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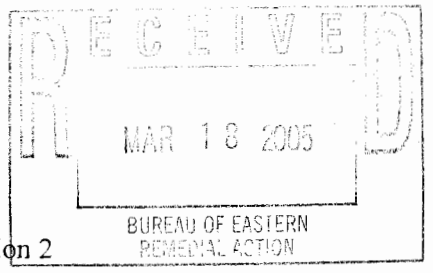

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Mr. George Jacob
United Stated Environmental Protection Agency – Region 2
290 Broadway, 20th Floor
New York, New York 10007-1866

ENVIRONMENT

Subject:
Operational Year 2 Annual 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 2 Annual 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 G&M, Inc.

Steven M. Feldman
Project Manager

Date:
16 March 2005

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Operational Year 2 Annual Monitoring Report

Colesville Landfill,
Broome County, New York
NYSDEC Site 704010

ARCADIS
Infrastructure, buildings, environment, communications

ARCADIS

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Project Engineer

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Project Director

Operational Year 2
Annual Monitoring Report

Colesville Landfill,
Broome County, New York
NYSDEC Site 704010

Prepared for:
Broome County Division of Solid Waste Management

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Our Ref.:
NY000949.00017.00004

Date:
28 February 2005

Tables

Figures

Appendices

A Water-Level Measurement and Groundwater Sampling Logs.

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

C Automated Reagent Injection System Operating Parameters

1. Introduction

This Operational Year 2, Quarter Number 4 Annual Monitoring Report (Report) was prepared on behalf of the Broome County Division of Solid Waste Management to evaluate and document long-term monitoring (LTM) activities at the Colesville Landfill, located in Broome County, New York (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), which was approved by the United States Environmental Protection Agency (USEPA) and New York State Department of Environmental Conservation (NYSDEC). The LTM Plan provides a detailed description of the LTM program, methodology, and rationale. Where applicable these elements are either summarized or incorporated by reference herein.

This report provides the data collected from the September 2004 water-level measurement round and the results of groundwater quality monitoring conducted during Operational Year 2, Quarter Number 4 (annual monitoring event). A description of the operation, maintenance, and monitoring (OM&M) associated with the Groundwater Remediation System during Operational Year 2, Quarter Number 4 has also been included. In addition, this report describes SP-5 Spring Water Remediation System OM&M activities conducted during this quarter. Included in the analysis of results is a summary and discussion of all data collected during Operational Year 2 (September 2003 through September 2004). 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 2, Quarter Number 4. A site plan, which shows the location of environmental effectiveness monitoring, is provided on Figure 1.

2.1 Environmental Effectiveness Monitoring

The environmental effectiveness monitoring performed during Operational Year 2, Quarter Number 4 included the following:

- Water-level (hydraulic) measurements were collected from 17 monitoring wells on September 20, 2004.

- Groundwater samples (Year 2, Q4 list of wells) were collected from 17 monitoring wells during the week of September 20, 2004 and selectively analyzed for volatile organic compounds (VOCs), dissolved gases, select inorganic parameters, and field parameters.

The depth to groundwater in monitoring wells was measured using methods consistent with those described in the LTM Plan.

Monitoring wells were purged and sampled using methods described in the LTM Plan.

2.2 Groundwater Remediation System Performance Monitoring

Groundwater Remediation System performance monitoring activities during Operational Year 2, Quarter Number 4 were as follows:

- Pump-and-treat (PT) system production well influent and effluent samples were collected during the OM&M quarterly site visit on October 8, 2004 and selectively analyzed for VOCs and total iron.

- One vapor sample from the PT system air stripper effluent was collected during the OM&M quarterly site visit on October 8, 2004 and analyzed for VOCs.

- Total organic carbon (TOC) samples were collected from injection wells IW-1, IW-8, and IW-14 on September 23, 2004.

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

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

- Bromide samples were collected from wells GMPW-1, GMMW-4 and GMMW-5 on September 23, 2004 and October 8, 2004.

PT system groundwater samples were collected as grab samples directly from production wells GMPW-3, GMPW-4 and 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

SP-5 Spring Water Remediation System OM&M was conducted on September 23, 2004. System OM&M was conducted in accordance with the LTM Plan Addendum for Spring Water Remediation Systems (ARCADIS 2003) and consisted of recording field parameters (discharge flowrate and depth to water in treatment unit) and the collection of an influent and effluent spring water sample for analysis of VOCs. The influent sample was collected after removing three well volumes from the influent monitoring well, which is located within the SP-5 treatment unit and screened below the liquid phase granular activated carbon (LPGAC) zone. The treatment system effluent sample was collected as a grab sample from the discharge pipe prior to entering the riprap-lined outlet. All spring water samples were analyzed for VOCs using USEPA Method 8260.

3. Groundwater Flow

Water-level measurements were made from existing wells on September 20, 2004. Water-level elevation data for Operational Year 2, Quarter Number 4 is provided in Table 1. A summary of water-level elevation data for Operational Year 2 is included in this table. Water-level elevations and the groundwater flow direction for the September 2004 monitoring event are shown on Figure 1. As shown on Figure 1, the groundwater flow direction in the project area (i.e., adjacent to the landfill western perimeter) and site-wide in the Operational Year 2, Quarter Number 4 round was consistent with previous rounds. The groundwater flow direction in the project area is toward the southwest from the western perimeter of the landfill. The groundwater flow direction in areas further to the east of the project area is toward the south/southwest.

Water-level elevation data for Operational Year 2 was similar to prior rounds of data. Seasonal fluctuations are observed during each operating quarter; however, the data generally indicate groundwater flow directions consistent with that observed during the Operational Year 2, Quarter Number 4 monitoring event.

4. Groundwater Quality

The following sections describe the analytical results for groundwater samples collected during the September 2004 monitoring round (Operational Year 2, Quarter Number 4). A discussion of analytical results for all data collected during Operational

Year 2 is also provided. Groundwater analytical data for Operational Year 2, Quarter Number 4 is provided in Tables 2 and 3. A summary of all analytical data collected during Operational Year 2 is also provided on the referenced tables.

4.1 Volatile Organic Compounds

A comparison of Operational Year 2, Quarter Number 4 groundwater analytical results to previous analytical data indicate that the dissolved phase plume continues to be stable and that the anaerobic in-situ reactive zone (IRZ) continues to make adsorbed phase mass available for treatment.

As shown in Table 2, total VOCs (TVOCs) for plume boundary monitoring wells W-17S and W-18 remained stable at 0.0 ug/L and 14.1 ug/L, respectively. Similarly, offsite monitoring well W-20S remained stable at 2.9 ug/L. Background monitoring well W-14S also remained stable at 0.0 ug/L. Landfill perimeter monitoring wells W-13, PW-7, W-6, and W-7 remained stable at 0.0 ug/L, 77.9 ug/L, 15.6, ug/L, and 67.7 ug/L, respectively. Similarly, landfill interior monitoring well PW-13 exhibited stable concentrations at 15.6 ug/L. Mid-plume monitoring wells W-16S, PW-3, PW-4, W-5, and GMMW-2 remained consistent at 63.6 ug/L, 111.7 ug/L, 102.3 ug/L, 349.7 ug/L, and 580.7 ug/L, respectively. Mid-plume monitoring well GMMW-6 decreased to 1,775 ug/L while mid-plume monitoring well PW-5 increased to 39.3 ug/L.

Overall, groundwater analytical data for VOCs during Operational Year 2 continue to corroborate historical data and indicate that the dissolved phase plume is stable. This observation provides continued evidence that ongoing natural attenuation processes are effectively controlling the further migration of the plume.

Monitoring well GMMW-5, currently located within the limits of the IRZ, remained stable at 940 ug/L during Operational Year 2, Quarter Number 4 but above baseline conditions (i.e., conditions prior to initiation of molasses injections). This observation is consistent with Operational Year 2 analytical data and indicates that the IRZ continues to release adsorbed phase mass making it available for treatment within the IRZ.

PT system analytical results for VOCs are provided in Table 5. Groundwater analytical results for PT system production wells GMPW-3, GMPW-4, and GMPW-5 are consistent with prior rounds of data. Specifically, TVOC concentrations for the Operational Year 2, Quarter Number 4 sampling round were as follows: GMPW-3 (317.0 ug/L), GMPW-4 (515.1 µg/L) and GMPW-5 (329.4 ug/L). 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 are provided in Table 3. Based on the groundwater data collected during Operational Year 2, Quarter Number 4, monitoring wells located immediately downgradient of the injection transect (GMMW-5) continue to indicate reducing conditions, including depressed dissolved oxygen and oxidation-reduction potential (ORP). Further details of the ARI system performance monitoring are provided in Section 7.2.2 of this report.

4.3 Evidence of Biodegradation

Table 3 provides the results of biodegradation end product concentrations in monitoring wells and indicates the continued occurrence of bioactivity and biodegradation of VOCs within the plume. Specifically, Operational Year 2, Quarter Number 4 biogeochemical results (methane, ethane, and ethene) for monitoring well GMMW-5 continue to be elevated when compared to baseline conditions. GMMW-5 is located closest to the ARI injection wells and would be expected to be the first well to exhibit increases in biodegradation end products. Biogeochemical results for monitoring well GMMW-6 increased significantly during Operational Year 2, Quarter Number 4 and may indicate that the IRZ has extended to the vicinity of this well. 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 monitoring was not conducted during Operational Year 2, Quarter Number 4 as outlined in the LTM Plan. Nonetheless, Table 5 presents the analytical results for spring sampling locations SP-2, SP-3, and SP-4 during Operational Year 2. As shown in Table 5, spring water quality remained relatively stable with the exception of spring location SP-2 which exhibited an increase in TVOCs during the Operational Year 2, Quarter Number 3 monitoring event. In accordance with the methodology outlined in the Interim Remedial Action Report (ARCADIS 2004), monitoring of spring location SP-4 will be conducted from the North Stream, immediately downgradient of the former spring location. The revised sampling methodology is the result of the remedial construction efforts which were conducted during Operational Year 2. Further details of the SP-4 remedial construction effort are provided in the

Interim Remedial Action Report. Analytical results for the SP-5 Spring Water Remediation System are discussed in Section 8 of this report.

6. Surface Water Quality

Surface water monitoring was not conducted during Operational Year 2, Quarter Number 4 as outlined in the LTM Plan. Nonetheless, Table 6 presents the analytical results for surface water sampling location F-6 during Operational Year 2. As indicated in the Operational Year 2, Quarter Number 2 Monitoring Report, the surface water sample collected during the corresponding monitoring event was collected erroneously at the SP-4 spring location. Accordingly, it was mutually agreed with the USEPA that the corresponding analytical data should not be used. Sample results were non-detect for all compounds during the Operational Year 2, Quarter Number 3 monitoring event indicating that surface water is not being adversely impacted by the dissolved phase groundwater plume.

7. Groundwater Remediation System Performance

The following section describes the results of the Groundwater Remediation System performance monitoring conducted during Operational Year 2, Quarter Number 4. A brief summary of system performance during Operational Year 2 is also provided.

7.1 PT System

The following section describes the results of the PT system performance monitoring conducted during Operational Year 2, Quarter Number 4. Included in the discussion is a brief summary of system performance during Operational Year 2.

7.1.1 Summary of Operation, Maintenance, and Monitoring

During the Operational Year 2, Quarter Number 4 system operation, the PT system shutdowns or periods of intermittent operation due to mechanical problems were as follows:

- On July 27, 2004 the PT system shut down due to failure of level switch LSH-500. On August 11, 2004 the level switch was replaced and the PT system was restarted.

PT system OM&M for Operational Year 2, Quarter Number 4 was conducted on October 8, 2004 and included operation and maintenance of system equipment, the

collection of system performance samples (water and vapor), and recording system operating parameters. Table 7 provides a summary of the recorded system operating parameters for the current operating period as well as an annual summary for Operational Year 2. As shown in Table 7, the total effluent groundwater recovery rate for Operational Year 2, Quarter Number 4 was approximately 0.34-gallon per minute (gpm), with individual recovery rates of 0.03-gpm, 0.19-gpm, and 0.14-gpm for production wells GMPW-3, GMPW-4, and GMPW-5, respectively. The average individual recovery well rates decreased during the reporting period when compared to previous operation. The overall decline is directly related to the system shutdown caused by the mechanical problems referenced previously. However, the significant decrease in recovery rate at production well GMPW-3 may be the result of fouling of the well screen, or other well condition problem. A total of 56,724 gallons of groundwater was recovered during Operational Year 2, Quarter Number 4 and a total of 780,949 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 discharge pressure of 8.9-inches of water column (i.w.c.) and a low profile air stripper blower flowrate of 318 standard cubic feet per minute (scfm).

Overall system performance during Operational Year 2 was consistent with previous operation. Specifically, the PT system operated continuously with intermittent shutdowns due to routine OM&M and occasional mechanical failure/repair periods. As shown in Table 7, the total effluent groundwater recovery rate for Operational Year 2 was approximately 0.63-gpm, with individual recovery rates of 0.2-gpm, 0.2-gpm, and 0.25-gpm for production wells GMPW-3, GMPW-4, and GMPW-5, respectively. A total of 333,384 gallons of groundwater was recovered during Operational Year 2.

7.1.2 Results of Performance Sampling

PT system performance sampling for Operational Year 2, Quarter Number 4 was conducted on October 8, 2004. Five groundwater samples and one vapor sample were collected during the quarterly sampling round. Groundwater samples collected included individual production 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 sampling groundwater analytical results for the Operational Year 2, Quarter Number 4 monitoring event as well as a summary of all data for Operational Year 2. 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 during Operational Year 2, Quarter Number

4. Total iron after the cartridge filters was 0.179 mg/L for the fourth quarter, which is below the BPJ recommended daily average limit of 0.61 mg/L and the recommended daily limit of 1.2 mg/L. Based on the total groundwater recovered during the reporting period and total influent groundwater concentration, an estimated 0.20 pounds (lbs) of VOC mass were removed from the subsurface during the quarterly reporting period, as shown in Table 8. A total of approximately 1.19 lbs of VOCs have been removed from the subsurface since system startup.

Table 9 provides a summary of the PT system performance sampling vapor analytical results for the Operational Year 2, Quarter Number 4 monitoring event as well as a summary of all data for Operational Year 2. As shown in Table 9, there were no constituents of concern (COCs) detected above the detection limit in the air stripper effluent vapor sample during Operational Year 2, Quarter Number 4. To be conservative, a NYSDEC DAR-1 air model was calculated using the detection limit of all COCs detected in the influent groundwater. All COCs were below their respective short-term guidance concentrations (SGCs) and annual guidance 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 December 22, 2003.

As shown in Table 4, the PT system operated effectively during Operational Year 2 and reduced groundwater VOCs to below their respective BPJ limits during each operational period. Total iron after the cartridge filters had one minor exceedance over its BPJ recommended daily average limit due to fouling of the cartridge filter units. The cartridge filters continue to be inspected during regular O&M visits to assess the changeout frequency needed for efficient operation. As shown in Table 8, a total of approximately 0.51 lbs of VOC mass were recovered during Operational Year 2. Although an annual summary of NYSDEC DAR-1 screening simulations has not been provided herein, all COCs were below their respective SGCs and AGCs during each operating period of Operational Year 2.

7.2 ARI System

The following section describes the results of the ARI system performance monitoring conducted during Operational Year 2, Quarter Number 4. A brief summary of ARI system performance for Operational Year 2 has also been provided.

7.2.1 Summary of Operation, Maintenance, and Monitoring

The ARI system was operated intermittently during Operational Year 2, Quarter Number 4 period due to troubleshooting of mixing tank MT-800. A chronology of the events related to tank troubleshooting activities is as follows:

- On July 26, 2004 the automated injection was interrupted due to a low flow molasses injection alarm.
- During a site inspection on August 10, 2004 to address the problem, a minor leak was detected on the bottom of MT-800. Upon further inspection of the tank interior, it was noted that the upper portion of the tank was oxidizing and required rehabilitation.
- On October 8, 2004, an FDA-approved vinyl ester resin was sprayed onto the mixing tank interior to prevent further oxidation of the tank; and,
- Following the required curing period of the resin, the ARI system was subsequently restarted on October 18, 2004.

Because of the required repairs described above, one complete and one partial automated reagent injection were conducted during the reporting period. Based on the number of injection events, quantity of molasses solution delivered to each injection well, and molasses solution percentage, approximately 3,200-gallons of molasses solution were delivered to the subsurface during Operational Year 2, Quarter Number 4. A total of 50,384-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 2, Quarter Number 4.

Despite intermittent system shutdowns for routine OM&M and equipment repair, the ARI system operated effectively during Operational Year 2 and delivered a sufficient quantity of organic carbon to the subsurface to maintain the anaerobic IRZ. Based on the number of injection events, quantity of molasses solution delivered to each injection well, and molasses solution percentage, approximately 23,460-gallons of molasses solution was delivered to the subsurface during Operational Year 2.

7.2.2 Results of Performance Sampling

ARI system performance sampling was conducted on September 23, 2004 and on October 8, 2004 and included the collection of TOC samples from injection wells and

collection of bromide samples from select monitoring wells. In addition to performance sampling conducted explicitly for ARI system monitoring, analytical results from select wells sampled under the environmental effectiveness monitoring program were also utilized to determine the effectiveness of the ARI system.

As discussed previously, Tables 2 and 3 summarize the results of VOCs, and biogeochemical and field parameters, respectively, for the ARI system performance monitoring and environmental effectiveness Operational Year 2, Quarter Number 4 sampling event. Analytical results and field parameters indicate that geochemical conditions in the current area of ARI system influence exhibit a lack of dissolved oxygen (DO), low ORP, sufficient TOC within injection wells, an increase in chlorinated VOC (CVOC) degradation products (i.e., ethene and ethane), and an increase in reduced forms of alternate electron acceptors (i.e., methane). Operational Year 2, Quarter Number 4 analytical data for monitoring well GMMW-6 also indicate that the IRZ may have extended to the vicinity of this well and provides evidence that VOCs are being completed degraded along the downgradient flow path.

Key observations in comparison to Operational Year 2, Quarter Number 3 results are as follows:

- Laboratory analytical DO concentrations in monitoring well GMMW-5 remained depressed at 0.40 mg/L.
- The TOC concentration in well GMMW-5 remained elevated at 360 mg/L.
- The ethene concentration in monitoring well GMMW-5 increased from 7,900 to 30,000 nanograms per liter (ng/L).
- The methane concentration in monitoring well GMMW-5 increased from 11,000 to 12,000 micrograms per liter (µg/L).
- The TOC concentration in well GMMW-6 increased from <20 to 58.8 mg/L.
- Ethane and ethene concentrations in monitoring well GMMW-6 increased from 800 to 3,100 ng/L and 84,000 to 200,000 ng/L, respectively.
- The methane concentration in monitoring well GMMW-6 increased from 530 to 1,700 µg/L.

As referenced previously, TVOC concentrations remained stable within well GMMW-5 during Operational Year 2, Quarter Number 4 when compared to the previous quarter analytical results while TVOC concentrations in well GMMW-6 decreased significantly when making the same comparison.

Bromide was detected for the first time since its injection during Operational Year 2, Quarter Number 1. Specifically, bromide analytical results for wells GMPW-1, GMMW-4, and GMMW-5 were, 1.2, 1.2, and 1.2 mg/L, respectively for the September 21, 2004 monitoring event. Bromide analytical results for these wells were 1.23, 1.32, and 1.24 mg/L, respectively, for the October 8, 2004 monitoring event. A detailed explanation of the bromide tracer injection is available in the Operational Year 2, Quarter Number 1 Monitoring Report. Based on the monitoring results presented herein, the estimated groundwater seepage velocity was calculated to be approximately 0.031 feet per day within the vicinity of the injection wells. The revised estimate is an order of magnitude lower than previously projected values.

The establishment of the anaerobic IRZ continued during Operational Year 2 as evidenced by strong reducing conditions in the vicinity of the injection wells, observation of degradation end products, and increases in reduced forms of alternate electron acceptors. A summary of key observations for Operational Year 2 are as follows:

- Consistently low laboratory analytical DO concentrations in monitoring well GMMW-5 indicate strongly anaerobic conditions in the subsurface.
- Elevated TOC observed within injection wells and in well GMMW-5 indicates that sufficient organic carbon is being delivered to the subsurface to maintain the anaerobic IRZ.
- Ethene concentrations in monitoring well GMMW-5 increased from 4,600 ng/L to 30,000 ng/L during the operational year.
- Methane concentrations in monitoring well GMMW-5 increased from 8,200 ug/L to 12,000 ug/L during the operational year; and,
- The significant increase in degradation end products, methane, and TOC in monitoring well GMMW-6 indicates that the IRZ may have extended to this vicinity and provides further evidence that complete degradation of contaminants is occurring within the IRZ.

8. Spring Water Remediation System Performance

SP-5 Spring Water Remediation System OM&M was conducted on September 23, 2004 and October 8, 2004 in accordance with the LTM Plan Addendum for Spring Water Remediation Systems (ARCADIS 2003). SP-5 Spring Water Remediation System Operational Year 2, Quarter Number 4 analytical results are provided in Table 10. A summary of all analytical results for Operational Year 2 is also provided. As shown in Table 10, nearly all effluent COCs were treated to below their respective BPJ limits via the LPGAC during the operating quarter with the exception of a slight exceedance of chloroethane. As a result of the exceedance, the LPGAC was replaced on October 7, 2004.

Table 11 contains the SP-5 Spring Water Remediation System operational parameters recorded during the current operation quarter and provides a summary of Operational Year 2 data. As shown in Table 11, the recorded instantaneous flowrate was 1.13 gpm for the Operational Year 2, Quarter Number 4 monitoring event. The flowrate for Operational Year 2, Quarter Number 4 is approximately 3 times greater than the Operational Year 2, Quarter Number 3 flowrate (0.396 gpm) due to the modification of the treatment which was completed on July 15, 2004. Approximately 0.11 lbs of mass was removed from the subsurface during the reporting period.

The SP-5 remedial construction was completed during Operational Year 2 in accordance with the NYSDEC-approved Spring Water Remediation Systems Design Drawings and Technical Specifications. Further details regarding the SP-5 construction activities are provided in the Interim Remedial Action Report. Since startup of the SP-5 remediation system in October 2003, the system has operated effectively and reduced influent VOCs to below their respective BPJ limits with the minor exception referenced above. As shown in Table 11, the SP-5 remedial system has treated approximately 259,616 gallons and removed 0.22 lbs of VOCs since system startup.

9. Conclusions

Based on the data obtained from the Operational Year 2, Quarter Number 4 monitoring and overall system performance during Operational Year 2, ARCADIS concludes the following:

- The groundwater flow direction in the project area (i.e., adjacent to the landfill western perimeter) and site-wide in the September 2004 round was consistent with previous rounds. The groundwater flow direction in the project area is toward the

southwest from the western perimeter of the landfill. The groundwater flow direction in areas further to the east of the project area is toward the south/southwest.

- The horizontal groundwater advective transport velocity was determined to be significantly less than previously anticipated in the vicinity of the injection wells.
- Groundwater analytical data for VOCs is consistent with site historical data and indicate that the dissolved phase plume is stable. This observation provides continued evidence that ongoing natural attenuation processes are effectively controlling the further migration of the plume.
- TVOC analytical results during Operational Year 2 in wells located closest to the ARI injection well line (GMMW-5) exhibited increased concentrations when compared to the baseline round, which demonstrates that adsorbed phase mass has been transferred to the dissolved phase making it available for treatment within the anaerobic IRZ.
- Degradation end product data observed during Operational Year 2 in wells closest to the ARI system injection wells continue to indicate increasing levels of biodegradation end products. Furthermore, increases in degradation end products and reduced forms of alternate electron acceptors at well GMMW-6 may provide evidence that the IRZ has extended to the vicinity of this well.
- The PT system is operating as designed and is treating recovered groundwater VOCs to below BPJ limits prior to discharge.
- Despite the ARI system shutdowns described herein, sufficient organic carbon was delivered to the subsurface to maintain the IRZ as evidenced through the analytical data.
- The SP-5 Spring Water Remediation System is operating as designed and is treating spring water VOCs to below BPJ limits prior to discharge.

10. Recommendations

ARCADIS recommends the following based on the findings in this report:

- In light of the stable plume configuration, strong evidence of enhanced biodegradation, and slow groundwater velocity in the vicinity of the landfill,

ARCADIS will reevaluate the LTM Plan monitoring schedule and will propose adjustments accordingly. If the current monitoring schedule is more aggressive than required to document the progress of remediation and monitor the plume configuration, then a revised monitoring schedule will be formally requested in writing to the USEPA and NYSDEC during Operational Year 3.

- Continue to observe and document the performance of production well GMPW-3 and other production wells to determine the cause of decline in production rate. Implement well rehabilitation measures, if necessary.

11. Project Schedule

Groundwater environmental effectiveness monitoring is scheduled to be conducted for Operational Year 3 on the quarterly schedule set forth in the LTM Plan unless revised otherwise as indicated above. System OM&M of the Groundwater Remediation System will continue to be performed on a quarterly basis consistent with the LTM Plan. In accordance with the methodology outlined in the Interim Remedial Action Report, monitoring of spring location SP-4 will be conducted from the North Stream, immediately downgradient of the former spring location.

12. References

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ARCADIS G&M, Inc. 2004. Operational Year 2, Quarter Number 3 Monitoring Report, Colesville Landfill, Broome County, New York, NYSDEC Site 704010. December 28, 2004.

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Table 1. Water-Level Measurements Collected During Operational Year 2, Colesville Landfill, Broome County, New York.

Well Identification	MP Elevation (feet above msl)	12/16/2003 Depth to Water (feet below MP)	12/16/2003 Water-Level Elevation (feet above msl)	3/10/2004 Depth to Water (feet below MP)	3/10/2004 Water-Level Elevation (feet above msl)	MP Description
GMMW-2	1030.95	36.11	994.84	35.75	995.20	Inner casing
GMMW-5	1043.66	47.11	996.55	46.29	997.37	Inner casing
GMMW-6	1033.56	38.59	994.97	38.20	995.36	Inner casing
PW-3	988.92	7.16	981.76	6.43	982.49	Inner casing
PW-4	1001.75	16.42	985.33	16.11	985.64	Inner casing
PW-5	986.12	AM	AM	AM	AM	Inner casing
W-5	1051.41	50.82	1000.59	50.48	1000.93	Inner casing
W-6	1050.38	49.68	1000.70	48.19	1002.19	Inner casing
PW-7	1042.47	38.37	1004.10	38.19	1004.28	Inner casing
W-7	1049.12	AM	AM	40.59	1008.53	Inner casing
PW-10	1049.29	36.46	1012.83	35.97	1013.32	Inner casing
PW-13	1072.41	60.85	1011.56	57.88	1014.53	Inner casing
W-13	1053.43	44.93	1008.50	45.39	1008.04	Inner casing
W-14S	957.68	AM	AM	7.71	949.97	Inner casing
W-16S	990.33	9.22	981.11	9.77	980.56	Outer casing
W-17S	959.13	10.91	948.22	8.89	950.24	Inner casing
W-18	973.56	11.05	962.51	9.78	963.78	Inner casing
W-20S	952.88	7.59	945.29	7.46	945.42	Inner casing

msl Mean sea level.
MP Measuring point.
NM Not measured.
AM Anomalous measurement.

Table 1. Water-Level Measurements Collected During Operational Year 2, Colesville Landfill, Broome County, New York.

Well Identification	MP Elevation (feet above msl)	6/15/2004 Depth to Water (feet below MP)	6/15/2004 Water-Level Elevation (feet above msl)	9/20/2004 Depth to Water (feet below MP)	9/20/2004 Water-Level Elevation (feet above msl)	MP Description
GMMW-2	1030.95	37.51	993.44	36.18	994.77	Inner casing
GMMW-5	1043.66	48.27	995.39	46.37	997.29	Inner casing
GMMW-6	1033.56	40.01	993.55	38.34	995.22	Inner casing
PW-3	988.92	9.07	979.85	9.20	979.72	Inner casing
PW-4	1001.75	18.00	983.75	16.30	985.45	Inner casing
PW-5	986.12	AM	AM	AM	AM	Inner casing
W-5	1051.41	52.18	999.23	50.80	1000.61	Inner casing
W-6	1050.38	49.73	1000.65	48.06	1002.32	Inner casing
PW-7	1042.47	36.62	1005.85	38.12	1004.35	Inner casing
W-7	1049.12	42.82	1006.30	39.89	1009.23	Inner casing
PW-10	1049.29	37.86	1011.43	36.55	1012.74	Inner casing
PW-13	1072.41	60.08	1012.33	60.21	1012.20	Inner casing
W-13	1053.43	46.43	1007.00	44.58	1008.85	Inner casing
W-14S	957.68	10.20	947.48	6.99	950.69	Inner casing
W-16S	990.33	11.17	979.16	8.32	982.01	Outer casing
W-17S	959.13	11.57	947.56	8.24	950.89	Inner casing
W-18	973.56	13.44	960.12	9.90	963.66	Inner casing
W-20S	952.88	11.25	941.63	7.33	945.55	Inner casing

msl Mean sea level.
MP Measuring point.
NM Not measured.
AM Anomalous measurement.

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Table 2. Concentrations of Volatile Organic Compounds Detected in Groundwater, Operational Year 2, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID: / Date:	GMMW-02 12/16/03	GMMW-02 3/8/04	GMMW-02 6/16/04	GMMW-02 9/23/04	GMMW-02* 9/23/04	GMMW-05 12/15/03	GMMW-05 3/8/04	GMMW-05 6/17/04	GMMW-05 9/21/04	GMMW-06 12/16/03	GMMW-06 3/8/04
1,1,1-Trichloroethane		**81**	**67**	**71**	**66**	**67**	<10	<50	<10	<50	<1.0	**1.4**
1,1,2-Trichloroethane		<1.0	<1.0	<1.0	<1.0	<1.0	<10	<50	<10	<50	**5.2**	**4.3**
1,1-Dichloroethane		**120**	**110**	**130**	**130**	**130**	**280 D**	**190**	**230**	**170**	**660**	**560**
1,1-Dichloroethene		**3.2**	**2.8**	**3.0**	**2.7**	**2.4**	<10	<50	<10	<50	**5.2**	**3.3**
1,2-Dichloroethane		<1.0	<1.0	<1.0	<1.0	<1.0	<10	<50	<10	<50	**7.3**	**5.0**
1,2-Dichloropropane		<1.0	<1.0	<1.0	<1.0	<1.0	<10	<50	<10	<50	**1.2**	**1.2**
Benzene		**3.5**	**3.4**	**3.6**	**3.2**	**3.2**	<10	<50	<10	<50	**6.0**	**5.7**
Chlorobenzene		**54**	**47**	**50**	**44**	**44**	<10	<50	**24**	<50	**49**	**34**
Chloroethane		**35**	**38**	**42**	**46**	**41**	**66**	<50	**70**	**100**	**160**	**180**
Chloroform		<1.0	<1.0	<1.0	<1.0	<1.0	<10	<50	<10	<50	**4.3**	**2.6**
cis-1,2-Dichloroethene		**200**	**170**	**190**	**160**	**160**	**460 D**	**320**	**660**	**670**	**930**	**820**
Dichlorodifluoromethane		<1.0	**1.8**	<1.0	**1.7**	**1.5**	<10	<50	<10	<50	**9.6**	**4.0**
Ethylbenzene		<1.0	<1.0	<1.0	<1.0	<1.0	<10	<50	<10	<50	<1.0	<1.0
Methylene chloride		<2.3	<2.3	**2.3**	**2.7**	**2.6**	<10	<50	<10	<50	<13	<11
Methyl tert-butyl ether		<1.0	<1.0	<1.0	<1.0	<1.0	<10	<50	<10	<50	<1.0	<1.0
Naphthalene		**1.1**	<1.0	<1.0	<1.0	<1.0	<10	<50	<10	<50	**1.7**	<1.0
o-Xylene		<1.0	<1.0	<1.0	<1.0	<1.0	<10	<50	<10	<50	**1.8**	<1.0
Tetrachloroethene		<1.0	<1.0	<1.0	<1.0	<1.0	<10	<50	<10	<50	**1.2**	<1.0
Toluene		<1.0	<1.0	<1.0	<1.0	<1.0	<10	<50	<10	<50	**1.0**	<1.0
trans-1,2-Dichloroethene		**2.1**	**2.0**	**1.8**	**1.1**	<1.0	<10	<50	<10	<50	**5.5**	**4.1**
Trichloroethene		**150**	**130**	**130**	**110**	**110**	<10	<50	<10	<50	**41**	**21**
Vinyl chloride		**30**	**24**	**24**	**24**	**19**	**56**	<50	**41**	<50	**220**	**190**
Total VOCs		**679.9**	**596.0**	**647.7**	**591.4**	**580.7**	**862.0**	**510.0**	**1,025.0**	**940.0**	**2,110.0**	**1,836.6**

Bold Constituent detected above MDL.

VOCs Volatile Organic Compounds.

ug/L Micrograms per liter.

* Field replicate.

J Estimated value.

MDL Method detection limit.

Table 2. Concentrations of Volatile Organic Compounds Detected in Groundwater, Operational Year 2, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID: / Date:	GMMW-06 6/16/04	GMMW-06 9/21/04	PW-03 3/10/04	PW-03 9/22/04	PW-04 12/16/03	PW-04 3/8/04	PW-04 6/16/04	PW-04 9/22/04	PW-05 3/9/04	PW-05 9/23/04	PW-07 9/23/04
1,1,1-Trichloroethane		<1.0	<10	**15**	**13**	**26**	**21**	**25**	**26**	<1.0	<1.0	**7.7**
1,1,2-Trichloroethane		**4.4**	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane		**1,100**	**640**	**38**	**34**	**17**	**13**	**18**	**18**	<1.0	**2.8**	**24**
1,1-Dichloroethene		**2.8**	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane		**5.0**	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane		**1.2**	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene		**6.1**	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene		<1.0	**42**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**12**
Chloroethane		**420**	**340**	**9.6**	**9.1**	**2.3**	**2.9**	**4.1**	**7.4**	<1.0	<1.0	**20**
Chloroform		**2.3**	<10	**1.6**	**1.4**	**2.0**	**1.7**	**1.7**	**1.7**	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene		**1,100**	**470**	**39**	**32**	**31**	**15**	**22**	**24**	<1.0	**35**	**3.8**
Dichlorodifluoromethane		**8.8**	<10	<1.0	<1.0	**3.5**	**1.6**	<1.0	**2.0**	<1.0	<1.0	<1.0
Ethylbenzene		<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methylene chloride		**13**	**31**	**1.3**	**2.6**	<1.0	<1.0	<1.0	**1.2**	<1.0	<1.0	<1.0
Methyl tert-butyl ether		<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene		<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
o-Xylene		<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene		<1.0	<10	**2.4**	**2.6**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene		<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene		<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene		**16**	**12**	**18**	**17**	**36**	**26**	**26**	**22**	<1.0	**1.5**	**4.1**
Vinyl chloride		**520**	**240**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**6.3**
Total VOCs		**3,199.6**	**1,775.0**	**124.9**	**111.7**	**117.8**	**81.2**	**96.8**	**102.3**	**0.0**	**39.3**	**77.9**

Bold Constituent detected above MDL.

VOCs Volatile Organic Compounds.

ug/L Micrograms per liter.

* Field replicate.

J Estimated value.

MDL Method detection limit.

Table 2. Concentrations of Volatile Organic Compounds Detected in Groundwater, Operational Year 2, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID: / Date:	PW-13 9/21/04	W-05 12/15/03	W-05 3/8/04	W-05 6/17/04	W-05 9/22/04	W-06 3/10/04	W-06 9/21/04	W-07 3/9/04	W-07 9/21/04	W-13 9/22/04	W-14S 9/23/04
1,1,1-Trichloroethane		<1.0	**4.1**	**2.3**	<10	**3.1**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane		<1.0	<1.0	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane		**2.6**	**300**	**160**	**180**	**150**	**23**	**32**	**5.1**	**3.4**	<1.0	<1.0
1,1-Dichloroethene		<1.0	<1.0	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane		<1.0	<1.0	**1.0**	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane		<1.0	<1.0	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene		<1.0	**4.0**	**3.8**	<10	**3.4**	**3.0**	**4.4**	<1.0	<1.0	<1.0	<1.0
Chlorobenzene		**6.0**	**33**	**25**	**29**	**19**	**7.2**	**11**	**3.2**	**5.7**	<1.0	<1.0
Chloroethane		**2.8**	**130**	**110**	**130**	**120**	**5.6**	**8.0**	**2.6**	**5.5**	<1.0	<1.0
Chloroform		<1.0	<1.0	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene		**1.2**	**4.3**	**3.1**	<10	**13**	**5.1**	**5.5**	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane		<1.0	**4.2**	**1.4**	<10	**2.0**	<1.0	**2.9**	<1.0	<1.0	<1.0	<1.0
Ethylbenzene		<1.0	<1.0	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methylene chloride		<1.0	<5.2	<3.3	<10	**2.8**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl tert-butyl ether		<1.0	<1.0	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene		<1.0	<1.0	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
o-Xylene		<1.0	<1.0	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene		<1.0	<1.0	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene		<1.0	**3.2**	**2.7**	<10	**1.9**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene		<1.0	<1.0	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene		**3.0**	**4.2**	**1.1**	<10	**4.5**	**3.5**	**3.9**	**1.2**	**1.0**	<1.0	<1.0
Vinyl chloride		<1.0	**24**	**16**	<10	**30**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total VOCs		**15.6**	**511.0**	**326.4**	**339.0**	**349.7**	**47.4**	**67.7**	**12.1**	**15.6**	**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.

Table 2. Concentrations of Volatile Organic Compounds Detected in Groundwater, Operational Year 2, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID: / Date:	W-16S 6/16/04	W-16S 9/22/04	W-17S 9/22/04	W-18 3/9/04	W-18 9/23/04	W-20S 9/22/04	FB 9-21-04 9/21/04	FB 9-22-04 9/22/04	FB 9-23-04 9/23/04	TB 9-21-04A 9/21/04
1,1,1-Trichloroethane		<1.0	<1.0	<1.0	**3.1**	**3.3**	<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	<1.0
1,1-Dichloroethane		**21**	**22**	<1.0	**3.0**	**2.6**	<1.0	<1.0	<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	<1.0
1,2-Dichloroethane		<1.0	<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	<1.0
Benzene		**3.0**	**2.9**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene		**26**	**22**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane		**11**	**12**	<1.0	<1.0	<1.0	<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	<1.0
cis-1,2-Dichloroethene		<1.0	**1.6**	<1.0	**1.8**	**1.8**	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane		<1.0	**1.4**	<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	<1.0
Methylene chloride		<1.0	<1.0	<1.0	<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	**2.9**	<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	<1.0
o-Xylene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene		<1.0	<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	<1.0	<1.0	<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	<1.0
Trichloroethene		<1.0	**1.7**	<1.0	**6.5**	**6.4**	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl chloride		**1.9**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total VOCs		**62.9**	**63.6**	**0.0**	**14.4**	**14.1**	**2.9**	**0.0**	**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.

Table 2. Concentrations of Volatile Organic Compounds Detected in Groundwater, Operational Year 2, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID: TB 9-21-04B Date: 9/21/04	TB 9-22-04A 9/22/04	TB 9-22-04B 9/22/04	TB 9-23-04A 9/23/04	TB 9-23-04B 9/23/04
1,1,1-Trichloroethane	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethene	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0
Methylene chloride	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl tert-butyl ether	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	<1.0	<1.0	<1.0	<1.0	<1.0
o-Xylene	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	<1.0	<1.0	<1.0	<1.0	<1.0
Total VOCs	**0.0**	**0.0**	**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.

Table 3. Concentrations of Selected Metals, General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Spring and Surface Water Samples, Operational Year 2, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	GMMW-02 12/16/03	GMMW-02 3/8/04	GMMW-02 6/16/04	GMMW-02 9/23/04	GMMW-02* 9/23/04	GMMW-04 3/22/04	GMMW-04 4/22/04
	UNITS							
METALS								
Iron, Dissolved	mg/L	--	R	--	<0.0853	<0.152	--	--
Manganese, Dissolved	mg/L	--	**0.0413**	--	<0.0469	<0.0982	--	--
GENERAL CHEMISTRY								
Bromide	mg/L	--	--	--	--	--	<0.10	<0.10
Chloride	mg/L	--	**17.6**	--	**2.50**	**2.20**	--	--
Nitrogen, Nitrate (As N)	mg/L	--	<0.1	--	<0.2	<0.2	--	--
Nitrogen, Nitrite	mg/L	--	<0.1	--	<0.01	<0.01	--	--
Total Organic Carbon	mg/L	<2.0	**2.23**	<2.0	<2.0	<2.0	--	--
Sulfate	mg/L	--	**6.66**	--	**7.92**	**7.90**	--	--
Sulfide (field)	mg/L	--	**0.043**	**0.031**	**0.004**	**0.004**	--	--
Iron (field)	mg/L	--	0.00	--	--	--	--	--
FIELD PARAMETERS								
pH	Standard units	**6.59**	**6.37**	**6.07**	**6.14**	**6.14**	--	--
Specific Conductance	mmhos/cm	**0.404**	**60**	**0.44**	**0.536**	**0.536**	--	--
Turbidity	NTU	**107**	**125**	**2.27**	**13**	**13**	--	--
Dissolved Oxygen	mg/L	**4.04**	**0.2**	**2.99**	**7.85**	**7.85**	--	--
Temperature	deg C	**12.33**	**12.5**	**12.39**	**13.99**	**13.99**	--	--
ORP	mV	**96**	**64**	**293.5**	**290.7**	**290.7**	--	--
DISSOLVED GASES								
Carbon dioxide	mg/L	--	**190**	--	**220**	--	--	--
Carbon monoxide	mg/L	--	<0.40	--	<0.40	--	--	--
Ethane	ng/L	--	**490**	--	**660**	--	--	--
Ethene	ng/L	--	**3,000**	--	**3,400**	--	--	--
Methane	ug/L	--	**720**	--	**1,200**	--	--	--
Nitrogen	mg/L	--	**13**	--	**17**	--	--	--
Oxygen	mg/L	--	**0.72**	--	**2.9**	--	--	--

1 Spring water sample
2 Surface water sample
* Duplicate sample

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.
R Qualifier assigned to analytical data indicating result is unusable due to contamination detected in the blank.

Table 3. Concentrations of Selected Metals, General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Spring and Surface Water Samples, Operational Year 2, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	GMMW-04 6/17/04	GMMW-04 9/23/04	GMMW-04 10/8/04	GMMW-05 12/15/03	GMMW-05 3/8/04	GMMW-05 3/22/04	GMMW-05 4/22/04
	UNITS							
METALS								
Iron, Dissolved	mg/L	--	--	--	--	**330**	--	--
Manganese, Dissolved	mg/L	--	--	--	--	**15.7**	--	--
GENERAL CHEMISTRY								
Bromide	mg/L	<0.10	**1.2**	**1.32**	--	--	<0.10	<0.40
Chloride	mg/L	--	--	--	--	**48.2**	--	--
Nitrogen, Nitrate (As N)	mg/L	--	--	--	--	<0.2	--	--
Nitrogen, Nitrite	mg/L	--	--	--	--	<0.2	--	--
Total Organic Carbon	mg/L	--	--	--	**1,770**	**1,630**	--	--
Sulfate	mg/L	--	--	--	--	**2.69**	--	--
Sulfide (field)	mg/L	--	--	--	--	**0.107**	--	--
Iron (field)	mg/L	--	--	--	--	**2.06**	--	--
FIELD PARAMETERS								
pH	Standard units	**6.58**	--	--	**5.54**	**5.42**	--	--
Specific Conductance	mmhos/cm	**0.524**	--	--	**3.59**	**0.4**	--	--
Turbidity	NTU	--	--	--	**69.9**	**130**	--	--
Dissolved Oxygen	mg/L	--	--	--	**4.19**	**0.3**	--	--
Temperature	deg C	**16.84**	--	--	**8.3**	**9.9**	--	--
ORP	mV	--	--	--	**-112**	**-146**	--	--
DISSOLVED GASES								
Carbon dioxide	mg/L	--	--	--	**730**	**450**	--	--
Carbon monoxide	mg/L	--	--	--	<0.40	<0.40	--	--
Ethane	ng/L	--	--	--	**630**	**130**	--	--
Ethene	ng/L	--	--	--	**4,600**	**2,300**	--	--
Methane	ug/L	--	--	--	**8,200**	**5,600**	--	--
Nitrogen	mg/L	--	--	--	**11**	**7.9**	--	--
Oxygen	mg/L	--	--	--	**0.63**	**0.63**	--	--

1 Spring water sample
2 Surface water sample
* Duplicate sample

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.
R Qualifier assigned to analytical data indicating result is unusable due to contamination detected in the blank.

Table 3. Concentrations of Selected Metals, General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Spring and Surface Water Samples, Operational Year 2, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	GMMW-05 6/17/04	GMMW-05 9/21/04	GMMW-05 9/23/04	GMMW-05 10/8/04	GMMW-06 12/16/03	GMMW-06 3/8/04
	UNITS						
METALS							
Iron, Dissolved	mg/L	--	259	--	--	--	2.28
Manganese, Dissolved	mg/L	--	9.39	--	--	--	3.62
GENERAL CHEMISTRY							
Bromide	mg/L	<0.20	--	1.2	1.24	--	--
Chloride	mg/L	--	38.0	--	--	--	34.6
Nitrogen, Nitrate (As N)	mg/L	--	1.53	--	--	--	<0.1
Nitrogen, Nitrite	mg/L	--	0.280	--	--	--	<0.1
Total Organic Carbon	mg/L	554	360	--	--	5.32	21.3
Sulfate	mg/L	--	30.1	--	--	--	<1.0
Sulfide (field)	mg/L	0.227	0.075	--	--	--	0.044
Iron (field)	mg/L	--	--	--	--	--	0.97
FIELD PARAMETERS							
pH	Standard units	5.67	6.01	--	--	6.81	6.73
Specific Conductance	mmhos/cm	1.699	1.851	--	--	0.77	0.12
Turbidity	NTU	12.4	26	--	--	190	170
Dissolved Oxygen	mg/L	1.4	1.54	--	--	2.81	0.3
Temperature	deg C	17.91	15.63	--	--	10.85	11.1
ORP	mV	21.7	3.1	--	--	-65	-89
DISSOLVED GASES							
Carbon dioxide	mg/L	490	280	--	--	--	160
Carbon monoxide	mg/L	<0.40	<0.40	--	--	--	<0.40
Ethane	ng/L	110	71	--	--	--	800
Ethene	ng/L	7,900	30,000	--	--	--	84,000
Methane	ug/L	11,000	12,000	--	--	--	530
Nitrogen	mg/L	11	11	--	--	--	16
Oxygen	mg/L	0.42	0.40	--	--	--	0.85

1 Spring water sample
2 Surface water sample
* Duplicate sample

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.
R Qualifier assigned to analytical data indicating result is unusable due to contamination detected in the blank.

Table 3. Concentrations of Selected Metals, General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Spring and Surface Water Samples, Operational Year 2, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	GMMW-06 6/16/04	GMMW-06 9/21/04	GMPW-01 3/22/04	GMPW-01 4/22/04	GMPW-01 6/17/04	GMPW-01 9/23/04	GMPW-01 10/8/04
	UNITS							
METALS								
Iron, Dissolved	mg/L	--	**17.4**	--	--	--	--	--
Manganese, Dissolved	mg/L	--	**4.07**	--	--	--	--	--
GENERAL CHEMISTRY								
Bromide	mg/L	--	--	<0.10	<0.20	<0.10	**1.2**	**1.23**
Chloride	mg/L	--	**3.60**	--	--	--	--	--
Nitrogen, Nitrate (As N)	mg/L	--	**0.440**	--	--	--	--	--
Nitrogen, Nitrite	mg/L	--	**0.0360**	--	--	--	--	--
Total Organic Carbon	mg/L	<20	**58.8**	--	--	--	--	--
Sulfate	mg/L	--	**4.13**	--	--	--	--	--
Sulfide (field)	mg/L	**0.032**	**0.033**	--	--	--	--	--
Iron (field)	mg/L	--	--	--	--	--	--	--
FIELD PARAMETERS								
pH	Standard units	**6.11**	**6.56**	--	--	--	--	--
Specific Conductance	mmhos/cm	**0.941**	**1.421**	--	--	--	--	--
Turbidity	NTU	**27.5**	**50**	--	--	--	--	--
Dissolved Oxygen	mg/L	**0.46**	**1.85**	--	--	--	--	--
Temperature	deg C	**16.27**	**13.67**	--	--	--	--	--
ORP	mV	**50.6**	**-4.1**	--	--	--	--	--
DISSOLVED GASES								
Carbon dioxide	mg/L	--	**350**	--	--	--	--	--
Carbon monoxide	mg/L	--	<0.40	--	--	--	--	--
Ethane	ng/L	--	**3,100**	--	--	--	--	--
Ethene	ng/L	--	**200,000**	--	--	--	--	--
Methane	ug/L	--	**1,700**	--	--	--	--	--
Nitrogen	mg/L	--	**17**	--	--	--	--	--
Oxygen	mg/L	--	**1.5**	--	--	--	--	--

[1] Spring water sample
[2] Surface water sample
* Duplicate sample

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.
R Qualifier assigned to analytical data indicating result is unusable due to contamination detected in the blank.

Table 3. Concentrations of Selected Metals, General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Spring and Surface Water Samples, Operational Year 2, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	PW-03 3/10/04	PW-03 9/22/04	PW-04 12/16/03	PW-04 3/8/04	PW-04 6/16/04	PW-04 9/22/04
	UNITS						
METALS							
Iron, Dissolved	mg/L	--	--	--	R	--	**0.217**
Manganese, Dissolved	mg/L	--	--	--	**0.00868**	--	**0.0361**
GENERAL CHEMISTRY							
Bromide	mg/L	--	--	--	--	--	--
Chloride	mg/L	--	--	--	**173**	--	**136**
Nitrogen, Nitrate (As N)	mg/L	--	--	--	**1.48**	--	**0.828**
Nitrogen, Nitrite	mg/L	--	--	--	<0.1	--	**0.0250**
Total Organic Carbon	mg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Sulfate	mg/L	--	--	--	**5.44**	--	**5.37**
Sulfide (field)	mg/L	--	**0.026**	--	**0.012**	**0.011**	**0.011**
Iron (field)	mg/L	--	--	--	**0.03**	--	--
FIELD PARAMETERS							
pH	Standard units	**6.31**	**6.25**	**6.02**	**5.91**	**5.56**	**5.77**
Specific Conductance	mmhos/cm	**55**	**3.36**	**0.421**	**80**	**0.738**	**0.639**
Turbidity	NTU	**130**	**65**	**38.4**	**80**	**7.11**	**11**
Dissolved Oxygen	mg/L	**5.9**	**4.22**	**17.55**	**1.9**	**2.41**	**2.17**
Temperature	deg C	**6.8**	**27.22**	**14.26**	**10.7**	**14.0**	**15.1**
ORP	mV	**153**	**145**	**144**	**188**	**351.7**	**106.1**
DISSOLVED GASES							
Carbon dioxide	mg/L	--	**200**	--	**180**	--	**220**
Carbon monoxide	mg/L	--	<0.40	--	<0.40	--	<0.40
Ethane	ng/L	--	**32**	--	**45**	--	**32**
Ethene	ng/L	--	**39**	--	**110**	--	**42**
Methane	ug/L	--	**3.3**	--	**3.9**	--	**6.0**
Nitrogen	mg/L	--	**17**	--	**15**	--	**18**
Oxygen	mg/L	--	**6.7**	--	**3.5**	--	**3.1**

[1] Spring water sample
[2] Surface water sample
* Duplicate sample

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.
R Qualifier assigned to analytical data indicating result is unusable due to contamination detected in the blank.

Table 3. Concentrations of Selected Metals, General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Spring and Surface Water Samples, Operational Year 2, Annual Summary, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	PW-05 3/9/04	PW-05 9/23/04	PW-07 9/23/04	PW-13 9/21/04	W-05 12/15/03	W-05 3/8/04
	UNITS						
METALS							
Iron, Dissolved	mg/L	--	--	--	--	--	**21.5**
Manganese, Dissolved	mg/L	--	--	--	--	--	**2.59**
GENERAL CHEMISTRY							
Bromide	mg/L	--	--	--	--	--	--
Chloride	mg/L	--	--	--	--	--	**44.2**
Nitrogen, Nitrate (As N)	mg/L	--	--	--	--	--	<0.2
Nitrogen, Nitrite	mg/L	--	--	--	--	--	<0.2
Total Organic Carbon	mg/L	<2.0	<2.0	--	--	<2.0	**7.96**
Sulfate	mg/L	--	--	--	--	--	**6.16**
Sulfide (field)	mg/L	--	**0.046**	--	--	--	**0.141**
Iron (field)	mg/L	--	--	--	--	--	**1.12**
FIELD PARAMETERS							
pH	Standard units	**7.78**	**8.06**	**5.99**	**5.57**	**6.51**	**6.64**
Specific Conductance	mmhos/cm	**28**	**0.239**	**0.285**	**0.154**	**0.716**	**0.11**
Turbidity	NTU	**460**	--	**180**	--	**48.1**	**110**
Dissolved Oxygen	mg/L	**0.4**	**0.38**	**2.65**	**0.72**	**2.64**	**0.3**
Temperature	deg C	**9.6**	**10.32**	**11.25**	**13.93**	**6.67**	**14.7**
ORP	mV	**5**	**-76**	**-50.8**	**114.8**	**-121**	**-141**
DISSOLVED GASES							
Carbon dioxide	mg/L	--	**1.7**	--	--	**210**	**160**
Carbon monoxide	mg/L	--	<0.40	--	--	<0.40	<0.40
Ethane	ng/L	--	**9.0**	--	--	**41,000**	**36,000**
Ethene	ng/L	--	**360**	--	--	**26,000**	**12,000**
Methane	ug/L	--	**3.2**	--	--	**2,800**	**2,900**
Nitrogen	mg/L	--	**21**	--	--	**18**	**14**
Oxygen	mg/L	--	**3.4**	--	--	**0.89**	**0.79**

1 Spring water sample
2 Surface water sample
* Duplicate sample

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.
R Qualifier assigned to analytical data indicating result is unusable due to contamination detected in the blank.

Table 3. Concentrations of Selected Metals, General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Spring and Surface Water Samples, Operational Year 2, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	W-05 6/17/04	W-05 9/22/04	W-06 3/10/04	W-06 9/21/04	W-07 3/9/04	W-07 9/21/04	W-13 9/22/04
	UNITS							
METALS								
Iron, Dissolved	mg/L	--	**54.9**	--	--	--	--	--
Manganese, Dissolved	mg/L	--	**3.68**	--	--	--	--	--
GENERAL CHEMISTRY								
Bromide	mg/L	--	--	--	--	--	--	--
Chloride	mg/L	--	**3.20**	--	--	--	--	--
Nitrogen, Nitrate (As N)	mg/L	--	<0.2	--	--	--	--	--
Nitrogen, Nitrite	mg/L	--	**0.0380**	--	--	--	--	--
Total Organic Carbon	mg/L	<2.0	**4.20**	<2.0	<2.0	<2.0	<2.0	--
Sulfate	mg/L	--	**7.66**	--	--	--	--	--
Sulfide (field)	mg/L	**0.411**	**0.039**	--	**0.128**	--	**0.004**	--
Iron (field)	mg/L	--	--	--	--	--	--	--
FIELD PARAMETERS								
pH	Standard units	**5.72**	**6.11**	**6.24**	**5.93**	**6.07**	**5.88**	**6.14**
Specific Conductance	mmhos/cm	**0.645**	**0.698**	**59**	**0.563**	**39**	**0.482**	**0.611**
Turbidity	NTU	--	--	**130**	**12**	**93**	**11**	**45**
Dissolved Oxygen	mg/L	--	**5.52**	**0.2**	**1.29**	**0.7**	**0.00**	**4.89**
Temperature	deg C	**15.28**	**19.10**	**12.6**	**15.13**	**10.8**	**17.77**	**12.79**
ORP	mV	--	**-57.9**	**-34**	**-6.5**	**19**	**29**	**-14.1**
DISSOLVED GASES								
Carbon dioxide	mg/L	**210**	**250**	--	--	--	--	--
Carbon monoxide	mg/L	<0.40	<0.40	--	--	--	--	--
Ethane	ng/L	**32,000**	**20,000**	--	--	--	--	--
Ethene	ng/L	**21,000**	**15,000**	--	--	--	--	--
Methane	ug/L	**2,600**	**1,600**	--	--	--	--	--
Nitrogen	mg/L	**18**	**18**	--	--	--	--	--
Oxygen	mg/L	**0.57**	**0.67**	--	--	--	--	--

1 Spring water sample
2 Surface water sample
* Duplicate sample

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.
R Qualifier assigned to analytical data indicating result is unusable due to contamination detected in the blank.

Table 3. Concentrations of Selected Metals, General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Spring and Surface Water Samples, Operational Year 2, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	W-14S 9/23/04	W-16S 6/16/04	W-16S 9/22/04	W-17S 9/22/04	W-18 3/9/04	W-18 9/23/04	W-20S 9/22/04
	UNITS							
METALS								
Iron, Dissolved	mg/L	<1.85	--	--	--	--	--	--
Manganese, Dissolved	mg/L	**1.24**	--	--	--	--	--	--
GENERAL CHEMISTRY								
Bromide	mg/L	--	--	--	--	--	--	--
Chloride	mg/L	**2.30**	--	--	--	--	--	--
Nitrogen, Nitrate (As N)	mg/L	**0.409**	--	--	--	--	--	--
Nitrogen, Nitrite	mg/L	**0.0830**	--	--	--	--	--	--
Total Organic Carbon	mg/L	<20	<2.0	<2.0	--	<2.0	**2.15**	--
Sulfate	mg/L	**12.6**	--	--	--	--	--	--
Sulfide (field)	mg/L	--	**0.008**	0	--	--	**0.006**	--
Iron (field)	mg/L	--	--	--	--	--	--	--
FIELD PARAMETERS								
pH	Standard units	**5.88**	**6.20**	**6.25**	**6.12**	**5.92**	**6.05**	**5.96**
Specific Conductance	mmhos/cm	**0.065**	**0.351**	**0.463**	**0.272**	**18**	**0.166**	**0.102**
Turbidity	NTU	--	**0.76**	--	--	**360**	**3.9**	**2.3**
Dissolved Oxygen	mg/L	**3.22**	**1.91**	**5.2**	**2.89**	**6.4**	**8.64**	**2.36**
Temperature	deg C	**13.88**	**12.72**	**18.79**	**14.73**	**6.5**	**15.13**	**18.32**
ORP	mV	**114**	**230.9**	**137**	**153**	**221**	**147.6**	**266.3**
DISSOLVED GASES								
Carbon dioxide	mg/L	--	--	**170**	--	--	**72**	--
Carbon monoxide	mg/L	--	--	<0.40	--	--	<0.40	--
Ethane	ng/L	--	--	**390**	--	--	**22**	--
Ethene	ng/L	--	--	**260**	--	--	**29**	--
Methane	ug/L	--	--	**970**	--	--	**3.6**	--
Nitrogen	mg/L	--	--	**15**	--	--	**19**	--
Oxygen	mg/L	--	--	**6.7**	--	--	**8.1**	--

1 Spring water sample
2 Surface water sample
* Duplicate sample

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.
R Qualifier assigned to analytical data indicating result is unusable due to contamination detected in the blank.

Table 3. Concentrations of Selected Metals, General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Spring and Surface Water Samples, Operational Year 2, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	IW-03 12/14/03	IW-03 3/10/04	IW-03 6/17/04	IW-01 9/23/04	IW-08 12/14/03	IW-08 3/10/04
	UNITS						
METALS							
Iron, Dissolved	mg/L	--	--	--	--	--	--
Manganese, Dissolved	mg/L	--	--	--	--	--	--
GENERAL CHEMISTRY							
Bromide	mg/L	--	--	--	--	--	--
Chloride	mg/L	--	--	--	--	--	--
Nitrogen, Nitrate (As N)	mg/L	--	--	--	--	--	--
Nitrogen, Nitrite	mg/L	--	--	--	--	--	--
Total Organic Carbon	mg/L	**444**	**1,520**	**4,160**	**38.2**	**21,200**	**362**
Sulfate	mg/L	--	--	--	--	--	--
Sulfide (field)	mg/L	--	--	--	--	--	--
Iron (field)	mg/L	--	--	--	--	--	--
FIELD PARAMETERS							
pH	Standard units	--	**4.61**	**3.82**	--	--	**4.79**
Specific Conductance	mmhos/cm	--	**0.12**	**1.861**	--	--	**0.12**
Turbidity	NTU	--	**640**	--	--	--	**180**
Dissolved Oxygen	mg/L	--	**2.2**	**4.1**	--	--	**1.8**
Temperature	deg C	--	**8.9**	**12.6**	--	--	**9.0**
ORP	mV	--	**109**	**194.1**	--	--	**103**
DISSOLVED GASES							
Carbon dioxide	mg/L	--	--	--	--	--	--
Carbon monoxide	mg/L	--	--	--	--	--	--
Ethane	ng/L	--	--	--	--	--	--
Ethene	ng/L	--	--	--	--	--	--
Methane	ug/L	--	--	--	--	--	--
Nitrogen	mg/L	--	--	--	--	--	--
Oxygen	mg/L	--	--	--	--	--	--

[1] Spring water sample
[2] Surface water sample
* Duplicate sample

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.
R Qualifier assigned to analytical data indicating result is unusable due to contamination detected in the blank.

Table 3. Concentrations of Selected Metals, General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Spring and Surface Water Samples, Operational Year 2, Annual Summary, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	UNITS	IW-08 6/17/04	IW-08 9/23/04	IW-14 12/14/03	IW-13 3/10/04	IW-14 6/17/04	IW-14 9/23/04
METALS								
Iron, Dissolved		mg/L	--	--	--	--	--	--
Manganese, Dissolved		mg/L	--	--	--	--	--	--
GENERAL CHEMISTRY								
Bromide		mg/L	--	--	--	--	--	--
Chloride		mg/L	--	--	--	--	--	--
Nitrogen, Nitrate (As N)		mg/L	--	--	--	--	--	--
Nitrogen, Nitrite		mg/L	--	--	--	--	--	--
Total Organic Carbon		mg/L	**3,010**	**2,020**	**241**	**124**	**332**	**254**
Sulfate		mg/L	--	--	--	--	--	--
Sulfide (field)		mg/L	--	--	--	--	--	--
Iron (field)		mg/L	--	--	--	--	--	--
FIELD PARAMETERS								
pH		Standard units	**4.52**	--	--	**5.93**	**4.76**	--
Specific Conductance		mmhos/cm	**2.274**	--	--	**80**	**0.642**	--
Turbidity		NTU	--	--	--	**140**	--	--
Dissolved Oxygen		mg/L	**5.47**	--	--	**2.6**	--	--
Temperature		deg C	**13.07**	--	--	**9.0**	**13.0**	--
ORP		mV	**25.4**	--	--	**10**	--	--
DISSOLVED GASES								
Carbon dioxide		mg/L	--	--	--	--	--	--
Carbon monoxide		mg/L	--	--	--	--	--	--
Ethane		ng/L	--	--	--	--	--	--
Ethene		ng/L	--	--	--	--	--	--
Methane		ug/L	--	--	--	--	--	--
Nitrogen		mg/L	--	--	--	--	--	--
Oxygen		mg/L	--	--	--	--	--	--

[1] Spring water sample
[2] Surface water sample
[*] Duplicate sample

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.
R Qualifier assigned to analytical data indicating result is unusable due to contamination detected in the blank.

Table 3. Concentrations of Selected Metals, General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Spring and Surface Water Samples, Operational Year 2, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	SP-2[1] 12/16/03	SP-2[1] 6/15/04	SP-3[1] 12/16/03	SP-3[1] 6/15/04	SP-4[1] 12/16/03	SP-4[1] 6/15/04
	UNITS						
METALS							
Iron, Dissolved	mg/L	--	--	--	--	--	--
Manganese, Dissolved	mg/L	--	--	--	--	--	--
GENERAL CHEMISTRY							
Bromide	mg/L	--	--	--	--	--	--
Chloride	mg/L	--	--	--	--	--	--
Nitrogen, Nitrate (As N)	mg/L	--	--	--	--	--	--
Nitrogen, Nitrite	mg/L	--	--	--	--	--	--
Total Organic Carbon	mg/L	--	--	--	--	--	--
Sulfate	mg/L	--	--	--	--	--	--
Sulfide (field)	mg/L	--	--	--	--	--	--
Iron (field)	mg/L	--	--	--	--	--	--
FIELD PARAMETERS							
pH	Standard units	**7.54**	**6.43**	**7.29**	**7.02**	**6.63**	**6.60**
Specific Conductance	mmhos/cm	**0.072**	**0.008**	**0.048**	**0.138**	**0.753**	**0.798**
Turbidity	NTU	**>999**	--	**727**	--	--	--
Dissolved Oxygen	mg/L	**5.12**	**5.09**	**3.37**	**9.53**	**1.32**	**1.89**
Temperature	deg C	**2.11**	**12.8**	**1.76**	**12.96**	**4.70**	**14.24**
ORP	mV	**49**	**49.8**	**45**	**85.5**	**-49.9**	**-11.3**
DISSOLVED GASES							
Carbon dioxide	mg/L	--	--	--	--	--	--
Carbon monoxide	mg/L	--	--	--	--	--	--
Ethane	ng/L	--	--	--	--	--	--
Ethene	ng/L	--	--	--	--	--	--
Methane	ug/L	--	--	--	--	--	--
Nitrogen	mg/L	--	--	--	--	--	--
Oxygen	mg/L	--	--	--	--	--	--

1 Spring water sample
2 Surface water sample
* Duplicate sample

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.
R Qualifier assigned to analytical data indicating result is unusable due to contamination detected in the blank.

Table 3. Concentrations of Selected Metals, General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Spring and Surface Water Samples, Operational Year 2, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	F-6[2] 6/15/04	FB 9-21-04 9/21/04	FB 9-22-04 9/22/04	FB 9-23-04 9/23/04
	UNITS				
METALS					
Iron, Dissolved	mg/L	--	**0.662**	<0.0350	**0.233**
Manganese, Dissolved	mg/L	--	**0.0805**	<0.00500	**0.016**
GENERAL CHEMISTRY					
Bromide	mg/L	--	--	--	--
Chloride	mg/L	--	<1.0	<1.0	<1.0
Nitrogen, Nitrate (As N)	mg/L	--	<0.2	<0.2	<0.2
Nitrogen, Nitrite	mg/L	--	<0.0100	**0.0140**	<0.01
Total Organic Carbon	mg/L	--	<2.0	<2.0	<2.0
Sulfate	mg/L	--	<2.0	<2.0	<2.0
Sulfide (field)	mg/L	--	--	--	--
Iron (field)	mg/L	--	--	--	--
FIELD PARAMETERS					
pH	Standard units	**6.98**	--	--	--
Specific Conductance	mmhos/cm	**0.147**	--	--	--
Turbidity	NTU	--	--	--	--
Dissolved Oxygen	mg/L	**9.55**	--	--	--
Temperature	deg C	**13.71**	--	--	--
ORP	mV	**167.7**	--	--	--
DISSOLVED GASES					
Carbon dioxide	mg/L	--	--	--	--
Carbon monoxide	mg/L	--	--	--	--
Ethane	ng/L	--	--	--	--
Ethene	ng/L	--	--	--	--
Methane	ug/L	--	--	--	--
Nitrogen	mg/L	--	--	--	--
Oxygen	mg/L	--	--	--	--

1 Spring water sample
2 Surface water sample
* Duplicate sample

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.
R Qualifier assigned to analytical data indicating result is unusable due to contamination detected in the blank.

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Table 4. Concentrations of Volatile Organic Compounds and Selected Metals Detected in Aqueous Samples Collected from the PT System, Operational Year 2, Colesville Landfill, Broome County, New York[5,6].

Constituents	Model Technology BPJ Limits[1,2] (ug/L)	Sample ID: Date:	GMPW-3 12/16/03	GMPW-3 3/10/04	GMPW-3 6/15/04	GMPW-3 10/8/04	GMPW-4 12/16/03	GMPW-4 3/10/04	GMPW-4 6/15/04	GMPW-4 10/8/04
1,1,1-Trichloroethane	10-20		**100**	**110**	**64**	**70**	**97**	**100**	**140**	**89**
1,1,2-Trichloroethane	10		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane	10		**56**	**77**	**44**	**56**	**82**	**100**	**120**	**100**
1,1-Dichloroethene	10		**4.7**	**6.3**	**3.0**	**3.8**	**4.4**	**5.3**	**6.7**	**5.3**
1,2-Dichloroethane	10-30		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene	5		**7.3**	**8.5**	**4.9**	**4.7**	**8.9**	**8.8**	**9.7**	**9.0**
Chlorobenzene	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**2.0**
Chloroethane	NA		**14**	**18**	**12**	**13**	**25**	**27**	**38**	**29**
Chloroform	NA		<1.0	**1.0**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene	10		**74**	**89**	**72**	**90**	**87**	**110**	**170**	**130**
Dichlorodifluoromethane	NA		**4.0**	**2.2**	<1.0	**1.4**	**4.8**	**2.2**	<1.0	**2.4**
Methylene Chloride	10-50		<12	**12**	**6.8**	**4.8**	<15	**13**	**13**	**7.1**
Naphthalene	10		<1.0	<1.0	<1.0	<1.0	**1.2**	<1.0	<1.0	<1.0
o-Xylene	5		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene	10		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	5		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	10-50		<1.0	**1.0**	<1.0	**3.8**	<1.0	<1.0	<1.0	**5.3**
Trichloroethene	10		**53**	**61**	**38**	**63**	**82**	**87**	**120**	**98**
Vinyl Chloride	10-50		**16**	**15**	**9.2**	**6.5**	**43**	**29**	**27**	**38**
Total VOCs			**329.0**	**401.0**	**253.9**	**317.0**	**435.3**	**482.3**	**644.4**	**515.1**
Metals (units in mg/L)	Model Technology BPJ Limits[3,4] (mg/L)									
Total Iron	1.2 / 0.61		**2.11**	**4.24**	**3.97**	**0.652**	**0.149**	**1.02**	**1.69**	**0.223**

See Notes on Last Page.

Table 4. Concentrations of Volatile Organic Compounds and Selected Metals Detected in Aqueous Samples Collected from the PT System, Operational Year 2, Colesville Landfill, Broome County, New York[5,6].

Constituents	Model Technology BPJ Limits[1,2] (ug/L)	Sample ID:	GMPW-5	GMPW-5	GMPW-5	GMPW-5	T. INFLUENT	T. INFLUENT	T. INFLUENT	T. INFLUENT
		Date:	12/16/03	3/10/04	6/15/04	10/8/04	12/16/03	3/10/04	6/15/04	10/8/04
1,1,1-Trichloroethane	10-20		<1.0	**34**	<1.0	**73**	**12**	**72**	**91**	**86**
1,1,2-Trichloroethane	10		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane	10		<1.0	**28**	<1.0	**60**	**6.7**	**67**	**70**	**81**
1,1-Dichloroethene	10		<1.0	**1.8**	<1.0	**3.5**	<1.0	**4.0**	**4.2**	**4.6**
1,2-Dichloroethane	10-30		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene	5		<1.0	**2.8**	<1.0	**5.6**	<1.0	**5.2**	**6.2**	**7.1**
Chlorobenzene	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.3**
Chloroethane	NA		<1.0	**7.3**	<1.0	**15**	**1.7**	**17**	**21**	**24**
Chloroform	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene	10		<1.0	**32**	<1.0	**87**	**8.5**	**78**	**110**	**120**
Dichlorodifluoromethane	NA		<1.0	<1.0	<1.0	**1.3**	<1.0	<1.0	<1.0	**2.0**
Methylene Chloride	10-50		<1.0	**4.1**	<1.0	**5.5**	<1.6	**6.8**	**8.3**	**5.9**
Naphthalene	10		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
o-Xylene	5		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene	10		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	5		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	10-50		<1.0	<1.0	<1.0	**3.5**	<1.0	<1.0	<1.0	**4.6**
Trichloroethene	10		<1.0	**22**	<1.0	**62**	**6.4**	**59**	**66**	**80**
Vinyl Chloride	10-50		<1.0	**56**	<1.0	**13**	**2.0**	**15**	**15**	**27**
Total VOCs			**0.0**	**188.0**	**0.0**	**329.4**	**37.3**	**324.0**	**391.7**	**443.5**

Metals (units in mg/L)	Model Technology BPJ Limits[3,4] (mg/L)								
Total Iron	1.2 / 0.61	**0.166**	**1.39**	**0.719**	**4.17**	**10**	**16.5**	**2.08**	**0.694**

See Notes on Last Page.

Table 4. Concentrations of Volatile Organic Compounds and Selected Metals Detected in Aqueous Samples Collected from the PT System, Operational Year 2, Colesville Landfill, Broome County, New York[5,6].

Constituents	Model Technology BPJ Limits[1,2] (ug/L)	Sample ID: Date:	T. EFFLUENT BC 12/16/04	T. EFFLUENT BC 3/10/04	T. EFFLUENT AC 12/16/03	T. EFFLUENT AC 3/10/04	T. EFFLUENT AC 6/15/04	T. EFFLUENT AC 10/8/04
1,1,1-Trichloroethane	10-20		--	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	10		--	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane	10		--	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethene	10		--	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane	10-30		--	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	NA		--	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene	5		--	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	NA		--	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	NA		--	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	NA		--	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene	10		--	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	NA		--	<1.0	<1.0	<1.0	<1.0	<1.0
Methylene Chloride	10-50		--	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	10		--	<1.0	<1.0	<1.0	<1.0	<1.0
o-Xylene	5		--	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	NA		--	<1.0	<1.0	<1.0	<1.0	**9.0**
Tetrachloroethene	10		--	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	5		--	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	10-50		--	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene	10		--	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	10-50		--	<1.0	<1.0	<1.0	<1.0	<1.0
Total VOCs			--	**0.0**	**0.0**	**0.0**	**0.0**	**9.0**

Metals (units in mg/L)	Model Technology BPJ Limits[3,4] (mg/L)						
Total Iron	1.2 / 0.61	**0.634**	**1.48**	**0.358**	**0.375**	**0.794**	**0.179**

See Notes on Last Page.

Table 4. Concentrations of Volatile Organic Compounds and Selected Metals Detected in Aqueous Samples Collected from the PT System, Operational Year 2, Colesville Landfill, Broome County, New York[5,6].

Notes:

1. Model Technology Best Professional Judgment (BPJ) Limits recommended for Air Stripping with appropriate pretreatment from Attachment C of TOGS 1.2.1.
2. When a range is listed for the BPJ limit, a variation in available references was found. Recommended daily maximum limits should be in this range.
3. Model Technology BPJ Limits recommended for Lime, Settle and Filter treatment.
4. The recommended daily maximum permit limit is 1.2 mg/L and the recommended daily average permit limit is 0.61 mg/L.
5. Production wells were sampled in accordance with the schedule set forth in Table 3 of the Long-Term Monitoring Plan (ARCADIS 2002).
6. Bold values indicate compound detected above method detection limit.

NA	No BPJ limit listed.
J	Estimated Value.
ug/L	Micrograms Per Liter.
mg/L	Milligrams Per Liter.
VOCs	Volatile Organic Compounds.
AC	After Cartridge Filter.
BC	Before Cartridge Filter.
PT	Pump and Treat.
--	Not Analyzed or Collected.
<	Analyte Below Detection Limit.
T.	Total.

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Table 5. Concentrations of Volatile Organic Compounds Detected in Springs, Operational Year 2, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID: Date:	SP-2 12/16/03	SP-2 6/15/04	SP-3 12/16/03	SP-3 6/15/04	SP-4 12/16/03	SP-4 6/15/04
1,1,1-Trichloroethane		<1.0	**1.6**	<1.0	<1.0	**5.0**	<10
1,1,2-Trichloroethane		<1.0	<1.0	<1.0	<1.0	<1.0	<10
1,1-Dichloroethane		<1.0	**63**	<1.0	**7.8**	**80**	**67**
1,1-Dichloroethene		<1.0	<1.0	<1.0	<1.0	<1.0	<10
1,2-Dichloroethane		<1.0	<1.0	<1.0	<1.0	<1.0	<10
1,2-Dichloropropane		<1.0	<1.0	<1.0	<1.0	<1.0	<10
Benzene		<1.0	**1.3**	<1.0	<1.0	<1.0	<10
Chlorobenzene		<1.0	<1.0	<1.0	<1.0	**8.1**	<10
Chloroethane		<1.0	**28**	<1.0	**1.8**	**33**	**30**
Chloroform		<1.0	<1.0	<1.0	<1.0	<1.0	<10
cis-1,2-Dichloroethene		<1.0	**2.1**	<1.0	<1.0	**34**	<10
Dichlorodifluoromethane		<1.0	<1.0	<1.0	<1.0	<1.0	<10
Ethylbenzene		<1.0	**6.6**	<1.0	<1.0	<1.0	<10
Methylene chloride		<1.0	**1.3**	<1.0	<1.0	<1.0	<10
Methyl tert-butyl ether		<1.0	<1.0	<1.0	<1.0	<1.0	<10
Naphthalene		<1.4	**6.2**	<1.0	<1.0	<1.0	<10
o-Xylene		<1.0	<1.0	<1.0	<1.0	<1.0	<10
Tetrachloroethene		<1.0	<1.0	<1.0	<1.0	<1.0	<10
Toluene		<1.0	<1.0	<1.0	<1.0	<1.0	<10
trans-1,2-Dichloroethene		<1.0	<1.0	<1.0	<1.0	<1.0	<10
Trichloroethene		<1.0	**4.2**	<1.0	<1.0	**2.6**	<10
Vinyl chloride		<1.0	**5.1**	<1.0	<1.0	**34**	**29**
Total VOCs		**0.0**	**119.4**	**0.0**	**9.6**	**196.7**	**126.0**

Bold Constituent detected above MDL.

VOCs Volatile Organic Compounds.

ug/L Micrograms per liter.

MDL Method detection limit.

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Table 6. Concentrations of Volatile Organic Compounds Detected in Surface Water, Operational Year 2, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID: Date:	F-6 6/15/04
1,1,1-Trichloroethane		<1.0
1,1,2-Trichloroethane		<1.0
1,1-Dichloroethane		<1.0
1,1-Dichloroethene		<1.0
1,2-Dichloroethane		<1.0
1,2-Dichloropropane		<1.0
Benzene		<1.0
Chlorobenzene		<1.0
Chloroethane		<1.0
Chloroform		<1.0
cis-1,2-Dichloroethene		<1.0
Dichlorodifluoromethane		<1.0
Ethylbenzene		<1.0
Methylene chloride		<1.0
Naphthalene		<1.0
o-Xylene		<1.0
Tetrachloroethene		<1.0
Toluene		<1.0
trans-1,2-Dichloroethene		<1.0
Trichloroethene		<1.0
Vinyl chloride		<1.0
Total VOCs		**0.0**

Bold Constituent detected above MDL.

VOCs Volatile Organic Compounds.
ug/L Micrograms per liter.
MDL Method detection limit.

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Table 7. PT System Operating Parameters, Operational Year 2, Quarter Number 4 and Annual Summary, Groundwater Remediation System, Colesville Landfill, Broome County, New York.

Date	Time Recorded	Air Stripper Measurements: Blower Discharge Pressure PI-301 (i.w.c.)	Air Stripper Measurements: Blower Effluent Flowrate (scfm)	Flow Measurements: Total Effluent Totalizer FQI-401 (gallons)	Flow Measurements: Water Bypass Totalizer FQI-402 (gallons)	Flow Measurements: GMPW-3 Totalizer FQI-101 (gallons)	Flow Measurements: GMPW-4 Totalizer FQI-102 (gallons)	Flow Measurements: GMPW-5 Totalizer FQI-103 (gallons)
6/15/2004	7:30 PM	9.4	598.0	724,225.5	655,519.0	343,638.0	168,801.0	226,932.0
10/8/2004	3:16 PM	8.9	318	780,949.0	708,178.5	348,902.5	199,825.6	250,519.8
Average Daily Flowrate During Reporting Period (gpm) =				**0.34**	**0.32**	**0.03**	**0.19**	**0.14**
Total Groundwater Recovered During Reporting Period (gallons) =				**56,724**	**52,660**	**5,265**	**31,025**	**23,588**
Average Daily Flowrate During Operational Year 2 (gpm) =				**0.63**	**0.57**	**0.20**	**0.20**	**0.25**
Total Groundwater Recovered During Operational Year 2 (gallons) =				**333,384**	**298,867**	**104,905**	**106,885**	**130,643**

Notes:

gpm Gallons per minute.
i.w.c. Inches of water column.
scfm Standard cubic feet per minute.

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Table 8. PT System Mass Removal Rate of Volatile Organic Compounds, Operational Year 2, Quarter Number 4 and Annual Summary, Groundwater Remediation System, Colesville Landfill, Broome County, New York.

Date Sampled	Total VOC Influent Concentration (ug/L)	Total Effluent Totalizer FQI-401 (gallons)	Total Groundwater Recovered[1] Between Sampling Intervals (gal)	Influent Concentration[2] Geometric Mean (ug/L)	Total Estimated Mass[3] Removed (lbs)
6/15/2004	391.7	724,225	NA	NA	NA
10/8/2004	443.5	780,949	56,724	416.8	0.20
			Total Estimated Mass Removed During Operational Year 2, Quarter Number 4 (lbs) =		**0.20**
			Total Estimated Mass Removed During Operational Year 2 (lbs) =		**0.51**
			Total Estimated Mass Removed Since System Startup (lbs) =		**1.19**

Notes:

NA	Not applicable.
ug/L	Micrograms per liter.
gal	Gallons.
lbs	Pounds.
VOC	Volatile organic compound.

1. Total Groundwater Recovered Between Sampling Intervals = Well Totalizer Reading for current sampling event - Well Totalizer Reading for prior sampling event.
2. Influent Concentration Geometric Mean = (Influent Concentration for prior sampling event x Influent Concentration for current sampling event) (1/2).
3. Total Mass Removed = (Total Groundwater Recovered Between Sampling Intervals) x Influent Concentration Geometric Mean x 3.7854 L/gallon x (1 lb / 453,592,370 ug).

Table 9. Concentrations of Volatile Organic Compounds Detected in Air Stripper Effluent, Operational Year 2, Groundwater Remediation System, Colesville Landfill, Broome County, New York.

Compounds	CAS Numbers	Sample ID: Date Sampled:	Effluent 12/16/03 ppbv	Effluent 3/10/04 ppbv	Effluent 6/15/04 ppbv	Effluent 10/8/04 ppbv
Vinyl Chloride	75-01-4		<10	<13	<11	<11
Chloroethane(Ethyl Chloride)	75-00-3		<10	<13	<11	<11
1,1-Dichloroethene(Vinylidene Chloride)	75-35-4		<10	<13	<11	<11
Methylene Chloride(Dichloromethane)	75-09-2		<10	<13	<11	<11
1,1-Dichloroethane	75-34-3		<10	<13	<11	<11
cis-1,2-Dichloroethylene	156-59-2		**11**	<13	<11	<11
Chloroform	67-66-3		<10	<13	<11	<11
1,1,1-Trichloroethane(Methyl Chloroform)	71-55-6		<10	<13	<11	<11
Benzene	71-43-2		<10	<13	<11	<11
Trichloroethene	79-01-6		<10	<13	<11	<11
Toluene	108-88-3		<10	<13	<11	<11
Ethyl benzene	100-41-4		<10	<13	<11	<11
m,p-Xylene	108-38-3/106-42-3		<10	<13	<11	<11
o-Xylene	95-47-6		<10	<13	<11	<11
1,2,4-Trimethylbenzene	95-63-6		<10	<13	<11	<11
2-Propanol (Isopropyl alcohol)	67-63-0		<10	<13	<11	<11
Dichlorodifluoromethane(Freon 12)	75-71-8		<10	<13	<11	<11

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.

Table 10. Concentrations of Volatile Organic Compounds Detected in Aqueous Samples Collected from the SP-5 Spring Water Remediation System, Operational Year 2, Colesville Landfill, Broome County, New York.

Constituents	Model Technology BPJ Limits[1,2] (ug/L)	Sample ID: Date:	SP-5 INF. 12/15/03	SP-5 INF. 3/10/04	SP-5 INF. 6/15/04	SP-5 INF. 9/23/04	SP-5 EFF. 12/15/03	SP-5 EFF. 3/10/04	SP-5 EFF. 6/15/04	SP-5 EFF. 9/23/04
VOCs (units in ug/L)										
1,1,1-Trichloroethane	10		<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane	10		**31**	**29**	**27**	**32**	<1.0	<1.0	<1.0	**4.7**
1,2-Dichloroethane	10-100		<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene	5		**3.0**	<10	**3.0**	**3.1**	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	10-25		**56**	**54**	**55**	**49**	<1.0	**1.6**	<1.0	**5.7**
Chloroethane	10		**12**	**13**	**12**	**16**	<1.0	<1.0	**5.7**	**13**
cis-1,2-Dichloroethene	10		**1.9**	<10	**2.7**	**2.3**	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	NA		**2.5**	<10	<1.0	**1.6**	<1.0	<1.0	<1.0	**1.1**
Ethylbenzene	5		<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	5		<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	10-100		<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene	10		<1.0	<10	**1.4**	**1.7**	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	10		<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total VOCs			**106.4**	**96.0**	**101.1**	**105.7**	**0.0**	**1.6**	**5.7**	**24.5**

Bold Constituent detected above MDL.

ug/L	Micrograms per liter.
VOCs	Volatile organic compounds.
<	Analyte below detection limit.
INF.	Influent.
EFF.	Effluent.
NA	No BPJ limit listed.

Notes:

1. Model Technology Best Professional Judgment (BPJ) Limits recommended for carbon adsorption with appropriate pretreatment from Attachment C of TOGS 1.2.1.
2. When a range is listed for the BPJ limit, a variation in available references was found. Recommended daily maximum limits should be in this range.

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Table 11. SP-5 Spring Water Remediation System Mass Removal Rate of Volatile Organic Compounds, Operational Year 2, Quarter Number 4, and Annual Summary, Colesville Landfill, Broome County, New York.

Date Sampled	Total VOC Influent Concentration (ug/L)	Effluent Flowrate (gpm)	Depth to Water (feet btc)	Total Groundwater Treated[1] Between Sampling Intervals (gal)	Influent Concentration[2] Geometric Mean (ug/L)	Total Estimated Mass[3] Removed (lbs)
6/15/2004	101.1	0.396	0.19	NA	NA	NA
9/23/2004	105.7	1.13	0.20	131,011	103.4	0.11

Total Estimated Mass Removed During Operational Year 2, Quarter Number 4 (lbs) =	**0.11**
Total Estimated Mass Removed During Operational Year 2 (lbs) =	**0.22**
Total Estimated Mass Removed Since System Startup (lbs) =	**0.22**
Total Effluent Treated During Operational Year 2 (gallons) =	**259,616**
Total Effluent Treated Since System Startup (gallons) =	**259,616**

Notes:

NA	Not applicable.
ug/L	Micrograms per liter.
gpm	Gallons per minute.
btc	Below top of casing.
gal	Gallons.
lbs	Pounds.
VOC	Volatile organic compound.

1. Total Spring Water Treated Between Sampling Intervals = Effluent Flowrate x 1440 min/day x days between sampling events.
2. Influent Concentration Geometric Mean = (Influent Concentration for prior sampling event x Influent Concentration for current sampling event)^(1/2).
3. Total Mass Removed = (Total Groundwater Treated Between Sampling Intervals) x Influent Concentration Geometric Mean x 3.7854 L/gallon x (1 lb / 453,592,370 ug).

Appendix A

Water-Level Measurement and Groundwater Sampling Logs.

Water Level Record

Project NY000949.0017.0003A

Date 9-20-04

Well (s)	Depth to Water (ft)	Time	Remarks
PW-13	60.21	2:12 pm	No lock. Wasps on well - No PID reading taken
W-13	44.58	2:19	PID Zero at wellhead
PW-7	38.12	2:42	PID Zero at wellhead
PW-10	36.55	2:50	PID Zero at wellhead
W-6	48.06	3:16	PID Zero at wellhead
W-7	39.89	3:20	PID Zero at wellhead
GMMW-6	38.34	3:31	PID Zero at wellhead
W-5	50.80	3:35	PID Zero at wellhead
GMMW-5	46.37	3:41	PID Zero at wellhead
GMMW-2	36.18	3:48	PID Zero at wellhead
PW-4	16.30	3:51	PID Zero at wellhead
W-20S	7.33	4:00	PID Zero at wellhead
W-14S	6.99	4:16	Far distance from road. PID Zero at wellhead
W-17S	8.24	4:34	PID Zero at wellhead
W-16S	8.32	4:46	steel casing. PID Zero at wellhead
PW-3	9.20	5:00	PID Zero at wellhead
W-18	9.90	5:07	steel casing. PID Zero at wellhead.
PW-5	—	5:15	Artesian

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY000949.0017 Task: 0003A Well ID: GMMW-2

Date: 9-23-04 Sampled By: PP/GW

Sampling Time: 2:00pm. Recorded By: PP

Weather: Shaded Area 79° Coded Replicate No.: MS/MSD plus Rep 9-23-04

Instrument Identification

Water Quality Meter(s): YSI 650 MDS Serial #: 02J0183 A1

Purging Information

Casing Material: PVC Purge Method: Rediflow Pump/Low Flow

Casing Diameter: 2" Screen Interval (ft bmp): Top 45 Bottom 55

Sounded Depth (ft bmp): 60 Pump Intake Depth (ft bmp): 50

Depth to Water (ft bmp): 36.87 Purge time Start: 1:30pm Finish: 2:00pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
1:30	—	—	—	11.75	6.10	.534	101.5	6.81	120	42.74	—
1:35	—	—	—	13.15	6.05	.508	188.3	6.98	60	42.76	—
1:40	—	—	—	13.61	6.10	.486	207.9	6.68	60	42.76	—
1:45	—	—	—	13.98	6.14	.500	246.1	7.36	65	42.73	—
1:50	—	—	—	14.03	6.28	.527	222.0	8.34	25	42.74	—
1:55	—	—	—	14.02	6.18	.532	259.9	8.11	15	42.74	—
2:00	—	—	—	13.99	6.14	.536	290.7	7.85	13	42.74	—
						S2-	.004	mg/L			

Sample Condition Color: — Odor: — Appearance: —

Sample Collection

Parameter: See CoC Container: No. Preservative:

PID Reading: At wellhead Zero

Comments: Lot of old tubing still at this well (on ground)

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY000949.0017 Task: 0003A Well ID: GMMW-5
Date: 9-21-04 Sampled By: GG
Sampling Time: 4:00 pm Recorded By: GG
Weather: 81° Partly cloudy Coded Replicate No.: N/A

Instrument Identification
Water Quality Meter(s): YSI 650 MDS Serial #: 02J0183 A1

Purging Information
Casing Material: PVC Purge Method: Rediflow Pump / Low Flow
Casing Diameter: 2" Screen Interval (ft bmp): Top 53 Bottom 63
Sounded Depth (ft bmp): 68 Pump Intake Depth (ft bmp): 58
Depth to Water (ft bmp): 45.98 Purge time Start: 3:30 pm Finish: 4:00 pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
3:30	—	—	—	12.60	5.94	1.813	11.2	2.77	40	53.67	—
3:35	—	—	—	12.18	5.92	1.915	15.3	1.70	27	55.00	—
3:40	—	—	—	12.76	5.88	1.916	16.6	1.52	26	55.43	—
3:45	—	—	—	13.51	5.89	1.893	11.6	1.48	26	55.67	—
3:50	—	—	—	14.35	5.93	1.876	6.8	1.50	25	55.81	—
3:55	—	—	—	15.11	5.99	1.856	15.9	1.61	26	55.79	—
4:00	—	—	—	15.63	6.01	1.851	3.1	1.54	26	55.87	—
						S2-	<0.075	8 mg/L			

Sample Condition Color: — Odor: — Appearance: —

Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading At wellhead zero

Comments

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY000949.0017 Task: 0003A Well ID: GMMW-6
Date: 9-21-04 Sampled By: PP GW
Sampling Time: 5:25pm Recorded By: PP
Weather: Partly cloudy 74° Coded Replicate No.: N/A

Instrument Identification
Water Quality Meter(s): YSI 650 MDS Serial #: 02J0183 A1

Purging Information
Casing Material: PVC Purge Method: Red Flow Pump/Low Flow
Casing Diameter: 2" Screen Interval (ft bmp): Top 46 Bottom 50
Sounded Depth (ft bmp): 50 Pump Intake Depth (ft bmp): 45
Depth to Water (ft bmp): 38.22 Purge time Start: 4:50pm Finish: 5:25pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
4:50	—	—	—	11.71	6.32	1.435	44.2	3.59	500	—	—
4:55	—	—	—	12.21	6.36	1.431	23.8	3.10	350	43.55	—
5:00	—	—	—	12.47	6.40	1.432	15.9	2.85	230	43.47	—
5:05	—	—	—	12.83	6.52	1.445	4.6	2.52	100	43.29	—
5:10	—	—	—	12.81	6.51	1.448	.4	2.48	116	43.22	—
5:15	—	—	—	12.83	6.53	1.441	-1.9	2.40	75	43.14	—
5:20	—	—	—	13.26	6.54	1.433	-3.2	2.02	60	42.81	—
5:25	—	—	—	13.67	6.56	1.421	-4.1	1.85	50	42.82	—
						S^{2-} = 0.033 mg/L					

Sample Condition Color: — Odor: — Appearance: —

Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading: Zero at Wellhead

Comments:

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: N4000949.0017 Task: 0003A Well ID: PW3
Date: 9-22-04 Sampled By: FRANM (BROOMS) GW
Sampling Time: 1:45 pm Recorded By: FRANM
Weather: Sunny 75° Coded Replicate No.: N/A

Instrument Identification
Water Quality Meter(s): Quanta G Serial #: 05833

Purging Information
Casing Material: PVC Purge Method: Reg. Flow Pump / Low Flow
Casing Diameter: 2" Screen Interval (ft bmp): Top 4.7 Bottom 29.7
Sounded Depth (ft bmp): 29.7 Pump Intake Depth (ft bmp): ~
Depth to Water (ft bmp): 16.48 Purge time Start: 1:10 pm Finish: 1:45 pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
1:10	–	–	–	17.11	6.09	4.10	190	7.27	–	16.48	–
1:15	–	–	–	17.52	6.22	4.22	165	6.06	–	–	–
1:20	–	–	–	17.89	6.27	4.26	160	6.10	–	10.25	–
1:25	–	–	–	17.69	6.29	4.18	151	6.32	–	~~10.42~~	–
1:30	–	–	–	18.12	6.26	4.11	147	6.17	–	10.18	–
1:35	–	–	–	18.04	6.36	4.05	138	6.21	–	–	–
1:40	–	–	–	24.52	6.25	3.57	146	4.73	–	9.98	–
1:45	–	–	6.9gl	27.22	6.39	3.36	145	4.22	65	–	–
						S^{2-}	0.026	mg/L			

Sample Condition Color: COLORLESS Odor: NONE Appearance: CLEAR
Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading At wellhead zero

Comments

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY000949.0017 Task: 0003A Well ID: PW-4

Date: 9-22-04 Sampled By: PP/GW

Sampling Time: 10:20 AM Recorded By: PP

Weather: Sunny 56° Coded Replicate No.: N/A

Instrument Identification

Water Quality Meter(s): YSI 650 MDS Serial #: 02J0183 A1

Purging Information

Casing Material: PVC Purge Method: Red. flow Pump/Low Flow

Casing Diameter: 2" Screen Interval (ft bmp): Top 8 Bottom 23

Sounded Depth (ft bmp): 23 Pump Intake Depth (ft bmp): /

Depth to Water (ft bmp): 17.58 Purge time Start: 9:50 AM Finish: 10:20 AM

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
9:50	—	—	—	12.02	5.60	.658	106.8	3.62	250	—	—
9:55	—	—	—	12.45	5.62	.649	108.9	2.98	130	18.36	—
10:00	—	—	—	13.52	5.62	.682	111.0	2.75	70	18.37	—
10:05	—	—	—	14.37	5.68	.668	107.2	2.40	31	18.36	—
10:10	—	—	—	14.70	5.74	.655	105.9	2.27	17	18.34	—
10:15	—	—	—	14.90	5.75	.644	103.9	2.29	14	18.32	—
10:20	—	—	—	15.13	5.77	.639	106.1	2.17	11	18.31	—
						.011 mg/L	Sulfur reading				

Sample Condition Color: Colorless Odor: None Appearance: clear

Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading At Wellhead Zero

Comments /

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: WE000949.0017 Task: 0003A Well ID: PW-5
Date: 9-23-04 Sampled By: FRAN M (BRENNAN) GW
Sampling Time: 1:40pm Recorded By: FRAN M
Weather: clear 78° Coded Replicate No.: N/A

Instrument Identification
Water Quality Meter(s): Quanta G Serial #: 05833

Purging Information
Casing Material: / Purge Method: Rediflow Pump / Low Flow
Casing Diameter: 2" Screen Interval (ft bmp): Top 4.7 Bottom 29.7
Sounded Depth (ft bmp): 29.7 Pump Intake Depth (ft bmp): /
Depth to Water (ft bmp): 5.93 Purge time Start: 1:10pm Finish: 1:40pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
1:10	—	500mL/min	—	9.91	8.30	.239	9	4.01	—	—	—
1:15	—	—	—	10.11	8.31	.234	.54	.58	—	5.93	—
1:20	—	—	—	10.21	8.24	.233	-71	.83	—	~~5.69~~	—
1:25	—	—	—	10.25	8.24	.233	-77	.64	—	5.67	—
1:30	—	—	—	10.30	8.17	.234	-82	.38	—	—	—
1:35	—	—	—	10.33	8.20	.234	-85	.30	—	5.69	—
1:40	—	—	—	10.32	8.16	.239	-76	.38	—	—	—
			EGA								
						S2-	0.046	mg/L			

Sample Condition Color: — Odor: — Appearance: —
Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading: At Wellhead Zero

Comments: /

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY000949.0017 Task: 0003A Well ID: PW-7
Date: 9/23/04 Sampled By: RP/GW
Sampling Time: 4:25pm. Recorded By: RP
Weather: Partly Cloudy 81 Coded Replicate No.: N/A

Instrument Identification
Water Quality Meter(s): YSI 650 MDS Serial #: 02J0183 A1

Purging Information
Casing Material: PVC Purge Method: Rediflow Pump / Low Flow
Casing Diameter: 2" Screen Interval (ft bmp): Top 27 Bottom 62
Sounded Depth (ft bmp): 62 Pump Intake Depth (ft bmp): /
Depth to Water (ft bmp): 37.72 Purge time Start: 3:40pm Finish: 4:25pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
3:40	-	-	-	11.94	6.21	.320	-27.5	2.69	*	37.65	-
3:45	-	-	-	12.00	5.89	.319	-30.5	3.72	*	37.65	-
3:50	-	-	-	-	-	-	-	-	-	-	Flow Increased
3:55	-	-	-	10.99	5.82	.308	-46.9	2.46	*	49.52	-
4:00	-	-	-	11.79	5.94	.296	-48.4	2.29	*	49.00	-
4:05	-	-	-	11.61	6.00	.300	-51.9	2.45	*	48.76	-
4:10	-	-	-	11.28	6.02	.301	-53.2	2.30	750	48.72	-
4:15	-	-	-	11.28	5.99	.219	-52.6	2.43	390	48.75	-
4:20	-	-	-	11.28	5.99	.290	-51.1	2.54	250	48.71	-
4:25	-	-	-	11.25	5.99	.285	-50.8	2.65	180	48.72	-

Sample Condition Color: Light Brown Odor: None Appearance: Turbid

Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading: At wellhead Zero

Comments: * off scale greater than 200 NTU

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY000949.0017 Task: 0003A Well ID: PW 13
Date: 9-21-04 Sampled By: PP
Sampling Time: 11:55AM Recorded By: PP
Weather: Sunny 74° Coded Replicate No.: N/A

Instrument Identification
Water Quality Meter(s): YSI 650 MDS Serial #: 02J0183 A1

Purging Information
Casing Material: PVC Purge Method: Rediflow Pump / Low Flow
Casing Diameter: 2" Screen Interval (ft bmp): Top 43.5 Bottom 78.5
Sounded Depth (ft bmp): 78.5 Pump Intake Depth (ft bmp): /
Depth to Water (ft bmp): 63.18 Purge time Start: 11:25 AM Finish: 11:55 AM

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
11:25	–	500	–	12.62	6.10	.147	95.5	1.69	–	–	–
11:30	–	–	–	13.54	5.97	.155	80.7	.86	–	63.16	–
11:35	–	–	–	13.44	5.88	.155	81.8	.76	–	–	–
11:40	–	–	–	13.73	5.83	.152	83.6	.68	–	63.12	–
11:45	–	–	–	13.75	5.66	.154	98.0	.67	–	–	–
11:50	–	–	–	13.81	5.58	.156	106.7	.65	–	63.08	–
11:55	–	–	–	13.93	5.57	.154	114.8	.72	–	–	–

Sample Condition Color: / Odor: / Appearance: /
Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading At Wellhead Zero

Comments /

G:\AFR\PROJECT\WHCS Melville\ERD Pilot Test\lowflowsampforms.xls-Lof to-GW-Samp

Water Sampling Log

Project Celesville NY000949.0017.0003A Project No. NY000949.0017.0003A Page 1 of 1

Site Location Colesville NY Date 9-21-04

Site/Well No. 1S-5 Replicate No. N/A Code No.

Weather Clear 75° Sampling Time: Begin — End —

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	1051.41
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	58.50
Depth to Water (ft bmp)	50.66
Water-Level Elevation (ft)	—
Water Column in Well (ft)	7.84
Casing Diameter/Type	2" (0.16) / PVC
Gallons in Well	1.24
Gallons Pumped/Bailed Prior to Sampling	3.6
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin — end —
Pumping Rate (gpm)	—
Evacuation Method	Hand Bailed

Field Parameters

	I	IU	2	~~2~~ Sample
Color	—	—	—	—
Odor	—	—	—	—
Appearance	—	—	—	—
pH (s.u.)	6.26	6.12	—	6.11
Conductivity (mS/cm)	.251	.746	—	.699
ORP ~~(µmhos/cm)~~	-67	-71	—	-57.9
Turbidity (NTU)	7200	7200	—	—
Temperature (°C)	15.83	15.61	—	19.10
Dissolved Oxygen (mg/L)	2.59	4.03	—	5.52

Salinity (%) —

Sampling Method Bailed - well dry. Sample taken on 9/22/04.

Remarks DRY AT IU

WT RECOVER OVERNIGHT

S^{2-} = .039 mg/L

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel GW / PP

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

btmp	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 G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY000949.0017 Task: 0003A Well ID: W-6
Date: 9-21-04 Sampled By: PP
Sampling Time: 1:40pm Recorded By: PP
Weather: Sunny 86 Coded Replicate No.: N/A

Instrument Identification
Water Quality Meter(s): YSI 650 MDS Serial #: 02J0103 A1

Purging Information
Casing Material: PVC Purge Method: Rediflow Pump / Low Flow
Casing Diameter: 2" Screen Interval (ft bmp): Top 44.5 Bottom 59.5
Sounded Depth (ft bmp): 59.5 Pump Intake Depth (ft bmp):
Depth to Water (ft bmp): 52.55 Purge time Start: 1:10pm Finish: 1:40pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
1:10	–	–	–	12.62	5.82	.505	18.1	2.23	70	54.50	–
1:15	–	–	–	13.58	5.49	.496	15.5	1.46	39	54.60	–
1:20	–	–	–	14.62	5.56	.513	4.4	1.28	23	54.64	–
1:25	–	–	–	15.01	5.67	.529	-.4	1.34	20	54.65	–
1:30	–	–	–	15.31	5.54	.536	-1.7	1.24	15	54.61	–
1:35	–	–	–	15.20	5.53	.553	-2.9	1.24	13	54.64	–
1:40	–	–	–	15.13	5.93	.563	-6.5	1.29	12	54.50	–
						S^{2-} = .128 mg/L					

Sample Condition Color: Colorless Odor: None Appearance: clear

Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading At Wellhead Zero

Comments

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: N400D999.00017 Task: 0003A Well ID: W-7
Date: 9-21-04 Sampled By: Fran M (Brome) / GW
Sampling Time: 2:05pm Recorded By: Fran M
Weather: Sunny 85° Coded Replicate No.: N/A

Instrument Identification
Water Quality Meter(s): Quanta G Serial #: 05833

Purging Information
Casing Material: PVC Purge Method: Rediflow Pump / Low Flow
Casing Diameter: 2" Screen Interval (ft bmp): Top 35 Bottom 50
Sounded Depth (ft bmp): 51.5 Pump Intake Depth (ft bmp): /
Depth to Water (ft bmp): 43.65 Purge time Start: 1:35pm Finish: 2:05pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
1:35	—	—	—	12.38	5.56	.322	88	.22	—	43.65	—
1:40	—	—	—	13.25	5.60	.290	104	.50	—	~~43.97~~	—
1:45	—	—	—	14.30	5.66	.317	98	.21	—	43.97	—
1:50	—	—	—	15.37	5.71	.357	84	.00	—	~~43.79~~	—
1:55	—	—	—	16.38	5.77	.406	64	.00	—	43.79	—
2:00	—	—	—	16.77	5.88	.451	41	.00	—	—	—
2:05	—	—	—	17.77	5.88	.482	29	.00	11	43.78	—
						S^{2-} = .004 mg/L					

Sample Condition Color: — Odor: — Appearance: —

Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading: Zero at wellhead

Comments: /

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: Colesville | Project No. NY000949.0017.0003A | Page 1 of 1

Site Location: Colesville Landfill, Broome County, New York | Date: 9-22-04

Site/Well No.: W-13 | Replicate No.: N/A | Code No.:

Weather: Sunny 76° | Sampling Time: Begin 4:39pm End 4:42pm

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	1053.43
Land Surface Elevation (ft)	/
Sounded Well Depth (ft bmp)	50
Depth to Water (ft bmp)	45.58
Water-Level Elevation (ft)	/
Water Column in Well (ft)	4.42
Casing Diameter/Type	2" (0.16) PVC
Gallons in Well	.71
Gallons Pumped/Bailed Prior to Sampling	x3 2.13
Sample Pump Intake Setting (ft bmp)	/
Purge Time	begin / end 4:39pm
Pumping Rate (gpm)	/
Evacuation Method	Hand Bailed

Field Parameters	I	IV	2V	3V
Color	–	–	–	Colorless
Odor	–	–	–	slight
Appearance	–	–	–	clear with suspended solids
pH (s.u.)	6.48	6.11	6.04	6.14
Conductivity (mS/cm)	.593	.600	.604	.611
(µmhos/cm)	462	468	459	470
Turbidity (NTU)	–	30	39	45
Temperature (°C)	13.16	13.37	12.06	12.79
Dissolved Oxygen (mg/L)	4.70	4.47	4.16	4.89
~~Salinity (%)~~ ORP	-26.8	-22.4	-18.4	-14.1

Sampling Method: Bailer

Remarks: PID reading at wellhead zero

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel: GW/BP

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
	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Milligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: Colesville | Project No. NY000949.0017.0003A | Page 1 of 1

Site Location: Colesville Landfill, Broome County, New York | Date 9-23-04

Site/Well No. W-14S | Replicate No. N/A | Code No.

Weather: / | Sampling Time: Begin / End /

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	957.68
Land Surface Elevation (ft)	/
Sounded Well Depth (ft bmp)	19.5
Depth to Water (ft bmp)	7.99
Water-Level Elevation (ft)	/
Water Column in Well (ft)	11.51
Casing Diameter/Type	4" (8.16)
Gallons in Well	1.7 x 3
Gallons Pumped/Bailed Prior to Sampling	5.4
Sample Pump Intake Setting (ft bmp)	/
Purge Time	begin / end /
Pumping Rate (gpm)	/
Evacuation Method	Hand Bailed

Field Parameters

		1V	2V	3V
Color	-	-	-	-
Odor	-	-	-	-
Appearance	-	-	-	-
pH (s.u.)	6.19	5.75	6.0	5.88
Conductivity (mS/cm)	.084	0.077	0.066	0.065
(µmhos/cm)	75	110	84	114
Turbidity (NTU)	ORP -	-	-	-
Temperature (°C)	19.29	15.11	12.67	13.88
Dissolved Oxygen (mg/L)	2.91	3.02	3.50	3.22
Salinity (%)	-	-	-	-
Sampling Method	Bailer			

Remarks: PID reading at wellhead zero

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel: GW

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	Milligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY000944.0017 Task: 0003A Well ID: MW-26S

Date: 9-22-04 Sampled By: Fran M (Brown) GW

Sampling Time: 11:05AM Recorded By: Fran M

Weather: Sunny 64° Coded Replicate No.: N/A

Instrument Identification

Water Quality Meter(s): Quanta G Serial #: 05833

Purging Information

Casing Material: steel Purge Method: Redi-flow Pump / Low Flow

Casing Diameter: 2" Screen Interval (ft bmp): Top 7 Bottom 22

Sounded Depth (ft bmp): 22 Pump Intake Depth (ft bmp): —

Depth to Water (ft bmp): 8.78 Purge time Start: 10:35 AM Finish: 11:05 AM

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
10:35	—	—	—	14.21	6.69	.464	102	4.81	—	8.78	—
10:40	—	—	—	15.80	6.14	.463	99	.94	—	—	—
10:45	—	—	—	17.43	6.11	.451	90	.75	—	14.68	—
10:50	—	—	—	19.20	6.14	.451	111	1.83	—	—	—
10:55	—	—	—	19.16	6.16	.458	130	3.29	—	16.33	—
11:00	—	—	—	19.06	6.15	.464	148	3.89	—	—	—
11:05	—	—	—	18.57	6.25	.463	140	4.75	—	—	—
				18.74	6.25	.463	137	5.2	—	—	—
			4 Gal								
						5.2 =	Omg/L				

Sample Condition Color: — Odor: — Appearance: —

Sample Collection

Parameter: See COC Container: No. Preservative:

PID Reading: At wellhead Zero

Comments: —

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ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: 84.00044.0017 Task: 0003A Well ID: MW-17S
Date: 9.22.04 Sampled By: FRAN M (Broome) GW
Sampling Time: ~~9:00~~ 9:55 AM Recorded By: FRAN M
Weather: Sunny 60° Coded Replicate No.: N/A

Instrument Identification
Water Quality Meter(s): Quanta G Serial #: 05833

Purging Information
Casing Material: PVC Purge Method: Red. flow Pump / Low Flow
Casing Diameter: 2" Screen Interval (ft bmp): Top 5 Bottom 20
Sounded Depth (ft bmp): 20 Pump Intake Depth (ft bmp): —
Depth to Water (ft bmp): 8.18 Purge time Start: 9:05 AM Finish: 9:55 AM

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
9:05	—	—	—	13.36	6.01	.270	148	3.87	—	8.18	—
9:10	—	—	—	14.09	6.03	.271	142	2.30	—	—	—
9:15	—	—	—	14.28	6.06	.279	145	2.95	—	8.18	STOP
9:20	—	—	—	14.05	6.11	.279	142	4.17	—	~~9.18~~	—
9:25	—	—	—	14.52	6.09	.277	143	3.54	—	9.18	—
9:30	—	—	—	14.51	6.09	.276	150	2.90	—	—	—
9:35	—	—	—	14.40	6.11	.274	151	2.71	—	9.18	—
9:40	—	—	—	14.54	6.11	.272	151	3.12	—	—	—
9:45	—	—	—	14.66	6.10	.271	152	3.14	—	9.18	—
9:50	—	—	—	14.69	6.10	.270	153	2.45	—	—	—
9:55	—	—	—	14.73	6.12	.272	153	2.89	—	9.18	—
			TOTAL								

Sample Condition Color: Colorless Odor: None Appearance: Clear

Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading: At wellhead zero

Comments:

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY000949.0017 Task: 0003A Well ID: W-18
Date: 9/23/04 Sampled By: BP
Sampling Time: 10:10 AM Recorded By: BP
Weather: Sunny 63° Coded Replicate No.: N/A

Instrument Identification
Water Quality Meter(s): YSI 650 MDS Serial #: 02J0183 A1

Purging Information
Casing Material: PVC Purge Method: Rediflow Pump / Low Flow
Casing Diameter: 2" Screen Interval (ft bmp): Top 7 Bottom 22
Sounded Depth (ft bmp): 23 Pump Intake Depth (ft bmp): —
Depth to Water (ft bmp): 11.43 Purge time Start: 9:35 AM Finish: 10:05

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
9:35	—	—	—	14.80	5.97	.166	101.1	8.98	330	11.85	—
9:40	—	—	—	14.87	5.90	.167	114.9	8.86	75	11.85	—
9:45	—	—	—	15.06	5.98	.166	103.1	10.04	26	11.84	—
9:50	—	—	—	15.05	5.98	.166	134.9	8.74	12	11.83	—
9:55	—	—	—	15.08	6.02	.165	146.4	8.69	8.2	11.83	—
10:00	—	—	—	15.18	6.07	.166	121.6	9.86	4.5	11.83	—
10:05	—	—	—	15.13	6.05	.166	147.6	8.64	3.9	11.83	—
						52-	.006	mg/L			

Sample Condition Color: Colorless Odor: None Appearance: Clear

Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading: At wellhead Zero

Comments: Flow reduced for sampling - control Box ~~distance~~ located away from well.

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY000949.0017 Task: 0003A Well ID: W-20S
Date: 9-22-04 Sampled By: PP
Sampling Time: 2:05 pm Recorded By: PP
Weather: Sunny 75° Coded Replicate No.: N/A

Instrument Identification
Water Quality Meter(s): YSI 650 MDS Serial #: 02J0183 A1

Purging Information
Casing Material: PVC Purge Method: Rediflow Pump/Low Flow
Casing Diameter: 2" Screen Interval (ft bmp): Top 7 Bottom 22
Sounded Depth (ft bmp): 22 Pump Intake Depth (ft bmp): /
Depth to Water (ft bmp): 7.69 Purge time Start: 1:35pm Finish: 2:05pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
1:35	-	-	-	13.32	6.38	.109	90.1	2.26	22	-	-
1:40	-	-	-	16.85	5.93	.102	157.9	.70	21	13.07	-
1:45	-	-	-	17.62	5.87	.100	152.4	1.29	15	13.05	-
1:50	-	-	-	17.70	5.86	.103	186.5	1.41	13	13.06	-
1:55	-	-	-	17.90	5.93	.105	214.5	1.99	5.2	12.94	-
2:00	-	-	-	18.09	5.96	.106	244.7	2.25	3.6	13.06	-
2:05	-	-	-	18.32	5.96	.102	266.3	2.36	2.3	13.05	-

Sample Condition Color: - Odor: - Appearance: -

Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading: At wellhead Zero

Comments: /

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Appendix B

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

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Table B-1. NYSDEC DAR-1 Air Modeling Data, Operational Year 2, Quarter Number 4, Colesville Landfill, Broome County, New York.

Parameters for 10/8/2004 Sampling Event			
Discharge Temperature	T	521.67	°R
Ambient Temperature	Ta	510.67	°R
Stack Diameter	D	6	in
Stack Radius	R	0.25	ft
Stack Area	A	0.20	ft^2
Exit Velocity	V	26.70	fps
Exit Flow	Q	315	acfm
Exit Flow	Q	318	scfm
Stack Height	h_s	17	ft
Building Height	h_b	13.25	ft
Ratio of Heights	h_s/h_b	1.28	
Plume rise credit? $h_s/h_b > 1.5$?	(If no, $h_e=h_s$)	(If Yes, $h_e = h_s + 1.1 (F_m)^{1/3}$)	
Momentum Flux	Fm = Ta/T * V2 * R2	n/a	ft^4/s^2
Effective Stack Height	h_e	17.0	ft
Reduction Factor? $2.5 > h_s/h_b > 1.5$?		No, do not reduce impact	
Actual Annual Impact	C_a	$RF*6*Q_a/h_e^{2.25}$	
Mass Flow	Q_a	S lbs emitted for last 12 months	

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 62°F based on recorded parameters.
2. The ambient temperature is approximately 51°F, the average temperature for October 8.
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 December 22, 2003.
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.

Table B-2. NYSDEC DAR-1 Air Modeling Data, Operational Year 2, Quarter Number 4, Colesville Landfill, Broome County, New York.

Calculation of the Short-Term Guideline Concentration (SGC) for Sampling Event on 10/8/2004

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	11	*	28.58	3.40E-05	0.0058	0.37818	2.1E-04
Chloroethane(Ethyl Chloride)	75-00-3	--	11	*	29.50	3.51E-05	0.0060	0.39040	NA
1,1-Dichloroethene(Vinylidene Chloride)	75-35-4	--	11	*	44.33	5.28E-05	0.0090	0.58663	NA
Methylene Chloride(Dichloromethane)	75-09-2	14,000	11	*	38.84	4.63E-05	0.0079	0.51396	3.7E-03
1,1-Dichloroethane	75-34-3	--	11	*	45.26	5.39E-05	0.0092	0.59886	NA
cis-1,2 - Dichloroethylene	156-59-2	--	11	*	44.33	5.28E-05	0.0090	0.58663	NA
1,1,1-Trichloroethane(Methyl Chloroform)	71-55-6	68,000	11	*	61.01	7.27E-05	0.0124	0.80731	1.2E-03
Trichloroethene	79-01-6	54,000	11	*	60.09	7.16E-05	0.0122	0.79509	1.5E-03
Dichlorofluoromethane(Freon 12)	75-71-8	--	11	*	55.29	6.59E-05	0.0113	0.73155	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 December 22, 2003.
2. SGC refers to the Short-Term Guideline Concentration as determined using the hand calculations in the DAR-1 AGC/SGC Tables dated December 22, 2003.
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-3. NYSDEC DAR-1 Air Modeling Data, Operational Year 2, Quarter Number 4, Colesville Landfill, Broome County, New York.

Calculation of AGC based on 10/8/2004 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	11	*	28.58	3.41E-05	0.29498	**2.74**
Chloroethane(Ethyl Chloride)	75-00-3	10,000	978,044.97	11	*	29.50	3.52E-05	0.30451	**0.00**
1,1-Dichloroethene(Vinylidene Chloride)	75-35-4	70	6,846.31	11	*	44.33	5.28E-05	0.45757	**0.01**
Methylene Chloride(Dichloromethane)	75-09-2	2.1	205.39	11	*	38.84	4.63E-05	0.40089	**0.20**
1,1-Dichloroethane	75-34-3	0.63	61.62	11	*	45.26	5.39E-05	0.46711	**0.76**
cis-1,2-Dichloroethylene	156-59-2	1,900	185,828.54	11	*	44.33	5.28E-05	0.45757	**0.00**
1,1,1-Trichloroethane(Methyl Chloroform)	71-55-6	1,000	97,804.50	11	*	61.01	7.27E-05	0.62970	**0.00**
Trichloroethene	79-01-6	0.5	48.90	11	*	60.09	7.16E-05	0.62017	**1.27**
Dichlorodifluoromethane(Freon 12)	75-71-8	12,000	1,173,653.96	11	*	27.48	3.28E-05	0.28365	**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 62°F based on recorded parameters.
2. The ambient temperature is approximately 51°F, the average temperature for October 8.
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 December 22, 2003.
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.

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Appendix C

Automated Reagent Injection System Operating Parameters

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Table C-1. Automated Reagent Injection System Summary of Operational Year 2, Quarter Number 4 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.)
6/23/2004	2,720	272	157
7/26/2004	480	48	0
Quarter Totals (gal.) =	**3,200**	**320**	**157**
Totals for Operational Year 2 (gal.) =	**23,460**	**2,508**	**2,068**
Totals Since Startup (gal.) =	**50,384**	**6,281**	**6,425**

Notes:

gal. Gallons

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Table C-2. Automated Reagent Injection System, Operational Year 2, Quarter Number 4 Operating Parameters, Groundwater Remediation System, Colesville Landfill, Broome County, New York.

Injection Number 43

Injection Date = 6/23/2004

Molasses to Water Ratio (%) = 10.0

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 Flowrate (gpm)	Max. Injection Pressure (psi)
PW-6	160	5	16.0	0	8
IW-3	160	5	16.0	10	4
IW-1	160	4	16.0	10	5
IW-2	160	3	16.0	0	10
GMMW-1	160	3	16.0	12	12
IW-4	160	4	16.0	12	7
IW-5	160	5	16.0	0	8
IW-6	160	7	16.0	15	8
IW-7	160	8	16.0	15	8
IW-8	160	9	16.0	0	9
IW-9	160	11	16.0	14	9
IW-10	160	12	16.0	15	9
IW-11	160	13	16.0	0	11
IW-12	160	15	16.0	17	9
IW-13	160	16	16.0	18	11
IW-14	160	18	16.0	0	14
IW-15	160	19	16.0	0	23
Totals (gal.) =	2,720	157	272.0	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 is approximately 1-pipeline volume for each injection well.
3.	Parameters believed incorrect due to control system malfunctioning.
4.	Molasses solution injected manually.
5.	Parameters not recorded by system.

Table C-2. Automated Reagent Injection System, Operational Year 2, Quarter Number 4 Operating Parameters, Groundwater Remediation System, Colesville Landfill, Broome County, New York.

Injection Number 44

Injection Date = 7/26/2004

Molasses to Water Ratio (%) = 10.0 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 Flowrate (gpm)	Max. Injection Pressure (psi)
PW-6[4]	NM	NM	NM	NM	NM
IW-3[4]	NM	NM	NM	NM	NM
IW-1[4]	NM	NM	NM	NM	NM
IW-2[4]	NM	NM	NM	NM	NM
GMMW-1[4]	NM	NM	NM	NM	NM
IW-4[4]	NM	NM	NM	NM	NM
IW-5[4]	NM	NM	NM	NM	NM
IW-6[4]	NM	NM	NM	NM	NM
IW-7[4]	NM	NM	NM	NM	NM
IW-8[4]	NM	NM	NM	NM	NM
IW-9[4]	NM	NM	NM	NM	NM
IW-10[4]	NM	NM	NM	NM	NM
IW-11[4]	NM	NM	NM	NM	NM
IW-12[4]	NM	NM	NM	NM	NM
IW-13[5]	160	NM	16.0	0	8
IW-14[5]	160	NM	16.0	3	2
IW-15[5]	160	NM	16.0	0	13
Totals (gal.) =	480	0	48.0	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 is approximately 1-pipeline volume for each injection well.
3.	Parameters believed incorrect due to control system malfunctioning.
4.	Molasses solution injected manually.
5.	Parameters not recorded by system.