, 2008. The visit included operation and maintenance of system equipment and the collection of samples for analysis of TOC from injection wells IW-3, IW-8, and IW-13. In addition, a TOC sample was collected from monitoring well TW-1 to evaluate the long-term performance of the alternate electron donor in providing TOC to the subsurface.

One reagent injection was conducted during Operational Year 6, Quarter Number 3. The injection was initiated on March 26, 2008 and was completed on May 10, 2008. As described in the Hydraulic Injection Test and Alternate Electron Donor Pilot Test Letter Work Plan (ARCADIS 2006), a slow-release alternate electron donor (e.g., emulsified edible oil [EOS]) was injected into existing injection well IW-8 during the week of December 18, 2006. Accordingly, IW-8 was not included in the current reagent injection to allow for long-term groundwater monitoring of the alternate electron donor.

Based on the number of injection events, quantity of molasses solution delivered to each injection well, and molasses solution percentage, approximately 13,705-gallons of molasses solution were delivered to the subsurface during Operational Year 6, Quarter Number 3. A total of 172,047-gallons of molasses solution have been injected since system startup. Appendix C provides a summary of the recorded system operating parameters for each of the injection events for Operational Year 6, Quarter Number 3.

7.2.2 Results of Performance Sampling

ARI system performance sampling was conducted in the week of June 23, 2008. As discussed previously, this event consisted of collecting TOC samples at three injection wells. In addition, analytical results from select monitoring wells under the environmental effectiveness monitoring program were used to determine the effectiveness of the ARI system. A summary of key observations is as follows:

- The TOC concentrations at injection wells IW-3, IW-8, and IW-13 are 210 mg/L, 920 mg/L, and 2,300 mg/L, which indicated that sufficient organic carbon is being delivered to the subsurface to maintain the IRZ.

- The TOC in monitoring well TW-1 was 1,900 mg/L. This data, combined with TOC data from IW-8, indicate that the slow-release alternate electron donor (EOS) continues to provide sufficient organic carbon to the subsurface following the one time injection in injection well IW-8.

- VOC data for monitoring Well TW-1 remained stable when compared to its previous quarterly monitoring data and is currently 30 percent lower when compared to data from September 2007. The data indicate a stable to decreasing trend in the concentration of VOCs in the vicinity of alternate electron donor pilot test.

- Monitoring wells in close proximity to the anaerobic IRZ (i.e., GMMW-5, W-5 and GMMW-6) exhibited stable VOC concentrations and remain significantly lower than baseline conditions.

- The methane concentration in monitoring wells GMMW-5 and TW-1 remained elevated at 15,000 ug/L and 22,000 ug/L, respectively. These data provide evidence that strongly reducing conditions (methanogenic) are being maintained within the IRZ.

- The ethene concentration in monitoring well GMMW-6 remained elevated at 45,000 ng/L.

- The ethane concentration remained elevated in monitoring wells GMMW-5 and GMMW-6 at 23,000 and 11,000 ng/L, respectively.

8. Spring Water Remediation System Performance

SP-5 Spring Water Remediation System OM&M could not be conducted during Operational Year 6, Quarter Number 3 due to the presence of tailwater (e.g. backed up water) at the discharge sampling location. The source of the tailwater has been evaluated and a corrective measure has been scheduled for implementation during Operation Year 6, Quarter Number 4.

9. Conclusions

Based on the data obtained from the Operational Year 6, Quarter Number 3 monitoring, ARCADIS concludes the following:

- The anaerobic IRZ established downgradient of the injection transect is successfully reducing the concentration of site-related VOCs through enhanced reductive dechlorination.

- The PT system is operating as designed and is treating recovered groundwater VOCs to below BPJ limits prior to discharge.

- Sufficient organic carbon was delivered to the subsurface to maintain the IRZ.

- Surface water quality continues to be consistent with historical data indicating that impacted groundwater is not causing an adverse impact to surface water along the North Stream.

- Ongoing TOC data from the alternate electron donor pilot test indicate the EOS is an effective product to provide sufficient organic carbon to the subsurface over long periods of time. VOC data from Monitoring Well TW-1 continues to indicate stability to decreased VOCs in the alternate electron donor pilot test area.

10. Recommendations

The following recommendations are made for Operational Year 6, Quarter Number 3 activities:

- Continue to inspect the former spring locations and the side slopes of the North Stream.

- Continue to implement a weekly site inspection schedule until sufficient data are obtained to evaluate and make conclusions on the instantaneous pumping rate of individual recovery wells over time. Propose recommendations for modifications to the O&M schedule if warranted by the data.

- Continue to operate the ARI system without injection well IW-8. Continue to obtain and evaluate data related to the ongoing slow-release alternate electron donor pilot program.

- Perform maintenance of the SP-5 remediation system to eliminate the tailwater currently observed at the SP-5 outfall discharge location.

- Evaluate the instantaneous and long-term performance of recovery well pump GMPW-3 and GMPW-5 to determine if the filter sock replacement period needs to be adjusted.

- Continue to evaluate and determine the source of water emerging at the SP-5 spring water remediation system outfall location.

11. Project Schedule

Groundwater environmental effectiveness monitoring is scheduled to be conducted for Operational Year 6 on the quarterly schedule set forth in the Proposed Modifications to Long-Term Monitoring Program (ARCADIS 2005). System OM&M of the Groundwater Remediation System will continue to be performed on a quarterly basis consistent with the LTM Plan. Implementation of corrective measures to address the tailwater at the SP-5 spring water remediation system will be completed during operational Year 6, Quarter 4.

12. References

ARCADIS G&M, Inc. 2002. Long-Term Monitoring Plan, Colesville Landfill, Broome County, New York, NYSDEC Site 704010. June 28, 2002.

ARCADIS G&M, Inc. 2003. Long-Term Monitoring Plan Addendum for Spring Water Remediation Systems, Colesville Landfill, Broome County, New York, NYSDEC Site 704010. November 3, 2003.

ARCADIS G&M, Inc. 2004. Interim Remedial Action Report, Colesville Landfill, Broome County, New York, NYSDEC Site 704010. September 22, 2004.

ARCADIS G&M, Inc. 2005 Proposed Modifications to Long-Term Monitoring Program, Broome County, New York, NYSDEC Site 704010. June 28, 2005.

ARCADIS G&M, Inc. 2006. Hydraulic Injection Test and Alternate Electron Donor Pilot Test, Colesville Landfill, Broome County, New York (Site No. 704010). November 30, 2006.

ARCADIS of New York, Inc. 2008. Operational Year 6, Quarter Number 2 Monitoring Report, Colesville Landfill, Broome County, New York (Site No. 704010).

Table 1. Concentrations of Volatile Organic Compounds Detected in Groundwater and Surface Water, Operational Year 6, Quarter Number 3, Colesville Landfill, Broome County, New York.

(units in ug/L) Sample ID: / Date:	GMMW-02 3/25/2008	GMMW-02 6/25/2008	GMMW-05 3/25/2008	GMMW-05 6/25/2008	GMMW-06 3/25/2008	GMMW-06 6/24/2008	GMMW-06 * 6/26/2008	PW-04 3/25/2008	PW-04 6/25/2008
1,1,1-Trichloroethane	**9.0**	**6.5**	<1.0	<1.0	**1.8**	**5.5**	**5.5**	**8.9**	**8.2**
1,1,2-Trichloroethane	<1.0	<1.0	<1.0	<1.0	<1.0	**1.2**	**1.1**	<1.0	<1.0
1,1-Dichloroethane	**110**	**110**	**21**	**22**	**130**	**150**	**140**	**8.3**	**15**
1,1-Dichloroethene	**1.2**	**1.3**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	<1.0	<1.0	<1.0	<1.0	**1.0**	<1.0	<1.0	<1.0	<1.0
Benzene	**2.5**	**2.7**	<1.0	**1.2**	**8.1**	**5.7**	**5.7**	<1.0	<1.0
Carbon Tetrachloride	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	**30**	**30**	**11**	**15**	**35**	**29**	**28**	<1.0	<1.0
Chloroethane	**24**	**27**	**33**	**92**	**140**	**120**	**110**	**3.6**	**4.4**
Chloroform	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.4**	**1.0**
cis-1,2-Dichloroethene	**110**	**100**	**1.8**	**2.6**	**7.8**	**37**	**38**	**5.8**	**12**
Dichlorodifluoromethane	**1.2**	**1.1**	<1.0	<1.0	**4.6**	**2.7**	**2.6**	**1.4**	**1.2**
Ethylbenzene	<1.0	<1.0	<1.0	<1.0	**2.9**	**1.1**	**1.1**	<1.0	<1.0
Methylene chloride	<1.0	**1.4**	<1.0	**1.8**	**5.8**	**6.0**	**6.2**	<1.0	<1.0
Methyl tert-butyl ether	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
o-Xylene	<1.0	<1.0	**1.1**	**1.3**	**2.2**	<1.0	<1.0	<1.0	<1.0
m,p-Xylene	<2.0	<2.0	<2.0	<2.0	**6.0**	**2.3**	**2.2**	<2.0	<2.0
Tetrachloroethene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	<1.0	<1.0	<1.0	**1.7**	**2.8**	**1.2**	**1.2**	<1.0	<1.0
trans-1,2-Dichloroethene	<1.0	<1.0	<1.0	<1.0	**1.6**	**1.6**	**1.6**	<1.0	<1.0
Trichloroethene	**28**	**27**	**1.1**	<1.0	**3.2**	**16**	**16**	**18**	**22**
Vinyl chloride	**15**	**16**	<1.0	**1.0**	**5.1**	**20**	**19**	<1.0	<1.0
Total VOCs	**330.9**	**323.0**	**69.0**	**138.6**	**357.9**	**399.3**	**378.2**	**47.4**	**63.8**

Bold Constituent detected above MDL.
VOCs Volatile Organic Compounds.
ug/L Micrograms per liter.
* Field replicate.
J Estimated value.
MDL Method detection limit.
NA Not analyzed.

Table 1. Concentrations of Volatile Organic Compounds Detected in Groundwater and Surface Water, Operational Year 6, Quarter Number 3, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID: / Date:	W-05 3/25/2008	W-05 6/25/2008	TW-01 3/25/2008	TW-01 6/25/2008	SP-4 3/26/2008	SP-4 6/25/2008	F-6 6/25/2008	F-06 12/19/2007	FBV032608 6/25/2008
1,1,1-Trichloroethane		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane		**67**	**66**	**18**	**2.4**	<1.0	**2.2**	<1.0	<1.0	<1.0
1,1-Dichloroethene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane		**1.0**	**1.0**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene		**5.8**	**6.0**	**3.3**	**1.9**	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon Tetrachloride		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene		**9.9**	**9.5**	**15**	**15**	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane		**100**	**91**	**67**	**29**	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene		**3.5**	**3.2**	**12**	**3.8**	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane		**1.2**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methylene chloride		**2.6**	**2.5**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl tert-butyl ether		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
o-Xylene		**3.0**	**3.2**	**1.5**	**1.4**	<1.0	<1.0	<1.0	<1.0	<1.0
m,p-Xylene		<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene		<1.0	<1.0	<1.0	<1.1	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene		<1.0	<1.0	**20**	**81**	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene		**1.4**	**1.2**	**2.2**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl chloride		<1.0	**1.2**	<1.0	**2.3**	<1.0	<1.0	<1.0	<1.0	<1.0
Total VOCs		**195.4**	**184.8**	**139.0**	**136.8**	**0.0**	**2.2**	**0.0**	**0.0**	**0.0**

Bold Constituent detected above MDL.
VOCs Volatile Organic Compounds.
ug/L Micrograms per liter.
* Field replicate.
J Estimated value.
MDL Method detection limit.
NA Not analyzed.

Table 2. Concentrations of General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Operational Year 6, Quarter Number 3, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	GMMW-02 3/25/08	GMMW-02 6/25/08	GMMW-05 3/25/08	GMMW-05 6/25/08	GMMW-06 3/25/08	GMMW-06 6/24/08
	UNITS						
GENERAL CHEMISTRY							
Total Organic Carbon	mg/L	**1.9**	**2.4**	**16**	**18**	**3.4**	**2.6**
FIELD PARAMETERS							
pH	Standard units	**6.95**	**6.76**	**6.72**	**6.62**	**6.89**	**6.39**
Specific Conductance	mmhos/cm	**0.615**	**0.729**	**0.281**	**0.629**	**0.863**	**0.946**
Turbidity	NTU	--	--	--	--	--	--
Dissolved Oxygen	mg/L	**2.91**	--	**1.05**	--	**2.79**	**0.82**
Temperature	deg C	**9.04**	**11.31**	**12.07**	**12.78**	**10.03**	**13.06**
ORP	mV	**-22**	--	**-111**	--	**-55**	**-23**
DISSOLVED GASES							
Carbon dioxide	mg/L	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
Carbon monoxide	mg/L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Ethane	ng/L	**630**	**1,100**	**26,000**	**23,000**	**9,800**	**11,000**
Ethene	ng/L	**13,000**	**12,000**	**780**	**730**	**57,000**	**45,000**
Methane	ug/L	**3,300**	**2,900**	**6,100**	**15,000**	**1,300**	**1,700**
Nitrogen	mg/L	**18.00**	**16.00**	**19.00**	**10.00**	**19.00**	**22.00**
Oxygen	mg/L	**2.10**	**2.40**	**2.50**	**2.90**	**3.20**	**3.00**

Bold Constituent detected above MDL.

mg/L	Milligrams per liter.
mmhos/cm	Millimhos per centimeter.
NTU	Nephelometric Turbidity Units.
deg C	Degrees Celsius.
mV	Millivolts.
ng/L	Nanograms per liter.
--	Not analyzed or collected.
ug/L	Micrograms per liter.
IW	Injection well.
ORP	Oxidation-reduction potential.
J	Qualifier assigned to analytical data indicating result is estimated.

Table 2. Concentrations of General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Operational Year 6, Quarter Number 3, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	PW-04 3/25/08	PW-04 6/25/08	W-05 3/25/08	W-05 6/25/08	IW-03 3/25/08	IW-03 6/24/08
	UNITS						
GENERAL CHEMISTRY							
Total Organic Carbon	mg/L	**0.8**	**0.9**	**6.9**	**5.8**	**260**	**210**
FIELD PARAMETERS							
pH	Standard units	**6.15**	**6.09**	**6.72**	**6.64**	**6**	**6.1**
Specific Conductance	mmhos/cm	**0.818**	**1.051**	**0.955**	**0.983**	**0.653**	**0.809**
Turbidity	NTU	--	--	--	--	--	--
Dissolved Oxygen	mg/L	**5.26**	--	**1.3**	--	**1.21**	**0.59**
Temperature	deg C	**8.34**	**10.4**	**9.26**	**11.9**	**9.28**	**12.75**
ORP	mV	**41**	--	**-87**	--	**-54**	**-9**
DISSOLVED GASES							
Carbon dioxide	mg/L	<5.00	<5.00	<5.00	<5.00	--	--
Carbon monoxide	mg/L	<1.00	<1.00	<1.00	<1.00	--	--
Ethane	ng/L	**40**	**26**	**17,000**	**13,000**	--	--
Ethene	ng/L	**52**	**36**	**2,000**	**1,800**	--	--
Methane	ug/L	**3.1**	**4.8**	**4,900**	**4,100**	--	--
Nitrogen	mg/L	**21.00**	**18.00**	**20.00**	**21.00**	--	--
Oxygen	mg/L	**6.00**	**4.80**	**2.70**	**3.20**	--	--

Bold Constituent detected above MDL.

mg/L	Milligrams per liter.
mmhos/cm	Millimhos per centimeter.
NTU	Nephelometric Turbidity Units.
deg C	Degrees Celsius.
mV	Millivolts.
ng/L	Nanograms per liter.
--	Not analyzed or collected.
ug/L	Micrograms per liter.
IW	Injection well.
ORP	Oxidation-reduction potential.
J	Qualifier assigned to analytical data indicating result is estimated.

Table 6. Concentrations of Volatile Organic Compounds Detected in Air Stripper Effluent, Operational Year 6, Quarter Number 3, Groundwater Remediation System, Colesville Landfill, Broome County, New York.

Compounds	CAS Numbers	Sample ID: Date Sampled:	Effluent 6/26/2008 ppbv
Vinyl Chloride	75-01-4		<7.3
Chloroethane(Ethyl Chloride)	75-00-3		<7.3
1,1-Dichloroethene(Vinylidene Chloride)	75-35-4		<7.3
Methylene Chloride(Dichloromethane)	75-09-2		<7.3
1,1-Dichloroethane	75-34-3		<7.3
cis-1,2-Dichloroethylene	156-59-2		<7.3
Chloroform	67-66-3		<7.3
1,1,1-Trichloroethane(Methyl Chloroform)	71-55-6		<7.3
Benzene	71-43-2		<7.3
Trichloroethene	79-01-6		<7.3
Toluene	108-88-3		<7.3
Ethyl benzene	100-41-4		<7.3
m,p-Xylene	108-38-3/106-42-3		<7.3
o-Xylene	95-47-6		<7.3
1,2,4-Trimethylbenzene	95-63-6		<7.3
2-Propanol (Isopropyl alcohol)	67-63-0		<7.3
Dichlorodifluoromethane(Freon 12)	75-71-8		<7.3

Bold Constituent detected above MDL.
ppbv: parts per billion by volume

Notes/Assumptions:

1. Samples collected by ARCADIS personnel on the dates shown and submitted to Air Toxics Laboratories LTD. for volatile organic compound (VOC) analyses using a modified USEPA Method TO-14A.

ARCADIS

Appendix A

Groundwater Sampling Logs

ARCADIS

Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0020	Page	1 of 1
Site Location	Harpursville, NY			Date	6/25/08
Site/Well No.	W-5	Replicate No.	—	Code No.	—
Weather	Sun 75	Sampling Time: Begin	0920	End	0935

Evacuation Data

Measuring Point	Top of PVC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	
Depth to Water (ft bmp)	51.95
Water-Level Elevation (ft)	
Water Column in Well (ft)	
Casing Diameter/Type	2"
Gallons in Well	
Gallons Pumped/Bailed Prior to Sampling	0.25
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin ____ end ____
Pumping Rate (gpm)	—
Evacuation Method	Bailer (TOC) PDB

Field Parameters

Color	Clear
Odor	None
Appearance	Slightly cloudy
pH (s.u.)	6.64
Conductivity (mS/cm)	0.983
(µmhos/cm)	
Turbidity (NTU)	
Temperature (°C)	11.90
Dissolved Oxygen (mg/L)	
ORP	
Sampling Method	PDB/ Bailer
Remarks	Redeployed a PDB

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials	2	Na PO4
TOC	40 ML Amber VOA VIALS	2	H2SO4
Total Iron	250 ML Plastic	—	HNO3

Sampling Personnel: KA

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0020	Page	1 of 1
Site Location	Harpursville, NY			Date	6/25/08
Site/Well No.	GMMW-5	Replicate No.	MS/MSD	Code No.	—
Weather	Sun 75°	Sampling Time: Begin	0830	End	0910

Evacuation Data

Measuring Point	Top of PVC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	
Depth to Water (ft bmp)	48.62
Water-Level Elevation (ft)	
Water Column in Well (ft)	
Casing Diameter/Type	2"
Gallons in Well	
Gallons Pumped/Bailed Prior to Sampling	
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin ____ end ____
Pumping Rate (gpm)	
Evacuation Method	PDB / Bailer (TOC)

Field Parameters

Color	yellow / clear
Odor	Med
Appearance	Black tiny pcls
pH (s.u.)	6.620
Conductivity (mS/cm)	0.629
(µmhos/cm)	
Turbidity (NTU)	
Temperature (°C)	12.78
Dissolved Oxygen (mg/L)	
ORP	
Sampling Method	PDB - Bailer
Remarks	Redployed a PDB

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL / MS/MSD
Ethene, Ethane, Methane	40 ML Vials	2	
TOC	40 ML Amber VOA VIALS	2	H2SO4
Total Iron	250 ML Plastic		HNO3

Sampling Personnel: KA

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0020	Page	1 of 1
Site Location	Harpursville, NY			Date	6/24/08
Site/Well No.	GMMW-6	Replicate No.	REPV240608	Code No.	—
Weather	Partly Cloudy 75 Rain	Sampling Time:	Begin 1353	End	1405

Evacuation Data

Measuring Point	Top of PVC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	
Depth to Water (ft bmp)	37.99
Water-Level Elevation (ft)	
Water Column in Well (ft)	
Casing Diameter/Type	2"
Gallons in Well	—
Gallons Pumped/Bailed Prior to Sampling	—
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin — end —
Pumping Rate (gpm)	—
Evacuation Method	2" Disposable poly bailer / PDB

Field Parameters

Color	Clear
Odor	Med
Appearance	Clear
pH (s.u.)	6.39
Conductivity (mS/cm)	0.946
(µmhos/cm)	ω1
Turbidity (NTU)	
Temperature (°C)	13.06
Dissolved Oxygen (mg/L)	0.82
ORP	-23
Sampling Method	Bailer / PDB
Remarks	Redeployed a PDB

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML ~~VOA~~ Amber Vials	2	
TOC	~~250 ML~~ Plastic SAA	2	Unpres.
Total Iron	250 ML Plastic	1	HNO3

Sampling Personnel: KA / FM

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0020	Page	1 of 1
Site Location	Harpursville, NY			Date	6/25/08
Site/Well No.	PW-4	Replicate No.	—	Code No.	
Weather	Sun 75°	Sampling Time: Begin	1040	End	1050

Evacuation Data

Measuring Point	TOP OF PVC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	
Depth to Water (ft bmp)	16.97
Water-Level Elevation (ft)	
Water Column in Well (ft)	
Casing Diameter/Type	2"
Gallons in Well	
Gallons Pumped/Bailed Prior to Sampling	
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin ____ end ____
Pumping Rate (gpm)	—
Evacuation Method	PDB / Baker (TOC)

Field Parameters

Color	Clear
Odor	None
Appearance	Cloudy
pH (s.u.)	6.09
Conductivity (mS/cm)	1.081
(µmhos/cm)	
Turbidity (NTU)	
Temperature (°C)	10.40
Dissolved Oxygen (mg/L)	
ORP	
Sampling Method	PDB / Baker
Remarks	PDB Redeployment

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials	3	
TOC	40 ML Amber VOA VIALS	2	H2SO4
Total Iron	250 ML Plastic	—	HNO3

Sampling Personnel: KA / FM

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0020	Page	1 of 1
Site Location	Harpursville, NY			Date	6/25/08
Site/Well No.	GMMW-2	Replicate No.	—	Code No.	—
Weather	Sun 75°	Sampling Time: Begin	1020	End	1031

Evacuation Data

Measuring Point	Top of PVC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	
Depth to Water (ft bmp)	35.62
Water-Level Elevation (ft)	
Water Column in Well (ft)	
Casing Diameter/Type	2"
Gallons in Well	
Gallons Pumped/Bailed Prior to Sampling	0.25
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin ____ end ____
Pumping Rate (gpm)	—
Evacuation Method	PDB / Bailer (TOC)

Field Parameters

Color	Clear
Odor	
Appearance	
pH (s.u.)	6.76
Conductivity (mS/cm)	0.729
(µmhos/cm)	
Turbidity (NTU)	
Temperature (°C)	11.31
Dissolved Oxygen (mg/L)	
ORP	
Sampling Method	PDB / Bailer
Remarks	Redeployed as PDB

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials	2	
TOC	40 ML Amber VOA VIALS	2	H2SO4
Total Iron	250 ML Plastic	—	HNO3

Sampling Personnel: KA / FM

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0020	Page	1 of 1
Site Location	Harpursville, NY			Date	6/25/08
Site/Well No.	TGw-1	Replicate No.	—	Code No.	—
Weather	Sun 75	Sampling Time:	Begin 0940	End	0950

Evacuation Data

Measuring Point	Top of PVC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	
Depth to Water (ft bmp)	—
Water-Level Elevation (ft)	
Water Column in Well (ft)	
Casing Diameter/Type	2"
Gallons in Well	
Gallons Pumped/Bailed Prior to Sampling	0.25
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin ____ end ____
Pumping Rate (gpm)	—
Evacuation Method	PDB / Bailer (TOC)

Field Parameters

Color	Yellow Brown
Odor	Strong
Appearance	Yellow
pH (s.u.)	6.57
Conductivity (mS/cm)	4.57
(µmhos/cm)	
Turbidity (NTU)	
Temperature (°C)	12.49
Dissolved Oxygen (mg/L)	
ORP	
Sampling Method	PDB Bulk
Remarks	Redployed a PDB

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials	2	
TOC	40 ML Amber VOA VIALS	2	H2SO4
Total Iron	250 ML Plastic	—	HNO3

Sampling Personnel: KA / FM

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0020	Page	1 of 1
Site Location	Harpursville, NY			Date	6/24/08
Site/Well No.	TW-3	Replicate No.	—	Code No.	
Weather	Cloudy 75	Sampling Time: Begin	1440	End	1450

Evacuation Data

Measuring Point	—
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	—
Depth to Water (ft bmp)	—
Water-Level Elevation (ft)	—
Water Column in Well (ft)	—
Casing Diameter/Type	2"
Gallons in Well	—
Gallons Pumped/Bailed Prior to Sampling	0.25
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin — end —
Pumping Rate (gpm)	
Evacuation Method	Bailer

Field Parameters

Color	Yellow Brown
Odor	Strong
Appearance	
pH (s.u.)	6.10
Conductivity (mS/cm)	0.809
(µmhos/cm)	
Turbidity (NTU)	
Temperature (°C)	12.75
Dissolved Oxygen (mg/L)	0.59
ORP	-9
Sampling Method	Bailer
Remarks	

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	—	HCL
Ethene, Ethane, Methane	40 ML Vials	—	
TOC	40 ML Amber VOA VIALS	2	H2SO4
Total Iron	250 ML Plastic	—	HNO3

Sampling Personnel: KA

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0020	Page	1 of 1
Site Location	Harpursville, NY			Date	6/24/08
Site/Well No.	IW-13	Replicate No.	—	Code No.	
Weather	Cloudy 75	Sampling Time: Begin	1521	End	1523

Evacuation Data

Measuring Point	—
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	
Depth to Water (ft bmp)	
Water-Level Elevation (ft)	
Water Column in Well (ft)	
Casing Diameter/Type	2"
Gallons in Well	
Gallons Pumped/Bailed Prior to Sampling	0.25
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin ____ end ____
Pumping Rate (gpm)	
Evacuation Method	Bailer

Field Parameters

Color	Orange, Red
Odor	Strong
Appearance	
pH (s.u.)	4.56
Conductivity (mS/cm)	2.86
(µmhos/cm)	
Turbidity (NTU)	—
Temperature (°C)	12.76
Dissolved Oxygen (mg/L)	1.26
ORP	83
Sampling Method	Bailer
Remarks	

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	—	HCL
Ethene, Ethane, Methane	40 ML Vials	—	
TOC	40 ML Amber VOA VIALS	2	H2SO4
Total Iron	250 ML Plastic	—	HNO3

Sampling Personnel: KA

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0020	Page	1 of 1
Site Location	Harpursville, NY			Date	10/25/05
Site/Well No.	TW-8	Replicate No.	—	Code No.	
Weather	SW 80	Sampling Time:	Begin 1255	End	1304

Evacuation Data

Measuring Point	—
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	
Depth to Water (ft bmp)	
Water-Level Elevation (ft)	
Water Column in Well (ft)	
Casing Diameter/Type	2"
Gallons in Well	
Gallons Pumped/Bailed Prior to Sampling	
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin ____ end ____
Pumping Rate (gpm)	—
Evacuation Method	Bailer

Field Parameters

Color	Yellow
Odor	Strong
Appearance	Yellow
pH (s.u.)	4.88
Conductivity (mS/cm)	1.263
(µmhos/cm)	
Turbidity (NTU)	
Temperature (°C)	18.42
Dissolved Oxygen (mg/L)	0.48
ORP	
Sampling Method	Bailer
Remarks	had to weight the Bailer - sides of PVC are coated + stop Bailer

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	—	HCL
Ethene, Ethane, Methane	40 ML Vials	—	
TOC	40 ML Amber VOA VIALS	2	H2SO4
Total Iron	250 ML Plastic	—	HNO3

Sampling Personnel: KA

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Surface Water Sampling Form

Project: Colesville Landfill | Project No.: NY000949.0021 | Page: of

Site Location: Harpursville NY | Date: 6/25/08

Site/Well No.: SP-4 | Replicate No.: —

Weather: Sun 80 | Sampling Time: Begin 1347 End:

Site Conditions

Water Quality Meter: Quanta

Location Condition: Cobble

Vegetation: green algae

Depth of Water: 4"

Estimated Flow Rate: 5' / 10 Sec

Collection Method: direct grab

Field Parameters

Color	Clear
Odor	None
Appearance	Clear
pH (s.u.)	7.04
Conductivity (mS/cm)	0.192
Temperature (°C)	17.75
DO (mg/L)	
Turbidity (NTU)	
ORP	
Time	

Remarks:

Constituents Sampled: See COC | Sampling Personnel: KA

ARCADIS

Surface Water Sampling Form

Project Colesville Landfill Project No. NY000949.0021 Page 1 of 1

Site Location Harpursville NY Date 6/25/08

Site/Well No. F-6 Replicate No. —

Weather Sun 80 Sampling Time: Begin 1335 End _____

Site Conditions

Water Quality Meter: Quanta

Location Condition: Cobbles + dark green algae

Vegetation: See above

Depth of Water: 5"

Estimated Flow Rate: 5' / 10 Sec

Collection Method: direct grab

Field Parameters

Color	Clear
Odor	None
Appearance	Clear
pH (s.u.)	6.79
Conductivity (mS/cm)	0.201
Temperature (°C)	18.83
DO (mg/L)	
Turbidity (NTU)	
ORP	
Time	

Remarks:

Constituents Sampled: See COC Sampling Personnel: KA

ARCADIS

Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0020	Page	1 of 1
Site Location	Harpursville, NY			Date	6/25/08
Site/Well No.	GMPW-3	Replicate No.	—	Code No.	
Weather	—	Sampling Time:	Begin 1440	End	1445

Evacuation Data

Measuring Point	
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	
Depth to Water (ft bmp)	
Water-Level Elevation (ft)	
Water Column in Well (ft)	
Casing Diameter/Type	2"
Gallons in Well	
Gallons Pumped/Bailed Prior to Sampling	
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin ____ end ____
Pumping Rate (gpm)	
Evacuation Method	

Field Parameters

Color	
Odor	
Appearance	Cloudy
pH (s.u.)	6.81
Conductivity (mS/cm)	
(µmhos/cm)	
Turbidity (NTU)	
Temperature (°C)	
Dissolved Oxygen (mg/L)	
ORP	
Sampling Method	Direct grab from system
Remarks	

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials	—	
TOC	40 ML Amber VOA VIALS	—	H2SO4
Total Iron	250 ML Plastic	1	HNO3

Sampling Personnel: KA / DM

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0020	Page	1 of 1
Site Location	Harpursville, NY			Date	6/25/08
Site/Well No.	GMW-4	Replicate No.	—	Code No.	
Weather	—	Sampling Time:	Begin 1420	End	1425

Evacuation Data

Measuring Point	
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	
Depth to Water (ft bmp)	
Water-Level Elevation (ft)	
Water Column in Well (ft)	
Casing Diameter/Type	2"
Gallons in Well	
Gallons Pumped/Bailed Prior to Sampling	
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin ____ end ____
Pumping Rate (gpm)	
Evacuation Method	

Field Parameters

Color	Clear
Odor	
Appearance	
pH (s.u.)	6.80
Conductivity (mS/cm)	
(µmhos/cm)	
Turbidity (NTU)	
Temperature (°C)	
Dissolved Oxygen (mg/L)	
ORP	
Sampling Method	Direct grab
Remarks	

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials		
TOC	40 ML Amber VOA VIALS		H2SO4
Total Iron	250 ML Plastic	1	HNO3

Sampling Personnel: KA / DM

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0020	Page	1 of 1
Site Location	Harpursville, NY			Date	6/25/08
Site/Well No.	GMPW-5	Replicate No.	—	Code No.	
Weather	—	Sampling Time:	Begin 1415	End	1419

Evacuation Data

Measuring Point	
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	
Depth to Water (ft bmp)	
Water-Level Elevation (ft)	
Water Column in Well (ft)	
Casing Diameter/Type	2"
Gallons in Well	
Gallons Pumped/Bailed Prior to Sampling	
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin ____ end ____
Pumping Rate (gpm)	
Evacuation Method	

Field Parameters

Color	Clear
Odor	
Appearance	
pH (s.u.)	7.43
Conductivity (mS/cm)	
(µmhos/cm)	
Turbidity (NTU)	
Temperature (°C)	
Dissolved Oxygen (mg/L)	
ORP	
Sampling Method	Direct grab
Remarks	

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials		
TOC	40 ML Amber VOA VIALS		H2SO4
Total Iron	250 ML Plastic	1	HNO3

Sampling Personnel: KA

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0020	Page	1 of 1
Site Location	Harpursville, NY			Date	6/25/08
Site/Well No.	Combined influent	Replicate No.	—	Code No.	
Weather	—	Sampling Time:	Begin 1448	End	1452

Evacuation Data

Measuring Point	
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	
Depth to Water (ft bmp)	
Water-Level Elevation (ft)	
Water Column in Well (ft)	
Casing Diameter/Type	2"
Gallons in Well	
Gallons Pumped/Bailed Prior to Sampling	
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin ____ end ____
Pumping Rate (gpm)	
Evacuation Method	

Field Parameters

Color	cloudy
Odor	
Appearance	
pH (s.u.)	
Conductivity (mS/cm)	
(µmhos/cm)	
Turbidity (NTU)	
Temperature (°C)	
Dissolved Oxygen (mg/L)	
ORP	
Sampling Method	grab Sample
Remarks	

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials	—	
TOC	40 ML Amber VOA VIALS		H2SO4
Total Iron	250 ML Plastic	1	HNO3

Sampling Personnel: KA / DM

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0020	Page	1 of 1
Site Location	Harpursville, NY			Date	6/25/08
Site/Well No.	EFFLUENT	Replicate No.	—	Code No.	
Weather	WATER	Sampling Time: Begin	1458	End	[illegible]

Evacuation Data

Measuring Point	
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	
Depth to Water (ft bmp)	
Water-Level Elevation (ft)	
Water Column in Well (ft)	
Casing Diameter/Type	2"
Gallons in Well	
Gallons Pumped/Bailed Prior to Sampling	
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin ____ end ____
Pumping Rate (gpm)	
Evacuation Method	

Field Parameters

Color	
Odor	
Appearance	
pH (s.u.)	
Conductivity (mS/cm)	
(µmhos/cm)	
Turbidity (NTU)	
Temperature (°C)	
Dissolved Oxygen (mg/L)	
ORP	
Sampling Method	Direct grab
Remarks	

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials		
TOC	40 ML Amber VOA VIALS		H2SO4
Total Iron	250 ML Plastic	1	HNO3

Sampling Personnel: KA / DM

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Millisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Appendix B

New York State Department of Environmental Conservation DAR-1 Air Modeling Data

Table B-2. NYSDEC DAR-1 Air Modeling Data, Operational Year 6, Quarter Number 3, Colesville Landfill, Broome County, New York.

Calculation of the Short-Term Guideline Concentration (SGC) for Sampling Event on 6/26/2008

Compounds	CAS Numbers	Maximum Limit (SGC) (ug/m^3)	Analytical Concentration (ppb)	Detection Limit Used	Actual Emissions C_a (ug/m^3)	Mass/hour (lb/hr)	Maximum Potential Impact (Step III.A.3 in DAR-1) (ug/m^3)	Short Term Impact (Step III.A.5 in DAR-1) (ug/m^3)	Percent of the SGC (%)
Vinyl Chloride	75-01-4	180,000	7.3	*	18.97	2.66E-05	0.0046	0.29596	1.6E-04
Chloroethane(Ethyl Chloride)	75-00-3	--	7.3	*	19.58	2.75E-05	0.0047	0.30553	NA
1,1-Dichloroethene(Vinylidene Chloride)	75-35-4	--	7.3	*	29.42	4.13E-05	0.0071	0.45909	NA
Methylene Chloride(Dichloromethane)	75-09-2	14,000	7.3	*	25.78	3.62E-05	0.0062	0.40222	2.9E-03
1,1-Dichloroethane	75-34-3	--	7.3	*	30.03	4.22E-05	0.0072	0.46866	NA
cis-1,2 - Dichloroethylene	156-59-2	--	7.3	*	29.42	4.13E-05	0.0071	0.45909	NA
1,1,1-Trichloroethane(Methyl Chloroform)	71-55-6	68,000	7.3	*	40.49	5.69E-05	0.0097	0.63179	9.3E-04
Trichloroethene	79-01-6	14,000	7.3	*	39.88	5.60E-05	0.0096	0.62223	4.4E-03
m,p-Xylene	108-38-3/106-42-3	4,300	7.3	*	31.60	4.44E-05	0.0076	0.49314	1.1E-02
Dichlorofluoromethane(Freon 12)	75-71-8	--	7.3	*	36.69	5.15E-05	0.0088	0.57251	NA

ug/m^3: Micrograms per cubic meter
ppb: parts per billion
*: Analyte concentration below detection limit, detection limit was used in calculations
lb/hr: pounds per hour
--: No SGC listed for compound
NA: Not applicable

Notes:
1. DAR-1 refers to DAR-1 AGC/SGC Tables dated September 10,2007.
2. SGC refers to the Short-Term Guideline Concentration as determined using the hand calculations in the DAR-1 AGC/SGC Tables dated September 10, 2007.
3. To be conservative the lower detection limit was used for compounds that were below the limit of detection, but are found in the influent groundwater of the Groundwater Remediation System.

Table B-2. NYSDEC DAR-1 Air Modeling Data, Operational Year 6, Quarter Number 3, Colesville Landfill, Broome County, New York.

Calculation of AGC based on 6/26/2008 Sampling Event

Compounds	CAS Numbers	Maximum Limit on C_a (AGC[4]) ug/m^3	Maximum Mass Flow Q_a lb/yr	Lab Data ppb	Detection Limit Used[5]	Actual Emissions C_a ug/m^3	Actual Mass Flow per Hour lb/hr	Actual Mass Flow per Year lb/yr	**Percent of Annual** %
Vinyl Chloride	75-01-4	0.11	10.76	7.3	*	18.97	1.54E-05	0.13381	**1.24**
Chloroethane(Ethyl Chloride)	75-00-3	10,000	978,044.97	7.3	*	19.58	1.59E-05	0.13813	**0.00**
1,1-Dichloroethene(Vinylidene Chloride)	75-35-4	70	6,846.31	7.3	*	29.42	2.39E-05	0.20756	**0.00**
Methylene Chloride(Dichloromethane)	75-09-2	2.1	205.39	7.3	*	25.78	2.09E-05	0.18185	**0.09**
1,1-Dichloroethane	75-34-3	0.63	61.62	7.3	*	30.03	2.44E-05	0.21188	**0.34**
cis-1,2-Dichloroethylene	156-59-2	63	6,161.68	7.3	*	29.42	2.39E-05	0.20756	**0.00**
1,1,1-Trichloroethane(Methyl Chloroform)	71-55-6	1,000	97,804.50	7.3	*	40.49	3.29E-05	0.28564	**0.00**
Trichloroethene	79-01-6	0.5	48.90	7.3	*	39.88	3.24E-05	0.28131	**0.58**
m,p-Xylene	108-38-3/106-42-3	100	9,780.45	7.3	*	31.60	2.56E-05	0.22295	**0.00**
Dichlorodifluoromethane(Freon 12)	75-71-8	12,000	1,173,653.96	7.3	*	18.24	1.48E-05	0.12867	**0.00**

fps: feet per second
acfm: actual cubic feet per minute
ug/m^3: micrograms per cubic meter
lb/yr: pounds per year
lb/hr: pounds per hour
ppb: parts per billion

Notes/Assumptions:

1. The stack discharge temperature is 64 °F based on recorded parameters.
2. The ambient temperature is approximately 84°F based on recorded conditions.
3. Calculations assume that the system will run with the maximum allowable concentrations between quarterly readings.
4. AGC refers to the Annual Guideline Concentration as determined using the hand calculations in the DAR-1 AGC/SGC Tables dated September 10, 2007.
5. To be conservative the lower detection limit was used for compounds that were below the limit of detection, but are found in the influent groundwater of the Groundwater Remediation System.

Appendix C

Automated Reagent Injection System
Operating Parameters

ARCADIS

Table C-1. Automated Reagent Injection System Summary of Operational Year 6, Quarter Number 3 Injection Quantities, Groundwater Remediation System, Colesville Landfill, Broome County, New York.

Summary of Automated Reagant Injections

Date	Total Quantity of Molasses Solution Injected (gal.)	Total Quantity of Molasses Injected (gal.)	Total Quantity of Rinse Water Injected (gal.)
5/10/2008	13,705	137	148
Quarter Totals (gal.) =	**13,705**	**137**	**148**
Totals Since Startup (gal.) =	**172,047**	**9,013**	**8,571**

Notes:

gal. Gallons

ARCADIS

Table C-2. Automated Reagent Injection System, Operational Year 6, Quarter Number 3 Operating Parameters, Groundwater Remediation System, Colesville Landfill, Broome County, New York.

Injection Number 58

Injection Start Date =	3/26/2008		
Injection Completion Date =	5/10/2008		
Molasses to Water Ratio (%) =	1.0	Programmed Mixing Time (min.)[1] =	60

Injection Well ID	Molasses Solution Injection Quantity (gal.)	Rinse[2] Quantity (gal.)	Raw Molasses Per Well (gal.)	Min. Injection[3] Flowrate (gpm)	Max. Injection Pressure (psi)
PW-6	530	5	5.3	NM	26
IW-3	530	5	5.3	NM	26
IW-1	210	4	2.1	NM	27
IW-2	210	3	2.1	NM	25
GMMW-1	140	3	1.4	NM	10
IW-4	989	4	9.9	NM	27
IW-5	989	5	9.9	NM	27
IW-6	989	7	9.9	NM	27
IW-7	989	8	9.9	NM	28
IW-8[4]	0	0	0.0	NM	0
IW-9	1,230	11	12.3	NM	0
IW-10	1,230	12	12.3	NM	28
IW-11	1,230	13	12.3	NM	26
IW-12	1,230	15	12.3	NM	27
IW-13	1,230	16	12.3	NM	27
IW-14	989	18	9.9	NM	27
IW-15	989	19	9.9	NM	26
Totals (gal.) =	13,705	148	137.1	NA	NA

Notes:

gal.	Gallons.
min.	Minutes.
i.w.c.	Inches of water column.
psi	Pounds per square inch.
gpm	Gallons per minute.
NA	Not applicable.
NM	Not measured.
1.	Programmed mixing time is calculated from the expiration time of the molasses injection countdown timer to the startup of transfer pump TP-900 during an injection sequence or from the end of transfer pump TP-600 operation to the restart of an injection during a mixing sequence.
2.	Rinse quantity was injected manually at 20 gpm for 1 minute.
3.	Parameter not measured due to SCADA system malfunction.
4.	Injection not conducted into IW-8 for ongoing Alternate Electron Donor Pilot test evaluation.