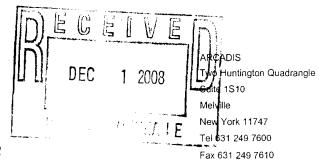


Infrastructure, environment, facilities

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



Fax 631 249 7610 www.arcadis-us.com

Subject:

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

Dear Mr. Jacob:

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

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

Sincerely,

**ARCADIS** 

Steven M. Feldman Project Manager

Copies:

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

Date:

November 25, 2008

Contact:

Steven M. Feldman

Phone:

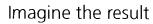
(631) 391-5244

Email:

sfeldman@arcadis-us.com

Our ref:

NY000949.0021.00004





**Broome County Division of Solid Waste Management** 

Operational Year 6 Quarter Number 3 Monitoring Report

November 25, 2008

Kenneth Zegelman Kenneth Zegel, P.E. Senior Engineer

Steven Teldman

Steven M. Feldman Project Director Operational Year 6 Quarter Number 3 Monitoring Report

Colesville Landfill, Broome County, New York NYSDEC Site 704010

Prepared for: Broome County Division of Solid Waste Management

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

Our Ref.;

NY000949.0021.00004

Date:

November 25, 2008

This document is intended only for the use of the individual or entity for which it was prepared and may contain information that is privileged, confidential and exempt from disclosure under applicable law. Any dissemination, distribution or copying of this document is strictly prohibited.

ARCADIS Table of Contents

1.	Introd	uction		1
2.	Metho	dology		1
	2.1	Enviro	onmental Effectiveness Monitoring	1
	2.2	Groun	ndwater Remediation System Performance Monitoring	2
	2.3	Spring	Water Remediation System Performance Monitoring	3
3.	Groun	dwater	Flow	3
4.	Groun	dwater	Quality	3
	4.1	Volatil	e Organic Compounds	3
	4.2	Indicat	tors of Reducing Conditions	4
	4.3	Evider	nce of Biodegradation	4
5.	Spring	Water	Quality	4
6.	Surfac	e Water	r Quality	4
7.	Groun	dwater	Remediation System Performance	5
	7.1	PT Sys	stem	5
		7.1.1	Summary of Operation, Maintenance, and Monitoring	5
		7.1.2	Results of Performance Sampling	6
	7.2	ARI Sy	ystem	6
		7.2.1	Summary of Operation, Maintenance, and Monitoring	7
		7.2.2	Results of Performance Sampling	7
8.	Spring	Water	Remediation System Performance	8
9.	Conclu	sions		8
10.	Recom	menda	tions	9
11.	Project	Sched	lule	10

ARCADIS Table of Contents

12. References 11

## **Tables**

Table 1 Concentrations of Volatile Organic Compounds Detected in Groundwater and Surface Water, Operational Year 6, Quarter Number 3, Colesville Landfill, Broome County, New York. Table 2 Concentrations of General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Operational Year 6. Quarter Number 3, Colesville Landfill, Broome County, New York. PT Groundwater Remediation System Operating Parameters, Table 3 Operational Year 6, Quarter Number 3, Colesville Landfill, Broome County, New York. Table 4 Concentrations of Volatile Organic Compounds and Selected Metals Detected in Aqueous Samples Collected from the PT System, Operational Year 6, Quarter Number 3, Colesville Landfill, Broome County, New York. Table 5 PT Groundwater Remediation System Mass Removal Rate of Volatile Organic Compounds, Operational Year 6, Quarter Number 3, Colesville Landfill, Broome County, New York. Table 6 Concentrations of Volatile Organic Compounds Detected in Groundwater Remediation System Air Stripper Effluent, Operational Year 6, Quarter Number 3, Colesville Landfill, Broome County, New

## **Figures**

York.

Figure 1 Long-Term Effectiveness Monitoring Locations, Colesville Landfill, Broome County, New York.

ARCADIS Table of Contents

## **Appendices**

- A Groundwater Sampling Logs
- B New York State Department of Environmental Conservation DAR-1 Air Modeling Data
- C Automated Reagent Injection System Operating Parameters

Operational Year 6 Quarter Number 3 Monitoring Report

Colesville Landfill Broome County, New York NYSDEC Site 704010

#### 1. Introduction

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

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

#### 2. Methodology

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

## 2.1 Environmental Effectiveness Monitoring

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

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

Operational Year 6 Quarter Number 3 Monitoring Report

Colesville Landfill Broome County, New York NYSDEC Site 704010

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

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

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

#### 2.2 Groundwater Remediation System Performance Monitoring

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

- Pump-and-treat (PT) system recovery well influent and effluent samples were collected on June 25, 2008. The samples were selectively analyzed for VOCs and total iron.
- One vapor sample from the PT system air stripper effluent was collected on June 26, 2008. The sample was analyzed for VOCs.
- PT system operating parameters were recorded during the quarterly OM&M site visit.
- Total organic carbon (TOC) samples were collected from select injection wells during the week of June 23, 2008.
- A TOC sample was collected from alternate electron donor monitoring well TW-1 on June 25, 2008.
- Automated reagent injection (ARI) system operating parameters were recorded during each injection event.

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

Operational Year 6 Quarter Number 3 Monitoring Report

Colesville Landfill Broome County, New York NYSDEC Site 704010

## 2.3 Spring Water Remediation System Performance Monitoring

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

#### 3. Groundwater Flow

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

#### 4. Groundwater Quality

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

#### 4.1 Volatile Organic Compounds

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

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

Operational Year 6 Quarter Number 3 Monitoring Report

Colesville Landfill Broome County, New York NYSDEC Site 704010

#### 4.2 Indicators of Reducing Conditions

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

#### 4.3 Evidence of Biodegradation

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

#### 5. Spring Water Quality

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

## 6. Surface Water Quality

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

Operational Year 6 Quarter Number 3 Monitoring Report

Colesville Landfill Broome County, New York NYSDEC Site 704010

## 7. Groundwater Remediation System Performance

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

#### 7.1 PT System

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

#### 7.1.1 Summary of Operation, Maintenance, and Monitoring

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

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

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

Operational Year 6 Quarter Number 3 Monitoring Report

Colesville Landfill Broome County, New York NYSDEC Site 704010

#### 7.1.2 Results of Performance Sampling

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

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

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

### 7.2 ARI System

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

Operational Year 6 Quarter Number 3 Monitoring Report

Colesville Landfill Broome County, New York NYSDEC Site 704010

## 7.2.1 Summary of Operation, Maintenance, and Monitoring

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

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

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

#### 7.2.2 Results of Performance Sampling

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

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

Operational Year 6 Quarter Number 3 Monitoring Report

Colesville Landfill Broome County, New York NYSDEC Site 704010

- The TOC in monitoring well TW-1 was 1,900 mg/L. This data, combined with TOC data from IW-8, indicate that the slow-release alternate electron donor (EOS) continues to provide sufficient organic carbon to the subsurface following the one time injection in injection well IW-8.
- VOC data for monitoring Well TW-1 remained stable when compared to its
  previous quarterly monitoring data and is currently 30 percent lower when
  compared to data from September 2007. The data indicate a stable to
  decreasing trend in the concentration of VOCs in the vicinity of alternate
  electron donor pilot test.
- Monitoring wells in close proximity to the anaerobic IRZ (i.e., GMMW-5, W-5 and GMMW-6) exhibited stable VOC concentrations and remain significantly lower than baseline conditions.
- The methane concentration in monitoring wells GMMW-5 and TW-1 remained elevated at 15,000 ug/L and 22,000 ug/L, respectively. These data provide evidence that strongly reducing conditions (methanogenic) are being maintained within the IRZ.
- The ethene concentration in monitoring well GMMW-6 remained elevated at 45,000 ng/L.
- The ethane concentration remained elevated in monitoring wells GMMW-5 and GMMW-6 at 23,000 and 11,000 ng/L, respectively.

#### 8. Spring Water Remediation System Performance

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

#### 9. Conclusions

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

Operational Year 6 Quarter Number 3 Monitoring Report

Colesville Landfill Broome County, New York NYSDEC Site 704010

- The anaerobic IRZ established downgradient of the injection transect is successfully reducing the concentration of site-related VOCs through enhanced reductive dechlorination.
- The PT system is operating as designed and is treating recovered groundwater VOCs to below BPJ limits prior to discharge.
- Sufficient organic carbon was delivered to the subsurface to maintain the IRZ.
- Surface water quality continues to be consistent with historical data indicating that impacted groundwater is not causing an adverse impact to surface water along the North Stream.
- Ongoing TOC data from the alternate electron donor pilot test indicate the EOS is an effective product to provide sufficient organic carbon to the subsurface over long periods of time. VOC data from Monitoring Well TW-1 continues to indicate stability to decreased VOCs in the alternate electron donor pilot test area.

#### 10. Recommendations

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

- Continue to inspect the former spring locations and the side slopes of the North Stream.
- Continue to implement a weekly site inspection schedule until sufficient data
  are obtained to evaluate and make conclusions on the instantaneous pumping
  rate of individual recovery wells over time. Propose recommendations for
  modifications to the O&M schedule if warranted by the data.
- Continue to operate the ARI system without injection well IW-8. Continue to
  obtain and evaluate data related to the ongoing slow-release alternate electron
  donor pilot program.
- Perform maintenance of the SP-5 remediation system to eliminate the tailwater currently observed at the SP-5 outfall discharge location.

Operational Year 6 Quarter Number 3 Monitoring Report

Colesville Landfill Broome County, New York NYSDEC Site 704010

- Evaluate the instantaneous and long-term performance of recovery well pump GMPW-3 and GMPW-5 to determine if the filter sock replacement period needs to be adjusted.
- Continue to evaluate and determine the source of water emerging at the SP-5 spring water remediation system outfall location.

## 11. Project Schedule

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

Operational Year 6 Quarter Number 3 Monitoring Report

Colesville Landfill Broome County, New York NYSDEC Site 704010

## 12. References

- ARCADIS G&M, Inc. 2002. Long-Term Monitoring Plan, Colesville Landfill, Broome County, New York, NYSDEC Site 704010. June 28, 2002.
- ARCADIS G&M, Inc. 2003. Long-Term Monitoring Plan Addendum for Spring Water Remediation Systems, Colesville Landfill, Broome County, New York, NYSDEC Site 704010. November 3, 2003.
- ARCADIS G&M, Inc. 2004. Interim Remedial Action Report, Colesville Landfill, Broome County, New York, NYSDEC Site 704010. September 22, 2004.
- ARCADIS G&M, Inc. 2005 Proposed Modifications to Long-Term Monitoring Program, Broome County, New York, NYSDEC Site 704010. June 28, 2005.
- ARCADIS G&M, Inc. 2006. Hydraulic Injection Test and Alternate Electron Donor Pilot Test, Colesville Landfill, Broome County, New York (Site No. 704010). November 30, 2006.
- ARCADIS of New York, Inc. 2008. Operational Year 6, Quarter Number 2 Monitoring Report, Colesville Landfill, Broome County, New York (Site No. 704010).

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

(units in ug/L)	Sample ID: Date:	GMMW-02 3/25/2008	GMMW-02 6/25/2008	GMMW-05 3/25/2008	GMMW-05 6/25/2008	GMMW-06 3/25/2008	GMMW-06 6/24/2008	GMMW-06 * 6/26/2008	PW-04 3/25/2008	PW-04 6/25/2008	
1,1,1-Trichloroethane		9.0	6.5	<1.0	<1.0	1.8	5.5	5.5	8.9	8.2	
1,1,2-Trichloroethane		<1.0	<1.0	<1.0	<1.0	<1.0	1.2	1.1	<1.0	<1.0	
1,1-Di <b>c</b> hloroethane		110	110	21	22	130	150	140	8.3	15	
1,1-Dichloroethene		1.2	1.3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
1,2-Dichloroethane		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
1,2-Dichloropropane		<1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	<1.0	<1.0	
Benzene		2.5	2.7	<1.0	1.2	8.1	5.7	5.7	<1.0	<1.0	
Carbon Tetrachloride		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Chlorobenzene		30	30	11	15	35	29	28	<1.0	<1.0	
Chloroethane		24	27	33	92	140	120	110	3.6	4.4	
Chloroform		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.4	1.0	
cis-1,2-Dichloroethene		110	100	1.8	2.6	7.8	37	38	5.8	12	
Dichlorodifluoromethane		1.2	1.1	<1.0	<1.0	4.6	2.7	2.6	1.4	1.2	
Ethylbenzene		<1.0	<1.0	<1.0	<1.0	2.9	1.1	1.1	<1.0	<1.0	
Methylene chloride		<1.0	1.4	<1.0	1.8	5.8	6.0	6.2	<1.0	<1.0	
Methyl tert-butyl ether		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Naphthalene		<b>&lt;1</b> .0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
o-Xylene		<1.0	<1.0	1.1	1.3	2.2	<1.0	<1.0	<1.0	<1.0	
n,p-Xylene		<2.0	<2.0	<2.0	<2.0	6.0	2.3	2.2	<2.0	<2.0	
Tetrachloroethene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Toluene		<1.0	<1.0	<1.0	1.7	2.8	1.2	1.2	<1.0	<1.0	
rans-1,2-Dichloroethene		<1.0	<1.0	<1.0	<1.0	1.6	1.6	1.6	<1.0	<1.0	
Trichloroethene		28	27	1.1	<1.0	3.2	16	16	18	22	
Vinyl chloride		15	16	<1.0	1.0	5.1	20	19	<1.0	<1.0	
Total VOCs		330.9	323.0	69.0	138.6	357.9	399.3	378.2	47.4	63.8	

VOCs Volatile Organic Compounds.

ug/L Micrograms per liter.

Field replicate.

J Estimated value.

MDL Method detection limit.

NA Not analyzed.

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

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

VOCs Volatile Organic Compounds.

ug/L Micrograms per liter.

Field replicate.

J Estimated value.

MDL Method detection limit.

NA Not analyzed.

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

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

mg/L Milligrams per liter.

mmhos/cm Millimhos per centimeter.
NTU Nephelometric Turbidity Units.

deg C Degrees Celsius.

mV Millivolts.

ng/L Nanograms per liter.
-- Not analyzed or collected.
ug/L Micrograms per liter.

IW Injection well.ORP Oxidation-reduction potential.

J Qualifier assigned to analytical data indicating result is estimated.

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

Parameters	Sample ID: Date:	PW-04 3/25/08	PW-04 6/25/08	W-05 3/25/08	W-05 6/25/08	IW-03 3/25/08	IW-03 6/24/08
OFNERAL QUEMICTOY	<u>UNITS</u>						
GENERAL CHEMISTRY Total Organic Carbon	mg/L	8.0	0.9	6.9	5.8	260	210
FIELD PARAMETERS pH Specific Conductance Turbidity	Standard units mmhos/cm NTU	6.15 0.818	6.09 1.051	6.72 0.955	6.64 0.983	6 0.653	6.1 0.809
Dissolved Oxygen Temperature ORP	mg/L deg C mV	5.26 8.34 41	  10.4 	1.3 9.26 -87	  11.9 	1.21 9.28 -54	0.59 12.75 -9
DISSOLVED GASES Carbon dioxide Carbon monoxide Ethane Ethene Methane Nitrogen Oxygen	mg/L mg/L ng/L ng/L ug/L mg/L mg/L	<5.00 <1.00 40 52 3.1 21.00 6.00	<5.00 <1.00 26 36 4.8 18.00 4.80	<5.00 <1.00 17,000 2,000 4,900 20.00 2.70	<5.00 <1.00 13,000 1,800 4,100 21.00 3.20	    	   

mg/L Milligrams per liter.
mmhos/cm Millimhos per centimeter.

NTU Nephelometric Turbidity Units.

deg C Degree**s** Celsius. mV Millivolts.

ng/L Nanograms per liter.
-- Not analyzed or collected.
ug/L Micrograms per liter.
IW Injection well.

ORP Oxidation-reduction potential.

J Qualifier assigned to analytical data indicating result is estimated.

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

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

#### Bold Constituent detected above MDL.

ppbv: parts per billion by volume

## Notes/Assumptions:

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

## Appendix A

Groundwater Sampling Logs

Project Colesville Landfill	Project No.	NY000949.0020	Page <u>1</u> of <u>1</u>
Site Location Harpursville, NY			Date (0/25/08
Site/Well No. (, )-5	Replicate No.		Code No.
Weather Sun 75	Sampling Time	e: Begin <u>0920</u>	End <u>()935</u>
Evacuation Data		Field Parameters	
Measuring Point Top	DE PUC	Color	Clar
MP Elevation (ft)		Odor	None
Land Surface Elevation (ft)		Appearance	Slightheloudy
Sounded Well Depth (ft bmp)		pH (s.u.)	6.64
Depth to Water (ft bmp)	1.95	Conductivity (mS/cm)	0.983
Water-Level Elevation (ft)		(µmhos/cm)	
Water Column in Well (ft)		Turbidity (NTU)	
Casing Diameter/Type2		Temperature (°C)	11.90
Gallons in Well		Dissolved Oxygen (m	ng/L)
Gallons Pumped/Bailed	\ -C	ORP _	
Prior to Sampling	> 75	Sampling Method	PDB Bailer
Sample Pump Intake Setting (ft bmp)		Remarks Remarks	0-7
Purge Time begin_	end	· · · · · · · · · · · · · · · · · · ·	
Pumping Rate (gpm)			
Evacuation Method (2003)	1 1 1 1 1 1		
	.kr (Tec) (108		
Constituents Sampled	Container Description	Number	Preservative
		Number	Preservative HCL
Constituents Sampled	Container Description	Number 2 2	
Constituents Sampled 8021 VOLATILES	Container Description 40 ML VOA VIALS	2 Z	HCL
Constituents Sampled 8021 VOLATILES Ethene, Ethane, Methane	Container Description 40 ML VOA VIALS 40 ML Vials	2 Z	HCL Nu loy
Constituents Sampled 8021 VOLATILES Ethene, Ethane, Methane TOC	Container Description  40 ML VOA VIALS  40 ML Vials  40 ML Amber VOA VIAL  250 ML Plastic	2 Z	HCL Na (04 H2SO4
Constituents Sampled  8021 VOLATILES  Ethene, Ethane, Methane  TOC  Total Iron	Container Description  40 ML VOA VIALS  40 ML Vials  40 ML Amber VOA VIAL  250 ML Plastic	2 Z	HCL Na (04 H2SO4
Constituents Sampled  8021 VOLATILES  Ethene, Ethane, Methane  TOC  Total Iron  Sampling Personnel K  Well Casing Volumes  Gal./Ft. 1-¼" = 0.06 2"	Container Description  40 ML VOA VIALS  40 ML Vials  40 ML Amber VOA VIAL  250 ML Plastic	2 Z .s 2 ————————————————————————————————————	HCL Na 104 H2SO4
Constituents Sampled  8021 VOLATILES  Ethene, Ethane, Methane  TOC  Total Iron  Sampling Personnel K  Well Casing Volumes  Gal./Ft. 1-¼" = 0.06 2"  1-½" = 0.09 2-  bmp below measuring point m  °C Degrees Celsius m	Container Description  40 ML VOA VIALS  40 ML Vials  40 ML Amber VOA VIAL  250 ML Plastic  A  2 = 0.16 3" = 0.37 4" = 0  2 = 0.26 3-½" = 0.50 6" = 2  I mililiter  S/cm Milisiemens per centimeter	2 Z .s 2 	HCL Nafori H2SO4 HNO3
Constituents Sampled  8021 VOLATILES  Ethene, Ethane, Methane  TOC  Total Iron  Sampling Personnel K  Well Casing Volumes  Gal./Ft. 1-¼" = 0.06 2'  1-½" = 0.09 2-  bmp below measuring point m	Container Description  40 ML VOA VIALS  40 ML Vials  40 ML Amber VOA VIAL  250 ML Plastic  A  2 = 0.16 3" = 0.37 4" = 0  2" = 0.26 3-½" = 0.50 6" = 0  I mililiter  S/cm Milisiemens per centimeter sl mean sea-level (A Not Applicable	2 Z S S D.65 1.47  NTU Nephe PVC Polyvir s.u. Standa	HCL Nu for H2SO4 HNO3

# ARCADIS Water Sampling Log

Project Colesville !	<u>_andfill</u>	Project No. N	IY000949.0020	Page <u>1</u>	of <u>1</u>
Site Location Harpursvill	e, NY			Date 6	25/08
Site/Well No. 6 MMW	5_5_	Replicate No{	nslmsD	Code No.	
Weather Sun	750_	Sampling Time:	Begin 0850	End OAI	<u>O</u>
Evacuation Data		F	leld Parameters		
Measuring Point	TEP OF PU	<u> </u>	olor	yellow	Ciear
MP Elevation (ft)		C	Odor	med	
Land Surface Elevation (ft)		<u> </u>	ppearance	Block 4	HUY PELS
Sounded Well Depth (ft bm)	p)	р	H (s.u.)	(0.620	<u> </u>
Depth to Water (ft bmp)	48.62		conductivity (mS/cm)	0.629	
Water-Level Elevation (ft)			(µmhos/cm)		
Water Column in Well (ft)		т	urbidity (NTU)		
Casing Diameter/Type	2"	т	emperature (°C)	12.78	
Gallons in Well			issolved Oxygen	(mg/L)	
Gallons Pumped/Bailed Prior to Sampling			RP		
Sample Pump Intake Setting (ft bmp)			ampling Method emarks	diployed o	-kc PDB
Purge Time	begin end		<del></del>		
Pumping Rate (gpm)			-		
Evacuation Method	PDB/ Buk C				
Constituents Sampled	Container	Description	Numbe	r Prese	ervative
8021 VOLATILES	40 ML V	/OA VIALS		HCL_	1 M5/M5Z
Ethene, Ethane, Methane	40 ML \	√ials			
TOC	40 ML A	Amber VOA VIALS		H2SC	04
Total Iron	250 ML	. Plastic	<del>-</del>	HNO	3
Sampling Personnel	KA				
Well Casing V	'olumes				
Gal./Ft. $1-\frac{1}{4}$ " = 0.06 $1-\frac{1}{2}$ " = 0.09		= 0.37 4" = 0.6 " = 0.50 6" = 1.4	-		
bmp below measuring point °C Degrees Celsius ft feet gpm Gallons per minute mg/L Miligrams per liter	ml mililiter mS/cm Milisiemens msI mean sea-l N/A Not Applica NR Not Record	ible	PVC Polys.u. Star umhos/cm Mic	phelometric Turbidity I yvinyl chloride ndard units romhos per centimete atile Organic Compou	ır

Project Colesville	e Landfill	Project No.	NY000949.00	20 !	Page <u>1</u> of <u>1</u>
Site Location Harpursy	ille, NY		- Harring		Date Colzylos
Site/Well No. 6mm	w.6	Replicate No.	REPV 2	40608	Code No.
Weather Arth	down 75	Sampling Time	: Begin 13	<u>53</u>	End 1405
Evacuation Data	•		Field Parame	eters	
Measuring Point	TOP OF PUC	<u> </u>	Color	<u></u>	lea R
MP Elevation (ft)		<del></del>	Odor	1	<u>Ned</u>
Land Surface Elevation (ft	(1)		Appearance		Year-
Sounded Well Depth (ft br	mp)		pH (s.u.)	صک	. 39
Depth to Water (ft bmp)	37.99	····	Conductivity (mS/cm)	Ċ	946
Water-Level Elevation (ft)			(µmhos/ci	n) 📂	
Water Column in Well (ft)			Turbidity (NTL	J)	- manual and a
Casing Diameter/Type	2"		Temperature	(°C)	3.06
Gallons in Well	·		Dissolved Oxy	/gen (mg/L	082
Gallons Pumped/Bailed			ORP	****	23
Prior to Sampling	Registratives.	<del></del>	Sampling Met	hod f	Bailer / PDB
Sample Pump Intake Setting (ft bmp)	Carterior Control			Zeda Pla	ed a ppB
Purge Time	begin end		4:	*	<u> </u>
Pumping Rate (gpm)	4		h.		
Evacuation Method	2" Disposable poly b	ailer / PDB			
Constituents Sampled	Container	Description	Nu	mber	Preservative
8021 VOLATILES	40 ML V	OA VIALS		2	HCL
Ethene, Ethane, Methane	40 ML∜	A Vials		2	
TOC	2 <del>90 ML</del>	Plastic 5AA		2	Unpres.
Total Iron	250 ML	Plastic		$\bigcirc$	HNO3
Sampling Personnel	KA/For				
Wall Cooing					
Gal./Ft. 1-½" = 0.06 1-½" = 0.09	Volumes 2" = 0.16 3" =	= 0.37 4" = 0 " = 0.50 6" = 1			
Gal./Ft. $1-\frac{1}{2}$ " = 0.06	Volumes 2" = 0.16 3" = 2-½" = 0.26 3-½ ml mililiter	"= 0.50 6" = 1 s per centimeter evel ble		Polyvinyl c Standard u Micromhos	

Project Colesville Landfill	Project No. N	IY000949.0020	Page <u>1</u> of <u>1</u>
Site Location Harpursville, NY			Date 6/25/08
Site/Well No. Pw-4	Replicate No.		Code No.
Weather Sun 75"	Sampling Time:	Begin <u>1040</u>	End 10.50
Evacuation Data	F	ield Parameters	
Measuring Point Top oF	PUC C	olor	Clear
MP Elevation (ft)	0	dor	0000
Land Surface Elevation (ft)	A	ppearance	Cloudy
Sounded Well Depth (ft bmp)	pl	H (s.u.)	6.09
Depth to Water (ft bmp)	<u> </u>	onductivity (mS/cm)	1.80.1
Water-Level Elevation (ft)	· · · · · · · · · · · · · · · · · · ·	(µmhos/cm)	
Water Column in Well (ft)		urbidity (NTU)	
Casing Diameter/Type 2"	To	emperature (°C)	10.40
Gallons in Well	D	issolved Oxygen (r	ng/L)
Gallons Pumped/Bailed	0	RP .	and the second s
Prior to Sampling	S	ampling Method	PDB/ Bake
Sample Pump Intake Setting (ft bmp)	R	emarks PDI	3 Redeployment
Purge Time begin	end		
Pumping Rate (gpm)			
Evacuation Method YDG /	Backer (Toc)		
Constituents Sampled C	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	<u>Z</u>	HCL
Ethene, Ethane, Methane	40 ML Vials		
TOC	40 ML Amber VOA VIALS		H2SO4
Total Iron	250 ML Plastic		HNO3
Sampling Personnel KA / F	m		
Well Casing Volumes			
Gal./Ft. $1-\frac{1}{2}$ " = 0.06 2" = 0.16 $1-\frac{1}{2}$ " = 0.09 $2-\frac{1}{2}$ " = 0.2	3'' = 0.37 $4'' = 0.626 3-\frac{1}{2} 0.50 6'' = 1.4$		
bmp below measuring point ml m	nililiter	NTU Nephe	elometric Turbidity Units

Project Colesville I	andfill	Project No.	NY000949.00	020 Pag	e <u>1</u> of <u>1</u>
Site Location Harpursvill	e, NY			Dat	e 6/25/08
Site/Well No. Gmm	N - S	Replicate No.	****	Coc	le No.
Weather Sun	75	Sampling Tim	e: Begin 1	) <u>20</u> End	1031
Evacuation Data	The state of the s		Fleid Parame	eters	
Measuring Point	TOP OF F	36	Color		1/a/P
MP Elevation (ft)			Odor		
Land Surface Elevation (ft)			Appearance		
Sounded Well Depth (ft bm	p)		pH (s.u.)	<u> </u>	. 76
Depth to Water (ft bmp)	35.62		Conductivity (mS/cm)	_0.	729
Water-Level Elevation (ft)			(µmhos/c	m)	
Water Column in Well (ft)			Turbidity (NT	U)	
Casing Diameter/Type	2"	<del></del>	Temperature	(°C)	1.31
Gallons in Well			Dissolved Ox	ygen (mg/L)	,
Gallons Pumped/Bailed	A > 5		ORP		
Prior to Sampling	0.23		Sampling Met	thod PDB	Paula
Sample Pump Intake Setting (ft bmp)			Remarks	Redept	and a PDB
Purge Time	begin end		<del></del>	<u> </u>	
Pumping Rate (gpm)					
Evacuation Method	POB Banke	(Joc)			
Constituents Sampled	Container	r Description	Nu	ımber	Preservative
8021 VOLATILES	40 ML \	/OA VIALS		2	HCL
Ethene, Ethane, Methane	40 ML	Vials		2	
TOC	40 ML A	Amber VOA VIA	LS_	2	H2SO4
Total Iron	250 ML	Plastic			HNO3
Sampling Personnel	KA /FM				
Well Casing V	olumes				
Gal./Ft. 1-¼" = 0.06 1-½" = 0.09			0.65 1.47		
bmp below measuring point °C Degrees Celsius ft feet gpm Gallons per minute mg/L Miligrams per liter	ml mililiter mS/cm Milisiemens msI mean sea-I N/A Not Applica NR Not Record	level ible	NTU PVC s.u. umhos/cm VOC	Nephelometric Polyvinyl chlor Standard units Micromhos per Volatile Organi	centimeter

Project Colesville	Landfill	Project No. N	IY000949,0020	Page <u>1</u> of <u>1</u>
Site Location Harpursvill	le, NY			Date 6/25/08
Site/Well No.	i	Replicate No.		Code No.
Weather Sun	75	Sampling Time:	Begin <u>1940</u>	End <u>595</u> 0
Evacuation Data		F	ield Parameters	
Measuring Point	TOP OF PUC	C	olor	40100 Brown
MP Elevation (ft)			)dor	242000
Land Surface Elevation (ft)		A	ppearance	yellow
Sounded Well Depth (ft bm	p)	р	H (s.u.)	6.57
Depth to Water (ft bmp)	C. and C.		onductivity (mS/cm)	u Fi
Water-Level Elevation (ft)	•		(µmhos/cm)	7.00
Water Column in Well (ft)		<del></del>	urbidity (NTU)	
Casing Diameter/Type	2"		emperature (°C)	12.49
Gallons in Well			issolved Oxygen (r	ng/L)
Gallons Pumped/Bailed	\$ T 1"		RP	
Prior to Sampling	0.65		ampling Method	PDB Bowle
Sample Pump Intake Setting (ft bmp)	·		emarks $Q_{e}\lambda$	colourd a DDB
Purge Time	begin end			
Pumping Rate (gpm)				
Evacuation Method	PDB/Baile	er (Toc)		
Constituents Sampled	Container	Description	Number	Preservative
8021 VOLATILES	40 ML V	OA VIALS	2_	HCL
Ethene, Ethane, Methane	40 ML \	/ials	2_	
TOC	40 ML A	mber VOA VIALS		H2SO4
Total Iron		Plastic		HNO3
Sampling Personnel	KA/FM			
Well Casing V  Gal./Ft. 1-1/4" = 0.06		0.37 4" = 0.6	·	· — — —
1-1/2" = 0.09		'= 0.50 6" = 1.4		
bmp below measuring point  °C Degrees Celsius  ft feet gpm Gallons per minute mg/L Miligrams per liter	ml milliter mS/cm Milisiemens msI mean sea-le N/A Not Applicat NR Not Recorde	ole	PVC Polyvi s.u. Stand- umhos/cm Micror	elometric Turbidity Units nyl chloride ard units nhos per centimeter e Organic Compounds

Project Colesville L	andfill	Project No. N	1Y000949.00	20	Page <sub>.</sub>	1 of 1
Site Location Harpursville	e, NY				Date	6/24/08
Site/Well No. Tur.	3	Replicate No.			Code N	lo.
Weather Cloudy	15	Sampling Time:	Begin 1	170	End (	450
Evacuation Data		F	ield Parame	ters		
Measuring Point	-		Color		علاءك	au Brown
MP Elevation (ft)			Odor	<u> </u>	34,001	70
Land Surface Elevation (ft) _	, , , , , , , , , , , , , , , , , , ,		Appearance			
Sounded Well Depth (ft bmp	)		H (s.u.)	_(	<u>کا .ف</u>	<u> </u>
Depth to Water (ft bmp)			Conductivity (mS/cm)	ک	<u>08 - C</u>	9
Water-Level Elevation (ft)	-	<del></del>	(µmhos/ci	m)		
Water Column in Well (ft)		_ <del></del>	urbidity (NTL	J)		
Casing Diameter/Type	2"	Ţ	emperature	(°C)	12.	75
Gallons in Well	A company of the second of the		issolved Oxy	/gen (mg/	′L) .	0 59
Gallons Pumped/Bailed	a 25	C	)RP		- 9	
Prior to Sampling _	0.42	s	ampling Met	hod	$B_{\alpha}$	VCC
Sample Pump Intake Setting (ft bmp)			lemarks			
Purge Time b	pegin end		·			
Pumping Rate (gpm)		_ <del></del>				
Evacuation Method	Zoile					
Constituents Sampled	Container	Description	Nu	mber		Preservative
8021 VOLATILES	40 ML V	OA VIALS				HCL
Ethene, Ethane, Methane	40 ML V	/ials				
TOC	40 ML A	mber VOA VIALS		<u>Z</u>		H2SO4
Total Iron	250 ML	Plastic			-	HNO3
Sampling Personnel	KA					
Well Casing Vo	olumes					
Gal./Ft. $1-\frac{1}{2}$ " = 0.06 $1-\frac{1}{2}$ " = 0.09		0.37 $4'' = 0.66'' = 1.4$				
bmp below measuring point  °C Degrees Celsius  ft feet gpm Gallons per minute mg/L Miligrams per liter	ml mililiter mS/cm Milisiemens msI mean sea-le N/A Not Applicat NR Not Records	evel ole	NTU PVC s.u. umhos/cm VOC	Polyvinyl Standard Micromho	chloride units os per cer	bidity Units ntimeter ompounds

Project Colesville	Landfill	Project No.	NY000949.	0020	Page 1	of _1
Site Location Harpursvil	lle, NY				Date 6	124/08
Site/Well No. TW -	13	Replicate No	). <del></del>	•	Code No.	
Weather Cloudy	75	Sampling Tir	me: Begin	1521	End 1	,23
Evacuation Data			Field Parar	meters		_
Measuring Point			Color	2_	Mary	Rell
MP Elevation (ft)			Odor		240	200
Land Surface Elevation (ft)			Appearance	·		
Sounded Well Depth (ft bm	np)		pH (s.u.)		4.56	<u> </u>
Depth to Water (ft bmp)			Conductivity (mS/cm		2 8(	0
Water-Level Elevation (ft)			(µmhos	/cm)		
Water Column in Well (ft)			Turbidity (N	TU)	Aggregation of the second	
Casing Diameter/Type	2"		Temperatur	e (°C)	12.7	6
Gallons in Well			Dissolved C	xygen (mg/	′L)	.26
Gallons Pumped/Bailed	*.		ORP		83	)
Prior to Sampling	-0.2	_5	Sampling M	ethod i	30iler	
Sample Pump Intake Setting (ft bmp)	Constitution of the Consti	ur	Remarks _		3410	
Purge Time	begin	end				
Pumping Rate (gpm)						
Evacuation Method	Bailes					
Constituents Sampled		Container Description	1	Number	Pre	servative
8021 VOLATILES		40 ML VOA VIALS		N. applicate	нс	<u>L</u>
Ethene, Ethane, Methane		40 ML Vials		*	-	
TOC	·	40 ML Amber VOA VI	ALS		H2:	SO4
Total Iron		250 ML Plastic	<del></del>		HN	103
	<del></del> .		<del></del>		-	
Sampling Personnel	KA					
Well Casing \						
Gai./Ft. $1-\frac{1}{2}$ " = 0.06 $1-\frac{1}{2}$ " = 0.09	2" = 0.16 2-1/2" = 0		= 0.65 = 1.47			
bmp below measuring point °C Degrees Celsius ft feet gpm Gallons per minute	mS/cm msl N/A	mililiter Milisiemens per centimeter mean sea-level Not Applicable	NTU PVC s.u. umhos/cr	Polyvinyl Standard n Micromhe	units os per centim	eter
mg/L Miligrams per liter	NR	Not Recorded	VOC	Volatile C	Organic Comp	ounds

Project Colesvi	lle Landfill	Project No	o. <u>N</u>	IY000949.	0020	Page	<u>1</u> of <u>1</u>	
Site Location Harpurs	sville, NY					Date	10/25/08	-
Site/Well No. Tw	~ &	Replicate	No.		<del></del> ,	Code	No.	
Weather Sw	80	Sampling	Time:	Begin ]	255	End	1304	_
Evacuation Data			F	ield Parar	neters			_
Measuring Point		-	С	olor	_	4	1 how	_
MP Elevation (ft)			С	dor	•	U <sub>c</sub>	545000	
Land Surface Elevation	[ft)	<del></del>	Α	ppearance			y Now	<u> </u>
Sounded Well Depth (ft l	omp)		р	H (s.u.)	_	4.8	8	
Depth to Water (ft bmp)		······································	С	onductivity (mS/cm		1, 2	63	
Water-Level Elevation (ff	)			(µmhos	/cm) _	, ,	<del>\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ </del>	
Water Column in Well (ft	)		Т	urbidity (N	TU) _			_
Casing Diameter/Type	2"		Т	emperatur	e (°C) _	18.	42	_
Gallons in Well		· · · · · · · · · · · · · · · · · · ·	D	issolved C	xygen (m	g/L)	048	
Gallons Pumped/Bailed Prior to Sampling			0	RP	_			
Sample Pump Intake				ampling M	ethod	Boy	<u>Jec</u>	_
Setting (ft bmp)			К	emarks _	, J.,			_
Purge Time	begin	end			<u>07 K</u>	لمادي	10 4hr	
Pumping Rate (gpm)  Evacuation Method	Bales	, , , , , , , , , , , , , , , , , , ,			tow	- SIOK	S OF PUC	<u>ئ</u> ــــــــــــــــــــــــــــــــــــ
Evacuation Method	<u> </u>			020	Coco	<u> </u>	The Day	<u>د</u> > —
Constituents Sampled	(	Container Description	n	١	lumber		Preservative	
8021 VOLATILES		40 ML VOA VIALS				<del></del>	HCL	
Ethene, Ethane, Methan	<u> </u>	40 ML Vials						_
тос		40 ML Amber VOA	VIALS			<del></del>	H2SQ4	_
Total Iron		250 ML Plastic			<del></del>	_	HNO3	_
Sampling Personnel	KA							_
Well Casin		. ,						-
Gal./Ft. $1-\frac{1}{2}$ " = 0.06 $1-\frac{1}{2}$ " = 0.09		3" = 0.37 26 3-½" = 0.50	4" = 0.6 6" = 1.4					
bmp below measuring points  C Degrees Celsius  fet feet Gallons per minute	mS/cm M msl n N/A N	nililiter Ailisiemens per centime nean sea-level Not Applicable	ter	NTU PVC s.u. umhos/cn	Polyvin Standa n Microm	yl chloride rd units hos per ce	entimeter	
gpm Gallons per minute mg/L Miligrams per liter		Not Applicable Not Recorded		umhos/cn VOC		•	entimeter Compounds	

# Surface Water Sampling Form

Project Colesville Landfill	Project No. NY00094	9.002 <u>1</u>	F	Page of
Site Location Harpursville	NY		Date (0	25/08_
Site/Well No. 5P-	Replicate No.	Special Control Contro	<del>-</del>	
Weather S.D	Sampling Time	e: Begin <u>1347</u>	_ End	
Site Conditions		Field Parameters		
Water Quality Meter:	luanta	Color	Clear	
		Odor	DODE	
Location Condition:	cobbk	Appearance	Clear	······································
	,	pH (s.u.)	7.00	
Vegetation:	Troch alaga	Conductivity (ms/cm)	0.19	2
Double of Malania	Lill	Temperature (°C)		<u>.</u>
Depth of Water:		DO (mg/L)		
Estimated Flow Rate:	5' 110 Sec	Turbidity (NTU)		<del></del>
	•	ORP		
Collection Method:	5' 10 Sec	Time	·	NORMAN PROPERTY.
Remarks:				
	. ,			
			,	
0 " 10 " -	200	<b>.</b>		
Constituents Sampled: Se	ee COC Sampling	Personnel: KA		

# ARCADIS Surface Water Sampling Form

Project Colesville Landfill	Project No. <u>NY0009</u>	Page of			
Site Location Harpursvil	le NY		Date 6 25/08		
Site/Well No. F-(	Replicate No.				
Weather <u>Sw</u>	Sampling Tim	ne: Begin <u>1335</u>	End		
Site Conditions		Field Parameters			
Water Quality Meter:	Quanta	Color	Clear		
		Odor	DONG		
Location Condition:	Colodos +	Appearance	Clear		
dork	Gran ofade				
		pH (s.u.)	6.79		
Vegetation:	See a bove	, , ,	Mitanian and American Marian and American American and American Am		
		Conductivity (ms/cm)	105.0		
		Temperature (°C)	18.83		
Depth of Water:	_5"		A sea Maria and a sea		
	. 1 1	DO (mg/L)	attat		
Estimated Flow Rate:	5/10 Sec.	Turbidity (NTU)	***		
		ORP	MINISTER CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CO		
Collection Method:	direct grab	Time			
	•				
Remarks:					
<del> </del>	·				
Canatituanta Campladi	See COC Sampling	. Domannal:	۸		
Constituents Sampled:	Sampling	Personnel: K	<u>4</u>		

Project Colesville Landfill	Project No. N	Y000949.0020	Page <u>1</u> of <u>1</u>	
Site LocationHarpursville, NY			Date 6 25/08	
Site/Well No. GMPW-3	Replicate No.	*	Code No.	
Weather	Sampling Time:	Begin <u>1440</u>	End 1445	
Evacuation Data	F	ield Parameters		
Measuring Point	c	olor		
MP Elevation (ft)		odor		
Land Surface Elevation (ft)	A	ppearance	Cloudy	
Sounded Well Depth (ft bmp)	p	H (s.u.)	6.81	
Depth to Water (ft bmp)	C	onductivity (mS/cm)		
Water-Level Elevation (ft)		(µmhos/cm)		
Water Column in Well (ft)	T	urbidity (NTU)		
Casing Diameter/Type 2"		emperature (°C)		
Gallons in Well	D	issolved Oxygen (mg	g/L)	
Gallons Pumped/Bailed Prior to Sampling	0	RP		
	S	ampling Method	of dop took	au zhzku
Sample Pump Intake Setting (ft bmp)	R	emarks	7	
Purge Time begin	end	4		
Pumping Rate (gpm)				
Evacuation Method				
Constituents Sampled	Container Description	Number	Preservative	
8021 VOLATILES	40 ML VOA VIALS	_ 2	HCL	
Ethene, Ethane, Methane	40 ML Vials	· +		
TOC	40 ML Amber VOA VIALS		H2SO4	
Total Iron	250 ML Plastic		HNO3	
Sampling Personnel KA 1	D 0=	<del></del>	M	
	UM			
Well Casing Volumes  Gal./Ft. 1-¼" = 0.06 2" = 0.16  1-½" = 0.09 2-½" = 0.				
°C Degrees Celsius mS/cm M ft feet msl m gpm Gallons per minute N/A M	mililiter Milisiemens per centimeter nean sea-level Not Applicable Not Recorded	PVC Polyviny s.u. Standar umhos/cm Micromi	ometric Turbidity Units yl chloride d units hos per centimeter Organic Compounds	

Project	Colesville	Landfill	_	Project No.	NY0009	49.002	:0	Page	1 of 1
Site Location	Harpursvill	e, NY						Date	80/25/02
Site/Well No.	Smpw.	. 4	_	Replicate No.	·	-		Code	No
Weather			<u> </u>	Sampling Tim	e: Begi	14	20	End	1425
Evacuation D	ata	, , , , , , , , , , , , , , , , , , ,			Field Pa	ramet	ers		
Measuring Pol	int	· · · · · · · · · · · · · · · · · · ·		·····	Color			Cle	ar_
MP Elevation	(ft)				Odor		<del></del>		
Land Surface	Elevation (ft)	· · · · · · · · · · · · · · · · · · ·		<del>,</del>	Appeara	ince			
Sounded Well	Depth (ft bm	p)		···	pH (s.u.)	)		(0,5	30
Depth to Wate	r (ft bmp)			<del></del>	Conduct (mS		_		
Water-Level E	levation (ft)	maide.		<del></del>	(µml	nos/cm	)		
Water Column	in Well (ft)				Turbidity	(NTU)			
Casing Diamet	ter/Type	2"		<u> </u>	Tempera	ature (°	C)		
Gallons in Wel	1		·······		Dissolve	d Oxyg	jen (mg	g/L)	
Gallons Pumpe Prior to	ed/Bailed Sampling				ORP		-	······································	
Sample Pump Setting (		, , , , , ,			Samplin		od Î	27500	t grab
Purge Time		begin	end						
Pumping Rate	(gpm)	. , <u></u>					<del></del>		
Evacuation Me	ethod			· · · · · ·					
Constituents S	ampled		Container	Description		Num	nber		Preservative
8021 VOLATIL	.ES	····················	40 ML V	OA VIALS	<del></del>		<u>2_</u>	****	HCL
Ethene, Ethan	e, Methane		40 ML V	/ials				_	
TOC			40 ML A	mber VOA VIA	LS				H2SO4
Total Iron	<del></del>	<del></del>	250 ML	Plastic	<del></del>		1		HNO3
Sampling Pers	onnel	KA / *	D(m)					<del></del>	
Gal./Ft.	Well Casing V 1-¼" = 0.06 1-½" = 0.09	olumes 2" = 0.1 2-1/2" = (			0.65 1.47				
bmp below me °C Degrees of ft feet gpm Gallons p mg/L Miligrams	er minute	ml mS/cm msl N/A NR	mililiter Milisiemens mean sea-le Not Applicat Not Recorde	ole	NTU PVC s.u. umho VOC	s/cm	Polyviny Standard Micromh	il chloride d unils nos per ce	

Project Colesville Landfill	Project No.	NY000949.00	20 Page	<u>1</u> of <u>1</u>
Site LocationHarpursville, NY			Date	6/25/08
Site/Well No. GM PW-5	Replicate No.		Code	No.
Weather	Sampling Time	: Begin L	115 End	1419
Evacuation Data		Field Parame	ters	
Measuring Point		Color	<u></u>	aR
MP Elevation (ft)	<del> </del>	Odor	<del> </del>	
Land Surface Elevation (ft)		Appearance		······································
Sounded Well Depth (ft bmp)		pH (s.u.)		43
Depth to Water (ft bmp)		Conductivity (mS/cm)		
Water-Level Elevation (ft)		(µmhos/cr	n)	**************************************
Water Column in Well (ft)		Turbidity (NTL	J)	
Casing Diameter/Type2"		Temperature (	(°C)	
Gallons in Well	- <u> </u>	Dissolved Oxy	gen (mg/L)	<u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>
Gallons Pumped/Bailed Prior to Sampling		ORP	·····	.humuyin kan makalayah akida makulus,
Sample Pump Intake Setting (ft bmp)		Sampling Met Remarks	hod DAG	ect grab
Purge Time begin	end			, , , , , , , , , , , , , , , , , , ,
Pumping Rate (gpm)			,	
Evacuation Method				
Constituents Sampled	Container Description	Nu	mber	Preservative
8021 VOLATILES	40 ML VOA VIALS	·············	2	HCL
Ethene, Ethane, Methane	40 ML Vials		-	
TOC	40 ML Amber VOA VIAL	<u> </u>		H2SO4
Total Iron	250 ML Plastic	<del></del>		HNO3
Sampling Personnel KA				
Well Casing Volumes			7	· · · · · · · · · · · · · · · · · · ·
Gal./Ft. $1-\frac{1}{2}$ " = 0.06 2" = 0 $1-\frac{1}{2}$ " = 0.09 $2-\frac{1}{2}$ "	0.16 3" = 0.37 4" = 0 = 0.26 3-\%" = 0.50 6" = 1			
bmp below measuring point ml °C Degrees Celsius mS/c ft feet msl gpm Gallons per minute N/A mg/L Miligrams per liter NR	mililiter m Milisiemens per centimeter mean sea-level Not Applicable Not Recorded	NTU PVC s.u. umhos/cm VOC	Nephelometric T Polyvinyl chlorid Standard units Micromhos per o Volatile Organic	e centimeter

Project Colesville Landfill	Project No. N	Y000949.002	20 Page	1 of 1
Site Location Harpursville, NY			Date	6/25/08
Site/Well No. Combined without	Replicate No.		Code	No
Weather	Sampling Time:	Begin <u>간</u>	4 <u>8</u> End	1446 H52
Evacuation Data	F	ield Paramet	ers	
Measuring Point	C	olor	_00	udy
MP Elevation (ft)		dor		ر.
Land Surface Elevation (ft)	<u>/</u> A	ppearance	<del></del>	
Sounded Well Depth (ft bmp)	p	H (s.u.)		
Depth to Water (ft bmp)	c	onductivity (mS/cm)		
Water-Level Elevation (ft)		(µmhos/cm	1)	
Water Column in Well (ft)	T	urbidity (NTU	)	
Casing Diameter/Type 2"		emperature (	,C)	
Gallons in Well	D	is <b>s</b> olved Oxy	gen (mg/L)	
Gallons Pumped/Bailed Prior to Sampling	0	RP	******	
Sample Pump Intake Setting (ft bmp)		ampling Methemarks	log Traj	o Sample
Purge Time begin end				
Pumping Rate (gpm)		····		
Evacuation Method				
Constituents Sampled Container	r Description	Nur	nber	Preservative
8021 VOLATILES 40 ML \	VOA VIALS	<del>-</del>	2	HCL
Ethene, Ethane, Methane 40 ML	Vials	-		
TOC 40 ML A	Amber VOA VIALS		<del></del>	H2SO4
Total Iron 250 ML	Plastic	_	<u> </u>	HNO3
Sampling Personnel KA / D (M				
	= 0.37			
bmp below measuring point ml mililiter  °C Degrees Celsius mS/cm Milisiemens ft feet msl mean sea-l gpm Gallons per minute N/A Not Applica mg/L Miligrams per liter NR Not Record	able	NTU PVC s.u. umhos/cm VOC	Nephelometric T Polyvinyl chloride Standard units Micromhos per c Volatile Organic	eentimeter

Project Colesville	Landfill	Project No. N	IY000949.002	20 Page	1 of 1
Site Location Harpursy	ille, NY_			Date	6/25/08
Site/Well No. EFF	4 NT	Replicate No.	-	Code	No
Weather	witer	Sampling Time:	Begin LL	50 End	MARIB
Evacuation Data		F	ield Paramet	ers	•
Measuring Point	· · · · · · · · · · · · · · · · · · ·		olor	t	
MP Elevation (ft)			dor		
Land Surface Elevation (ft	.)	A	ppearance		
Sounded Well Depth (ft br	mp)	P	H (s.u.)		
Depth to Water (ft bmp)	· ·	C	onductivity (mS/cm)		
Water-Level Elevation (ft)		bloss:	(µmhos/cm	)	
Water Column in Well (ft)			urbidity (NTU)	)	
Casing Diameter/Type	2"	Т	emperature (°	C)	
Gallons in Well			issolved Oxyg	jen (mg/L)	
Gallons Pumped/Bailed Prior to Sampling		C	RP	***************************************	
, -		s	ampling Meth	od Disers	t acop
Sample Pump Intake Setting (ft bmp)		R	emarks		<u> </u>
Purge Time	beginend				
Pumping Rate (gpm)			*		
Evacuation Method					
Constituents Sampled	Container	Description	Num	nber	Preservative
8021 VOLATILES	40 ML V	OA VIALS		<u> </u>	HCL
Ethene, Ethane, Methane	40 ML \	√ials		<del> </del>	
TOC	40 ML A	mber VOA VIALS			H2SO4
Total Iron	250 ML	Plastic	<del></del>	1	HNO3
Sampling Personnel	KADM				
Well Casing Gal./Ft. 1-1/4" = 0.06 1-1/2" = 0.09	2" = 0.16 3" =	= 0.37 4" = 0.6 " = 0.50 6" = 1.4		_	
bmp below measuring point °C Degrees Celsius ft feet gpm Gallons per minute mg/L Miligrams per liter	ml millilter mS/cm Millsiemens msl mean sea-li N/A Not Applica NR Not Record	evel ble	PVC s.u. umhos/cm	Nephelometric T Polyvinyl chlorid Standard units Micromhos per c Volatile Organic	e centimeter

## Appendix B

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

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

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

Compounds	CAS Numbers	Maximum Limit (SGC)	Analytical Concentration	Detection Limit Used	Actual Emissions C <sub>a</sub>	Mass/hour	Maximum Potential Impact (Step III.A.3 in DAR-1)	Short Term Impact (Step III.A.5 in DAR-1)	Percent of the SGC
		(ug/m³)	(ppb)		(ug/m³)	(lb/hr)	(ug/m³)	(ug/m³)	(%)
Vinyl Chloride	75-01-4	180,000	7.3	*	18.97	2.66E-05	0.0046	0.29596	1.6E-04
Chloroethane(Ethyl Chloride)	75-00-3		7.3	*	19.58	2.75E-05	0.0047	0.30553	NA
1,1-Dichloroethene(Vinylidene Chloride)	75-35-4		7.3	*	29.42	4.13E-05	0.0071	0.45909	NA
Methylene Chloride(Dichloromethane)	75-09 <b>-</b> 2	14,000	7.3	•	25.78	3.62E-05	0.0062	0.40222	2.9E-03
1,1-Dichloroethane	75-34-3		7.3	*	30.03	4.22E-05	0.0072	0.46866	NA
cis-1,2 - Dichloroethylene	156-59-2		7.3	*	29.42	4.13E-05	0.0071	0.45909	NA
1,1,1-Trichloroethane(Methyl Chloroform)	71-55-6	68,000	7.3	*	40.49	5.69E-05	0.0097	0.63179	9.3E-04
Trichloroethene	79-01-6	14,000	7.3	*	39.88	5.60E-05	0.0096	0.62223	4.4E-03
m,p-Xylene	108-38-3/106-42-3	4,300	7.3	*	31.60	4.44E-05	0.0076	0.49314	1.1E-02
Dichlorofluoromethane(Freon 12)	75-71-8		7.3	*	36.69	5.15E-05	0.0088	0.57251	NA

ug/m<sup>3</sup>: Micrograms per cubic meter

ppb: parts per billion

lb/hr: pounds per hour

NA: Not applicable

#### Notes:

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

<sup>\*:</sup> Analyte concentration below detection limit, detection limit was used in calculations

<sup>--:</sup> No SGC listed for compound

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

Compounds	CAS Numbers	Maximum Limit on C <sub>a</sub> (AGC <sup>4</sup> )	Maximum Mass Flow Q <sub>a</sub>	Lab Data	Detection Limit Used⁵	Actual Emissions C <sub>a</sub>	Actual Mass Flow per Hour	Actual Mass Flow per Year	Percent of Annual
		ug/m³	lb/yr	ppb		ug/m³	lb/hr	lb/yr	%
Vinyl Chloride	75-01-4	0.11	10.76	7.3	*	18.97	1.54E-05	0.13381	 1, <b>2</b> 4
Chloroethane(Ethyl Chloride)	75-00-3	10,000	978,044.97	7.3	*	19.58	1.59E-05	0.13813	0.00
1,1-Dichloroethene(Vinylidene Chloride)	75-35-4	70	6,846,31	7.3	*	29.42	2.39E-05	0.20756	0.00
Methylene Chloride(Dichloromethane)	75-09-2	2.1	205.39	7.3	*	25.78	2.09E-05	0.18185	0.09
1,1-Dichloroethane	75-34-3	0.63	61.62	7.3	*	30.03	2.44E-05	0.21188	0.34
cis-1,2-Dichloroethylene	156-59-2	63	6,161.68	7.3	*	29.42	2.39E-05	0.20756	0.00
1,1,1-Trichloroethane(Methyl Chloroform)	71-55-6	1.000	97.804.50	7.3	*	40.49	3.29E-05	0.28564	0.00
Trichloroethene	79-01-6	0.5	48.90	7.3	*	39.88	3.24E-05	0.28131	0.58
m,p-Xylene	108-38-3/106-42-3	100	9,780.45	7.3	*	31.60	2.56E-05	0.22295	0.00
Dichlorodifluoromethane(Freon 12)	75-71-8	12,000	1,173,653.96	7.3	*	18.24	1.48E-05	0.12867	0.00

fps: feet per second

acfm: actual cubic feet per minute ug/m³: micrograms per cubic meter

lb/yr: pounds per year lb/hr: pounds per hour ppb: parts per billion

#### Notes/Assumptions:

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

## Appendix C

Automated Reagent Injection System Operating Parameters

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

## **Summary of Automated Reagant Injections**

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

Notes:

gal.

Gallons

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

			Injection Number	r 58					
Injection Start Date = Injection Completion Date = Molasses to Water Ratio (%) =		3/26/2008 5/10/2008							
		1.0		Programmed Mix	Programmed Mixing Time (min.) <sup>1</sup> =				
Injection Well ID	Molasses Solution Injection Quantity (gal.)	Rinse <sup>2</sup> Quantity (gal.)	Raw Molasses Per Well (gal.)	Min. Injection <sup>3</sup> Flowrate (gpm)	Max. Injection Pressure (psi)				
PW-6	530	5	 5.3	NM	26				
IW-3	530	5	5.3	NM	26				
IW-1	210	4	2.1	NM	27				
IW-2	210	3	2.1	NM	25				
GMMW-1	<b>1</b> 40	3	1.4	NM	10				
IW-4	989	4	9.9	NM	27				
IW-5	989	5	9.9	NM	27				
IW-6	989	7	9.9	NM	27				
IW-7	989	8	9.9	NM	28				
IW-8 <sup>4</sup>	0	0	0.0	NM	0				
IW-9	1,230	11	12.3	NM	0				
IW-10	1,230	12	12.3	NM	28				
IW-11	1,230	13	12.3	NM	26				
IW-12	1,230	15	12.3	NM	27				
IW-13	1,230	16	12.3	NM	27				
IW-14	989	18	9.9	NM	27				
IW-15	989	19	9.9	NM	26				
rotals (gal.) =	13,705	148	137.1	NA	NA				
Notes:									
al.	Gallons.								
nin.	Minutes.								
w.c.	Inches of water colu	mn.							
si	Pounds per square in								
pm	Gallons per minute.								
A	Not applicable.								
М	Not measured.								
•	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.								
	Rinse quantity was injected manually at 20 gpm for 1 minute.								
•	Research was injected manually at 20 gpm of 1 million.								

Parameter not measured due to SCADA system malfunction.

Injection not conducted into IW-8 for ongoing Alternate Electron Donor Pilot test evaluation.

3.

4.