



TETRA TECH, INC.

April 12, 2013

Mr. Dustin Johnson  
The City of Bozeman  
P.O. Box 1230  
Bozeman, Montana 59771-1230

**RE: Report of Groundwater Monitoring Activities – December 2012  
City of Bozeman Sanitary Landfill  
Bozeman, Montana**

Dear Dustin:

Enclosed is the above referenced report. Please contact me with any questions or comments to this report or project.

We appreciate the opportunity to work with the City of Bozeman on this project.

Sincerely,

Mark F. Pearson  
Project Manager

mfp

Enclosure: Report of Groundwater Monitoring Activities – December 2012

Copies of this report have been sent to:

- 1) Mr. Martin VanOort, Montana DEQ
- 2) Mr. and Mrs. Gianforte

851 Bridger Drive, Suite 6 (59715)  
P.O. Box 1413 (59771)  
Bozeman, MT  
Office 406.582.8780  
Fax 406.582.8790

**REPORT OF GROUNDWATER MONITORING ACTIVITIES  
DECEMBER 2012**

**BOZEMAN SANITARY LANDFILL  
BOZEMAN, MONTANA**

**REPORT OF GROUNDWATER MONITORING ACTIVITIES  
DECEMBER 2012**

**BOZEMAN SANITARY LANDFILL  
BOZEMAN, MONTANA**

Submitted to:

Mr. Dustin Johnson, P.E.  
City of Bozeman  
P.O. Box 1230  
Bozeman, Montana 59771-1230

Submitted by:

Tetra Tech, Inc.  
851 Bridger Drive, Ste 6  
Bozeman, Montana 59715

April 12, 2013

## TABLE OF CONTENTS

	Page
<b>1.0 INTRODUCTION</b> .....	1
1.1 METHODS .....	1
1.1.1 Water Level and Field Parameter Measurements .....	1
1.1.2 Groundwater Monitoring .....	1
<b>2.0 DATA PRESENTATION AND ANALYSIS</b> .....	3
2.1 GROUNDWATER OCCURRENCE AND MOVEMENT .....	3
2.2 GROUNDWATER QUALITY .....	4
2.2.1 Inorganic Groundwater Quality .....	4
2.2.2 Organic Groundwater Quality .....	5
<b>3.0 DATA VALIDATION</b> .....	5
3.1 FIELD QA/QC .....	5
3.2 LABORATORY QA/QC .....	6
<b>4.0 STATISTICAL ANALYSIS OF WATER QUALITY DATA</b> .....	7
4.1 STATISTICAL TEST SELECTION .....	8
4.1 STATISTICAL METHODS .....	8
4.2.1 Non-Parametric 1-Sample Wilcoxon Test .....	9
4.2.2 Parametric 1-Sample t-Test .....	9
4.2 RESULTS .....	10
<b>5.0 SUMMARY</b> .....	11
<b>6.0 REFERENCES</b> .....	13

## LIST OF APPENDICES

### APPENDIX A: FIGURES

- FIGURE 1 Site Location Map
- FIGURE 2 Site Map
- FIGURE 3 December 2012 – Water Table Map

### APPENDIX B: TABLES

- TABLE 1 Groundwater Levels
- TABLE 2 Summary of Detected Volatile Organic Compounds in Selected Groundwater Samples
- TABLE 3 Comparison of Medians of Selected Groundwater Quality Data
- TABLE 4 Summary of Statistical Analysis of Selected Groundwater Quality Data

### APPENDIX C: GROUNDWATER SAMPLING LOGS

### APPENDIX D: LABORATORY ANALYTICAL REPORT

### APPENDIX E: STATISTICAL EVALUATION DATA AND WORKSHEETS

## 1.0 INTRODUCTION

This report presents the results of groundwater monitoring activities for December 2012 at the City of Bozeman Sanitary Landfill (**Figure 1, Appendix A**). Tetra Tech personnel conducted the monitoring in accordance with a Task Order for conducting the December 2012 and June 2013 monitoring events dated November 9, 2012 and the *Groundwater Sampling and Analysis Plan* dated October 28, 2010. The task order was approved by the City of Bozeman on December 3, 2012.

Monitoring activities included the measurement of water levels, field parameters, and sampling of wells and a surface water spring (McIlhattan Seep). Monitoring sites are shown in **Figure 2 (Appendix A)**.

### 1.1 METHODS

This section describes methods used to monitor groundwater at the Bozeman Sanitary Landfill. Results of the monitoring activities are presented in Section 2.0. Figures presenting the site location, monitoring sites, and other site aspects are contained in **Appendix A**. Data tables are contained in **Appendix B**.

Prior to this monitoring event, the Department of Environmental Quality (DEQ) approved of a decreased monitoring scope and metals analysis. Therefore, on November 28, 2012, DEQ approved the following decreases in the frequency of monitoring:

- Wells MW-7B, MW-8B, and MW-9B would be reduced to once every 3 years.
- Well MW-14 would be reduced to once every year.
- Wells MW-6B, MW-8C, and MW-16 need 4 independent samples (minimum semi-annually) collected before a change in future monitoring schedules would be considered.

On November 28, 2012, DEQ provided a one-time approval to drop analysis of metal constituents in wells: MW-4, MW-7A, MW-9A, MW-10, MW-11, MW-12, and McIlhattan Seep station.

#### 1.1.1 Water Level and Field Parameter Measurements

Depth to groundwater was measured in each monitoring well during the monitoring event. Water levels were measured from a designated measuring point on the north quadrant of the polyvinyl chloride (PVC) collar of each well. An electric well probe was used for water level measurements and routinely decontaminated before use at each well. Other field parameter measurements, including temperature, pH, specific conductivity, dissolved oxygen (DO), and oxidation reduction potential (ORP) were measured with a YSI<sup>®</sup>-556 multimeter in samples collected from the monitoring wells during purging; in purge water during pumping of wells; or downhole, in most of the wells following purging with a bailer. In the case of McIlhattan Spring, the multiprobe was completely submersed in the spring flow at the sampling location. The measurements were recorded on groundwater sampling logs included in **Appendix C**.

#### 1.1.2 Groundwater Monitoring

The December 2012 monitoring event was an assessment groundwater monitoring event and consisted of groundwater samples being collected from 15 monitoring wells (LF-2, LF-3, MW-4,

MW-5, MW-6, MW-6B, MW-7A, MW-8A, MW-9A, MW-10, MW-11, MW-12, MW-13, MW-15, and MW-16), the McIlhattan Seep, and Valley View (formerly McIlhattan) Veterinary Clinic (Vet) well. In addition, samples were collected from the water supply well: Landfill Shop Well (shop well). Well and other sampling locations are shown in **Figure 2**.

Samples collected from these locations were analyzed for VOCs and inorganic parameters listed in Appendix I to 40 CFR Part 258 contained in ARM 17.50.1306(7). The analytical lists are included with the laboratory analytical report in **Appendix D**. DEQ had previously approved omissions and additions of constituents to the Appendix I list. These include the omission of antimony, beryllium, and mercury and the addition of iron, manganese, and dichlorodifluoromethane. Therefore, all of the wells and sample sites were analyzed for VOCs, iron and manganese, and inorganic parameters with exception to wells LF-2 (VOCs and nitrate+nitrite as N), MW-16 (VOCs), and the shop well (VOCs).

Pace Analytical Services, Inc. (Pace), in Billings, Montana was contracted to furnish the sample containers, a trip blank, and conduct the analysis. The trip blank was prepared in Pace's Billings laboratory and consisted of de-ionized water. Upon Pace's receipt of the samples, the trip blank was analyzed for VOCs (8260 method) listed in Appendix I to 40 CFR Part 258 contained in ARM 17.50.1306(7) plus dichlorodifluoromethane. A duplicate sample was also collected at well MW-13 and submitted for analysis of VOCs, iron and manganese, and inorganic parameters.

Water samples were collected from each monitoring well in accordance with the *Groundwater Monitoring Sampling and Analysis Plan* for the site (Tetra Tech 2010). In general, the following sampling procedures were used:

- Monitoring wells were purged using either dedicated submersible pump(s), decontaminated submersible pumps with disposable tubing, or dedicated and/or disposable polyethylene bailers.
- A minimum of three well casing volumes were removed in wells that had suitable recovery, with the objective of sampling "formation" water. In wells with poor recovery, an effort was made to purge to a casing water column that was less than the length of a bailer and then allow the well to recover for sampling and subsequent monitoring (if DO and ORP was being measured downhole).
- Each sample obtained for dissolved metals analysis was filtered in the field through a disposable 0.45-micron filter. The samples were filtered directly from the dedicated (or disposable) bailer or pump discharge hose into appropriate labeled containers and preserved with nitric acid.
- All other samples were transferred into appropriate labeled containers and preserved, as necessary.
- Pertinent information (sample date, time, well location, personnel, etc.) was recorded on groundwater monitoring logs. These forms are included in **Appendix C**.
- Samples were packed in ice-filled coolers and shipped with chain-of-custody forms to Pace Analytical Services, Inc., in Billings, Montana. Chain-of-custody forms for the sampling events are included with the laboratory reports in **Appendix D**.

- Monitoring activities at the McIlhatten Seep (**Figure 2**) consisted of directly filling the sample bottles where the seep emanates at ground surface. Consistent with previous monitoring events, dissolved metals analysis had been selected at this location to provide for direct comparison with other monitoring locations' dissolved metals analysis. The sample for dissolved metals analysis was collected in a disposable bailer, filtered, and preserved with nitric acid. All other samples were collected in appropriate labeled containers and preserved, as necessary.
- Monitoring activities at the water supply well located at Valley View Veterinary Hospital on 2717 McIlhatten Road (formerly McIlhatten Veterinary Clinic) consisted of purging the well through a faucet in the kennel adjacent to the office. Approximately 90 gallons were purged prior to collecting a sample. The purging method and volume purged was consistent with previous monitoring events. As in previous monitoring events, the sample for metals was not filtered for reporting as total recoverable metals concentrations. All other samples were collected in appropriate labeled containers and preserved, as necessary.

The December 2012 monitoring event field parameter measurements and laboratory analytical results were entered into Tetra Tech's database management system. Data entries were then checked by Tetra Tech personnel to ensure correct data entry.

## 2.0 DATA PRESENTATION AND ANALYSIS

Data collected at the City of Bozeman Sanitary Landfill during the December 2012 monitoring event are summarized in this section. Figures and tables cited in the report are contained in **Appendix A** and **B**, respectively. Groundwater sampling logs, chain-of-custody documents, and laboratory analytical reports for the monitoring events are contained in **Appendices C** and **D**, respectively.

### 2.1 GROUNDWATER OCCURRENCE AND MOVEMENT

Groundwater occurrence, movement, hydraulic gradient, and other groundwater aspects are discussed. A groundwater flow and gradient map representing the December 2012 groundwater elevations is presented in **Figure 3**.

#### ***Site Groundwater Flow Direction and Hydraulic Gradient***

The December 2012 water levels at the landfill were generally consistent with groundwater elevations measured in previous December monitoring events and indicate a southwest groundwater flow beneath the *Unlined Closed Cell* shifting to a west-southwest flow between the *Lined Closed Cell* and well MW-10, at the western margin of the site. The groundwater gradient beneath the *Unlined Closed Cell* is a consistent 5.4% between wells MW-15 and MW-12. The groundwater gradient decreases between wells MW-12 and MW-4 to approximately 1.7 to 2.2% and then steepens again to approximately 4.2% between wells MW-4 and MW-10. In the vicinity of well MW-10, groundwater gradient is inferred to significantly decrease as indicated by topography in the vicinity of this well, near-surface groundwater level at this location, and its proximity with the East Gallatin River (**Figure 3**).

In addition to map hydraulic gradients mentioned above, the measurement of groundwater elevations in monitoring wells determined the following vertical groundwater gradients at the site:

MW-6 and 6B	The groundwater elevation in well MW-6B is 12 feet higher than in well MW-6 indicating a distinct upward hydraulic gradient between groundwater at screened depths (below ground surface) of approximately 41 to 56 feet (MW-6) and 90 to 100 feet (MW-6B).
MW-7A and 7B	As observed in previous monitoring events, groundwater elevations are the same in both wells indicating no upward or downward gradients in groundwater to approximately 74 feet depth (below ground surface).
MW-8A, 8B, and 8C	The groundwater elevation in well MW-8C is approximately 4 feet higher than in well MW-8A indicating an upward hydraulic gradient groundwater at depths of approximately 41 to 70 feet (MW-8A and 8B) and 93 to 103 feet (MW-8C). As observed in previous monitoring events, groundwater elevations in wells MW-8A and 8B are the same indicating no upward or downward gradients in groundwater to approximately 70 feet depth.
MW-9A and 9B	As observed in previous monitoring events, groundwater elevations are the same in both wells indicating no upward or downward gradients in groundwater to approximately 57 feet depth.

### ***Hydraulic Conductivity and Groundwater Movement***

Hydraulic conductivities of the alluvial fan deposits underlying the site had been evaluated in 1994 using a short-term aquifer test and laboratory hydraulic conductivity tests (Huntingdon, 1994). Results of these tests indicate hydraulic conductivity ranging between 97 centimeters per second (cm/sec) and  $5.2 \times 10^{-6}$  cm/sec. The relatively wide range of hydraulic conductivity values is indicative of a heterogeneous nature of the alluvial fan deposits. The average calculated hydraulic conductivity of the alluvial fan sediments is approximately  $2.0 \times 10^{-2}$  cm/sec (56.7 feet per day). This is a typical hydraulic conductivity value for clean sand (Freeze and Cherry, 1979). Assuming an effective porosity of 0.35 (typical values for sand and gravel range from 0.28 to 0.39; Todd, 1980) and map hydraulic gradients ranging from 1.7% to 5.4%, the approximate rate of groundwater movement beneath the Bozeman Landfill ranges between 2.8 and 9.1 feet per day.

## **2.2 GROUNDWATER QUALITY**

A discussion of the December 2012 results for analyses of inorganic parameters and volatile organic compounds is presented in the following sections. The Groundwater Protection Standard (GPS) is the concentration of constituents in site upgradient wells MW-5 and MW-15 and/or equal to the United States Environmental Protection Agency (USEPA) Maximum Contaminant Level (MCL) or the Montana Human Health Standard (HHS) cited in Circular DEQ-7 Montana Numeric Water Quality Standards (DEQ 2012).

### **2.2.1 Inorganic Groundwater Quality**

Montana landfill inorganic parameters include chloride, sulfate, electrical conductivity, pH, nitrate+nitrite, and up to 15 metals. Metal concentrations in samples collected from monitoring wells during the December 2012 were generally near or below the practical quantitation limit (PQL) and this is consistent with previous monitoring events. With exception to nitrate+nitrite as N and iron, inorganic constituent concentrations in wells did not meet or exceed the regulatory standards. Sites where metal concentrations were higher than the analytical reporting limit (RL) or of note are listed below:



- The nitrate+nitrite as N concentrations ranged between non-detection to 16 milligrams per liter (mg/L). The nitrate+nitrite as N concentration in well MW-8A was 16 mg/L and exceeded the GPS or MCL for nitrate+nitrite as N of 10 mg/L (DEQ 2012). Well MW-8C had nitrate+nitrite as N concentration of 5.8 mg/L.
- Iron concentrations ranged between non-detection to 3.6 mg/L. Iron concentrations in wells MW-10 and MW-12 were the highest (2.8 and 3.6 mg/L, respectively). There is no longer a human health guideline for iron (DEQ 2012).
- Manganese concentrations ranged between non-detection to 4.2 mg/L. Manganese concentrations in wells MW-10, MW-12, and MW-13 were the highest (0.1 to 4.2). There is no longer a human health guideline for manganese (DEQ 2012).
- Chloride concentrations ranged between 1.8 and 70.4 mg/L.
- Sulfate concentrations ranged between 4.3 and 111 mg/L.

### 2.2.2 Organic Groundwater Quality

**Table 2** summarizes concentrations of selected VOCs in monitoring events. Wells or sites with concentrations of tetrachloroethene and/or trichloroethene included wells LF-2, LF-3, MW-4, MW-6, MW-7A, MW-8A, MW-9A, MW-11, MW-12, MW-13, MW-16, shop well, and the McIlhattan Seep. Tetrachloroethene concentrations ranged between non-detection and 7.7 micrograms per liter ( $\mu\text{g/L}$ , well MW-7A). Trichloroethene concentrations ranged between non-detection and 2.1  $\mu\text{g/L}$  (shop well). Wells or sites with concentrations of vinyl chloride included wells MW-6, MW-7A, MW-12, and MW-13 where concentrations ranged between 1.5 and 21.2  $\mu\text{g/L}$ .

Tetrachloroethene (in well MW-7A) and vinyl chloride (in wells MW-6, MW-7A MW-12, and MW-13) were the only VOCs detected above the GPS during the December 2012 monitoring event. The GPS for tetrachloroethene is 5  $\mu\text{g/L}$ . The United States Environmental Protection Agency (USEPA) GPS for vinyl chloride is 2  $\mu\text{g/L}$ . However, Montana has a lower GPS (also known as the Human Health Standard) for vinyl chloride, 0.2  $\mu\text{g/L}$  (DEQ 2012).

## 3.0 DATA VALIDATION

This section describes the data validation process used to determine the adequacy and quality of laboratory analytical data from the December 2012 monitoring event at the Bozeman Sanitary Landfill. The objective of data validation is to identify any unreliable or invalid laboratory measurements and qualify that data for interpretive use. These validations are performed according to guidelines prepared by U.S. EPA (1994a and 1994b).

### 3.1 FIELD QA/QC

A duplicate sample was collected from well MW-13 during the December 2012 monitoring event. The sample was labeled "Dup" and shipped to Pace Analytical Services, Inc., in Billings, Montana for analysis of VOCs and inorganic parameters listed in ARM 17.50.1306 plus dichlorodifluoromethane. A trip blank also accompanied the groundwater samples collected in December 2012. The trip blank was labeled "Trip Blank", and consisted of deionized water containerized by the laboratory, shipped to Tetra Tech's Bozeman, Montana office with the sample containers, and shipped back to the laboratory with the samples upon conclusion of the

field activities. The trip blank was analyzed for all VOCs listed in ARM 17.50.1306 plus dichlorodifluoromethane.

Field duplicate results aid in the assessment of sampling and analytical precision. Analytical results for the natural and duplicate samples collected from McIlhattan Seep were evaluated using the following criteria:

- The Relative Percent Difference (RPD) between the two samples was calculated when both values of the natural/duplicate pair were greater than five times the Minimum Detection Limit (MDL) for a given analyte.
- The Absolute Value Difference (AVD) between the natural and duplicate sample for a given analyte was calculated when one or both values were less than five times the MDL.

RPDs are calculated by dividing the difference between the two reported values for a given parameter by the average of the two parameters. Analytical results of parameters where the RPD was greater than 20 percent are considered estimated concentrations. Analytical results between the natural and duplicate samples collected from well MW-13 had no RPDs greater than 20 percent.

AVDs are calculated by subtracting the results of the two reported values for a given parameter. If the difference exceeds the MDL, then results for this parameter are considered estimated. Analytical results between the natural and duplicate samples collected from well MW-13 had AVDs greater than the MDL.

All trip blank results were evaluated using the following criteria:

- Analytical results of the trip blank sample were reviewed to determine if any parameter was measured in the sample at detectable concentrations. No VOCs were detected in the December 2012 trip blank.
- For detected constituents, all results greater than the MDL but less than five times the concentration of the detected constituent are considered estimated and are likely biased towards the high end.
- The following constituents are common laboratory contaminants and are considered estimated when results are greater than the MDL but less than 10 times the concentration in the contaminated blank:
  - Methylene chloride
  - Acetone
  - 2-butanone

### **3.2 LABORATORY QA/QC**

Pace Analytical received groundwater samples collected from the City of Bozeman Sanitary Landfill on December 7, 2012. Chain-of-custody documents accompanied the samples from collection to receipt at the laboratory. The pH was measured in all bottles upon receipt or before analysis to assure proper field preservation techniques were used. All samples were properly preserved and all samples were analyzed within the respective holding time for each analyte. The

quality assurance coordinator at Pace Analytical reviewed calibration standards, calibration verification, laboratory controls, laboratory duplicates, and laboratory spikes on a daily basis.

Review of all other laboratory quality assurance indicators showed all inorganic and organic analyses were in compliance with published QA/QC criteria and within the laboratory precision and accuracy guidelines with the exception of pH method SM 4500-H+B, where analysis was initiated more than 15 minutes after sample collection. System performance checks were also performed to evaluate proper system performance and calibration for VOC and semi-volatile analyses. All data indicate the GC/MS system was performing properly.

#### 4.0 STATISTICAL ANALYSIS OF WATER QUALITY DATA

The City of Bozeman completed a corrective measures assessment for the Bozeman Sanitary Landfill in August 1995. A landfill gas extraction system was installed as a result, and has been operated at the site since December 1997 (Maxim, 2000). According to ARM 17.50.1310(5)(b), remedies selected as a result of the corrective measures assessment are considered complete when concentrations of all parameters listed in ARM 17.50.1307 have not exceeded the GPS for a period of three consecutive years based on statistical analysis of the data.

Of those parameters listed in ARM 17.50.1307, the following parameters have equaled or exceeded the Groundwater Protection Standard at the Bozeman Sanitary Landfill on at least a single occasion since 2005:

- Nitrate+Nitrite as N
- Tetrachloroethene
- Trichloroethene
- Vinyl Chloride

These parameters were statistically evaluated to determine which are present at statistically significant concentrations above enforcement standards. Selection and description of the statistical tests employed are described below, as are the results.

There are two point-of-compliance (POC) wells downgradient of the closed *Unlined Cell* and these are wells MW-6 and MW-8A (**Figure 2**). The upgradient wells are MW-5 and MW-15.

In consideration of vinyl chloride concentrations in well MW-6 and MW-7A, statistics was conducted using the USEPA Maximum Contaminant Level (MCL) of 2 µg/L as the GPS instead of the Montana Human Health Standard (HHS) of 0.2 µg/L. The reasons for this are as follows:

- A data set of 15 to 20 data points can be used when the GPS is set to 2 µg/L.
- The MW-6 and MW-7A data sets incorporating a PQL or MDL of 0.2 µg/L are, at present, too small to conduct meaningful statistical calculations (see **Table 2**).
- Statistical calculations can continue to be performed for vinyl chloride in wells MW-6 and MW-7A while the collection of additional data points at a lower detection limit is ongoing. A GPS of 0.2 µg/L can be used when these data sets are of adequate size for meaningful statistical calculations.

In accordance with ARM 17.50.1307, the statistical analysis was conducted in three steps:

Step 1 - comparison of parameters in samples collected from the background wells (MW-5 and MW-15) and the POC wells (MW-6 and MW-8A) since December 2009.

Step 2 - statistical analysis of parameters in samples collected from the POC wells that are higher than in samples collected from the background wells. In addition, the statistical analysis was conducted on parameters that have exceeded the GPS in the last seven years (since 2005) to determine if there is a statistically significant increase over background values.

Step 3 - statistical examination of trends of those parameters that have exceeded the GPS in the last seven years (since 2005) and if they are significantly greater than the GPS.

Selection and description of the statistical tests employed are described below, as are the results.

#### 4.1 STATISTICAL TEST SELECTION

Most data in this statistical analysis exhibit non-normal distributions for which non-parametric techniques are appropriate (U.S. EPA, 1992). The demonstration of normality is a three-step process:

- Selection of all data sets with 20 or more data points;
- From the above selection, select those data sets with less than 10 percent non-detected data points; and
- Comparison of the appropriate statistic to a table of critical values at the 95 percent confidence level for all qualified data sets.

In the third step of this process, any result that is below the practical quantitation limit (PQL) or RL is considered to be equal to half of the PQL. In the December 2012 data results lower than the PQL were used and included results between the PQL and MDL. Results less than the MDL considered being equal to the MDL. The MDL is, at a minimum, half of the PQL. This is in accordance with EPA guidelines (U.S. EPA 1992). Only those data sets which meet all three of the above criteria are considered normally distributed in this analysis.

Of the parameters in the December 2012 monitoring that had sufficient sample sizes to test for normality, none exhibited a normal distribution. Hence, where the proportion of non-detects permit, non-parametric techniques were employed. The 1-sample Wilcoxon test is used as the non-parametric equivalent to a parametric confidence interval test (Helsel and Hirsch, 1992).

#### 4.2 STATISTICAL METHODS

A confidence interval approach is used to compare parameter concentrations in downgradient wells to the GPS. This approach is recommended by U.S. EPA (1989 and 1992) and endorsed by Gibbons, the author of *Statistical Methods for Groundwater Monitoring* (1994). Historical data for the parameters that have equaled or exceeded their GPS on at least a single occasion since 2005 were tested for statistical significance with respect to the GPS using two methods:

- Non-parametric 1-sample Wilcoxon test.
- Parametric 1-sample t-test.

Hypothesis tests, interpretation of results, and data requirements for each of the statistical methods used are discussed below.

#### **4.2.1 Non-Parametric 1-Sample Wilcoxon Test**

This test is a special case of the signed-rank test used to compare the median difference between paired observations. In this case, the paired observations are constituent levels in the compliance well versus the GPS. The null hypothesis is that there is no difference. The alternative hypothesis is that the median of the comparison well is greater than the GPS. A resulting p-value is used to test the significance of the test. The large sample approximation to the test was utilized for sample sets of more than 15 data points. The exact test was used for data sets of seven to 15 observations when the large sample approximation resulted in a p-value less than 0.15. In these instances, p-values were determined from tabulated quantiles for the reported Wilcoxon statistic and sample size. A p-value less than or equal to 0.01 indicates a significant difference exists at the 99 percent confidence level (Helsel and Hirsch, 1992).

A minimum of seven data points are required to employ this non-parametric test at a 99 percent confidence level (U.S. EPA, 1989). In addition, 2 µg/L was considered the GPS for vinyl chloride in the December 2012 monitoring. Non-detect data with a reported PQL above the GPS are discarded in order to avoid misleading results. For non-detect data equal to the GPS, concentration levels are reduced to just below the standard in order to maintain relative ranking among data.

Well MW-6 has exhibited vinyl chloride concentrations above the USEPA GPS of 2 µg/L, in monitoring events conducted between December 2009 and June 2011 (four events). Vinyl chloride concentrations have been below the USEPA GPS in the three sample data sets after June 2011 (December 11, June 2012, and December 2012). There are five valid sample data monitor values with no flag in the past seven years of data sampling (with an additional two values as “J” flag data). Due to data censoring rules for the 1-sample Wilcoxon test, there are an insufficient number of samples for meaningful statistics at station MW-6.

#### **4.2.2 Parametric 1-Sample t-Test**

This test is used to compare the mean difference between paired observations when normality can be demonstrated in the data set. As with the non-parametric case, the paired observations are constituent levels in the compliance well versus the GPS. The null hypothesis is that there is no difference. The alternative hypothesis is that the mean of the comparison well is greater than the GPS. A resulting p-value is used to evaluate the significance of the test. A p-value less than or equal to 0.01 indicates a significant difference exists at the 99 percent confidence level (Helsel and Hirsch, 1992).

Often, water quality data are not normally distributed without mathematical transformation. For those data sets which do not demonstrate normality, a log transformation often applies adequately to water quality data (Helsel and Hirsch 1992) and is also applied to the data sets in this analysis. The test for normality is then performed on the log transformed data. In sample sets containing non-detect data, values one-half the reported PQL (in un-transformed units) are used to replace non-detect data.

### 4.3 RESULTS

The progression of the statistics calculations were described as Steps 1 through 3 in the beginning of Section 4.0. Results of statistical analyses are summarized in **Tables 3** and **4** and output from statistical analysis including descriptive statistics, data plots, and test results are contained in **Appendix E**.

#### Step 1

A comparison of medians between the upgradient and POC wells was conducted for the last three years of data. Results of this comparison indicated that the following constituents were above background concentrations in one or both of the POC wells:

- 1,1 dichloroethane
- cis 1,2 dichloroethene
- Tetrachloroethene
- Trichloroethene
- Vinyl Chloride
- N as NO<sub>2</sub>+NO<sub>3</sub>
- Chloride
- Sulfate

#### Step 2

A comparison of medians between the upgradient and POC wells was conducted for the last seven years of data (approximately 15 data points, although up to 20 data points could be used) and results of the Mann-Whitney U test are presented in **Table 3**. Plots and calculations supporting **Table 3** are contained in **Appendix E**. These results indicated that the following constituents were above background concentrations in one or both of the POC wells:

- 1,1 dichloroethane
- cis 1,2 dichloroethene
- Tetrachloroethene
- Trichloroethene
- Vinyl Chloride
- Chloride
- Sulfate

#### Step 3

Seven statistical tests were performed using the 1-sample Wilcoxon method at the 99 percent confidence level. Results are presented in **Table 4**.

Using the USEPA GPS of 2 µg/L for vinyl chloride, concentrations of vinyl chloride in wells MW-12 and MW-13 were statistically significantly greater than the GPS at the 99 percent confidence level. Vinyl chloride has been detected in these wells since the 1990's.

Although concentrations have increased since 2009, tetrachloroethene in well MW-7A does not exhibit concentrations statistically and significantly greater than the GPS at the 99 percent confidence level. Due to the consideration of sampling results only for the last seven years, trichloroethene in well MW-12 does not exhibit concentrations statistically significantly greater than the GPS at the 99 percent confidence level. In addition, Trichloroethene in well MW-12 exhibits a negative trend over time indicating a decrease in trichloroethene concentrations in this well. The

null hypothesis, that there was no significant difference, was accepted for all other parameters at the 99 percent confidence level.

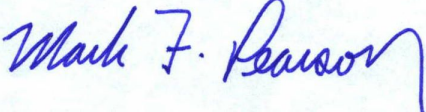
## 5.0 SUMMARY

The following summarizes data, calculations, and interpretations resulting from the December 2012 groundwater monitoring event at the Bozeman Sanitary Landfill:

- December 2012 groundwater levels were generally consistent with previous monitoring events and indicate a southwest groundwater flow beneath the *Unlined Closed Cell* shifting to a west-southwest flow between the *Lined Closed Cell* and well MW-10.
- Consistent with the results of the June 2012 monitoring event, upward groundwater gradients were measured at MW-6 and MW-8A well locations. Also, consistent with results of previous monitoring events, MW-7 and MW-9 well locations have no upward or downward groundwater gradients down to 74 and 57 feet depths, respectively.
- Tetrachloroethene concentrations ranged between 0.23 (estimated) and 7.7 µg/L in wells LF-2, LF-3, MW-4, MW-6, MW-7A, MW-8A, MW-9A, MW-11, MW-13, MW-16, Landfill Shop Well, and the McIlhattan Seep. Concentrations of vinyl chloride ranged between 1.5 and 21.2 µg/L in wells MW-6, MW-7A, MW-12, and MW-13.
- Tetrachloroethene (in well MW-7A) and vinyl chloride (in wells MW-6, MW-7A, MW-12, and MW-13) exceeded the Montana Human Health Standard and GPS during the December 2012 monitoring event. The concentration of vinyl chloride in well MW-6 has exceeded the Montana Human Health Standard of 0.2 µg/L since December 2009.
- Due to higher analytical reporting limits for vinyl chloride in monitoring results before 2009, the USEPA GPS of 2 µg/L was used in the statistics calculations. Therefore, as of December 2012, the concentration of vinyl chloride in wells MW-12 and MW-13 meet statistics criteria to be significantly greater than the USEPA GPS of 2 µg/L. As of December 2012, vinyl chloride in well MW-6 does not meet statistics criteria to be significantly greater than the USEPA GPS.
- Trichloroethene concentrations ranged between 0.14 (estimated) and 2.1 µg/L in wells LF-2, LF-3, MW-4, MW-6, MW-7A, MW-8A, MW-9A, MW-10, MW-11, MW-13, MW-16, Landfill Shop Well, and the McIlhattan Seep.
- As of December 2012, the concentration of tetrachloroethene and trichloroethene in POC wells did not meet statistics criteria to be significantly greater than the GPS.
- Although statistics calculations indicated that nitrate+nitrite as N in well MW-8A was not statistically above background concentrations or greater than the GPS, nitrate+nitrite as N in well MW-8A has exceeded the GPS for the fifth consecutive monitoring event (since December 2010). The concentration of nitrate+nitrite as N was 16 mg/L in well MW-8A and 3.0 mg/L in well LF-2 (downgradient of well MW-8A).

According to ARM 17.50.1310(5)(b), the City of Bozeman is required to continue corrective actions at the landfill and associated groundwater monitoring until all of the approved constituents in Appendix I to 40 CFR Part 258 contained in ARM 17.50.1306 have not exceeded the GPS for a period of three consecutive years based on statistical analysis of the data. The next corrective measures assessment groundwater monitoring event is scheduled for June 2013.

Prepared by:



Mark F. Pearson  
Project Manager

Preparation of Statistics and Review by:



J. Frederick Rial, P.E.  
Senior Project Manager



Shann Easterling  
Senior Engineering Technician



## 6.0 REFERENCES

- Freeze, R.A., and Cherry, J.A., 1979.** *Groundwater*, Prentice-Hall, Inc.
- DEQ, 2012.** Circular DEQ-7 Montana Numeric Water Quality Standards. October.
- Gibbons, R.D., 1994.** *Statistical Methods for Groundwater Monitoring*. John Wiley & Sons, Inc. New York, New York.
- Helsel, D.R, and Hirsch, R.M., 1992.** *Statistical Methods in Water Resources*. Elsevier Science Publishing Company, Inc. New York, New York.
- Huntingdon, 1994.** *January 1994 Groundwater Monitoring Report for the City of Bozeman Sanitary Landfill, Gallatin County, Montana*. March 1994.
- Maxim, 2000.** *Effectiveness of Corrective Measures and March & June 2000 Groundwater Monitoring, Bozeman Sanitary Landfill, Bozeman, Montana*. August 2000.
- Maxim, 2003.** Letter to Pat Potts, MDEQ regarding “City of Bozeman Landfill – Groundwater Monitoring Methods. September 30, 2003.
- Tetra Tech, 2009.** *Report of Groundwater Monitoring Activities – June 2009, City of Bozeman Sanitary Landfill, Gallatin County, Montana*. August 3.
- Tetra Tech, 2010.** *Groundwater Monitoring Sampling and Analysis Plan, City of Bozeman Sanitary Landfill*. September 17.
- Tetra Tech, 2012.** *Report of Groundwater Monitoring Activities – June 2012, City of Bozeman Sanitary Landfill, Gallatin County, Montana*. September 26.
- Riser-Roberts, Eve.** *Bioremediation of Petroleum Contaminated Sites*. C.K. Smokely, Boca Raton, p. 95.
- Todd, D. W., 1980.** *Groundwater Hydrology*. John Wiley and Sons, New York, New York.
- U.S. EPA, 1989.** Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Final Guidance. April 1989.
- U.S. EPA, 1992.** *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, DRAFT Addendum to Interim Final Guidance*. July 1992.
- U.S. EPA, 1994a.** *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*. Office of Emergency and Remedial Response. February 1994.
- U.S. EPA, 1994b.** *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*. Office of Emergency and Remedial Response. February 1994.

## ONLINE REFERENCES

USEPA Groundwater Protection Standard for Vinyl Chloride:

<http://water.epa.gov/drink/contaminants/index.cfm#List>

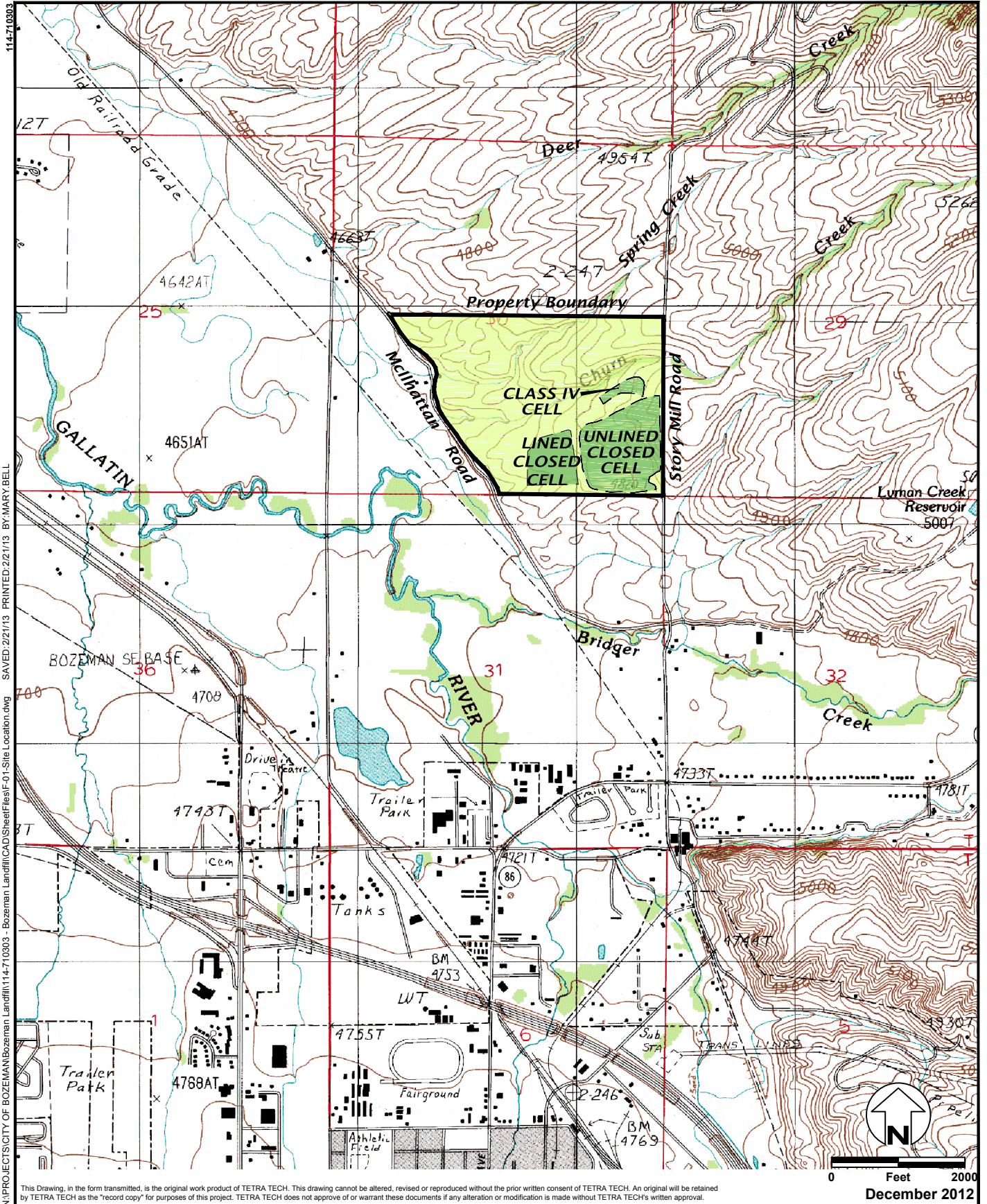
Montana DEQ Solid Waste Program Laws and Rules:

<http://www.deq.mt.gov/SolidWaste/LawsRules.mcp>

# **APPENDIX A**

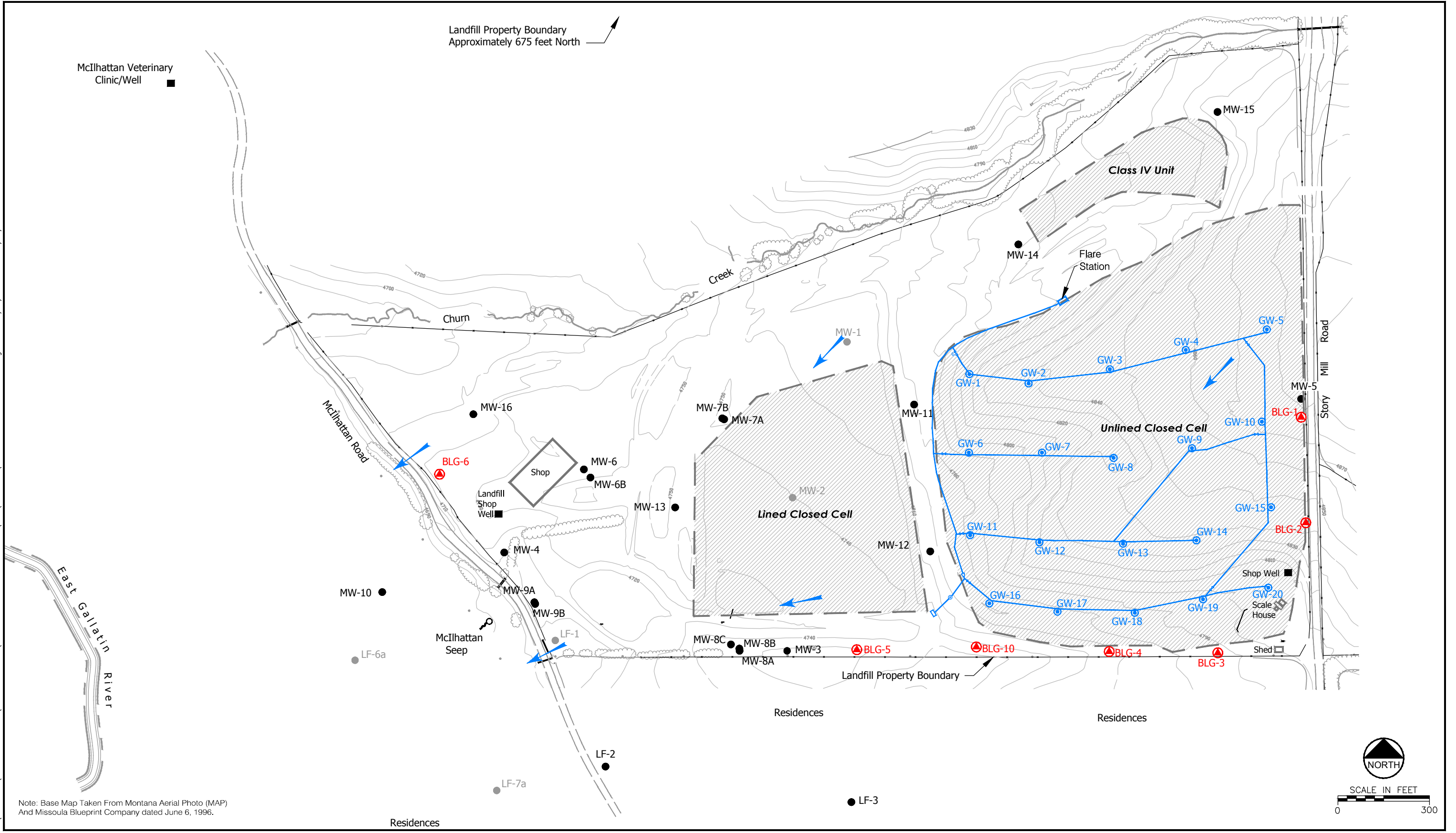
## **FIGURES**

- FIGURE 1 Site Location Map
- FIGURE 2 Site Map
- FIGURE 3 December 2012 – Water Table Map





N:\PROJECTS\CITY OF BOZEMAN\Bozeman Landfill\114-710303 - December Landfill\CAD\SheetFiles\2012 - December GW Tables.dwg - December GW Tables.dwg - December GW Tables.dwg SAVED: 2/21/13 PRINTED: 2/21/13 BY: MARY BELL



Note: Base Map Taken From Montana Aerial Photo (MAP) And Missoula Blueprint Company dated June 6, 1996.

Note: Site topographic contours shown are not indicative of current site topography.

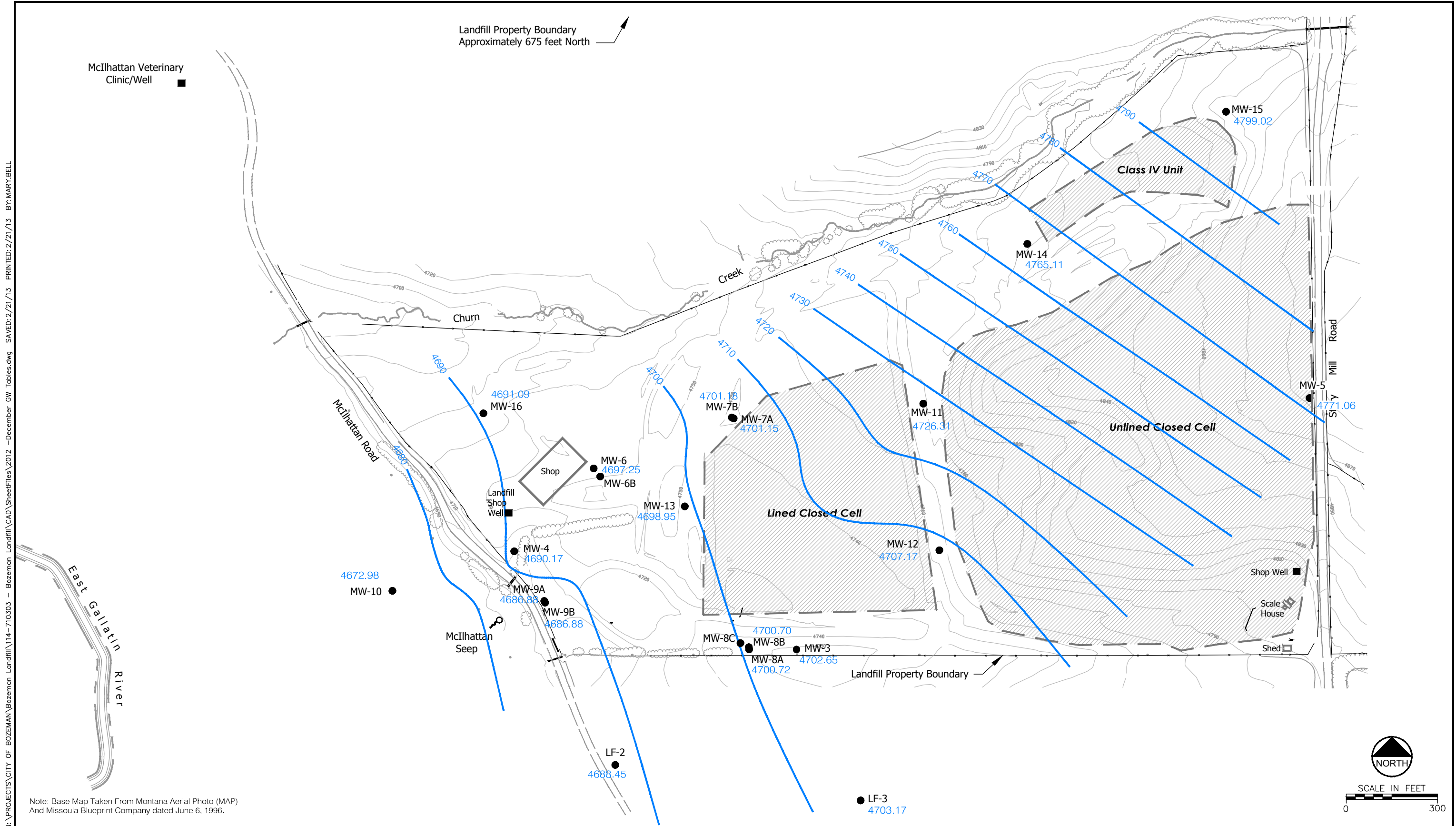
- Landfill Gas Extraction Well
- ▲ Surface Water Station
- Monitoring Well
- Supply Well
- Abandoned Monitoring Well
- ▲ Gas Monitoring Probe
- Abandoned Gas Monitoring Probe
- Landfill Gas Collection Piping (Subgrade)
- ← Typical Groundwater Flow Direction (Based on Historic Water Table Contours)



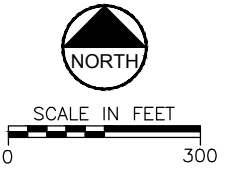
114-710303.402

Site Map  
Bozeman Sanitary Landfill  
Bozeman, Montana  
FIGURE 2

N:\PROJECTS\CITY OF BOZEMAN\Bozeman Landfill\114-710303 - Bozeman Landfill\CAD\SheetFiles\2012 - December GW Tables.dwg - December GW Tables.dwg  
SAVED: 2/21/13 PRINTED: 2/21/13 BY: MARY BELL



Note: Base Map Taken From Montana Aerial Photo (MAP) And Missoula Blueprint Company dated June 6, 1996.



Note: Site topographic contours shown are not indicative of current site topography.

- Monitoring Well
- Supply Well

4703.17 Groundwater Elevation (feet AMSL)



114-710303.402

## **APPENDIX B**

### **TABLES**

- TABLE 1 Groundwater Levels
- TABLE 2 Summary of Detected Volatile Organic Compounds in Selected Groundwater Samples
- TABLE 3 Comparison of Medians of Selected Groundwater Quality Data
- TABLE 4 Summary of Statistical Analysis of Selected Groundwater Quality Data

**TABLE 1**  
Groundwater Levels  
Bozeman Sanitary Landfill, Bozeman Montana

MP elev change	MEASURING POINT ELEVATION (in feet above mean sea level)													
	4702.71		4717.10		4,751.89		4,710.90		4,882.37		4738.68		4,727.23	
Well No.	LF-2		LF-3		MW-3		MW-4		MW-5		MW-6 <sup>1</sup>		MW-6B	
DATE	DTW	ELEV	DTW	ELEV	DTW	ELEV	DTW	ELEV	DTW	ELEV	DTW	ELEV	DTW	ELEV
05/86	14.20	4688.51	15.50	4701.60	48.76	4703.13	20.60	4690.30	N.M.	-----	N.M.	-----	-----	-----
10/22/1986	14.53	4688.18	15.20	4701.90	48.87	4703.02	20.64	4690.26	N.M.	-----	N.M.	-----	-----	-----
08/92	N.M.	-----	N.M.	-----	N.M.	-----	N.M.	-----	N.M.	-----	45.40	4693.28	-----	-----
2/24/1993	N.M.	-----	16.39	4700.71	N.M.	-----	22.35	4688.55	112.66	4769.71	43.57	4695.11	-----	-----
7/27/1993	14.52	4688.19	15.10	4702.00	49.91	4701.98	21.73	4689.17	111.60	4770.77	43.35	4695.33	-----	-----
1/17/1994	14.72	4687.99	14.85	4702.25	49.50	4702.39	20.70	4690.20	110.76	4771.61	43.02	4695.66	-----	-----
6/27/1994	15.42	4687.29	15.45	4701.65	50.34	4701.55	20.97	4689.93	110.26	4772.11	42.91	4695.77	-----	-----
2/1/1995	14.43	4688.28	14.72	4702.38	50.41	4701.48	20.67	4690.23	110.71	4771.66	42.88	4695.80	-----	-----
6/28/1995	14.7	4688.01	14.88	4702.22	50.27	4701.62	20.08	4690.82	110.06	4772.31	42.71	4695.97	-----	-----
11/28/1995	14.39	4688.32	15.33	4701.77	49.87	4702.02	20.51	4690.39	109.70	4772.67	42.80	4695.88	-----	-----
6/25/1996	13.68	4689.03	13.92	4703.18	49.30	4702.59	20.78	4690.12	109.50	4772.87	42.55	4696.13	-----	-----
12/11/1996	14.29	4688.42	14.34	4702.76	48.82	4703.07	20.3	4690.60	110.10	4772.27	44.77	4693.91	-----	-----
6/19/1997	12.31	4690.40	12.40	4704.70	47.07	4704.82	13.39	4697.51	108.64	4773.73	39.85	4698.83	-----	-----
12/15/1997	14.16	4688.55	14.00	4703.10	48.02	4703.87	20.37	4690.53	106.71	4775.66	42.73	4695.95	-----	-----
6/30/1998	13.21	4689.50	12.98	4704.12	N.M.	-----	19.27	4691.63	106.10	4776.27	30.95	4697.74	-----	-----
12/14/1998	14.32	4688.39	13.82	4703.28	47.97	4703.92	20.37	4690.53	105.75	4776.62	31.24	4697.45	-----	-----
6/22/1999	14.07	4688.64	13.53	4703.57	47.74	4704.15	20.25	4690.65	106.01	4776.36	31.13	4697.56	-----	-----
12/14/1999	14.42	4688.29	14.31	4702.79	48.22	4703.67	20.54	4690.36	106.86	4775.51	31.33	4697.36	-----	-----
6/8/2000	N.M.	-----	13.98	4703.12	48.28	4703.61	20.47	4690.43	108.22	4774.15	31.33	4697.36	-----	-----
11/28/2000	14.53	4688.18	14.23	4702.87	48.77	4703.12	20.69	4690.21	109.69	4772.68	31.53	4697.16	-----	-----
6/11/2001	14.27	4688.44	13.97	4703.13	48.91	4702.98	20.60	4690.30	110.61	4771.76	31.66	4697.03	-----	-----
12/17/2001	14.63	4688.08	14.01	4703.09	49.40	4702.49	20.83	4690.07	111.77	4770.60	31.79	4696.90	-----	-----
6/13/2002	13.31	4689.40	13.66	4703.44	48.59	4703.30	19.72	4691.18	112.47	4769.90	31.59	4697.10	-----	-----
12/12/2002	14.78	4687.93	14.22	4702.88	49.85	4702.04	20.92	4689.98	113.26	4769.11	31.87	4696.82	-----	-----
6/10/2003	14.20	4688.51	14.02	4703.08	49.35	4702.54	20.41	4690.49	113.52	4768.85	31.79	4696.90	-----	-----
12/3/2003	14.92	4687.79	14.35	4702.75	50.32	4701.57	21.02	4689.88	114.30	4768.07	31.96	4696.73	-----	-----
6/8/2004	14.36	4688.35	14.23	4702.87	50.13	4701.76	20.72	4690.18	114.94	4767.43	31.95	4696.74	-----	-----
12/6/2004	14.71	4688.00	14.71	4702.39	50.53	4701.36	20.99	4689.91	115.68	4766.69	32.43	4696.26	-----	-----
6/16/2005	14.13	4688.58	14.13	4702.97	50.05	4701.84	20.57	4690.33	116.01	4766.36	31.92	4696.77	-----	-----
12/14/2005	14.86	4687.85	14.29	4702.81	50.72	4701.17	20.98	4689.92	116.85	4765.52	32.07	4696.62	-----	-----
3/16/2006	N.M.	-----	14.02	4703.08	N.M.	-----	N.M.	-----	N.M.	-----	31.94	4696.75	-----	-----
6/12/2006	13.95	4688.76	14.85	4702.25	N.M.	-----	21.80	4689.10	114.39	4767.98	31.90	4696.79	-----	-----
12/2006 to 6/2010	No entry of DTW data													
12/1/2010	14.32	4688.39	13.81	4703.29	N.M.	-----	20.69	4690.21	111.97	4770.40	31.52	4697.17	-----	-----
6/13/2011	12.73	4689.98	12.66	4704.44	N.M.	-----	19.29	4691.61	110.63	4771.74	30.99	4697.70	-----	-----
12/5/2011	14.29	4688.42	13.71	4703.39	N.M.	-----	20.48	4690.42	110.05	4772.32	31.40	4697.29	-----	-----
6/5/2012	14.12	4688.59	13.52	4703.58	N.M.	-----	20.39	4690.51	110.12	4772.25	31.29	4697.40	18.69	4710.00
12/4/2012	14.26	4688.45	13.93	4703.17	49.24	4702.65	20.73	4690.17	111.31	4771.06	31.44	4697.25	19.40	4709.29

MP elev change : Measuring point elevation change

DTW : Depth to water below measuring point (feet)

ELEV : Groundwater elevation above mean sea level (feet). Well locations shown on Figure 2.

1 : 9.99 feet of PVC was removed on 06/30/1998.

N.M. Not measured

----- Not calculated

**TABLE 1 (Continued)**  
Groundwater Levels  
Bozeman Sanitary Landfill, Bozeman Montana

MP elev change	MEASURING POINT ELEVATION (in feet above mean sea level)													
	4755.51		4755.52		4748.22		4747.98		4747.63		4715.27		4715.50	
	7/6/2011	4757.87	7/6/2011	4757.95			7/3/2012	4748.47						
Well No.	MW-7A <sup>2</sup>		MW-7B <sup>2</sup>		MW-8A		MW-8B		MW-8C		MW-9A		MW-9B	
DATE	DTW	ELEV	DTW	ELEV	DTW	ELEV	DTW	ELEV	DTW	ELEV	DTW	ELEV	DTW	ELEV
08/92	55.50	4700.01	N.M.	----	46.90	4701.32	48.50	4699.48	----	----	27.75	4687.52	N.M.	----
2/24/1993	55.11	4700.40	55.25	4700.27	48.81	4699.41	48.96	4699.02	----	----	29.66	4685.61	29.97	4685.53
7/27/1993	54.35	4701.16	54.55	4700.97	47.69	4700.53	47.90	4700.08	----	----	28.59	4686.68	28.84	4686.66
1/17/1994	49.50	4706.01	49.48	4706.04	47.69	4700.53	47.99	4699.99	----	----	28.96	4686.31	29.31	4686.19
6/27/1994	54.43	4701.08	54.42	4701.10	47.51	4700.71	47.81	4700.17	----	----	28.77	4686.50	29.05	4686.45
2/1/1995	54.43	4701.08	54.45	4701.07	47.82	4700.40	47.53	4700.45	----	----	28.71	4686.56	28.99	4686.51
6/28/1995	53.98	4701.53	53.93	4701.59	46.54	4701.68	46.84	4701.14	----	----	28.17	4687.10	28.42	4687.08
11/28/1995	54.10	4701.41	N.M.	----	47.07	4701.15	47.37	4700.61	----	----	28.52	4686.75	28.75	4686.75
6/25/1996	53.91	4701.60	53.93	4701.59	46.44	4701.78	46.72	4701.26	----	----	27.76	4687.51	27.92	4687.58
12/11/1996	54.78	4700.73	54.21	4701.31	46.97	4701.25	47.25	4700.73	----	----	28.08	4687.19	28.23	4687.27
6/19/1997	53.03	4702.48	53.05	4702.47	45.09	4703.13	45.41	4702.57	----	----	25.45	4689.82	25.33	4690.17
12/15/1997	53.79	4701.72	53.80	4701.72	46.38	4701.84	46.69	4701.29	----	----	28.39	4686.88	28.61	4686.89
6/30/1998	53.49	4702.02	53.50	4702.02	45.65	4702.57	45.94	4702.04	----	----	26.91	4688.36	26.96	4688.54
12/14/1998	53.73	4701.78	53.74	4701.78	46.32	4701.90	46.60	4701.38	----	----	28.40	4686.87	28.61	4686.89
6/22/1999	53.64	4701.87	53.66	4701.86	46.06	4702.16	46.36	4701.62	----	----	28.23	4687.04	28.43	4687.07
12/14/1999	53.87	4701.64	53.91	4701.61	46.59	4701.63	46.87	4701.11	----	----	28.56	4686.71	28.79	4686.71
6/8/2000	53.95	4701.56	53.96	4701.56	46.68	4701.54	46.96	4701.02	----	----	28.33	4686.94	28.54	4686.96
11/28/2000	54.23	4701.28	54.26	4701.26	47.09	4701.13	47.40	4700.58	----	----	28.65	4686.62	28.91	4686.59
6/12/2001	54.30	4701.21	54.37	4701.15	47.20	4701.02	47.51	4700.47	----	----	28.51	4686.76	28.71	4686.79
12/18/2001	54.78	4700.73	54.69	4700.83	47.66	4700.56	47.96	4700.02	----	----	28.82	4686.45	28.82	4686.68
6/13/2002	54.21	4701.30	54.25	4701.27	46.87	4701.35	47.13	4700.85	----	----	26.93	4688.34	26.98	4688.52
12/12/2002	54.81	4700.70	54.91	4700.61	48.08	4700.14	48.34	4699.64	----	----	29.03	4686.24	29.24	4686.26
6/10/2003	54.56	4700.95	N.M.	----	47.63	4700.59	47.92	4700.06	----	----	28.50	4686.77	28.70	4686.80
12/3/2003	55.03	4700.48	55.06	4700.46	48.49	4699.73	48.73	4699.25	----	----	29.04	4686.23	29.27	4686.23
6/8/2004	55.01	4700.50	55.03	4700.49	48.34	4699.88	48.59	4699.39	----	----	28.59	4686.68	28.78	4686.72
12/6/2004	55.22	4700.29	55.23	4700.29	48.67	4699.55	48.89	4699.09	----	----	28.86	4686.41	29.11	4686.39
6/16/2005	54.92	4700.59	54.95	4700.57	48.34	4699.88	48.55	4699.43	----	----	28.19	4687.08	28.37	4687.13
12/14/2005	55.35	4700.16	55.39	4700.13	48.91	4699.31	49.13	4698.85	----	----	28.94	4686.33	29.20	4686.30
3/16/2006	55.14	4700.37	N.M.	----	N.M.	----	N.M.	----	----	----	N.M.	----	N.M.	----
6/12/2006	55.00	4700.51	55.00	4700.52	48.28	4699.94	48.49	4699.49	----	----	28.10	4687.17	28.31	4687.19
12/2006 to 6/2010	No entry of DTW data													
12/1/2010	54.24	4701.27	54.31	4701.21	47.44	4700.78	47.72	4700.75	----	----	28.36	4686.91	28.58	4686.92
6/13/2011	53.15	4702.36	53.25	4702.27	45.51	4702.71	45.80	4702.67	----	----	26.83	4688.44	26.89	4688.61
12/5/2011	56.41	4701.46	56.49	4701.46	47.02	4701.20	47.31	4701.16	----	----	28.32	4686.95	28.56	4686.94
6/5/2012	56.36	4701.51	56.45	4701.50	46.95	4701.27	47.28	4701.19	42.62	4705.01	28.18	4687.09	28.38	4687.12
12/4/2012	56.69	4701.18	56.80	4701.15	47.50	4700.72	47.77	4700.70	43.09	4704.54	28.39	4686.88	28.62	4686.88

MP elev change : Measuring point elevation change

DTW : Depth to water below measuring point (feet)

ELEV : Groundwater elevation above mean sea level (feet). Well locations shown on Figure 2.

2 : Approximately 2.4 feet of PVC was added on 7/6/2011

N.M. Not measured

---- Not calculated



**TABLE 1 (Continued)**  
Groundwater Levels  
Bozeman Sanitary Landfill, Bozeman Montana

MP elev change	MEASURING POINT ELEVATION (in feet above mean sea level)													
	4675.01		4778.15		4763.02		4748.73		4797.94		4845.00		4717.33	
Well No.	MW-10		MW-11		MW-12		MW-13 <sup>3</sup>		MW-14		MW-15		MW-16	
DATE	DTW	ELEV	DTW	ELEV	DTW	ELEV	DTW	ELEV	DTW	ELEV	DTW	ELEV	DTW	ELEV
6/28/1995	6.58	4668.43	N.M.	----	N.M.	----	N.M.	----	----	----	----	----	----	----
9/12/1995	N.M.	----	51.40	4726.75	55.03	4707.99	49.45	4699.28	----	----	----	----	----	----
11/28/1995	2.07	4672.94	51.55	4726.60	55.09	4707.93	49.56	4699.17	----	----	----	----	----	----
6/25/1996	1.63	4673.38	51.72	4726.43	54.77	4708.25	49.16	4699.57	----	----	----	----	----	----
12/11/1996	1.85	4673.16	51.83	4726.32	55.13	4707.89	49.53	4699.20	----	----	----	----	----	----
6/19/1997	0.90	4674.11	51.35	4726.80	53.82	4709.20	47.27	4701.46	----	----	----	----	----	----
12/15/1997	1.78	4673.23	51.42	4726.73	54.26	4708.76	59.16	4689.57	----	----	----	----	----	----
6/30/1998	1.38	4673.63	51.44	4726.71	53.83	4709.19	48.72	4700.01	----	----	----	----	----	----
12/14/1998	2.20	4672.81	51.52	4726.63	54.17	4708.85	49.14	4699.59	----	----	----	----	----	----
6/22/1999	1.61	4673.40	51.51	4726.64	54.64	4708.38	49.01	4699.72	----	----	----	----	----	----
12/14/1999	2.32	4672.69	51.69	4726.46	54.96	4708.06	43.13	4699.41	----	----	----	----	----	----
6/8/2000	1.95	4673.06	51.76	4726.39	55.11	4707.91	43.21	4699.33	----	----	----	----	----	----
11/28/2000	2.44	4672.57	51.99	4726.16	55.44	4707.58	43.49	4699.05	----	----	----	----	----	----
6/12/2001	1.38	4673.63	52.03	4726.12	55.75	4707.27	43.60	4698.94	32.96	4764.98	----	----	----	----
12/19/2001	2.55	4672.46	52.27	4725.88	56.06	4706.96	43.87	4698.67	33.71	4764.23	47.77	----	----	----
6/13/2002	1.25	4673.76	52.12	4726.03	55.90	4707.12	43.45	4699.09	----	----	----	----	----	----
12/12/2002	2.70	4672.31	52.39	4725.76	56.49	4706.53	44.10	4698.44	34.28	4763.66	48.63	----	----	----
6/10/2003	1.18	4673.83	52.22	4725.93	56.39	4706.63	43.87	4698.67	33.53	4764.41	48.10	----	----	----
12/3/2003	2.59	4672.42	52.47	4725.68	56.91	4706.11	44.31	4698.23	34.65	4763.29	49.44	----	----	----
6/8/2004	1.81	4673.20	52.44	4725.71	57.04	4705.98	44.26	4698.28	34.46	4763.48	49.89	----	----	----
12/6/2004	2.45	4672.56	53.01	4725.14	57.17	4705.85	44.44	4698.10	35.34	4762.60	50.76	----	----	----
6/16/2005	1.45	4673.56	52.47	4725.68	57.15	4705.87	44.26	4698.28	34.66	4763.28	50.35	----	----	----
12/14/2005	2.57	4672.44	52.77	4725.38	57.39	4705.63	44.60	4697.94	35.82	4762.12	51.74	----	----	----
3/16/2006	N.M.	----	N.M.	----	57.25	4705.77	44.32	4698.22	N.M.	----	N.M.	----	----	----
6/12/2006	1.90	4673.11	53.9	4724.25	57.20	4705.82	44.20	4698.34	34.41	4763.53	50.30	----	----	----
12/2006 to 6/2010	No entry of DTW data													
12/1/2010	1.78	4673.23	51.79	4726.36	55.95	4707.07	43.54	4699.00	31.84	4766.10	44.35	4800.65	----	----
6/13/2011	0.80	4674.21	51.18	4726.97	54.59	4708.43	42.40	4700.14	29.01	4768.93	41.52	4803.48	----	----
12/5/2011	2.09	4672.92	51.57	4726.58	55.40	4707.62	43.28	4699.26	31.10	4766.84	42.60	4802.40	----	----
6/5/2012	1.66	4673.35	51.54	4726.61	55.46	4707.56	43.26	4699.28	31.46	4766.48	43.95	4801.05	26.02	4691.31
12/5/2012	2.03	4672.98	51.84	4726.31	55.85	4707.17	43.59	4698.95	32.83	4765.11	45.98	4799.02	26.24	4691.09

MP elev change : Measuring point elevation change

DTW : Depth to water below measuring point (feet)

ELEV : Groundwater elevation above mean sea level (feet). Well locations shown on Figure 2.

3 : 6.19 feet of PVC was removed on 06/30/1998.

N.M. Not measured


---- Not calculated

**TABLE 2**  
**Summary of Detected Volatile Organic Compounds in Selected Groundwater Samples**  
**Bozeman Sanitary Landfill**

Sampling Location	Sampling Date	LABORATORY PARAMETERS							
		Benzene (µg/L)	Cis 1,2-dichloro-ethene (µg/L)	Methylene Chloride (µg/L)	1,1-Dichloro-ethane (µg/L)	Methyl chloride (µg/L)	Tetrachloro-ethene (µg/L)	Trichloro-ethene (µg/L)	Vinyl chloride (µg/L)
HHS		5	70	5	(1)	30	5	5	2
LF-2	12/6/2010	U 1	U 1	U 1	U 1	U 1	1.3	U 1	U 1
	6/14/2011	U 0.04	U 0.08	U 2	U 0.072	U 0.021	1.1	U 0.05	U 0.049
	12/5/2011	U 0.05	0.27	U 5	U 0.072	U 0.13	1.4	J 0.23	U 0.16
	6/4/2012	U 0.5	J 0.25	U 4	U 0.5	U 1	1.9	J 0.31	U 0.16
	12/6/2012	U 0.05	J 0.15	U 2	U 0.072	U 0.13	1.1	J 0.14	U 0.16
LF-3	1/18/1994	U 2	U 1	U 5	U 1	U 1	5	1	U 1
	6/27/1994	U 1	U 1	U 5	U 1	U 1	5	1	U 1
	2/1/1995	U 1	U 1	U 5	U 1	U 1	5	1	U 1
	6/28/1995	U 1	U 1	U 1	U 1	U 1	3	1	U 1
	11/28/1995	U 1	U 1	U 5	U 1	U 1	6	2	U 1
	6/25/1996	U 1	1	U 5	U 1	U 1	6	2	U 1
	12/11/1996	U 1	U* 1	U 5	U 1	U 1	5	2	U 1
	6/19/1997	U 1	1	U 1	U 1	U 2	6	2	U 2
	12/15/1997	U 1	1	U 5	U 1	U 1	2	6	U 1
	3/24/1998	U 1	1	U 5	U 1	U 1	7	2	U 1
	6/29/1998	U 1	U 1	<(2) 5	(2) U 1	< (2) 1	6	3	U 1
	9/29/1998	U 1	1	11	U 1	U 1	7	3	U 1
	12/14/1998	U 1	1	U(1)B 5	U 1	(1) U 1	6	6	U 1
	3/15/1999	U 1	(1) U 1	(1) U 5	U 1		6	2	U 1
	6/22/1999	U 1	U 1	(1) U 5	U 1	U 1	4	1	U 1
	9/13/1999	U 1	(1) U 1	(1) U 5	U 1	U 1	4	1	U 1
	12/13/1999	U 1	(1) U 1	(1) U 5	U 1	U 1	5	2	U 1
	3/22/2000	U 1	(1) U 1	U 5	U 1	U 1	5	2	U 1
	6/7/2000	U 1	(1) U 1	(1) U 5	U 1	U 1	4	1	U 1
	9/22/2000	U 1	U 1	(1) U 5	U 1	U 1	4	1	U 1
	11/28/2000	U 1	U 1	U 5	U 1	U 1	4	1	U 1
	3/22/2001	U 1	1	U 5	U 1	U 1	5	1	U 1
	6/11/2001	U 1	1	U 5	U 1	U 1	5	2	U 1
	9/19/2001	U 1	1	U(1,3) 5	U 1	1	5	3	U 1
	12/17/2001	U 1	1	(1) U 5	(1) U 1	U 1	6	2	U 1
	3/25/2002	U 1	1	U 5	U 1	2	6	1	U 1
	6/13/2002	U 1	1	(1) U 5	(1) U 1	U 1	5	1	U 1
	9/24/2002	U 1	1	UJR 5	U 1	U 1	5	1	U 1
	12/12/2002	U 1	1	(1) U 5	U 1	U 1	6	1	U 1
	3/24/2003	U 1	1	(1) U 5	(1) U 1	(1) U 1	5	1	U 1
	6/9/2003	U 1	1	(1) U 5	U 1	(1) U 1	5	1	U 1
	9/25/2003	U 1	1	(1) U 5	(1) U 1	U 1	5	1	U 1
	12/4/2003	U 1	(1) U 1	(1) U 5	U 1	U 1	4	1	JJF% 1
	3/25/2004	U 1	1	U 5	U 1	U 1	4	(1) U 1	U 1
	6/9/2004	U 1	1	(1) U 5	U 1	U 1	4	(1) U 1	U 1

**Notes:** µg/L - micrograms per liter  
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Montana Circular DEQ-7, October 2012  
NA - Not Applicable

J - Estimated Concentration  
(1) - No HHS established  
-- - Not collected/analyzed  
U - Below Analytical Reporting Limit  
\* (1) X F% - Additional QA/QC notes


 - Value greater than or equal to the HHS  
Vinyl Chloride concentration highlighted only if equal to or greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is 0.2 micrograms per liter.

**TABLE 2**  
**Summary of Detected Volatile Organic Compounds in Selected Groundwater Samples**  
**Bozeman Sanitary Landfill**

Sampling Location	Sampling Date	LABORATORY PARAMETERS							
		Benzene (µg/L)	Cis 1,2-dichloro-ethene (µg/L)	Methylene Chloride (µg/L)	1,1-Dichloro-ethane (µg/L)	Methyl chloride (µg/L)	Tetrachloro-ethene (µg/L)	Trichloro-ethene (µg/L)	Vinyl chloride (µg/L)
HHS		5	70	5	(1)	30	5	5	2
LF-3	9/9/2004	U 1	(1) U 1	(1) U 5	U 1	U 1	4	(1) U 1	U 1
	12/6/2004	U 1	(1) U 1	(1) U 5	U 1	U 1	4	(1) U 1	U 1
	3/29/2005	U 1	(1) U 1	(1) U 5	U 1	U 1	3	(1) U 1	U 1
	6/16/2005	U 1	(1) U 1	U 5	U 1	U 1	3	(1) U 1	U 1
	9/20/2005	U 1	(1) U 1	(1) BU 5	U 1	U 1	3	U 1	U 1
	12/13/2005	U 1	(1) U 1	(1) U 5	U 1	U 1	3	(1) U 1	U 1
	3/16/2006	U 1	(1) U 1	U 5	U 1	U 1	3	(1) U 1	U 1
	6/12/2006	U 0.5	0.8	(1) U 5	(1) U 1	U 1	2.7	0.5	U 0.5
	9/20/2006	U 0.5	0.6	U(1) 5	U(1) 1	U 1	2.3	U(1) 0.5	U 0.5
	12/5/2006	U 0.5	0.7	U 5	U 1	U 1	2.7	U(1) 0.5	U 0.5
	3/13/2007	U 0.5	0.8	U 5	U(1) 1	U 1	2.7	0.6	U 0.5
	6/21/2007	U 0.5	0.9	U 5	U 1	U 1	2.6	0.6	JJF% 0.5
	12/11/2007	U 0.5	0.8	U 5	U 1	U(1) 1	2.5	0.6	U 0.5
	6/25/2008	U 0.5	1	U(1) 5	U 1	U 1	2.9	0.7	U 0.5
	12/8/2008	U 1	1.6	U 4	U 1	U 1	3.9	1.1	U 0.4
	6/2/2009	U 0.5	1.5	U 2	U 0.5	U 2	4.5	1	U 0.2
	12/10/2009	U 0.5	1.8	UB 2	U 0.5	U 2	4.4	1	U 0.2
	6/16/2010	U 0.5	2.1	30.4	U 0.5	U 0.5	4.4	1.1	U 0.5
	12/6/2010	U 1	1.2	U 1	U 1	U 1	3.9	U 1	U 1
	6/13/2011	U 0.04	1.9	U 2	J 0.11	J 0.11	3.9	0.96	U 0.049
	12/6/2011	U 0.05	1.8	U 5	U 0.072	U 0.13	3.8	0.9	U 0.16
	6/4/2012	U 0.5	1.9	U 4	U 0.5	U 1	4.1	0.94	U 0.16
	12/6/2012	U 0.05	1.8	U 2	J 0.14	U 0.13	3.8	0.88	U 0.16
MW-4	1/18/1994	U 2	U 1	U 5	2	U 1	4	2	U 1
	6/27/1994	U 1	U 1	U* 5	2	U 1	4	2	U 1
	1/31/1995	U 1	U 1	U* 5	1	U 1	3	2	U 1
	6/27/1995	U 1	U 1	JX 1	1	U 1	2	1	U 1
	11/28/1995	U 1	U 1	U* 5	1	U 1	3	1	U 1
	6/25/1996	U 1	U 1	U 5	1	U 1	3	2	U 1
	12/11/1996	U 1	U* 1	U 5	U 1	U 1	2	1	U 1
	6/19/1997	U 1	U 1	U 1	U 1	U 2	2	U 1	U 2
	12/15/1997	U 1	U 1	U 5	U 1	U 1	U 1	1	U 1
	6/29/1998	U 1	<(2) 1	<(5) 5	(1) U 1	< (2) 1	2	1	U 1
	12/14/1998	U 1	(1) U 1	U(1)B 5	(1) U 1	(1) U 1	2	2	U 1
	6/22/1999	U 1	U 1	(1) U 5	U 1	U 1	U 1	1	U 1
	12/13/1999	U 1	U 1	(1) U 5	(1) U 1	U 1	2	1	U 1
	6/7/2000	U 1	U 1	U 5	U 1	U 1	U 1	1	U 1
	11/28/2000	U 1	U 1	U 5	U 1	U 1	1	1	U 1
	6/11/2001	U 1	U 1	U 5	U 1	U 1	2	1	U 1
	12/17/2001	U 1	1	(1) U 5	(1) U 1	U 1	1	1	U 1

**Notes:** µg/L - micrograms per liter  
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Montana Circular DEQ-7, October 2012  
NA - Not Applicable

J - Estimated Concentration  
(1) - No HHS established  
-- - Not collected/analyzed  
U - Below Analytical Reporting Limit  
\* (1) X F% - Additional QA/QC notes


 - Value greater than or equal to the HHS  
Vinyl Chloride concentration highlighted only if equal to or greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is 0.2 micrograms per liter.

**TABLE 2**  
**Summary of Detected Volatile Organic Compounds in Selected Groundwater Samples**  
**Bozeman Sanitary Landfill**

Sampling Location	Sampling Date	LABORATORY PARAMETERS							
		Benzene (µg/L)	Cis 1,2-dichloro-ethene (µg/L)	Methylene Chloride (µg/L)	1,1-Dichloro-ethane (µg/L)	Methyl chloride (µg/L)	Tetrachloro-ethene (µg/L)	Trichloro-ethene (µg/L)	Vinyl chloride (µg/L)
<b>HHS</b>		<b>5</b>	<b>70</b>	<b>5</b>	<b>(1)</b>	<b>30</b>	<b>5</b>	<b>5</b>	<b>2</b>
MW-4	6/13/2002	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	1	1	U 1
	12/11/2002	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	1	(1) U 1	U 1
	6/9/2003	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	1	(1) U 1	U 1
	12/4/2003	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	(1) U 1	(1) U 1	JJF% 1
	6/9/2004	U 1	(1) U 1	(1) U 5	U 1	U 1	(1) U 1	(1) U 1	U 1
	12/6/2004	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	(1) U 1	(1) U 1	U 1
	6/16/2005	U 1	(1) U 1	(1) U 5	U 1	U 1	(1) U 1	(1) U 1	U 1
	12/14/2005	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	(1) U 1	(1) U 1	U 1
	6/12/2006	U 0.5	(1) U 0.5	(1) U 5	(1) U 1	U 1	0.5	(1) U 0.5	U 0.5
	12/5/2006	U 0.5	U(1) 0.5	U 5	U 1	U 1	U(1) 0.5	U(1) 0.5	U 0.5
	6/19/2007	U 0.5	U 0.5	U 5	U 1	U 1	0.6	U 0.5	JJF% 0.5
	12/11/2007	U 0.5	U(1) 0.5	U 5	U 1	U 1	0.5	U(1) 0.5	U 0.5
	6/23/2008	U 0.5	U 0.5	U(1) 5	U 1	U 1	0.5	U(1) 0.5	U 0.5
	12/8/2008	U 1	U 1	U 4	U 1	U 1	U 1	U 1	U 0.4
	6/1/2009	U 0.5	U 0.5	U 2	U 0.5	U 2	J 0.98	J 0.54	U 0.2
	12/10/2009	U 0.5	U 0.5	UB 2	U 0.5	U 2	J 0.83	J 0.56	U 0.2
	6/15/2010	U 0.5	0.51	27.6	U 0.5	U 0.5	0.85	0.66	U 0.5
	12/7/2010	U 1	U 1	U 1	U 1	U 1	U 1	U 1	U 1
	6/13/2011	U 0.04	J 0.49	U 2	J 0.24	J 0.097	0.78	0.66	U 0.049
	12/7/2011	U 0.05	J 0.4	U 5	J 0.25	U 0.13	0.87	0.64	U 0.16
	6/4/2012	U 0.5	J 0.48	U 4	U 0.5	U 1	1.2	0.86	U 0.16
	12/4/2012	U 0.05	J 0.45	U 2	J 0.29	U 0.13	1.1	0.79	U 0.16
<b>MW-5</b>	1/17/1994	U 2	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	6/27/1994	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	1/31/1995	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	6/27/1995	U 1	U 1	U 1	U 1	U 1	U 1	U 1	U 1
	11/27/1995	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	6/25/1996	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	12/11/1996	U 1	U 1	U 5	U 1	U* 1	U 1	U 1	U 1
	6/19/1997	U 1	U 1	U 1	U 1	U 2	U 1	U 1	U 2
	12/15/1997	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	6/29/1998	U 1	U 1	U 5	U 1	1	U 1	U 1	U 1
	12/14/1998	U 1	U 1	U(1)B 5	U 1	(1) U 1	U 1	U 1	U 1
	6/22/1999	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1
	12/13/1999	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1
	6/7/2000	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	11/28/2000	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	6/11/2001	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	12/17/2001	U 1	U 1	(1) U 5	U 1	U 1	U 1	(1) U 1	U 1
	6/13/2002	U 1	U 1	(1) U 5	U 1	U 1	U 1	(1) U 1	U 1

**Notes:** µg/L - micrograms per liter  
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Montana Circular DEQ-7, October 2012  
NA - Not Applicable

J - Estimated Concentration  
(1) - No HHS established  
-- - Not collected/analyzed  
U - Below Analytical Reporting Limit  
\* (1) X F% - Additional QA/QC notes


 - Value greater than or equal to the HHS  
Vinyl Chloride concentration highlighted only if equal to or greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is 0.2 micrograms per liter.

**TABLE 2**  
**Summary of Detected Volatile Organic Compounds in Selected Groundwater Samples**  
**Bozeman Sanitary Landfill**

Sampling Location	Sampling Date	LABORATORY PARAMETERS							
		Benzene (µg/L)	Cis 1,2-dichloro-ethene (µg/L)	Methylene Chloride (µg/L)	1,1-Dichloro-ethane (µg/L)	Methyl chloride (µg/L)	Tetrachloro-ethene (µg/L)	Trichloro-ethene (µg/L)	Vinyl chloride (µg/L)
<b>HHS</b>		<b>5</b>	<b>70</b>	<b>5</b>	<b>(1)</b>	<b>30</b>	<b>5</b>	<b>5</b>	<b>2</b>
MW-5	12/11/2002	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1
	6/9/2003	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1
	12/3/2003	(1) U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	JJF% 1
	6/9/2004	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1
	12/6/2004	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1
	6/16/2005	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1
	12/14/2005	(1) U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1
	6/12/2006	U 0.5	U 0.5	(1) U 5	U 1	U 1	U 0.5	U 0.5	U 0.5
	12/5/2006	U 0.5	U 0.5	U 5	U 1	U 1	U 0.5	U 0.5	U 0.5
	6/19/2007	U 0.5	U 0.5	U 5	U 1	U 1	U 0.5	U 0.5	JJF% 0.5
	12/11/2007	U 0.5	U 0.5	U 5	U 1	U(1) 1	U 0.5	U 0.5	U 0.5
	6/23/2008	U 0.5	U 0.5	U(1) 5	U 1	U 1	U 0.5	U 0.5	U 0.5
	12/8/2008	U 1	U 1	U 4	U 1	U 1	U 1	U 1	U 0.4
	6/1/2009	U 0.5	U 0.5	U 2	U 0.5	U 2	U 0.5	U 0.5	U 0.2
	12/3/2009	U 0.5	U 0.5	UB 2	U 0.5	U 2	U 0.5	U 0.5	U 0.2
	6/14/2010	U 0.5	U 0.5	38.3	U 0.5	U 0.5	U 0.5	U 0.5	U 0.5
	12/6/2010	U 1	U 1	U 1	U 1	U 1	U 1	U 1	U 1
	6/13/2011	J 0.07	U 0.08	U 2	U 0.072	J 0.057	U 0.041	U 0.05	U 0.049
	12/6/2011	U 0.05	U 0.08	U 5	U 0.072	U 0.13	U 0.16	U 0.11	U 0.16
	6/4/2012	U 0.5	U 0.5	U 4	U 0.5	U 1	U 0.16	U 0.11	U 0.16
	12/4/2012	U 0.05	U 0.08	U 2	U 0.072	U 0.13	U 0.16	U 0.11	U 0.16
MW-6	8/3/1993	U 1	2.3	U 1	1.7	U 1	U 1	5.1	3.7
	1/18/1994	U 2	2	U 5	U 1	U 1	1	5	6
	6/28/1994	U 1	3	U 5	3	U 1	1	6	8
	2/1/1995	U* 1	3	U 5	3	U 1	1	5	12
	6/27/1995	U 1	2	U 1	U 1	U 1	U 1	3	9
	11/28/1995	U 1	1	U 5	2	U 1	1	3	6
	6/25/1996	U 1	U* 1	U 5	2	1	1	2	11
	12/11/1996	U 1	U 1	U 5	2	U 1	U* 1	2	11
	6/19/1997	U 1	U 1	U 1	U 1	U 2	1	U 1	U 2
	12/16/1997	U 1	U 1	U 5	2	U 1	2	U 1	14
	3/23/1998	U 1	U 1	U 5	2	U 1	U 1	2	13
	6/29/1998	U 1	<(2) 1	U 5	1	U 1	<(2) 1	1	15
	9/29/1998	U 1	U 1	U 5	1	U 1	U 1	1	9
	3/15/1999	U 1	U 1	(1) U 5	(1) U 1		(1) U 1	1	9
	6/22/1999	U 1	U 1	(1) U 5	U 1	U 1	U 1	(1) U 1	9
	9/13/1999	U 1	U 1	(1) U 5	(1) U 1	U 1	U 1	U 1	9
	12/13/1999	U 1	U 1	(1) U 5	U 1	U 1	U 1	(1) U 1	10
	3/22/2000	U 1	U 1	U 5	(1) U 1	U 1	U 1	(1) U 1	4
	6/7/2000	U 1	U 1	(1) U 5	(1) U 1	U 1	U 1	U 1	3

**Notes:** µg/L - micrograms per liter  
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Montana Circular DEQ-7, October 2012  
NA - Not Applicable

J - Estimated Concentration  
(1) - No HHS established  
-- - Not collected/analyzed  
U - Below Analytical Reporting Limit  
\* (1) X F% - Additional QA/QC notes


 - Value greater than or equal to the HHS  
Vinyl Chloride concentration highlighted only if equal to or greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is 0.2 micrograms per liter.

**TABLE 2**  
**Summary of Detected Volatile Organic Compounds in Selected Groundwater Samples**  
**Bozeman Sanitary Landfill**

Sampling Location	Sampling Date	LABORATORY PARAMETERS							
		Benzene (µg/L)	Cis 1,2-dichloroethene (µg/L)	Methylene Chloride (µg/L)	1,1-Dichloroethane (µg/L)	Methyl chloride (µg/L)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	Vinyl chloride (µg/L)
HHS		5	70	5	(1)	30	5	5	2
MW-6	9/22/2000	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	3
	11/28/2000	U 1	U 1	U 5	U 1	U 1	U 1	U 1	3
	3/21/2001	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	6/11/2001	U 1	U 1	U 5	U 1	U 1	U 1	1	U 1
	9/19/2001	U 1	(1) U 1	U(1,3) 5	U 1	U 1	(1) U 1	(1) U 1	U 1
	12/18/2001	U 1	(1) U 1	(1) U 5	1	U 1	(1) U 1	1	U 1
	3/25/2002	U 1	1	U 5	U 1	U 1	U 1	2	U 1
	6/13/2002	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	(1) U 1	1	U 1
	9/24/2002	U 1	1	UJR 5	U 1	U 1	U 1	1	U 1
	12/12/2002	U 1	2	(1) U 5	1	U 1	(1) U 1	2	(1) U 1
	3/24/2003	U 1	(1) U 1	(1) U 5	(1) U 1	(1) U 1	(1) U 1	1	U 1
	6/9/2003	U 1	1	(1) U 5	(1) U 1	U 1	(1) U 1	2	U 1
	9/25/2003	U 1	2	(1) U 5	(1) U 1	U 1	(1) U 1	2	U 1
	12/4/2003	U 1	1	(1) U 5	(1) U 1	U 1	(1) U 1	2	JJF% 1
	3/24/2004	U 1	2	U 5	1	U 1	(1) U 1	2	U 1
	6/8/2004	U 1	2	(1) U 5	(1) U 1	U 1	(1) U 1	2	U 1
	9/9/2004	U 1	1	(1) U 5	(1) U 1	U 1	(1) U 1	2	U 1
	12/7/2004	U 1	2	(1) U 5	(1) U 1	U 1	(1) U 1	2	U 1
	3/29/2005	U 1	2	(1) U 5	1	U 1	(1) U 1	2	U 1
	6/16/2005	U 1	1	U 5	1	U 1	2	2	U 1
	9/20/2005	U 1	2	(1) BU 5	(1) U 1	U 1	(1) U 1	3	U 1
	12/14/2005	U 1	1	(1) U 5	1	U 1	2	2	U 1
	3/16/2006	U 1	(1) U 1	U 5	(1) U 1	U 1	2	1	U 1
	6/13/2006	U 0.5	0.8	(1) U 5	1.1	U 1	2.5	1.1	U 0.5
	9/21/2006	U 0.5	1.8	U(1) 5	U(1) 1	U 1	0.9	2.2	U(1) 0.5
	12/6/2006	U 0.5	1.5	U 5	1	U 1	1.8	1.6	U 0.5
	3/15/2007	U 0.5	1	U 5	1	U 1	1.4	1	U 0.5
	6/20/2007	U 0.5	0.8	U 5	U 1	U 1	1.1	1	JJF% 0.5
	12/10/2007	U 0.5	1.8	U 5	1.1	U(1) 1	1.3	1.9	U 0.5
	6/24/2008	U 0.5	0.8	U(1) 5	U 1	U 1	0.9	0.8	U 0.5
	12/9/2008	U 1	1.8	U 4	1.4	U 1	1.7	2.2	U 0.4
	6/2/2009	U 0.5	1.4	U 2	1.1	U 2	J 0.88	1.3	U 0.2
	12/9/2009	U 0.5	1.8	UB 2	1.3	U 2	1.7	1.8	2.1
	6/15/2010	U 0.5	1.5	19.1	1.1	U 0.5	1.3	1.4	2.4
	12/7/2010	U 1	2.2	U 1	1.1	U 1	1	1.5	5.3
	6/13/2011	J 0.31	1.3	U 2	0.94	U 0.021	0.78	0.96	5.2
	12/5/2011	U 0.05	1	U 5	0.89	U 0.13	1.5	0.88	1.2
	6/5/2012	J 0.21	2.5	U 4	1.1	U 1	0.93	1.1	1.8
	12/4/2012	J 0.12	2.1	U 2	0.95	U 0.13	0.97	0.79	1.5
MW-6B	6/5/2012	U 0.5	U 0.5	U 4	U 0.5	U 1	U 0.16	U 0.11	U 0.16

**Notes:** µg/L - micrograms per liter  
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Montana Circular DEQ-7, October 2012  
NA - Not Applicable

J - Estimated Concentration  
(1) - No HHS established  
-- - Not collected/analyzed  
U - Below Analytical Reporting Limit  
\* (1) X F% - Additional QA/QC notes


 - Value greater than or equal to the HHS  
Vinyl Chloride concentration highlighted only if equal to or greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is 0.2 micrograms per liter.

**TABLE 2**  
**Summary of Detected Volatile Organic Compounds in Selected Groundwater Samples**  
**Bozeman Sanitary Landfill**

Sampling Location	Sampling Date	LABORATORY PARAMETERS							
		Benzene (µg/L)	Cis 1,2-dichloro-ethene (µg/L)	Methylene Chloride (µg/L)	1,1-Dichloro-ethane (µg/L)	Methyl chloride (µg/L)	Tetrachloro-ethene (µg/L)	Trichloro-ethene (µg/L)	Vinyl chloride (µg/L)
HHS		5	70	5	(1)	30	5	5	2
MW-6B	12/4/2012	U 0.05	U 0.08	U 2	U 0.072	U 0.13	U 0.16	U 0.11	U 0.16
MW-7A	1/18/1994	U 2	U 1	12	6	U 1	27	4	U 1
	6/28/1994	U* 1	U 1	18	7	U 1	32	5	U 1
	2/1/1995	U 1	U 1	14	6	U 1	24	4	1
	6/27/1995	2	U 1	JX 17	6	U 1	13	5	U 1
	11/27/1995	U* 1	U 1	10	4	U 1	17	4	1
	6/25/1996	2	U* 1	15	5	U 1	16	6	4
	12/11/1996	U* 1	U 1	10	3	U 1	10	4	2
	6/20/1997	2	U 1	15	4	U 2	13	5	7
	12/16/1997	2	1	JX 18	5	U 1	5	13	5
	3/23/1998	2	U 1	14	4	U 1	11	4	4
	6/30/1998	2	1	15	4	U 1	11	4	6
	9/29/1998	2	1	19	4	U 1	11	4	3
	12/14/1998	2	1	B 21	5	U 1	11	11	4
	3/15/1999	2	(1) U 1	14	4		10	3	3
	6/22/1999	2	U 1	(1) U 5	4	U (1) 5	6	3	4
	9/13/1999	2	(1) U 1	(1) U 5	3	U 1	8	3	3
	12/14/1999	1	U 1	(1) U 5	3	U 1	7	2	2
	3/22/2000	1	U 1	U 5	3	U 1	9	3	2
	6/7/2000	(1) U 1	(1) U 1	(1) U 5	3	U 1	7	U 1	3
	9/22/2000	(1) U 1	U 1	(1) U 5	3	U 1	7	2	3
	11/28/2000	U 1	U 1	U 5	3	U 1	7	2	3
	3/21/2001	U 1	U 1	U 5	4	U 1	11	3	2
	6/11/2001	1	U 1	U 5	4	U 1	12	3	3
	9/19/2001	(1) U 1	U 1	U(1,3) 5	3	U 1	8	2	(1) U 1
	12/17/2001	(1) U 1	(1) U 1	(1) U 5	5	U 1	11	3	2
	3/25/2002	U 1	U 1	U 5	3	U 1	9	2	1
	6/13/2002	(1) U 1	(1) U 1	(1) U 5	5	U 1	10	3	2
	9/24/2002	U 1	U 1	UJR 5	3	U 1	8	2	1
	12/12/2002	(1) U 1	(1) U 1	(1) U 5	5	U 1	12	3	1
	3/24/2003	(1) U 1	(1) U 1	(1) U 5	3	(1) U 1	9	2	(1) U 1
	6/10/2003	(1) U 1	(1) U 1	(1) U 5	3	U 1	9	2	(1) U 1
	9/25/2003	(1) U 1	(1) U 1	(1) U 5	3	U 1	8	2	(1) U 1
	12/4/2003	(1) U 1	(1) U 1	(1) U 5	4	U 1	7	2	JF% 1
	3/24/2004	U 1	U 1	(1) U 5	2	U 1	4	(1) U 1	(1) U 1
	6/8/2004	U 1	U 1	(1) U 5	2	U 1	6	1	(1) U 1
	9/9/2004	(1) U 1	U 1	(1) U 5	1	U 1	5	(1) U 1	(1) U 1
	12/7/2004	U 1	U 1	(1) U 5	2	U 1	6	1	(1) U 1
	3/29/2005	U 1	U 1	(1) U 5	1	U 1	3	(1) U 1	(1) U 1
	6/17/2005	U 1	U 1	U 5	2	U 1	6	1	U 1

**Notes:** µg/L - micrograms per liter  
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Montana Circular DEQ-7, October 2012  
NA - Not Applicable

J - Estimated Concentration  
(1) - No HHS established  
-- - Not collected/analyzed  
U - Below Analytical Reporting Limit  
\* (1) X F% - Additional QA/QC notes


 - Value greater than or equal to the HHS  
Vinyl Chloride concentration highlighted only if equal to or greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is 0.2 micrograms per liter.

**TABLE 2**  
**Summary of Detected Volatile Organic Compounds in Selected Groundwater Samples**  
**Bozeman Sanitary Landfill**

Sampling Location	Sampling Date	LABORATORY PARAMETERS							
		Benzene (µg/L)	Cis 1,2-dichloroethene (µg/L)	Methylene Chloride (µg/L)	1,1-Dichloroethane (µg/L)	Methyl chloride (µg/L)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	Vinyl chloride (µg/L)
<b>HHS</b>		<b>5</b>	<b>70</b>	<b>5</b>	<b>(1)</b>	<b>30</b>	<b>5</b>	<b>5</b>	<b>2</b>
MW-7A	9/20/2005	U 1	U 1	(1) BU 5	1	U 1	3	(1) U 1	U 1
	12/14/2005	U 1	U 1	(1) U 5	1	U 1	4	(1) U 1	(1) U 1
	3/16/2006	U 1	U 1	U 5	(1) U 1	U 1	2	(1) U 1	(1) U 1
	6/13/2006	(1) U 0.5	U 0.5	(1) U 5	1.6	U 1	4.2	0.7	(1) U 0.5
	9/21/2006	U(1) 0.5	U 0.5	U(1) 5	U(1) 1	U 1	2.7	U(1) 0.5	U(1) 0.5
	12/7/2006	U 0.5	U 0.5	U 5	U(1) 1	U 1	1.7	U(1) 0.5	U 0.5
	3/15/2007	U 0.5	U 0.5	U 5	1	U 1	2.2	U(1) 0.5	U 0.5
	6/20/2007	0.5	U 0.5	U 5	U 1	U 1	2.3	0.6	JJF% 0.5
	12/10/2007	U 0.5	U 0.5	U 5	1.3	U(1) 1	2.4	0.5	U 0.5
	6/24/2008	U 0.5	U 0.5	U(1) 5	1.5	U 1	3.5	0.7	U 0.5
	12/10/2008	U 1	U 1	U 4	2.9	U 1	5.5	1.3	0.53
	6/2/2009	U 0.5	U 0.5	U 2	1.6	U 2	4	J 0.81	U 0.2
	12/9/2009	U 0.5	U 0.5	UB 2	3.1	U 2	5.6	1.4	0.57
	6/16/2010	U 0.5	U 0.5	30.2	1.7	U 0.5	3.4	0.83	U 0.5
	12/7/2010	U 1	U 1	U 1	4.3	U 1	8.6	1.9	U 1
	6/14/2011	0.52	J 0.41	U 2	4.6	U 0.021	7.9	2	0.7
	12/6/2011	0.72	0.67	U 5	5.3	U 0.13	8.3	2.3	0.88
	6/5/2012	0.91	0.94	U 4	6.5	U 1	12	3	1.1
	12/5/2012	0.56	0.7	U 2	4.6	U 0.13	7.7	2	0.71
<b>MW-7B</b>	8/3/1993	U 1	U 1	U 1	U 1	U 1	U 1	U 1	U 1
	1/18/1994	U 2	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	6/28/1994	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	2/1/1995	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	6/27/1995	U 1	U 1	U 1	U 1	U 1	U 1	U 1	U 1
	12/6/2011	U 0.05	U 0.08	U 5	U 0.072	U 0.13	U 0.16	U 0.11	U 0.16
	6/5/2012	U 0.5	U 0.5	U 4	U 0.5	U 1	U 0.16	U 0.11	U 0.16
<b>MW-8A</b>	1/19/1994	U 2	U 1	U 5	U 1	U 1	5	1	U 1
	6/28/1994	U 1	1	U 5	U 1	U 1	4	3	U 1
	2/1/1995	U 1	1	U 5	1	U 1	4	3	U 1
	6/27/1995	U 1	1	U 1	1	U 1	2	3	U 1
	11/28/1995	U 1	1	U* 5	2	U 1	3	3	U 1
	6/25/1996	U 1	2	U 5	2	U 1	3	3	U 1
	12/12/1996	U 1	1	U 5	1	U 1	2	3	U 1
	6/19/1997	U 1	1	U 1	1	U 2	2	2	U 2
	12/16/1997	U 1	3	U 5	1	U 1	3	3	U 1
	6/30/1998	U 1	4	<(2) 5	2	U 1	4	5	U 1
	12/15/1998	U 1	5	U(1)B 5	1	(1) U 1	4	4	U 1
	6/22/1999	U 1	3	(1) U 5	U 1	U 1	2	3	U 1
	12/14/1999	U 1	3	(1) U 5	(1) U 1	U 1	2	3	U 1
	6/8/2000	U 1	2	(1) U 5	(1) U 1	U 1	2	3	U 1

**Notes:** µg/L - micrograms per liter  
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Montana Circular DEQ-7, October 2012  
NA - Not Applicable

J - Estimated Concentration  
(1) - No HHS established  
-- - Not collected/analyzed  
U - Below Analytical Reporting Limit  
\* (1) X F% - Additional QA/QC notes

 - Value greater than or equal to the HHS  
Vinyl Chloride concentration highlighted only if equal to or greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is 0.2 micrograms per liter.



**TABLE 2**  
**Summary of Detected Volatile Organic Compounds in Selected Groundwater Samples**  
**Bozeman Sanitary Landfill**

Sampling Location	Sampling Date	LABORATORY PARAMETERS							
		Benzene (µg/L)	Cis 1,2-dichloro-ethene (µg/L)	Methylene Chloride (µg/L)	1,1-Dichloro-ethane (µg/L)	Methyl chloride (µg/L)	Tetrachloro-ethene (µg/L)	Trichloro-ethene (µg/L)	Vinyl chloride (µg/L)
<b>HHS</b>		<b>5</b>	<b>70</b>	<b>5</b>	<b>(1)</b>	<b>30</b>	<b>5</b>	<b>5</b>	<b>2</b>
MW-8A	11/29/2000	U 1	2	U 5	U 1	U 1	2	2	U 1
	6/12/2001	U 1	1	U 5	U 1	U 1	2	2	U 1
	12/18/2001	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	1	1	U 1
	6/14/2002	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	1	1	U 1
	12/13/2002	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	1	(1) U 1	U 1
	6/10/2003	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	1	(1) U 1	U 1
	12/3/2003	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	(1) U 1	(1) U 1	JF% 1
	6/8/2004	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	(1) U 1	(1) U 1	U 1
	12/7/2004	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	(1) U 1	(1) U 1	U 1
	6/16/2005	U 1	U 1	(1) U 5	U 1	U 1	(1) U 1	(1) U 1	U 1
	12/14/2005	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	(1) U 1	(1) U 1	U 1
	6/13/2006	U 0.5	(1) U 0.5	(1) U 5	(1) U 1	U 1	0.7	(1) U 0.5	U 0.5
	12/6/2006	U 0.5	U 0.5	U 5	U(1) 1	U(1) 1	0.7	U(1) 0.5	U 0.5
	6/20/2007	U 0.5	U 0.5	U 5	U 1	U 1	0.8	U 0.5	JF% 0.5
	12/10/2007	U 0.5	U 0.5	U 5	U 1	U(1) 1	0.6	U 0.5	U 0.5
	6/24/2008	U 0.5	U 0.5	U(1) 5	U 1	U 1	0.6	U(1) 0.5	U 0.5
	12/9/2008	U 1	U 1	U 4	U 1	U 1	U 1	U 1	U 0.4
	6/1/2009	U 0.5	U 0.5	U 2	U 0.5	U 2	J 0.86	U 0.5	U 0.2
	12/9/2009	U 0.5	U 0.5	UB 2	U 0.5	U 2	J 0.85	U 0.5	U 0.2
	6/15/2010	U 0.5	U 0.5	20	U 0.5	U 0.5	0.81	U 0.5	U 0.5
	12/7/2010	U 1	U 1	U 1	U 1	U 1	1.3	U 1	U 1
	6/14/2011	U 0.04	U 0.08	U 2	U 0.072	U 0.021	0.64	J 0.28	U 0.049
	12/5/2011	U 0.05	J 0.42	U 5	U 0.072	U 0.13	0.6	J 0.3	U 0.16
	6/5/2012	U 0.5	J 0.46	U 4	U 0.5	U 1	0.8	J 0.35	U 0.16
	12/4/2012	U 0.05	0.62	U 2	U 0.072	U 0.13	0.65	J 0.28	U 0.16
<b>MW-8B</b>	2/1/1995	U 1	2	U 5	1	U 1	4	3	U 1
	12/5/2011	U 0.05	J 0.29	U 5	U 0.072	U 0.13	0.81	J 0.43	U 0.16
	6/5/2012	U 0.5	J 0.23	U 4	U 0.5	U 1	0.83	J 0.38	U 0.16
<b>MW-8C</b>	6/5/2012	U 0.5	U 0.5	U 4	U 0.5	U 1	U 0.16	U 0.11	U 0.16
	12/4/2012	U 0.05	U 0.08	U 2	U 0.072	U 0.13	U 0.16	U 0.11	U 0.16
<b>MW-9A</b>	1/18/1994	U 2	U 1	U 5	2	U 1	4	2	U 1
	6/27/1994	U 1	U 1	U 5	2	U 1	5	2	U 1
	1/31/1995	U 1	U* 1	U 5	1	U 1	4	2	U 1
	6/27/1995	U 1	U 1	U 1	1	U 1	2	U 1	U 1
	11/28/1995	U 1	U 1	U* 5	1	U 1	3	1	U 1
	6/25/1996	U 1	U 1	U 5	U* 1	U 1	2	U* 1	U 1
	12/11/1996	U 1	U 1	U 5	U 1	U 1	2	U* 1	U 1
	6/19/1997	U 1	U 1	U 1	U 1	U 2	1	U 1	U 2
	12/16/1997	U 1	U 1	U 5	U 1	U 1	U 1	1	U 1
	6/29/1998	U 1	U 1	5	(2) U 1	< (2) 1	1	U(2) 1	U 1

**Notes:** µg/L - micrograms per liter  
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Montana Circular DEQ-7, October 2012  
NA - Not Applicable

J - Estimated Concentration  
(1) - No HHS established  
-- - Not collected/analyzed  
U - Below Analytical Reporting Limit  
\* (1) X F% - Additional QA/QC notes

  - Value greater than or equal to the HHS  
Vinyl Chloride concentration highlighted only if equal to or greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is 0.2 micrograms per liter.

**TABLE 2**  
**Summary of Detected Volatile Organic Compounds in Selected Groundwater Samples**  
**Bozeman Sanitary Landfill**

Sampling Location	Sampling Date	LABORATORY PARAMETERS							
		Benzene (µg/L)	Cis 1,2-dichloro-ethene (µg/L)	Methylene Chloride (µg/L)	1,1-Dichloro-ethane (µg/L)	Methyl chloride (µg/L)	Tetrachloro-ethene (µg/L)	Trichloro-ethene (µg/L)	Vinyl chloride (µg/L)
<b>HHS</b>		<b>5</b>	<b>70</b>	<b>5</b>	<b>(1)</b>	<b>30</b>	<b>5</b>	<b>5</b>	<b>2</b>
MW-9A	12/14/1998	U 1	U 1	U(1)B 5	(1) U 1	(1) U 1	1	1	U 1
	6/22/1999	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1
	12/13/1999	U 1	U 1	(1) U 5	(1) U 1	U 1	1	(1) U 1	U 1
	6/7/2000	U 1	U 1	(1) U 5	(1) U 1	U 1	U 1	(1) U 1	U 1
	11/28/2000	U 1	U 1	U 5	U 1	U 1	2	U 1	U 1
	6/11/2001	U 1	U 1	U 5	1	U 1	2	1	U 1
	12/17/2001	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	2	1	U 1
	6/13/2002	U 1	1	(1) U 5	(1) U 1	U 1	2	1	U 1
	12/12/2002	U 1	1	(1) U 5	(1) U 1	U 1	2	1	U 1
	6/9/2003	U 1	(1) U 1	(1) U 5	(1) U 1	(1) U 1	1	(1) U 1	U 1
	12/4/2003	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	1	(1) U 1	JJF% 1
	6/8/2004	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	1	(1) U 1	U 1
	12/7/2004	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	1	(1) U 1	U 1
	6/16/2005	U 1	(1) U 1	(1) U 5	U 1	U 1	1	(1) U 1	U 1
	12/14/2005	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	1	(1) U 1	U 1
	6/13/2006	U 0.5	0.5	(1) U 5	(1) U 1	U 1	1	0.5	U 0.5
	12/6/2006	U 0.5	U(1) 0.5	U 5	U(1) 1	U 1	0.9	0.5	U 0.5
	6/20/2007	U 0.5	U 0.5	U 5	U 1	U 1	0.8	0.5	JJF% 0.5
	12/10/2007	U 0.5	U 0.5	U 5	U 1	U(1) 1	0.6	U(1) 0.5	U 0.5
	6/24/2008	U 0.5	U 0.5	U(1) 5	U 1	U 1	0.7	U(1) 0.5	U 0.5
	12/9/2008	U 1	U 1	U 4	U 1	U 1	U 1	U 1	U 0.4
	6/1/2009	U 0.5	U 0.5	U 2	U 0.5	U 2	1.2	J 0.55	U 0.2
	12/4/2009	U 0.5	J 0.62	UB 2	U 0.5	U 2	1.2	J 0.71	U 0.2
	6/15/2010	U 0.5	0.59	17.7	U 0.5	U 0.5	1.1	0.71	U 0.5
	12/7/2010	U 1	U 1	U 1	U 1	U 1	1.1	U 1	U 1
	6/14/2011	U 0.04	J 0.44	U 2	J 0.18	U 0.021	0.95	0.64	U 0.049
	12/5/2011	U 0.05	J 0.48	U 5	J 0.28	U 0.13	0.95	0.75	U 0.16
	6/4/2012	U 0.5	J 0.47	U 4	U 0.5	U 1	1.4	0.95	U 0.16
	12/4/2012	U 0.05	J 0.46	U 2	J 0.31	U 0.13	1.2	0.78	U 0.16
<b>MW-9B</b>	1/31/1995	U 1	U* 1	U 5	U* 1	U 1	4	2	U 1
	12/5/2011	U 0.05	0.67	U 5	J 0.28	U 0.13	1.2	1.1	U 0.16
	6/4/2012	U 0.5	0.53	U 4	U 0.5	U 1	1.4	1	U 0.16
<b>MW-10</b>	6/27/1994	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	2/2/1995	U 1	U 1	U 5	U 1	U 1	U 1	1	U 1
	6/28/1995	U 1	U 1	U 1	U 1	U 1	U 1	U 1	U 1
	11/28/1995	U 1	U 1	U* 5	U 1	U 1	U* 1	U* 1	U 1
	6/26/1996	U 1	U 1	U 5	U 1	U 1	U 1	U* 1	U 1
	12/12/1996	U 1	U 1	U 5	U 1	U* 1	U 1	U* 1	U 1
	6/20/1997	U 1	U 1	U 1	U 1	U 2	U 1	U 1	U 2
	12/17/1997	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1

**Notes:** µg/L - micrograms per liter  
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Montana Circular DEQ-7, October 2012  
NA - Not Applicable

J - Estimated Concentration  
(1) - No HHS established  
-- - Not collected/analyzed  
U - Below Analytical Reporting Limit  
\* (1) X F% - Additional QA/QC notes


- Value greater than or equal to the HHS  
Vinyl Chloride concentration highlighted only if equal to or greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is 0.2 micrograms per liter.

**TABLE 2**  
**Summary of Detected Volatile Organic Compounds in Selected Groundwater Samples**  
**Bozeman Sanitary Landfill**

Sampling Location	Sampling Date	LABORATORY PARAMETERS							
		Benzene (µg/L)	Cis 1,2-dichloro-ethene (µg/L)	Methylene Chloride (µg/L)	1,1-Dichloro-ethane (µg/L)	Methyl chloride (µg/L)	Tetrachloro-ethene (µg/L)	Trichloro-ethene (µg/L)	Vinyl chloride (µg/L)
<b>HHS</b>		<b>5</b>	<b>70</b>	<b>5</b>	<b>(1)</b>	<b>30</b>	<b>5</b>	<b>5</b>	<b>2</b>
MW-10	6/29/1998	U 1	U 1	U(3) 5	U 1	3	U 1	1	U 1
	12/15/1998	U 1	U 1	U(1)B 5	U 1	(1) U 1	(1) U 1	(1) U 1	U 1
	6/23/1999	U 1	U 1	(1) U 5	U 1	U 1	U 1	(1) U 1	U 1
	12/13/1999	U 1	U 1	(1) U 5	U 1	U 1	U 1	(1) U 1	U 1
	6/8/2000	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	11/29/2000	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	6/12/2001	U 1	U 1	U 5	U 1	U 1	U 1	1	U 1
	12/18/2001	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	(1) U 1	1	U 1
	6/14/2002	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	(1) U 1	(1) U 1	U 1
	12/12/2002	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	(1) U 1	1	U 1
	6/10/2003	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	(1) U 1	(1) U 1	U 1
	12/3/2003	U 1	(1) U 1	(1) U 5	U 1	U 1	(1) U 1	1	JJF% 1
	6/8/2004	U 1	(1) U 1	(1) U 5	U 1	U 1	U 1	(1) U 1	U 1
	12/6/2004	U 1	U 1	(1) U 5	U 1	U 1	U 1	(1) U 1	U 1
	6/17/2005	U 1	(1) U 1	B U 5	U 1	U 1	U 1	(1) U 1	U 1
	12/13/2005	U 1	(1) U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1
	6/13/2006	U 0.5	(1) U 0.5	(1) U 5	(1) U 1	U 1	U 0.5	0.6	U 0.5
	12/6/2006	U 0.5	U 0.5	U(1) 5	U 1	U 1	U 0.5	0.6	U 0.5
	6/19/2007	U 0.5	U 0.5	U 5	U 1	U 1	U 0.5	0.7	JJF% 0.5
	12/10/2007	U 0.5	U 0.5	U 5	U 1	U(1) 1	U 0.5	0.6	U 0.5
	6/26/2008	U 0.5	U 0.5	U(1) 5	U 1	U 1	U 0.5	U 0.5	U 0.5
	12/9/2008	U 1	U 1	U 4	U 1	U 1	U 1	U 1	U 0.4
	6/2/2009	U 0.5	U 0.5	U 2	U 0.5	U 2	U 0.5	J 0.66	U 0.2
	12/4/2009	U 0.5	U 0.5	UB 2	U 0.5	U 2	U 0.5	J 0.82	U 0.2
	6/16/2010	U 0.5	U 0.5	42.4	U 0.5	U 0.5	U 0.5	0.78	U 0.5
	12/6/2010	U 1	U 1	U 1	U 1	U 1	U 1	U 1	U 1
	6/14/2011	U 0.04	U 0.08	U 2	U 0.072	U 0.021	U 0.041	0.7	U 0.049
	12/6/2011	U 0.05	J 0.26	U 5	U 0.072	U 0.13	U 0.16	0.57	U 0.16
	6/4/2012	U 0.5	J 0.2	U 4	U 0.5	U 1	U 0.16	0.58	U 0.16
	12/5/2012	U 0.05	J 0.17	U 2	U 0.072	U 0.13	U 0.16	J 0.5	U 0.16
<b>MW-11</b>	11/27/1995	U 1	U 1	U* 5	U 1	U 1	U 1	U 1	U 1
	6/26/1996	U 1	U 1	U 5	U 1	U* 1	U 1	U 1	U 1
	12/12/1996	U 1	U 1	U 5	U 1	U* 1	U 1	U 1	U 1
	6/19/1997	U 1	U 1	U 1	U 1	U 2	U 1	U 1	U 2
	12/16/1997	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	6/30/1998	U 1	U 1	U(3) 5	U 1	U(3) 1	U 1	U 1	U 1
	12/14/1998	U 1	U 1	U(1)B 5	U 1	(1) U 1	U 1	U 1	U 1
	6/22/1999	U 1	U 1	(1) U 5	U 1	1	U 1	U 1	U 1
	12/14/1999	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1
	6/8/2000	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1

**Notes:** µg/L - micrograms per liter  
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Montana Circular DEQ-7, October 2012  
NA - Not Applicable

J - Estimated Concentration  
(1) - No HHS established  
-- - Not collected/analyzed  
U - Below Analytical Reporting Limit  
\* (1) X F% - Additional QA/QC notes

 - Value greater than or equal to the HHS  
Vinyl Chloride concentration highlighted only if equal to or greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is 0.2 micrograms per liter.

**TABLE 2**  
**Summary of Detected Volatile Organic Compounds in Selected Groundwater Samples**  
**Bozeman Sanitary Landfill**

Sampling Location	Sampling Date	LABORATORY PARAMETERS							
		Benzene (µg/L)	Cis 1,2-dichloro-ethene (µg/L)	Methylene Chloride (µg/L)	1,1-Dichloro-ethane (µg/L)	Methyl chloride (µg/L)	Tetrachloro-ethene (µg/L)	Trichloro-ethene (µg/L)	Vinyl chloride (µg/L)
<b>HHS</b>		<b>5</b>	<b>70</b>	<b>5</b>	<b>(1)</b>	<b>30</b>	<b>5</b>	<b>5</b>	<b>2</b>
MW-11	11/29/2000	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	6/12/2001	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	12/18/2001	U 1	U 1	(1) U 5	(1) U 1	U 1	(1) U 1	(1) U 1	U 1
	6/14/2002	U 1	U 1	(1) U 5	(1) U 1	U 1	(1) U 1	U 1	U 1
	12/13/2002	U 1	U 1	(1) U 5	(1) U 1	U 1	(1) U 1	(1) U 1	U 1
	6/10/2003	U 1	U 1	(1) U 5	(1) U 1	U 1	(1) U 1	(1) U 1	U 1
	12/3/2003	U 1	U 1	(1) U 5	(1) U 1	U 1	(1) U 1	U 1	JJF% 1
	6/8/2004	U 1	U 1	(1) U 5	(1) U 1	U 1	(1) U 1	U 1	U 1
	12/6/2004	U 1	U 1	(1) U 5	(1) U 1	U 1	(1) U 1	(1) U 1	U 1
	6/16/2005	U 1	U 1	(1) U 5	U 1	U 1	(1) U 1	U 1	U 1
	12/13/2005	U 1	U 1	(1) U 5	U 1	U 1	(1) U 1	(1) U 1	U 1
	6/13/2006	U 0.5	U 0.5	(1) U 5	(1) U 1	U 1	0.6	(1) U 0.5	U 0.5
	12/6/2006	U 0.5	U 0.5	U(1) 5	U 1	U 1	0.6	U 0.5	U 0.5
	6/20/2007	U 0.5	U 0.5	U 5	U 1	U 1	U 0.5	U 0.5	JJF% 0.5
	12/10/2007	U 0.5	U 0.5	U 2	U 1	U(1) 1	U 0.5	U 0.5	U 0.5
	6/24/2008	U 0.5	U 0.5	U(1) 5	U 1	U 1	U(1) 0.5	U 0.5	U 0.5
	12/9/2008	U 1	U 1	U 4	U 1	U 1	U 1	U 1	U 0.4
	6/1/2009	U 0.5	U 0.5	U 2	U 0.5	U 2	U 0.5	U 0.5	U 0.2
	12/4/2009	U 0.5	U 0.5	UB 2	U 0.5	U 2	J 0.54	U 0.5	U 0.2
	6/15/2010	U 0.5	U 0.5	27.7	U 0.5	U 0.5	U 0.5	U 0.5	U 0.5
	12/7/2010	U 1	U 1	U 1	U 1	U 1	U 1	U 1	U 1
	6/14/2011	U 0.04	U 0.08	U 2	U 0.072	U 0.021	U 0.041	U 0.05	U 0.049
	12/5/2011	U 0.05	U 0.08	U 5	U 0.072	U 0.13	J 0.25	U 0.11	U 0.16
	6/4/2012	U 0.5	U 0.5	U 4	U 0.5	U 1	J 0.32	U 0.11	U 0.16
	12/5/2012	U 0.05	U 0.08	U 2	J 0.2	U 0.13	J 0.34	U 0.11	U 0.16
MW-12	11/27/1995	9	12	U* 5	4	U 1	1	11	50
	6/26/1996	11	10	U 5	5	U* 1	U* 1	9	81
	12/12/1996	7	6	U 5	4	U 1	U* 1	9	49
	6/20/1997	8	2	U 1	3	U 2	U 1	2	99
	12/16/1997	6	1	U 5	3	U 1	1	U 1	48
	3/24/1998	5	U 1	U 5	3	U 1	U 1	1	44
	6/30/1998	4	U(3) 1	U(3) 5	2	U 1	U 1	U(3) 1	43
	9/29/1998	3	U 1	U 5	2	U 1	U 1	1	29
	12/15/1998	3	U 1	UB 5	2	(1) U 1	U 1	U 1	22
	3/17/1999	2	(1) U 1	(1) U 5	1	U 1	U 1	U 1	22
	6/23/1999	2	U 1	(1) U 5	U 1	U 1	U 1	U 1	23
	9/13/1999	2	U 1	(1) U 5	U 1	U 1	U 1	(1) U 1	25
	12/14/1999	2	(1) U 1	(1) U 5	U 1	U 1	U 1	U 1	25
	3/22/2000	1	(1) U 1	U 5	(1) U 1	U 1	U 1	U 1	16
	6/8/2000	1	U 1	(1) U 5	U 1	U 1	U 1	(1) U 1	27

**Notes:** µg/L - micrograms per liter  
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Montana Circular DEQ-7, October 2012  
NA - Not Applicable

J - Estimated Concentration  
(1) - No HHS established  
-- - Not collected/analyzed  
U - Below Analytical Reporting Limit  
\* (1) X F% - Additional QA/QC notes


- Value greater than or equal to the HHS  
Vinyl Chloride concentration highlighted only if equal to or greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is 0.2 micrograms per liter.

**TABLE 2**  
**Summary of Detected Volatile Organic Compounds in Selected Groundwater Samples**  
**Bozeman Sanitary Landfill**

Sampling Location	Sampling Date	LABORATORY PARAMETERS							
		Benzene (µg/L)	Cis 1,2-dichloro-ethene (µg/L)	Methylene Chloride (µg/L)	1,1-Dichloro-ethane (µg/L)	Methyl chloride (µg/L)	Tetrachloro-ethene (µg/L)	Trichloro-ethene (µg/L)	Vinyl chloride (µg/L)
HHS		5	70	5	(1)	30	5	5	2
MW-12	9/22/2000	2	U 1	U 5	1	U 1	U 1	U 1	33
	11/29/2000	2	U 1	U 5	U 1	U 1	U 1	U 1	29
	3/21/2001	2	U 1	U 5	1	U 1	U 1	U 1	19
	6/12/2001	1	U 1	U 5	U 1	U 1	U 1	1	18
	9/19/2001	1	1	U(1,3) 5	(1) U 1	U 1	U 1	1	16
	12/18/2001	2	2	(1) U 5	1	U 1	(1) U 1	2	20
	3/25/2002	1	2	U 5	1	U 1	U 1	3	21
	6/14/2002	1	2	(1) U 5	(1) U 1	U 1	U 1	2	22
	9/24/2002	1	3	UJR 5	U 1	U 1	U 1	3	15
	12/13/2002	1	4	U 5	(1) U 1	U 1	(1) U 1	4	22
	3/24/2003	1	4	(1) U 5	(1) U 1	(1) U 1	U 1	5	16
	6/10/2003	1	5	(1) U 5	(1) U 1	U 1	(1) U 1	6	14
	9/25/2003	1	6	(1) U 5	1	U 1	(1) U 1	8	19
	12/4/2003	2	6	(1) U 5	1	U 1	(1) U 1	8	JF% 27
	3/24/2004	2	7	U 5	1	U 1	(1) U 1	8	24
	6/8/2004	1	7	(1) U 5	1	U 1	(1) U 1	7	15
	9/9/2004	1	7	(1) U 5	1	U 1	(1) U 1	9	17
	12/7/2004	1	7	(1) U 5	1	U 1	(1) U 1	8	16
	3/29/2005	1	7	(1) U 5	1	U 1	(1) U 1	7	19
	6/17/2005	(1) U 1	7	B U 5	1	U 1	1	8	16
	9/20/2005	1	7	(1) BU 5	1	U 1	1	7	12
	12/14/2005	(1) U 1	6	(1) U 5	1	U 1	1	6	15
	3/16/2006	(1) U 1	6	U 5	(1) U 1	U 1	1	6	19
	6/13/2006	1.2	8.3	(1) U 5	1	U 1	1.2	6.8	13
	9/21/2006	0.8	5.9	U(1) 5	U(1) 1	U 1	1.5	6.3	12.5
	12/7/2006	0.5	3.6	U 5	U(1) 1	U 1	U(1) 0.5	2.8	4.4
	3/15/2007	0.9	7.4	U 5	1	U 1	3	7	11.5
	6/21/2007	1	8.2	U 5	U 1	U 1	1.8	6.5	JF% 21
	12/11/2007	0.9	10	U 5	1.2	U 1	1.2	7.5	19
	6/25/2008	0.9	7.1	U(1) 5	U(1) 1	U 1	0.6	5.1	16
	12/10/2008	1.5	7.7	U 4	U 1	U 1	U 1	5.7	13.3
	6/2/2009	1.9	8	U 2	J 0.91	U 2	U 0.5	5.1	19.7
	12/9/2009	2.5	11.6	UB 2	1.2	U 2	U 0.5	6.7	26.4
	6/15/2010	2.2	9.6	22.3	1.1	U 0.5	U 0.5	4.4	27.4
	12/7/2010	1.8	11.3	U 1	1.5	U 1	U 1	4.5	J 30.4
	6/14/2011	2	4.4	U 2	1.4	U 0.021	U 0.041	1.9	J 24.9
	12/6/2011	2.1	9.6	U 5	1.7	U 0.13	U 0.16	4.3	17.4
	6/5/2012	2	10.8	U 4	2	U 1	U 0.16	3.5	20.7
	12/5/2012	1.5	9.1	U 2	1.7	U 0.13	U 0.16	1.5	21.2
MW-13	11/28/1995	1	U 1	U* 5	2	U 1	U* 1	2	21

**Notes:** µg/L - micrograms per liter  
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Montana Circular DEQ-7, October 2012  
NA - Not Applicable

J - Estimated Concentration  
(1) - No HHS established  
-- - Not collected/analyzed  
U - Below Analytical Reporting Limit  
\* (1) X F% - Additional QA/QC notes


 - Value greater than or equal to the HHS  
Vinyl Chloride concentration highlighted only if equal to or greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is 0.2 micrograms per liter.

**TABLE 2**  
**Summary of Detected Volatile Organic Compounds in Selected Groundwater Samples**  
**Bozeman Sanitary Landfill**

Sampling Location	Sampling Date	LABORATORY PARAMETERS							
		Benzene (µg/L)	Cis 1,2-dichloro-ethene (µg/L)	Methylene Chloride (µg/L)	1,1-Dichloro-ethane (µg/L)	Methyl chloride (µg/L)	Tetrachloro-ethene (µg/L)	Trichloro-ethene (µg/L)	Vinyl chloride (µg/L)
<b>HHS</b>		<b>5</b>	<b>70</b>	<b>5</b>	<b>(1)</b>	<b>30</b>	<b>5</b>	<b>5</b>	<b>2</b>
MW-13	6/25/1996	1	U* 1	U 5	3	U 1	U* 1	1	41
	12/11/1996	1	U* 1	U 5	2	U 1	U 1	U 1	28
	6/20/1997	U 1	1	U 1	1	U 2	1	2	26
	12/16/1997	1	U 1	U 5	2	U 1	2	U 1	29
	3/23/1998	1	U 1	U 5	2	U 1	U 1	1	29
	6/30/1998	1	(3) U 1	U 5	1	U 1	(3) U 1	1	34
	9/29/1998	1	U 1	U 5	1	U 1	U 1	1	24
	12/14/1998	1	(1) U 1	U(1)B 5	1	(1) U 1	(1) U 1	(1) U 1	24
	3/15/1999	(1) U 1	U 1	6	(1) U 1	U 1	U 1	(1) U 1	19
	6/23/1999	(1) U 1	U 1	(1) U 5	U 1	U 1	U 1	(1) U 1	23
	9/13/1999	(1) U 1	U 1	U 5	U 1	U 1	U 1	(1) U 1	26
	12/14/1999	(1) U 1	U 1	(1) U 5	(1) U 1	U 1	U 1	(1) U 1	27
	3/22/2000	(1) U 1	U 1	U 5	(1) U 1	U 1	U 1	(1) U 1	18
	6/8/2000	(1) U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	23
	9/22/2000	(1) U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	24
	11/29/2000	U 1	U 1	U 5	U 1	U 1	U 1	U 1	22
	3/21/2001	U 1	U 1	U 5	U 1	U 1	U 1	U 1	15
	6/12/2001	1	U 1	U 5	U 1	U 1	U 1	U 1	19
	9/19/2001	(1) U 1	(1) U 1	U(1,3) 5	(1) U 1	U 1	(1) U 1	(1) U 1	12
	12/18/2001	(1) U 1	(1) U 1	(1) U 5	1	U 1	(1) U 1	(1) U 1	10
	3/25/2002	U 1	U 1	U 5	U 1	U 1	U 1	U 1	11
	6/13/2002	(1) U 1	(1) U 1	(1) U 5	1	U 1	(1) U 1	(1) U 1	12
	9/24/2002	U 1	U 1	UJR 5	U 1	U 1	U 1	U 1	10
	12/13/2002	(1) U 1	(1) U 1	(1) U 5	1	U 1	(1) U 1	(1) U 1	12
	3/24/2003	(1) U 1	(1) U 1	(1) U 5	(1) U 1	(1) U 1	(1) U 1	(1) U 1	8
	6/10/2003	(1) U 1	(1) U 1	(1) U 5	(1) U 1	U 1	(1) U 1	(1) U 1	7
	9/25/2003	(1) U 1	(1) U 1	(1) U 5	(1) U 1	U 1	(1) U 1	(1) U 1	13
	12/4/2003	(1) U 1	(1) U 1	(1) U 5	1	U 1	(1) U 1	(1) U 1	JF% 15
	3/24/2004	(1) U 1	U 1	U 5	1	U 1	(1) U 1	(1) U 1	13
	6/8/2004	(1) U 1	(1) U 1	(1) U 5	(1) U 1	U 1	(1) U 1	(1) U 1	8
	9/9/2004	(1) U 1	(1) U 1	(1) U 5	1	U 1	(1) U 1	(1) U 1	11
	12/7/2004	(1) U 1	(1) U 1	(1) U 5	1	U 1	U 1	(1) U 1	9
	3/29/2005	(1) U 1	(1) U 1	(1) U 5	1	U 1	(1) U 1	(1) U 1	11
	6/17/2005	(1) U 1	U 1	U 5	1	U 1	U 1	(1) U 1	9
	9/20/2005	(1) U 1	(1) U 1	(1) BU 5	1	U 1	(1) U 1	(1) U 1	8
	12/14/2005	(1) U 1	(1) U 1	(1) U 5	1	U 1	(1) U 1	(1) U 1	9
	3/16/2006	U 1	(1) U 1	U 5	(1) U 1	U 1	(1) U 1	(1) U 1	11
	6/13/2006	0.6	0.7	(1) U 5	(1) U 1	U 1	(1) U 0.5	(1) U 0.5	7.1
	9/21/2006	0.6	U(1) 0.5	U(1) 5	U(1) 1	U 1	U(1) 0.5	U(1) 0.5	7.6
	12/7/2006	0.5	0.7	U 5	U(1) 1	U 1	U 0.5	U(1) 0.5	9.7

**Notes:** µg/L - micrograms per liter  
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Montana Circular DEQ-7, October 2012  
NA - Not Applicable

J - Estimated Concentration  
(1) - No HHS established  
-- - Not collected/analyzed  
U - Below Analytical Reporting Limit


 - Value greater than or equal to the HHS  
Vinyl Chloride concentration highlighted only if equal to or greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is 0.2 micrograms per liter.

**TABLE 2**  
**Summary of Detected Volatile Organic Compounds in Selected Groundwater Samples**  
**Bozeman Sanitary Landfill**

Sampling Location	Sampling Date	LABORATORY PARAMETERS							
		Benzene (µg/L)	Cis 1,2-dichloro-ethene (µg/L)	Methylene Chloride (µg/L)	1,1-Dichloro-ethane (µg/L)	Methyl chloride (µg/L)	Tetrachloro-ethene (µg/L)	Trichloro-ethene (µg/L)	Vinyl chloride (µg/L)
<b>HHS</b>		<b>5</b>	<b>70</b>	<b>5</b>	<b>(1)</b>	<b>30</b>	<b>5</b>	<b>5</b>	<b>2</b>
MW-13	3/15/2007	U(1) 0.5	0.8	U 5	1	U 1	U(1) 0.5	U 0.5	9.6
	6/20/2007	0.6	1	U 5	1	U 1	U 0.5	0.6	JF% 20
	12/11/2007	0.6	0.9	U 5	1.2	U 1	U 0.5	U(1) 0.5	18
	6/24/2008	U(1) 0.5	0.8	U(1) 5	U 1	U 1	U(1) 0.5	0.5	15
	12/10/2008	U 1	1.3	U 4	1.3	U 1	U 1	U 1	20.2
	6/2/2009	J 0.53	1.1	U 2	J 0.96	U 2	U 0.5	J 0.61	14.6
	12/9/2009	J 0.69	1.1	UB 2	1.2	U 2	U 0.5	J 0.61	22.5
	6/16/2010	0.68	1.1	36.3	1	U 0.5	U 0.5	0.55	19.9
	12/7/2010	U 1	U 1	U 1	1.1	U 1	U 1	U 1	J 23.8
	6/15/2011	0.61	0.99	U 2	0.96	U 0.021	J 0.25	0.55	J 17.9
	12/7/2011	0.79	1	U 5	1	U 0.13	J 0.29	0.5	17.7
	6/6/2012	0.69	1.1	U 4	0.98	U 1	J 0.33	J 0.46	19.3
	12/5/2012	0.66	1.1	U 2	1.1	U 0.13	J 0.23	J 0.41	20.9
<b>MW-14</b>	3/22/2001	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	6/11/2001	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	12/12/2002	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1
	6/9/2003	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1
	12/3/2003	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	JJF% 1
	6/8/2004	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1
	12/6/2004	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1
	6/16/2005	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	12/14/2005	U 1	U 1	(1) U 5	U 1	U 1	U 1	(1) U 1	U 1
	6/13/2006	U 0.5	U 0.5	(1) U 5	U 1	U 1	U 0.5	U 0.5	U 0.5
	12/7/2006	U 0.5	U 0.5	U 5	U 1	U(1) 1	U 0.5	U 0.5	U 0.5
	6/21/2007	U 0.5	U 0.5	U 5	U 1	U 1	U 0.5	U 0.5	JJF% 0.5
	12/11/2007	U 0.5	U 0.5	U 5	U 1	U 1	U 0.5	U 0.5	U 0.5
	6/25/2008	U 0.5	U 0.5	U(1) 5	U 1	U 1	U 0.5	U 0.5	U 0.5
	12/10/2008	U 1	U 1	U 4	U 1	U 1	U 1	U 1	U 0.4
	6/3/2009	U 0.5	U 0.5	U 2	U 0.5	U 2	U 0.5	U 0.5	U 0.2
	12/10/2009	U 0.5	U 0.5	UB 2	U 0.5	U 2	U 0.5	U 0.5	U 0.2
	6/15/2010	U 0.5	U 0.5	19.7	U 0.5	U 0.5	U 0.5	U 0.5	U 0.5
	12/6/2010	U 1	U 1	U 1	U 1	U 1	U 1	U 1	U 1
	6/15/2011	U 0.04	U 0.08	U 2	U 0.072	U 0.021	U 0.041	U 0.05	U 0.049
	12/5/2011	U 0.05	U 0.08	U 5	U 0.072	U 0.13	U 0.16	U 0.11	U 0.16
	6/4/2012	U 0.5	U 0.5	U 4	U 0.5	U 1	U 0.16	U 0.11	U 0.16
<b>MW-15</b>	10/8/2001	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1
	12/11/2002	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1
	6/10/2003	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1
	12/3/2003	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	JJF% 1
	6/8/2004	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1

**Notes:** µg/L - micrograms per liter  
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Montana Circular DEQ-7, October 2012  
NA - Not Applicable

J - Estimated Concentration  
(1) - No HHS established  
-- - Not collected/analyzed  
U - Below Analytical Reporting Limit  
\* (1) X F% - Additional QA/QC notes

 - Value greater than or equal to the HHS  
Vinyl Chloride concentration highlighted only if equal to or greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is 0.2 micrograms per liter.

**TABLE 2**  
**Summary of Detected Volatile Organic Compounds in Selected Groundwater Samples**  
**Bozeman Sanitary Landfill**

Sampling Location	Sampling Date	LABORATORY PARAMETERS							
		Benzene (µg/L)	Cis 1,2-dichloro-ethene (µg/L)	Methylene Chloride (µg/L)	1,1-Dichloro-ethane (µg/L)	Methyl chloride (µg/L)	Tetrachloro-ethene (µg/L)	Trichloro-ethene (µg/L)	Vinyl chloride (µg/L)
<b>HHS</b>		<b>5</b>	<b>70</b>	<b>5</b>	<b>(1)</b>	<b>30</b>	<b>5</b>	<b>5</b>	<b>2</b>
MW-15	12/6/2004	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1
	6/16/2005	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	12/14/2005	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1
	6/12/2006	U 0.5	U 0.5	(1) U 5	U 1	U 1	(1) U 0.5	U 0.5	U 0.5
	12/5/2006	U 0.5	U 0.5	U 5	U 1	U 1	U 0.5	U 0.5	U 0.5
	6/19/2007	U 0.5	U 0.5	U 5	U 1	1.2	U 0.5	U 0.5	JJF% 0.5
	12/10/2007	U 0.5	U 0.5	U 5	U 1	U 1	U 0.5	U 0.5	U 0.5
	6/23/2008	U 0.5	U 0.5	U(1) 5	U 1	U 1	U 0.5	U 0.5	U 0.5
	12/8/2008	U 1	U 1	U 4	U 1	U 1	U 1	U 1	U 0.4
	6/1/2009	U 0.5	U 0.5	U 2	U 0.5	U 2	U 0.5	U 0.5	U 0.2
	12/4/2009	U 0.5	U 0.5	UB 2	U 0.5	U 2	U 0.5	U 0.5	U 0.2
	6/14/2010	U 0.5	U 0.5	32.9	U 0.5	U 0.5	U 0.5	U 0.5	U 0.5
	12/6/2010	U 1	U 1	U 1	U 1	U 1	U 1	U 1	U 1
	6/13/2011	U 0.04	U 0.08	U 2	U 0.072	U 0.021	U 0.041	U 0.05	U 0.049
	12/6/2011	U 0.05	U 0.08	U 5	U 0.072	U 0.13	U 0.16	U 0.11	U 0.16
	6/4/2012	U 0.5	U 0.5	U 4	U 0.5	U 1	U 0.16	U 0.11	U 0.16
	12/5/2012	U 0.05	U 0.08	U 2	U 0.072	U 0.13	U 0.16	U 0.11	U 0.16
MW-16	6/4/2012	U 0.5	3.4	U 4	1.3	U 1	2.2	2.9	U 0.16
	12/4/2012	U 0.05	3.4	U 2	1	U 0.13	1.2	2	U 0.16
Mclhattan Seep	1/19/1994	U 2	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	1/19/1994	U 2	1	U 5	U 1	U 1	4	3	U 1
	6/27/1994	U 1	U 1	U 5	U 1	U 1	5	1	U 1
	1/31/1995	U 1	U* 1	U 5	U* 1	U 1	4	1	U 1
	6/28/1995	U 1	U 1	U 1	U 1	U 1	3	2	U 1
	11/28/1995	U 1	U 1	U* 5	U* 1	U 1	5	1	U 1
	6/26/1996	U 1	U 1	U 5	U 1	U* 1	2	U* 1	U 1
	12/12/1996	U 1	U* 1	U 5	U* 1	U* 1	3	U* 1	U 1
	6/20/1997	U 1	U 1	U 1	U 1	U 2	U 1	U 1	U 2
	12/17/1997	U 1	U 1	U 5	U 1	U 1	1	4	U 1
	6/29/1998	U 1	U(3) 1	8	U(3) 1	U(3) 1	3	1	U 1
	12/15/1998	U 1	(1) U 1	U(1)B 5	(1) U 1	(1) U 1	4	4	U 1
	6/23/1999	U 1	U 1	(1) U 5	U 1	U 1	2	1	U 1
	12/14/1999	U 1	U 1	(1) U 5	U 1	U 1	3	2	U 1
	6/7/2000	U 1	U 1	(1) U 5	U 1	U 1	3	1	U 1
	11/29/2000	U 1	U 1	U 5	U 1	U 1	3	1	U 1
	6/12/2001	U 1	U 1	U 5	U 1	U 1	3	1	U 1
	12/18/2001	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	3	1	U 1
	6/14/2002	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	2	(1) U 1	U 1
	12/12/2002	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	4	1	(1) U 1
	6/10/2003	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	3	(1) U 1	U 1

**Notes:** µg/L - micrograms per liter  
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Montana Circular DEQ-7, October 2012  
NA - Not Applicable

J - Estimated Concentration  
(1) - No HHS established  
-- - Not collected/analyzed  
U - Below Analytical Reporting Limit  
\* (1) X F% - Additional QA/QC notes

- Value greater than or equal to the HHS  
Vinyl Chloride concentration highlighted only if equal to or greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is 0.2 micrograms per liter.




**TABLE 2**  
**Summary of Detected Volatile Organic Compounds in Selected Groundwater Samples**  
**Bozeman Sanitary Landfill**

Sampling Location	Sampling Date	LABORATORY PARAMETERS							
		Benzene (µg/L)	Cis 1,2-dichloro-ethene (µg/L)	Methylene Chloride (µg/L)	1,1-Dichloro-ethane (µg/L)	Methyl chloride (µg/L)	Tetrachloro-ethene (µg/L)	Trichloro-ethene (µg/L)	Vinyl chloride (µg/L)
<b>HHS</b>		<b>5</b>	<b>70</b>	<b>5</b>	<b>(1)</b>	<b>30</b>	<b>5</b>	<b>5</b>	<b>2</b>
Mclhattan Seep	12/3/2003	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	2	(1) U 1	JJF% 1
	6/8/2004	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	2	(1) U 1	U 1
	12/6/2004	U 1	(1) U 1	(1) U 5	(1) U 1	U 1	3	(1) U 1	U 1
	6/17/2005	U 1	(1) U 1	U 5	(1) U 1	U 1	2	(1) U 1	U 1
	12/14/2005	(1) U 1	(1) U 1	(1) U 5	(1) U 1	U 1	2	(1) U 1	U 1
	6/12/2006	U 0.5	(1) U 0.5	(1) U 5	(1) U 1	U 1	1.4	(1) U 0.5	U 0.5
	12/7/2006	U 0.5	U(1) 0.5	U 5	U 1	U 1	1.8	0.5	U 0.5
	6/19/2007	U 0.5	U 0.5	U 5	U 1	U 1	0.6	U 0.5	JJF% 0.5
	12/10/2007	U 0.5	U 0.5	U 5	U 1	U(1) 1	1.3	U 0.5	U 0.5
	6/26/2008	U 0.5	U 0.5	U(1) 5	U 1	U 1	0.6	U 0.5	U 0.5
	12/9/2008	U 1	U 1	U 4	U 1	U 1	1.4	U 1	U 0.4
	6/2/2009	U 0.5	U 0.5	U 2	U 0.5	U 2	1.1	U 0.5	U 0.2
	12/4/2009	U 0.5	U 0.5	UB 2	U 0.5	U 2	1.6	U 0.5	U 0.2
	6/16/2010	U 0.5	U 0.5	40.4	U 0.5	U 0.5	1.2	U 0.5	U 0.5
	12/6/2010	U 1	U 1	U 1	U 1	U 1	1.2	U 1	U 1
	6/14/2011	U 0.04	U 0.08	U 2	U 0.072	J 0.061	0.73	J 0.26	U 0.049
	12/6/2011	U 0.05	J 0.13	U 5	U 0.072	U 0.13	1.1	J 0.3	U 0.16
	6/5/2012	U 0.5	J 0.19	U 4	U 0.5	U 1	1.1	J 0.32	U 0.16
	12/5/2012	U 0.05	J 0.23	U 2	U 0.072	U 0.13	1.2	J 0.32	U 0.16
<b>Shop Well</b>	6/13/2011	U 0.04	1	U 2	1.6	U 0.021	3.8	2.3	J 0.13
	12/7/2011	U 0.05	0.95	U 5	1.7	U 0.13	3.9	2.2	U 0.16
	6/4/2012	U 0.5	0.64	U 4	1.2	U 1	3.7	1.7	U 0.16
	12/4/2012	U 0.05	0.86	U 2	1.7	J 0.21	4.5	2.1	U 0.16
<b>Vet Clinic Well</b>	1/19/1994	U 2	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	6/28/1994	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	1/31/1995	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	6/28/1995	U 1	U 1	U 1	U 1	U 1	4	2	U 1
	11/28/1995	U 1	U 1	U* 5	U 1	U 1	U 1	U 1	U 1
	6/26/1996	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	12/12/1996	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	6/20/1997	U 1	U 1	U 1	U 1	U 2	U 1	U 1	U 2
	12/17/1997	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	6/30/1998	U 1	U 1	U(3) 5	U 1	U 1	U 1	U 1	U 1
	12/15/1998	U 1	U 1	U(1)B 5	U 1	(1) U 1	U 1	U 1	U 1
	6/23/1999	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	12/14/1999	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	6/7/2000	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	11/28/2000	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	6/12/2001	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	12/18/2001	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1

**Notes:** µg/L - micrograms per liter  
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Montana Circular DEQ-7, October 2012  
NA - Not Applicable

J - Estimated Concentration  
(1) - No HHS established  
-- - Not collected/analyzed  
U - Below Analytical Reporting Limit  
\* (1) X F% - Additional QA/QC notes


 - Value greater than or equal to the HHS  
Vinyl Chloride concentration highlighted only if equal to or greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is 0.2 micrograms per liter.

**TABLE 2**  
**Summary of Detected Volatile Organic Compounds in Selected Groundwater Samples**  
**Bozeman Sanitary Landfill**

Sampling Location	Sampling Date	LABORATORY PARAMETERS							
		Benzene (µg/L)	Cis 1,2-dichloro-ethene (µg/L)	Methylene Chloride (µg/L)	1,1-Dichloro-ethane (µg/L)	Methyl chloride (µg/L)	Tetrachloro-ethene (µg/L)	Trichloro-ethene (µg/L)	Vinyl chloride (µg/L)
<b>HHS</b>		<b>5</b>	<b>70</b>	<b>5</b>	<b>(1)</b>	<b>30</b>	<b>5</b>	<b>5</b>	<b>2</b>
Vet Clinic Well	6/14/2002	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	12/12/2002	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1
	6/10/2003	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1
	12/4/2003	U 1	U 1	U 5	U 1	U 1	U 1	U 1	JJF% 1
	6/8/2004	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1
	12/6/2004	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1
	6/17/2005	U 1	U 1	U 5	U 1	U 1	U 1	U 1	U 1
	12/14/2005	U 1	U 1	(1) U 5	U 1	U 1	U 1	U 1	U 1
	6/12/2006	U 0.5	U 0.5	(1) U 5	U 1	U 1	U 0.5	U 0.5	U 0.5
	12/7/2006	U 0.5	U 0.5	U 5	U 1	U 1	U 0.5	U 0.5	U 0.5
	6/21/2007	U 0.5	U 0.5	U 5	U 1	U 1	U 0.5	U 0.5	JJF% 0.5
	12/12/2007	U 0.5	U 0.5	U 5	U 1	U 1	U 0.5	U 0.5	U 0.5
	6/25/2008	U 0.5	U 0.5	U(1) 5	U 1	U 1	U 0.5	U 0.5	U 0.5
	12/9/2008	U 1	U 1	U 4	U 1	U 1	U 1	U 1	U 0.4
	6/2/2009	U 0.5	U 0.5	U 2	U 0.5	U 2	U 0.5	U 0.5	U 0.2
	12/10/2009	U 0.5	U 0.5	UB 2	U 0.5	U 2	U 0.5	U 0.5	U 0.2
	6/16/2010	U 0.5	U 0.5	38.1	U 0.5	U 0.5	U 0.5	U 0.5	U 0.5
	12/8/2010	U 1	U 1	U 1	U 1	U 1	U 1	U 1	U 1
	6/15/2011	U 0.04	U 0.08	U 2	U 0.072	U 0.021	U 0.041	U 0.05	U 0.049
	12/7/2011	U 0.05	U 0.08	U 5	U 0.072	U 0.13	U 0.16	U 0.11	U 0.16
	6/5/2012	U 0.5	U 0.5	U 4	U 0.5	U 1	U 0.16	U 0.11	U 0.16
	12/6/2012	U 0.05	U 0.08	U 2	U 0.072	U 0.13	U 0.16	U 0.11	U 0.16

**Notes:** µg/L - micrograms per liter  
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Montana Circular DEQ-7, October 2012  
NA - Not Applicable

J - Estimated Concentration  
(1) - No HHS established  
-- - Not collected/analyzed  
U - Below Analytical Reporting Limit  
\* (1) X F% - Additional QA/QC notes

 - Value greater than or equal to the HHS  
Vinyl Chloride concentration highlighted only if equal to or greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is 0.2 micrograms per liter.

**Table 3**  
**Comparison of Medians of Selected Groundwater Quality Data**  
**Bozeman Sanitary Landfill, Bozeman, Montana**  
**December 2012 Monitoring Event**

Parameter	Units	Compliance Well MW-6 Median	Compliance Well MW-8A Median	Background Well MW-5 Median	Background Well MW-15 Median	N <sup>(1)</sup>	P-value <sup>2)</sup> MW- 5 / MW-15	Statistically Above Background <sup>(3)</sup>
1,1, Dichloroethane	ug/L	1	-	0.5	0.5	15	.000/.000	YES
cis1,2, Dichloroethene	ug/L	1.45	-	0.25	0.25	15	.000/.000	YES
Tetrachloroethene (PCE)	ug/L	1.3	-	0.25	0.25	18/15	.000/.000	YES
Tetrachloroethene (PCE)	ug/L	-	0.7	0.25	0.25	15/15	.000/.000	YES
Trichloroethene (TCE)	ug/L	1.20	-	0.25	0.25	16/15	.000/.000	YES
Trichloroethene (TCE)	ug/L	-	0.62	0.25	0.25	16/15	.000/.000	YES
Vinyl Chloride	ug/L	0.375	-	0.20	0.20	18/13	.001/.001	YES <sup>(4)</sup>
Vinyl Chloride	ug/L	-	0.25	0.25	0.25	15	.967/.967	NO
Chloride	mg/L	19.35	-	5.25	5	16/15	.000/.000	YES
Chloride	mg/L	-	43	5.1	5	15	.000/.000	YES
Nitrate+Nitrite as N	mg/L	-	7.8	4.45	5.73	15	.081/.389	NO
Sulfate	mg/L	14	-	9		15	.000	YES
Sulfate	mg/L	14			14	15	0.682	NO
Sulfate	mg/L	-	37	9	14	15	.000/.000	YES

**Notes:**

Units are in µg/L (micrograms per liter) and mg/L (milligrams per liter)

- (1) Sample Size
- (2) Mann-Whitney U test at the 99 percent confidence level
- (3) Results are significant if the p-value is less than or equal to 0.01 (and Z value is positive in worksheets)
- (4) The GPS for vinyl chloride is considered to be 2 µg/L as established by the U.S. EPA and the highest value in the MW 6 data set for vinyl chloride is less than the GPS

**Table 4**  
**Summary of Statistical Analysis of Selected Groundwater Quality Data**  
**Bozeman Sanitary Landfill, Bozeman, Montana**  
**December 2012 Monitoring Event**

Parameter	Well	GPS <sup>(1)</sup>	Test <sup>(2)</sup>	n <sup>(3)</sup>	Test Result (P-value)	Statistically Greater than GPS <sup>(4)</sup>
Nitrate+Nitrite as N	MW-8A	10	1SW	15	0.320	No
Trichloroethene	MW-12	5	1SW	18	0.727	No
Tetrachlorethene	MW-7A	5	1SW	18	0.727	No
Vinyl Chloride	MW-6	2	1SW	18	0.042	No
	MW-7A	2	1SW	18	0.000	No <sup>(5)</sup>
	MW-12	2	1SW	18	0.000	Yes
	MW-13	2	1SW	18	0.000	Yes

**Notes:**

- (1) Groundwater protection standards (GPS) are stated in micrograms per liter ( $\mu\text{g/L}$ ) except Nitrate+Nitrite which is in milligrams per liter. The GPS for vinyl chloride is considered to be 2  $\mu\text{g/L}$  as established by the U.S. EPA
- (2) 1SW indicates a 1-Sample Wilcoxon Test at the 99 percent confidence level; 1ST indicates a 1-Sample t-Test at the 99 percent confidence level
- (3) Sample size after data censoring (further reduction due to the values may occur in 1-Sample Wilcoxon test)
- (4) Results are significant if the p-value is less than or equal to 0.01
- (5) The Wilcoxon test indicated that there is a significant difference between well MW-7A vinyl chloride values and the GPS for vinyl chloride. The difference is due to the fact that well MW-7A vinyl chloride values are lower than the vinyl chloride GPS of 2  $\mu\text{g/L}$

# **APPENDIX C**

## **GROUNDWATER SAMPLING LOGS**

# GROUNDWATER SAMPLING LOG

Project: Bozeman Landfill Date: 12/6/2011/45 Station No. LF-2  
 Personnel: MFP Weather: \_\_\_\_\_  
 Well Locked? Yes  No  Note Any Problems With Condition of Well: \_\_\_\_\_  
 Casing Dia. & Type: 2-inch PVC  4-inch PVC  Other \_\_\_\_\_ Measuring Point: Top of PVC, north side  Other \_\_\_\_\_  
 Aquifer: Tertiary sediments (sand, gravel, and clayey silt)  
 Well Depth (ft. below measuring point): 19.60 - Depth to Water 14.26 = 5.34 ft. water in well

### WELL EVACUATION

Evacuation Method: Submersible Pump  Disposable bailer  Spigot  Other \_\_\_\_\_  
5.34 ft. water in well x \_\_\_\_\_ gal./ft. \* = one casing volume 3.5 gals. x 3 = purge volume 10.5 gals.  
 \* 2" well = 0.163 gal./ft. 4" well = 0.653 gal./ft. 6" well = 1.469 gal./ft. 8" well = 2.611 gal./ft. Well C feet in diameter = 5.875 x C<sup>2</sup>

Pumping rate (gpm): \_\_\_\_\_

### EVACUATION DATA

Time	Cumulative Gallons	Temp	pH	SC	ORP	DO
	<u>3.5</u>	<u>9.10</u>	<u>7.28</u>	<u>576</u>	<u>-14.4*</u>	<u>9.50*</u>
	<u>7.0</u>	<u>9.56</u>	<u>7.23</u>	<u>565</u>	<u>-14.7*</u>	<u>9.03*</u>
	<u>10.5</u>	<u>9.62</u>	<u>7.21</u>	<u>563</u>	<u>-14.6*</u>	<u>9.01*</u>
	<u>11.5</u>	<u>9.76</u>	<u>7.13</u>	<u>565</u>	<u>-13.8</u>	<u>8.41</u>

Downhole Post Purge

DO measured: In-well  In water bailed  In water pumped  Other \_\_\_\_\_

### WELL SAMPLING

Sampling Method: Submersible Pump  Disposable Polyethylene Bailer  Spigot  Grab  Other: \_\_\_\_\_  
 Sample Type: Natural  Duplicate  Other: \_\_\_\_\_

Sample Collected	Parameters	Sample Container	Preservative
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	VOCs	3 - 40 ml vials	HCl
Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Metals: dissolved [ <input type="checkbox"/> or total <input type="checkbox"/> full list <input type="checkbox"/> or reduced list <input type="checkbox"/> ]	500 ml poly	HNO <sub>3</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	COD, Nitrate as N	250 ml poly	H <sub>2</sub> SO <sub>4</sub>
Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	pH, SC, sulfate, chloride	250 ml poly	
Yes <input type="checkbox"/> No <input type="checkbox"/>	Cyanide	500 ml poly	NaOH
Yes <input type="checkbox"/> No <input type="checkbox"/>			

Laboratory: Pace Analytical Services, Inc., Billings, Montana

Chain-of-Custody: Yes  No

Meter	Model No.	Calibration Date	Decontamination	
Water level	<u>Water Line</u>		Liquinox: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Scrub: Yes <input type="checkbox"/> No <input type="checkbox"/>
pH	<u>YSI-556</u>	<u>12/6/12</u>	Potable H <sub>2</sub> O: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Steam: Yes <input type="checkbox"/> No <input type="checkbox"/>
SC			DI water: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Nitric Acid: Yes <input type="checkbox"/> No <input type="checkbox"/>
ORP				
DO				

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

### GROUNDWATER SAMPLING LOG

Project: Bozeman Landfill Date: 12/6/2012 @ 1035 Station No. LF-3  
 Personnel: MFP Weather: 26°F, Clear, calm, no snow  
 Well Locked? Yes  No  Note Any Problems With Condition of Well: None  
 Casing Dia. & Type: 2-inch PVC  4-inch PVC  Other \_\_\_\_\_ Measuring Point: Top of PVC, north side  Other \_\_\_\_\_  
 Aquifer: Tertiary sediments (sand, gravel, and clayey silt)  
 Well Depth (ft. below measuring point): 37.50 - Depth to Water 13.93 = 23.60 ft. water in well

Dedicated

WELL EVACUATION

Evacuation Method: Submersible Pump  Disposable bailer  Spigot  Other \_\_\_\_\_  
 \_\_\_\_\_ ft. water in well x \_\_\_\_\_ gal./ft. \* = one casing volume 15.4 gals. x 3 = purge volume 46.2 gals.  
 \* 2" well = 0.163 gal./ft. 4" well = 0.653 gal./ft. 6" well = 1.469 gal./ft. 8" well = 2.611 gal./ft. Well C feet in diameter = 5.875 x C<sup>2</sup>

Pumping rate (gpm): Pump Flow = 1 gal / 51.59 sec = 1.2 gpm

EVACUATION DATA

Time	Cumulative Gallons	Temp	pH S.U.	SC MS	ORP mV	DO mg/L	
955	<u>Start Pumping</u>						
1008	<u>15.4</u>	<u>9.41</u>	<u>7.00</u>	<u>672</u>	<u>-16.7</u>	<u>7.12</u>	Flow-through cell
1021	<u>30.8</u>	<u>9.45</u>	<u>7.07</u>	<u>671</u>	<u>-15.4</u>	<u>7.00</u>	
1024	<u>46.2</u>	<u>9.46</u>	<u>7.08</u>	<u>671</u>	<u>-14.6</u>	<u>6.96</u>	

DO measured: In-well  In water bailed  In water pumped  Other \_\_\_\_\_

WELL SAMPLING

Sampling Method: Submersible Pump  Disposable Polyethylene Bailer  Spigot  Grab  Other \_\_\_\_\_  
 Sample Type: Natural  Duplicate  Other: \_\_\_\_\_

Sample Collected	Parameters	Sample Container	Preservative
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	VOCs	3 - 40 ml vials	HCl
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Metals: dissolved <input checked="" type="checkbox"/> or total <input type="checkbox"/> full list <input type="checkbox"/> or reduced list <input checked="" type="checkbox"/>	500 ml poly	HNO <sub>3</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	COD, Nitrate as N	250 ml poly	H <sub>2</sub> SO <sub>4</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	pH, SC, sulfate, chloride	250 ml poly	
Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Cyanide	500 ml poly	NaOH
Yes <input type="checkbox"/> No <input type="checkbox"/>			

Laboratory: Pace Analytical Services, Inc., Billings, Montana Chain-of-Custody: Yes  No

Meter	Model No.	Calibration Date	Decontamination	
Water level	<u>Water Line</u>		Liquinox: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Scrub: Yes <input type="checkbox"/> No <input type="checkbox"/>
pH	<u>YSI-556</u>	<u>12/6/12 @ 9 AM</u>	Potable H <sub>2</sub> O: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Steam: Yes <input type="checkbox"/> No <input type="checkbox"/>
SC			DI water: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Nitric Acid: Yes <input type="checkbox"/> No <input type="checkbox"/>
ORP				
DO				

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

# GROUNDWATER SAMPLING LOG

Project: Bozeman Landfill Date: 12/4/12 @ 1530 Station No. MW-4  
 Personnel: MFP Weather: Cloudy, calm, no snow, ~50°F  
 Well Locked? Yes  No  Note Any Problems With Condition of Well: None  
 Casing Dia. & Type: 2-inch PVC  4-inch PVC  Other \_\_\_\_\_ Measuring Point: Top of PVC, north side  Other \_\_\_\_\_  
 Aquifer: Tertiary sediments (sand, gravel, and clayey silt)  
 Well Depth (ft. below measuring point): 38.0 - Depth to Water 20.73 = 17.27 ft. water in well

### WELL EVACUATION

Evacuation Method: Submersible Pump  Disposable bailer  Spigot  Other \_\_\_\_\_  
17.27 ft. water in well x \_\_\_\_\_ gal./ft.\* = one casing volume 11.3 gals. x 3 = purge volume 33.9 gals.  
 \* 2" well = 0.163 gal./ft. 4" well = 0.653 gal./ft. 6" well = 1.469 gal./ft. 8" well = 2.611 gal./ft. Well C feet in diameter = 5.875 x C<sup>2</sup>  
 Pumping rate (gpm): Flow = 0.25 gal / 13.14 sec = 1.14 gpm

### EVACUATION DATA

Time	Cumulative Gallons	Temp	pH	SC $\mu$ S	ORP mV	DO mg/L
<u>1456</u>	<u>0</u>	<u>start</u>				
<u>1506</u>	<u>11.3</u>	<u>8.98</u>	<u>6.92</u>	<u>1017</u>	<u>-4.4</u>	<u>2.04</u>
<u>1516</u>	<u>22.6</u>	<u>9.02</u>	<u>6.86</u>	<u>1040</u>	<u>-5.8</u>	<u>2.17</u>
<u>1526</u>	<u>33.9</u>	<u>9.02</u>	<u>6.86</u>	<u>1041</u>	<u>-6.0</u>	<u>2.17</u> Flow Thru

DO measured: In-well  In water bailed  In water pumped  Other \_\_\_\_\_

### WELL SAMPLING

Sampling Method: Submersible Pump  Disposable Polyethylene Bailer  Spigot  Grab  Other: \_\_\_\_\_  
 Sample Type: Natural  Duplicate  Other: \_\_\_\_\_

Sample Collected	Parameters	Sample Container	Preservative
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	VOCs	3 - 40 ml vials	HCl
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Metals: dissolved <input checked="" type="checkbox"/> or total <input type="checkbox"/> full list <input type="checkbox"/> or reduced list <input checked="" type="checkbox"/>	500 ml poly	HNO <sub>3</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	COD, Nitrate as N	250 ml poly	H <sub>2</sub> SO <sub>4</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	pH, SC, sulfate, chloride	250 ml poly	
Yes <input type="checkbox"/> No <input type="checkbox"/>	Cyanide	500 ml poly	NaOH
Yes <input type="checkbox"/> No <input type="checkbox"/>			

Laboratory: Pace Analytical Services, Inc., Billings, Montana

Chain-of-Custody: Yes  No

Meter	Model No.	Calibration Date	Decontamination	
Water level	<u>Water Line</u>		Liquinox: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Scrub: Yes <input type="checkbox"/> No <input type="checkbox"/>
pH	<u>YSI-556</u>	<u>12/4/12</u>	Potable H <sub>2</sub> O: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Steam: Yes <input type="checkbox"/> No <input type="checkbox"/>
SC			DI water: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Nitric Acid: Yes <input type="checkbox"/> No <input type="checkbox"/>
ORP				
DO				

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



# GROUNDWATER SAMPLING LOG

Project: Bozeman Landfill Date: 12/4/12 @ 1020 Station No. Mw-5  
 Personnel: MED Weather: ~26°F, Clear, calm, no snow  
 Well Locked? Yes  No  Note Any Problems With Condition of Well: \_\_\_\_\_  
 Casing Dia. & Type: 2-inch PVC  4-inch PVC  Other \_\_\_\_\_ Measuring Point: Top of PVC, north side  Other \_\_\_\_\_  
 Aquifer: Tertiary sediments (sand, gravel, and clayey silt)  
 Well Depth (ft. below measuring point): 160.0 - Depth to Water 111.31 = 49 ft. water in well

### WELL EVACUATION

Evacuation Method: Submersible Pump  Disposable bailer  Spigot  Other \_\_\_\_\_  
49 ft. water in well x \_\_\_\_\_ gal./ft.\* = one casing volume 8.0 gals. x 3 = purge volume 24.0 gals.  
 \* 2" well = 0.163 gal./ft. 4" well = 0.653 gal./ft. 6" well = 1.469 gal./ft. 8" well = 2.611 gal./ft. Well C feet in diameter = 5.875 x C<sup>2</sup>  
 Pumping rate (gpm): Flow = 1 gal / 47.4 sec = 1.25 gpm

### EVACUATION DATA

Time	Cumulative Gallons	Temp	pH	s.u.	SC	MS	ORP mV	DO mg/L
<u>951</u>	<u>0</u>	<u>Start</u>						
<u>958</u>	<u>8</u>	<u>9.10</u>	<u>6.73</u>		<u>464</u>		<u>-11</u>	<u>8.95</u>
<u>1006</u>	<u>16</u>	<u>9.21</u>	<u>6.88</u>		<u>462</u>		<u>-11.2</u>	<u>7.98</u>
<u>1014</u>	<u>24</u>	<u>9.31</u>	<u>7.00</u>		<u>463</u>		<u>-10.5</u>	<u>7.89</u> Flow Thru

DO measured: In-well  In water bailed  In water pumped  Other \_\_\_\_\_

### WELL SAMPLING

Sampling Method: Submersible Pump  Disposable Polyethylene Bailor  Spigot  Grab  Other: \_\_\_\_\_  
 Sample Type: Natural  Duplicate  Other: \_\_\_\_\_

Sample Collected	Parameters	Sample Container	Preservative
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	VOCs	3 - 40 ml vials	HCl
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Metals: dissolved <input checked="" type="checkbox"/> or total <input checked="" type="checkbox"/> full list <input type="checkbox"/> or reduced list <input checked="" type="checkbox"/>	500 ml poly	HNO <sub>3</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	COD, Nitrate as N	250 ml poly	H <sub>2</sub> SO <sub>4</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	pH, SC, sulfate, chloride	250 ml poly	
Yes <input type="checkbox"/> No <input type="checkbox"/>	Cyanide	500 ml poly	NaOH
Yes <input type="checkbox"/> No <input type="checkbox"/>			

Laboratory: Pace Analytical Services, Inc., Billings, Montana Chain-of-Custody: Yes  No

Meter	Model No.	Calibration Date	Decontamination	
Water level	<u>Water Liar</u>		Liquinox: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Scrub: Yes <input type="checkbox"/> No <input type="checkbox"/>
pH	<u>YSI-556</u>	<u>12/4/12</u>	Potable H <sub>2</sub> O: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Steam: Yes <input type="checkbox"/> No <input type="checkbox"/>
SC			DI water: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Nitric Acid: Yes <input type="checkbox"/> No <input type="checkbox"/>
ORP				
DO				

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

# GROUNDWATER SAMPLING LOG

Project: Bozeman Landfill Date: 12/4/12 @ 1240 Station No. MW-6  
 Personnel: MFP Weather: \_\_\_\_\_  
 Well Locked? Yes  No  Note Any Problems With Condition of Well: \_\_\_\_\_  
 Casing Dia. & Type: 2-inch PVC  4-inch PVC  Other \_\_\_\_\_ Measuring Point: Top of PVC, north side  Other \_\_\_\_\_  
 Aquifer: Tertiary sediments (sand, gravel, and clayey silt)  
 Well Depth (ft. below measuring point): 66.0 - Depth to Water 31.44 = 34.56 ft. water in well

### WELL EVACUATION

Evacuation Method: Submersible Pump  Disposable bailer  Spigot  Other \_\_\_\_\_  
34.6 ft. water in well x \_\_\_\_\_ gal./ft. \* = one casing volume 5.6 gals. x 3 = purge volume 16.9 gals.  
 \* 2" well = 0.163 gal./ft. 4" well = 0.653 gal./ft. 6" well = 1.469 gal./ft. 8" well = 2.611 gal./ft. Well C feet in diameter = 5.875 x C<sup>2</sup>  
 Pumping rate (gpm): Pump 1 gal / 18.01

### EVACUATION DATA

Time	Cumulative Gallons	Temp	pH	SC	ORP	DO
<u>11:06</u>	<u>0</u>	<u>Start</u>				
<u>5.6 gal</u>		<u>9.83</u>	<u>6.51</u>	<u>905</u>	<u>-5.2*</u>	<u>3.21 *</u>
<u>11.2</u>		<u>10.37</u>	<u>6.51</u>	<u>880</u>	<u>-6.8*</u>	<u>3.25 *</u>
<u>16.9</u>		<u>10.37</u>	<u>6.60</u>	<u>920</u>	<u>7.9*</u>	<u>4.16 *</u>
	<u>- near bottom of well</u>	<u>10.11</u>	<u>6.85</u>	<u>501</u>	<u>-4.8</u>	<u>4.82</u>
	<u>- near water surf.</u>	<u>10.39</u>	<u>6.58</u>	<u>756</u>	<u>-2.4</u>	<u>3.16</u>

DO measured: In-well  In water bailed  In water pumped  Other \_\_\_\_\_ \* Aeration

*Downhole post-purge*

### WELL SAMPLING

Sampling Method: Submersible Pump  Disposable Polyethylene Bailor  Spigot  Grab  Other: \_\_\_\_\_  
 Sample Type: Natural  Duplicate  Other: \_\_\_\_\_

Sample Collected	Parameters	Sample Container	Preservative
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	VOCs	3 - 40 ml vials	HCl
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Metals: dissolved <input checked="" type="checkbox"/> or total <input type="checkbox"/> full list <input type="checkbox"/> or reduced list <input checked="" type="checkbox"/>	500 ml poly	HNO <sub>3</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	COD, Nitrate as N	250 ml poly	H <sub>2</sub> SO <sub>4</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	pH, SC, sulfate, chloride	250 ml poly	
Yes <input type="checkbox"/> No <input type="checkbox"/>	Cyanide	500 ml poly	NaOH
Yes <input type="checkbox"/> No <input type="checkbox"/>			

Laboratory: Pace Analytical Services, Inc., Billings, Montana

Chain-of-Custody: Yes  No

Meter Water Line Model No. YSI-556 Calibration Date 12/4/12  
 Water level \_\_\_\_\_  
 pH \_\_\_\_\_  
 SC \_\_\_\_\_  
 ORP \_\_\_\_\_  
 DO \_\_\_\_\_

Decontamination  
 Liquinox: Yes  No  Scrub: Yes  No   
 Potable H<sub>2</sub>O: Yes  No  Steam: Yes  No   
 DI water: Yes  No  Nitric Acid: Yes  No

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

# GROUNDWATER SAMPLING LOG

Project: Bozeman Landfill Date: 12/4/12 @ 1125 Station No. MW-6B  
 Personnel: MFP Weather: \_\_\_\_\_  
 Well Locked? Yes  No  Note Any Problems With Condition of Well: \_\_\_\_\_  
 Casing Dia. & Type: 2-inch PVC  4-inch PVC  Other \_\_\_\_\_ Measuring Point: Top of PVC, north side  Other \_\_\_\_\_  
 Aquifer: Tertiary sediments (sand, gravel, and clayey silt)  
 Well Depth (ft. below measuring point): 100.0 - Depth to Water 19.4 = 80.6 ft. water in well

### WELL EVACUATION

Evacuation Method: Submersible Pump  Disposable bailer  Spigot  Other \_\_\_\_\_  
80.6 ft. water in well x \_\_\_\_\_ gal./ft.\* = one casing volume 13.14 gals. x 3 = purge volume 39.4 gals.  
 \* 2" well = 0.163 gal./ft. 4" well = 0.653 gal./ft. 6" well = 1.469 gal./ft. 8" well = 2.611 gal./ft. Well C feet in diameter = 5.875 x C<sup>2</sup>  
 Pumping rate (gpm): Flow = 1 gal / 18.01 sec = 3.33 gpm

### EVACUATION DATA

Time	Cumulative Gallons	Temp	pH	SC	ORP	DO
1106	0	Start				
1110		9.70	6.66	340	-22.3	8.25
1115		9.75	6.96	342	-11.5	5.80 ↑
1120		9.76	7.11	341	-9.5	8.02

Flow Thru Cell

DO measured: In-well  In water bailed  In water pumped  Other \_\_\_\_\_

### WELL SAMPLING

Sampling Method: Submersible Pump  Disposable Polyethylene Bailer  Spigot  Grab  Other: \_\_\_\_\_  
 Sample Type: Natural  Duplicate  Other: \_\_\_\_\_

Sample Collected	Parameters	Sample Container	Preservative
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	VOCs	3 - 40 ml vials	HCl
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Metals: dissolved <input checked="" type="checkbox"/> or total <input checked="" type="checkbox"/> full list <input type="checkbox"/> or reduced list <input checked="" type="checkbox"/>	500 ml poly	HNO <sub>3</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	COD, Nitrate as N	250 ml poly	H <sub>2</sub> SO <sub>4</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	pH, SC, sulfate, chloride	250 ml poly	
Yes <input type="checkbox"/> No <input type="checkbox"/>	Cyanide	500 ml poly	NaOH
Yes <input type="checkbox"/> No <input type="checkbox"/>			

Laboratory: Pace Analytical Services, Inc., Billings, Montana Chain-of-Custody: Yes  No

Meter	Model No.	Calibration Date	Decontamination	
Water level	<u>Water Line</u>		Liquinox: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Scrub: Yes <input type="checkbox"/> No <input type="checkbox"/>
pH	<u>YSI-556</u>	<u>12/4/12</u>	Potable H <sub>2</sub> O: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Steam: Yes <input type="checkbox"/> No <input type="checkbox"/>
SC	<u>/</u>	<u>/</u>	DI water: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Nitric Acid: Yes <input type="checkbox"/> No <input type="checkbox"/>
ORP	<u>/</u>	<u>/</u>		
DO	<u>/</u>	<u>/</u>		

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

# GROUNDWATER SAMPLING LOG

Project: Bozeman Landfill Date: 12/5/12 @ 1230 Station No. MW-7A  
 Personnel: MFP Weather: \_\_\_\_\_  
 Well Locked? Yes  No  Note Any Problems With Condition of Well: \_\_\_\_\_  
 Casing Dia. & Type: 2-inch PVC  4-inch PVC  Other \_\_\_\_\_ Measuring Point: Top of PVC, north side  Other \_\_\_\_\_  
 Aquifer: Tertiary sediments (sand, gravel, and clayey silt)  
 Well Depth (ft. below measuring point): 65.90 - Depth to Water 56.69 = 9.21 ft. water in well

### WELL EVACUATION

Evacuation Method: Submersible Pump  Disposable bailer  Spigot  Other \_\_\_\_\_  
9.21 ft. water in well x \_\_\_\_\_ gal./ft. \* = one casing volume 1.5 gals. x 3 = purge volume 4.5 gals.  
 \* 2" well = 0.163 gal./ft. 4" well = 0.653 gal./ft. 6" well = 1.469 gal./ft. 8" well = 2.611 gal./ft. Well C feet in diameter = 5.875 x C<sup>2</sup>  
 Pumping rate (gpm): \_\_\_\_\_

### EVACUATION DATA

Time	Cumulative Gallons	Temp	pH	SC	ORP	DO
_____	<u>1.5</u>	<u>10.16</u>	<u>7.02</u>	<u>469</u>	<u>-15.5</u> *	<u>5.92</u> *
_____	<u>3.0</u>	<u>10.13</u>	<u>6.82</u>	<u>559</u>	<u>-12.9</u> *	<u>4.91</u> *
_____	<u>4.5</u>	<u>10.10</u>	<u>6.69</u>	<u>647</u>	<u>-12.1</u> *	<u>4.13</u> *
_____	<u>6.0</u>	<u>10.09</u>	<u>6.64</u>	<u>684</u>	<u>-12.2</u> *	<u>3.70</u> *
_____	<u>6.5</u>	<u>10.10</u>	<u>6.69</u>	<u>620</u>	<u>-13.4</u>	<u>3.50</u>

Downhole Post Purge

DO measured: In-well  In water bailed  In water pumped  Other \_\_\_\_\_

### WELL SAMPLING

Sampling Method: Submersible Pump  Disposable Polyethylene Bailer  Spigot  Grab  Other \_\_\_\_\_  
 Sample Type: Natural  Duplicate  Other \_\_\_\_\_

Sample Collected	Parameters	Sample Container	Preservative
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	VOCs	3 - 40 ml vials	HCl
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Metals: dissolved <input checked="" type="checkbox"/> or total <input type="checkbox"/> full list <input type="checkbox"/> or reduced list <input checked="" type="checkbox"/>	500 ml poly	HNO <sub>3</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	COD, Nitrate as N	250 ml poly	H <sub>2</sub> SO <sub>4</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	pH, SC, sulfate, chloride	250 ml poly	
Yes <input type="checkbox"/> No <input type="checkbox"/>	Cyanide	500 ml poly	NaOH
Yes <input type="checkbox"/> No <input type="checkbox"/>			

Laboratory: Pace Analytical Services, Inc., Billings, Montana

Chain-of-Custody: Yes  No

<u>Water Line</u>	<u>12/5/12</u>	Liquinox: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Scrub: Yes <input type="checkbox"/> No <input type="checkbox"/>
<u>431-556</u>		Potable H <sub>2</sub> O: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Steam: Yes <input type="checkbox"/> No <input type="checkbox"/>
		DI water: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Nitric Acid: Yes <input type="checkbox"/> No <input type="checkbox"/>

Comments: MW-7B - Not Sampled - DTGW = 56.80'

# GROUNDWATER SAMPLING LOG

Project: Bozeman Landfill Date: 12/4/12 @ 1415 Station No. MW-8A  
 Personnel: MFP Weather: \_\_\_\_\_  
 Well Locked? Yes  No  Note Any Problems With Condition of Well: \_\_\_\_\_  
 Casing Dia. & Type: 2-inch PVC  4-inch PVC  Other \_\_\_\_\_ Measuring Point: Top of PVC, north side  Other \_\_\_\_\_  
 Aquifer: Tertiary sediments (sand, gravel, and clayey silt)  
 Well Depth (ft. below measuring point): 59.50 - Depth to Water 47.50 = 12 ft. water in well

### WELL EVACUATION

Evacuation Method: Submersible Pump  Disposable bailer  Spigot  Other \_\_\_\_\_  
12 ft. water in well x \_\_\_\_\_ gal./ft. = one casing volume 2 gals. x 3 = purge volume 6 gals.  
 \* 2" well = 0.163 gal./ft. 4" well = 0.653 gal./ft. 6" well = 1.469 gal./ft. 8" well = 2.611 gal./ft. Well C feet in diameter = 5.875 x C<sup>2</sup>

Pumping rate (gpm): \_\_\_\_\_

### EVACUATION DATA

Time	Cumulative Gallons	Temp	pH	SC	ORP	DO
	2	8.64	6.89	1278	0.6*	10.0 ↓ *
	4	8.65	6.92	1284	0.0*	7.56 *
	6	8.62	6.92	1283	0.0*	7.39 *
	7	8.81	6.82	1270	-0.5	6.36

\* Downhole Post-Purge

DO measured: In-well  In water bailed  In water pumped  Other \_\_\_\_\_

### WELL SAMPLING

Sampling Method: Submersible Pump  Disposable Polyethylene Bailer  Spigot  Grab  Other: \_\_\_\_\_  
 Sample Type: Natural  Duplicate  Other: \_\_\_\_\_

Sample Collected	Parameters	Sample Container	Preservative
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	VOCs	3 - 40 ml vials	HCl
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Metals: dissolved <input checked="" type="checkbox"/> or total <input type="checkbox"/> full list <input type="checkbox"/> or reduced list <input checked="" type="checkbox"/>	500 ml poly	HNO <sub>3</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	COD, Nitrate as N	250 ml poly	H <sub>2</sub> SO <sub>4</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	pH, SC, sulfate, chloride	250 ml poly	
Yes <input type="checkbox"/> No <input type="checkbox"/>	Cyanide	500 ml poly	NaOH
Yes <input type="checkbox"/> No <input type="checkbox"/>			

Laboratory: Pace Analytical Services, Inc., Billings, Montana Chain-of-Custody: Yes  No

Meter	Model No.	Calibration Date	Decontamination
Water level	<u>Water Line</u>		Liquinox: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Scrub: Yes <input type="checkbox"/> No <input type="checkbox"/>
pH	<u>YSI-556</u>	<u>12/4/12</u>	Potable H <sub>2</sub> O: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Steam: Yes <input type="checkbox"/> No <input type="checkbox"/>
SC			DI water: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Nitric Acid: Yes <input type="checkbox"/> No <input type="checkbox"/>
ORP			
DO			

Comments: MW-8B - Not sampled, water level only DTGW = 47.77'  
MW-3 " " " " " DTGW = 49.24'

### GROUNDWATER SAMPLING LOG

Project: Bozeman Landfill Date: 12/4/12 @ 1350 Station No. MW-8C  
 Personnel: MFP Weather: Breeze, no snow pack or snow, 45°F  
 Well Locked? Yes  No  Note Any Problems With Condition of Well: None  
 Casing Dia. & Type: 2-inch PVC  4-inch PVC  Other \_\_\_\_\_ Measuring Point: Top of PVC, north side  Other \_\_\_\_\_  
 Aquifer: Tertiary sediments (sand, gravel, and clayey silt)  
 Well Depth (ft. below measuring point): 103.0 - Depth to Water 43.09 = 59.91 ft. water in well

#### WELL EVACUATION

Evacuation Method: Submersible Pump  Disposable bailer  Spigot  Other \_\_\_\_\_  
 \_\_\_\_\_ ft. water in well x \_\_\_\_\_ gal./ft. = one casing volume 9.8 gals. x 3 = purge volume 29.3 gals.

\* 2" well = 0.163 gal./ft. 4" well = 0.653 gal./ft. 6" well = 1.469 gal./ft. 8" well = 2.611 gal./ft. Well C feet in diameter = 5.875 x C<sup>2</sup>

Pumping rate (gpm): Pump flow = 1 gal / 20.77 sec = 2.9 gpm

#### EVACUATION DATA

Time	Cumulative Gallons	Temp °C	pH	SC <u>MS</u>	ORP <u>MV</u>	DO <u>mg/L</u>
<u>1332</u>	<u>Start 0</u>					
<u>1336</u>	<u>10</u>	<u>9.44</u>	<u>7.22</u>	<u>399</u>	<u>-7.0</u>	<u>9.0</u>
<u>1340</u>	<u>21</u>	<u>9.52</u>	<u>7.31</u>	<u>402</u>	<u>-7.8</u>	<u>8.43</u>
<u>1345</u>	<u>30</u>	<u>9.55</u>	<u>7.33</u>	<u>403</u>	<u>-7.4</u>	<u>8.19</u>

*Flow Thru*

DO measured: In-well  In water bailed  In water pumped  Other \_\_\_\_\_

#### WELL SAMPLING

Sampling Method: Submersible Pump  Disposable Polyethylene Bailor  Spigot  Grab  Other: \_\_\_\_\_  
 Sample Type: Natural  Duplicate  Other: \_\_\_\_\_

Sample Collected	Parameters	Sample Container	Preservative
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	VOCs	3 - 40 ml vials	HCl
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Metals: dissolved <input checked="" type="checkbox"/> or total <input type="checkbox"/> full list <input type="checkbox"/> or reduced list <input checked="" type="checkbox"/>	500 ml poly	HNO <sub>3</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	COD, Nitrate as N	250 ml poly	H <sub>2</sub> SO <sub>4</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	pH, SC, sulfate, chloride	250 ml poly	
Yes <input type="checkbox"/> No <input type="checkbox"/>	Cyanide	500 ml poly	NaOH
Yes <input type="checkbox"/> No <input type="checkbox"/>			

Laboratory: Pace Analytical Services, Inc., Billings, Montana

Chain-of-Custody: Yes  No

Meter	Model No.	Calibration Date	Decontamination	
Water level	<u>Water Line</u>	<u>12/4/12</u>	Liquinox: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Scrub: Yes <input type="checkbox"/> No <input type="checkbox"/>
pH	<u>YSI-55C</u>	↓	Potable H <sub>2</sub> O: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Steam: Yes <input type="checkbox"/> No <input type="checkbox"/>
SC	↓	↓	DI water: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Nitric Acid: Yes <input type="checkbox"/> No <input type="checkbox"/>
ORP	↓	↓		
DO	↓	↓		

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

# GROUNDWATER SAMPLING LOG

Project: Bozeman Landfill Date: 12/4/12 @ 1545 Station No. MW-9A  
 Personnel: MFP Weather: \_\_\_\_\_  
 Well Locked? Yes  No  Note Any Problems With Condition of Well: \_\_\_\_\_  
 Casing Dia. & Type: 2-inch PVC  4-inch PVC  Other \_\_\_\_\_ Measuring Point: Top of PVC, north side  Other \_\_\_\_\_  
 Aquifer: Tertiary sediments (sand, gravel, and clayey silt)  
 Well Depth (ft. below measuring point): 39.0 - Depth to Water 28.39 = 10.61 ft. water in well

### WELL EVACUATION

Evacuation Method: Submersible Pump  Disposable bailer  Spigot  Other \_\_\_\_\_  
10.6 ft. water in well x \_\_\_\_\_ gal./ft.\* = one casing volume 1.7 gals. x 3 = purge volume 5.2 gals.  
 \* 2" well = 0.163 gal./ft. 4" well = 0.653 gal./ft. 6" well = 1.469 gal./ft. 8" well = 2.611 gal./ft. Well C feet in diameter = 5.875 x C<sup>2</sup>

Pumping rate (gpm): \_\_\_\_\_

### EVACUATION DATA

Time	Cumulative Gallons	Temp	pH	SC <sup>+</sup>	ORP	DO
	<u>1.7</u>	<u>8.73</u>	<u>6.94</u>	<u>1098</u>	<u>-4.2*</u>	<u>3.30*</u>
	<u>3.4</u>	<u>8.89</u>	<u>6.96</u>	<u>1091</u>	<u>-4.5*</u>	<u>3.52*</u>
	<u>5.2</u>	<u>8.91</u>	<u>6.97</u>	<u>1100</u>	<u>-4.4*</u>	<u>2.63*</u>
	<u>5.7</u>	<u>8.93</u>	<u>6.84</u>	<u>1104</u>	<u>-4.8</u>	<u>1.28</u>
	<u>1</u>	<u>8.88</u>	<u>6.81</u>	<u>1104</u>	<u>-2.0</u>	<u>1.72</u>

\* downhole post-purge  
 re-measure after DO sensor stabil.

DO measured: In-well  In water bailed  In water pumped  Other \_\_\_\_\_

### WELL SAMPLING

Sampling Method: Submersible Pump  Disposable Polyethylene Bailer  Spigot  Grab  Other \_\_\_\_\_  
 Sample Type: Natural  Duplicate  Other \_\_\_\_\_

Sample Collected	Parameters	Sample Container	Preservative
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	VOCs	3 - 40 ml vials	HCl
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Metals: dissolved <input checked="" type="checkbox"/> or total <input checked="" type="checkbox"/> full list <input type="checkbox"/> or reduced list <input checked="" type="checkbox"/>	500 ml poly	HNO <sub>3</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	COD, Nitrate as N	250 ml poly	H <sub>2</sub> SO <sub>4</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	pH, SC, sulfate, chloride	250 ml poly	
Yes <input type="checkbox"/> No <input type="checkbox"/>	Cyanide	500 ml poly	NaOH
Yes <input type="checkbox"/> No <input type="checkbox"/>			

Laboratory: Pace Analytical Services, Inc., Billings, Montana Chain-of-Custody: Yes  No

Meter	Model No.	Calibration Date	Decontamination	
Water level	<u>Water Line</u>		Liquinox: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Scrub: Yes <input type="checkbox"/> No <input type="checkbox"/>
pH	<u>YSI-556</u>	<u>12/4/12</u>	Potable H <sub>2</sub> O: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Steam: Yes <input type="checkbox"/> No <input type="checkbox"/>
SC	<u>1</u>	<u>1</u>	DI water: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Nitric Acid: Yes <input type="checkbox"/> No <input type="checkbox"/>
ORP	<u>1</u>	<u>1</u>		
DO	<u>1</u>	<u>1</u>		

Comments: MW-9B - Not sampled DTGW = 28.62'

# GROUNDWATER SAMPLING LOG

Project: Bozeman Landfill Date: 12/5/12 @ 950 Station No. MW-10  
 Personnel: MFP Weather: Breeze, no snow, ~ 35°F  
 Well Locked? Yes  No  Note Any Problems With Condition of Well: \_\_\_\_\_  
 Casing Dia. & Type: 2-inch PVC  4-inch PVC  Other \_\_\_\_\_ Measuring Point: Top of PVC, north side  Other \_\_\_\_\_  
 Aquifer: Tertiary sediments (sand, gravel, and clayey silt)  
 Well Depth (ft. below measuring point): 14.50 - Depth to Water 2.03 = 12.47 ft. water in well

### WELL EVACUATION

Evacuation Method: Submersible Pump  Disposable bailer  Spigot  Other \_\_\_\_\_  
12.5 ft. water in well x \_\_\_\_\_ gal./ft. = one casing volume 2 gals. x 3 = purge volume 6 gals.  
 \* 2" well = 0.163 gal./ft. 4" well = 0.653 gal./ft. 6" well = 1.469 gal./ft. 8" well = 2.611 gal./ft. Well C feet in diameter = 5.875 x C<sup>2</sup>

Pumping rate (gpm): \_\_\_\_\_

### EVACUATION DATA

Time	Cumulative Gallons	Temp °C	pH	SC	ORP mV	DO mg/L
_____	<u>2</u>	<u>6.66</u>	<u>6.89</u>	<u>1,105</u>	<u>-19.8*</u>	<u>2.82*</u>
_____	<u>4</u>	<u>6.74</u>	<u>6.82</u>	<u>1,134</u>	<u>-18.6*</u>	_____
_____	<u>6</u>	<u>6.77</u>	<u>6.82</u>	<u>1,139</u>	<u>-20.7*</u>	<u>1.39*</u>
_____	<u>6.5</u>	<u>6.90</u>	<u>6.90</u>	<u>1,139</u>	<u>-26.9</u>	<u>0.47</u> - Downhole Post-Purge

DO measured: In-well  In water bailed  In water pumped  Other \_\_\_\_\_

### WELL SAMPLING

Sampling Method: Submersible Pump  Disposable Polyethylene Bailer  Spigot  Grab  Other: \_\_\_\_\_  
 Sample Type: Natural  Duplicate  Other: \_\_\_\_\_

Sample Collected	Parameters	Sample Container	Preservative
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	VOCs	3 - 40 ml vials	HCl
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Metals: dissolved <input checked="" type="checkbox"/> or total <input type="checkbox"/> full list <input type="checkbox"/> or reduced list <input checked="" type="checkbox"/>	500 ml poly	HNO <sub>3</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	COD, Nitrate as N	250 ml poly	H <sub>2</sub> SO <sub>4</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	pH, SC, sulfate, chloride	250 ml poly	
Yes <input type="checkbox"/> No <input type="checkbox"/>	Cyanide	500 ml poly	NaOH
Yes <input type="checkbox"/> No <input type="checkbox"/>			

Laboratory: Pace Analytical Services, Inc. Billings, Montana Chain-of-Custody: Yes  No

<u>Water Line</u>	<u>12/5/12</u>	Liquinox: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Scrub: Yes <input type="checkbox"/> No <input type="checkbox"/>
pH <u>451-556</u>		Potable H <sub>2</sub> O: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Steam: Yes <input type="checkbox"/> No <input type="checkbox"/>
SC _____		DI water: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Nitric Acid: Yes <input type="checkbox"/> No <input type="checkbox"/>
ORP _____			
DO _____			

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



# GROUNDWATER SAMPLING LOG

Project: Bozeman Landfill Date: 12/5/12 @ 1430 Station No. MW-11  
 Personnel: MFP Weather: \_\_\_\_\_  
 Well Locked? Yes  No  Note Any Problems With Condition of Well: \_\_\_\_\_  
 Casing Dia. & Type: 2-inch PVC  4-inch PVC  Other \_\_\_\_\_ Measuring Point: Top of PVC, north side  Other \_\_\_\_\_  
 Aquifer: Tertiary sediments (sand, gravel, and clayey silt)  
 Well Depth (ft. below measuring point): 70.0 - Depth to Water 51.84 = 18.16 ft. water in well

### WELL EVACUATION

Evacuation Method: Submersible Pump  Disposable bailer  Spigot  Other \_\_\_\_\_  
18.16 ft. water in well x \_\_\_\_\_ gal./ft.\* = one casing volume 3 gals. x 3 = purge volume 9 gals.  
 \* 2" well = 0.163 gal./ft. 4" well = 0.653 gal./ft. 6" well = 1.469 gal./ft. 8" well = 2.611 gal./ft. Well C feet in diameter = 5.875 x C<sup>2</sup>

Pumping rate (gpm): \_\_\_\_\_

### EVACUATION DATA

Time	Cumulative Gallons	Temp	pH	SC	ORP	DO
	3	9.23	7.31	668	-10.2	4.90
	6	9.14	7.31	685	-11.1	5.22
	9	9.10	7.33	680	-11.3	5.60
	9.5	9.19	7.22	680	-12.3	4.60

Downhole Post-Purge

DO measured: In-well  In water bailed  In water pumped  Other \_\_\_\_\_

### WELL SAMPLING

Sampling Method: Submersible Pump  Disposable Polyethylene Bailor  Spigot  Grab  Other: \_\_\_\_\_  
 Sample Type: Natural  Duplicate  Other: \_\_\_\_\_

Sample Collected	Parameters	Sample Container	Preservative
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	VOCs	3 - 40 ml vials	HCl
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Metals: dissolved <input checked="" type="checkbox"/> or total <input type="checkbox"/> full list <input type="checkbox"/> or reduced list <input checked="" type="checkbox"/>	500 ml poly	HNO <sub>3</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	COD, Nitrate as N	250 ml poly	H <sub>2</sub> SO <sub>4</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	pH, SC, sulfate, chloride	250 ml poly	
Yes <input type="checkbox"/> No <input type="checkbox"/>	Cyanide	500 ml poly	NaOH
Yes <input type="checkbox"/> No <input type="checkbox"/>			

Laboratory: Pace Analytical Services, Inc., Billings, Montana Chain-of-Custody: Yes  No

Meter	Model No.	Calibration Date	Decontamination
Water level	<u>Water Line</u>		Liquinox: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Scrub: Yes <input type="checkbox"/> No <input type="checkbox"/>
pH	<u>YSI-556</u>	<u>12/5/12</u>	Potable H <sub>2</sub> O: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Steam: Yes <input type="checkbox"/> No <input type="checkbox"/>
SC	<u>/</u>	<u>/</u>	DI water: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Nitric Acid: Yes <input type="checkbox"/> No <input type="checkbox"/>
ORP	<u>/</u>	<u>/</u>	
DO	<u>/</u>	<u>/</u>	

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

# GROUNDWATER SAMPLING LOG

Project: Bozeman Landfill Date: 12/5/12 @ 1540 Station No. MW-12  
 Personnel: MFP Weather: \_\_\_\_\_

Well Locked? Yes  No  Note Any Problems With Condition of Well: \_\_\_\_\_

Casing Dia. & Type: 2-inch PVC  4-inch PVC  Other \_\_\_\_\_ Measuring Point: Top of PVC, north side  Other \_\_\_\_\_

Aquifer: Tertiary sediments (sand, gravel, and clayey silt)

Well Depth (ft. below measuring point): 65.80 - Depth to Water 55.85 = 9.95 ft. water in well

### WELL EVACUATION

Evacuation Method: Submersible Pump  Disposable bailer  Spigot  Other \_\_\_\_\_

9.95 ft. water in well x \_\_\_\_\_ gal./ft. \* = one casing volume 1.62 gals. x 3 = purge volume 4.9 gals.

\* 2" well = 0.163 gal./ft. 4" well = 0.653 gal./ft. 6" well = 1.469 gal./ft. 8" well = 2.611 gal./ft. Well C feet in diameter = 5.875 x C<sup>2</sup>

Pumping rate (gpm): \_\_\_\_\_

### EVACUATION DATA

Time	Cumulative Gallons	Temp	pH	SC	ORP	DO
_____	<u>1.6</u>	<u>11.15</u>	<u>6.66</u>	<u>887</u>	<u>-28.7</u> *	<u>2.36</u> *
_____	<u>3.2</u>	<u>11.33</u>	<u>6.65</u>	<u>897</u>	<u>-23.7</u> *	<u>2.24</u> *
_____	<u>4.9</u>	<u>11.19</u>	<u>6.65</u>	<u>899</u>	<u>-19.4</u> *	<u>1.86</u> *
_____	<u>5.4</u>	<u>11.61</u>	<u>6.51</u>	<u>901</u>	<u>-16.9</u>	<u>0.82</u>

\* Downhole post-purge

DO measured: In-well  In water bailed  In water pumped  Other \_\_\_\_\_

### WELL SAMPLING

Sampling Method: Submersible Pump  Disposable Polyethylene Bailer  Spigot  Grab  Other \_\_\_\_\_

Sample Type: Natural  Duplicate  Other \_\_\_\_\_

Sample Collected	Parameters	Sample Container	Preservative
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	VOCs	3 - 40 ml vials	HCl
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Metals: dissolved <input checked="" type="checkbox"/> or total <input type="checkbox"/> full list <input type="checkbox"/> or reduced list <input checked="" type="checkbox"/>	500 ml poly	HNO <sub>3</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	COD, Nitrate as N	250 ml poly	H <sub>2</sub> SO <sub>4</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	pH, SC, sulfate, chloride	250 ml poly	
Yes <input type="checkbox"/> No <input type="checkbox"/>	Cyanide	500 ml poly	NaOH
Yes <input type="checkbox"/> No <input type="checkbox"/>			

Laboratory: Pace Analytical Services, Inc., Billings, Montana Chain-of-Custody: Yes  No

Meter	Model No.	Calibration Date	Decontamination	
Water level	<u>Water Line</u>		Liquinox: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Scrub: Yes <input type="checkbox"/> No <input type="checkbox"/>
pH	<u>YSI-556</u>	<u>12/5/12</u>	Potable H <sub>2</sub> O: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Steam: Yes <input type="checkbox"/> No <input type="checkbox"/>
SC	<u>1</u>	<u>1</u>	DI water: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Nitric Acid: Yes <input type="checkbox"/> No <input type="checkbox"/>
ORP				
DO				

Comments: \_\_\_\_\_

### GROUNDWATER SAMPLING LOG

Project: Bozeman Landfill Date: 12/5/12 @ 1115 Station No. MW-13  
 Personnel: MFP Weather: Breeze, no snow, ~45°F  
 Well Locked? Yes  No  Note Any Problems With Condition of Well: \_\_\_\_\_  
 Casing Dia. & Type: 2-inch PVC  4-inch PVC  Other \_\_\_\_\_ Measuring Point: Top of PVC, north side  Other \_\_\_\_\_  
 Aquifer: Tertiary sediments (sand, gravel, and clayey silt)  
 Well Depth (ft. below measuring point): 61.3 - Depth to Water 43.59 = 17.71 ft. water in well

#### WELL EVACUATION

Evacuation Method: Submersible Pump  Disposable bailer  Spigot  Other \_\_\_\_\_  
17.7 ft. water in well x \_\_\_\_\_ gal./ft. \* = one casing volume 2.9 gals. x 3 = purge volume 8.7 gals.  
 \* 2" well = 0.163 gal./ft. 4" well = 0.653 gal./ft. 6" well = 1.469 gal./ft. 8" well = 2.611 gal./ft. Well C feet in diameter = 5.875 x C<sup>2</sup>

Pumping rate (gpm): \_\_\_\_\_

#### EVACUATION DATA

Time	Cumulative Gallons	Temp °C	pH	SC <sup>ug</sup>	ORP <sup>mV</sup>	DO <sup>mg/L</sup>
	<u>2.9</u>	<u>10.89</u>	<u>6.79</u>	<u>1,032</u>	<u>-8.2*</u>	<u>2.72*</u>
	<u>5.8</u>	<u>10.94</u>	<u>6.72</u>	<u>1,033</u>	<u>-9.6*</u>	<u>3.19*</u>
	<u>8.7</u>	<u>11.10</u>	<u>6.67</u>	<u>1,037</u>	<u>-12.5*</u>	<u>2.92*</u>
	<u>10.0</u>	<u>11.28</u>	<u>6.59</u>	<u>1,036</u>	<u>-13.4</u>	<u>0.85</u>

*Downhole Post-Purge*

DO measured: In-well  In water bailed  In water pumped  Other \_\_\_\_\_

#### WELL SAMPLING

Sampling Method: Submersible Pump  Disposable Polyethylene Bailer  Spigot  Grab  Other \_\_\_\_\_  
 Sample Type: Natural  Duplicate  Other \_\_\_\_\_

Sample Collected	Parameters	Sample Container	Preservative
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	VOCs	3 - 40 ml vials	HCl
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Metals: dissolved <input checked="" type="checkbox"/> or total <input type="checkbox"/> full list <input type="checkbox"/> or reduced list <input checked="" type="checkbox"/>	500 ml poly	HNO <sub>3</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	COD, Nitrate as N	250 ml poly	H <sub>2</sub> SO <sub>4</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	pH, SC, sulfate, chloride	250 ml poly	
Yes <input type="checkbox"/> No <input type="checkbox"/>	Cyanide	500 ml poly	NaOH
Yes <input type="checkbox"/> No <input type="checkbox"/>			

Laboratory: Pace Analytical Services, Inc., Billings, Montana Chain-of-Custody: Yes  No

Meter <u>Water - Line</u> Model No. <u>YSI-SSG</u> Calibration Date <u>12/5/12</u>	Decontamination Liquinox: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Scrub: Yes <input type="checkbox"/> No <input type="checkbox"/> Potable H <sub>2</sub> O: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Steam: Yes <input type="checkbox"/> No <input type="checkbox"/> DI water: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Nitric Acid: Yes <input type="checkbox"/> No <input type="checkbox"/>
--	--

Comments: Duplicate sample collected - DUP @ 1130 time 12/5/12

# GROUNDWATER SAMPLING LOG

Project: Bozeman Landfill Date: 12/5/12 @ 1600 Station No. MW-14  
 Personnel: MFP Weather: \_\_\_\_\_  
 Well Locked? Yes  No  Note Any Problems With Condition of Well: \_\_\_\_\_  
 Casing Dia. & Type: 2-inch PVC  4-inch PVC  Other \_\_\_\_\_ Measuring Point: Top of PVC, north side  Other \_\_\_\_\_  
 Aquifer: Tertiary sediments (sand, gravel, and clayey silt)  
 Well Depth (ft. below measuring point): \_\_\_\_\_ - Depth to Water 32.83 = \_\_\_\_\_ ft. water in well

### WELL EVACUATION

Evacuation Method: Submersible Pump  Disposable bailer  Spigot  Other \_\_\_\_\_

\_\_\_\_\_ ft. water in well x \_\_\_\_\_ gal./ft.\* = one casing volume \_\_\_\_\_ gals. x 3 = purge volume \_\_\_\_\_ gals.

\* 2" well = 0.163 gal./ft. 4" well = 0.653 gal./ft. 6" well = 1.469 gal./ft. 8" well = 2.611 gal./ft. Well C feet in diameter = 5.875 x C<sup>2</sup>

Pumping rate (gpm): \_\_\_\_\_

### EVACUATION DATA

Time	Cumulative Gallons	Temp	pH	SC	ORP	DO
	<u>1</u>	<u>9.66</u>	<u>7.24</u>	<u>814</u>	<u>-12.1</u>	<u>1.43</u>
						<u>1.15</u>

Downhole post-purge stabilized

DO measured: In-well  In water bailed  In water pumped  Other \_\_\_\_\_

No sample collected Annual Monitoring (in June)

Sampling Method: Submersible Pump  Disposable Polyethylene Bailer  Spigot  Grab  Other \_\_\_\_\_

Sample Type: Natural  Duplicate  Other \_\_\_\_\_

Sample Collected	Parameters	Sample Container	Preservative
Yes <input type="checkbox"/> No <input type="checkbox"/>	VOCs	3 - 40 ml vials	HCl
Yes <input type="checkbox"/> No <input type="checkbox"/>	Metals: dissolved <input type="checkbox"/> or total <input type="checkbox"/> full list <input type="checkbox"/> or reduced list <input type="checkbox"/>	500 ml poly	HNO <sub>3</sub>
Yes <input type="checkbox"/> No <input type="checkbox"/>	COD, Nitrate as N	250 ml poly	H <sub>2</sub> SO <sub>4</sub>
Yes <input type="checkbox"/> No <input type="checkbox"/>	pH, SC, sulfate, chloride	250 ml poly	
Yes <input type="checkbox"/> No <input type="checkbox"/>	Cyanide	500 ml poly	NaOH
Yes <input type="checkbox"/> No <input type="checkbox"/>			

Laboratory: Pace Analytical Services, Inc., Billings, Montana

Chain-of-Custody: Yes  No

Meter	Model No.	Calibration Date
Water level	<u>Water Line</u>	
pH	<u>YSI-556</u>	<u>12/5/12</u>
SC		
ORP		
DO		

Decontamination			
Liquinox:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Scrub: Yes <input type="checkbox"/> No <input type="checkbox"/>
Potable H <sub>2</sub> O:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Steam: Yes <input type="checkbox"/> No <input type="checkbox"/>
DI water:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Nitric Acid: Yes <input type="checkbox"/> No <input type="checkbox"/>

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

# GROUNDWATER SAMPLING LOG

Project: Bozeman Landfill Date: 12/5/12 @ 1330 Station No. MW-15  
 Personnel: MFP Weather: \_\_\_\_\_  
 Well Locked? Yes  No  Note Any Problems With Condition of Well: \_\_\_\_\_  
 Casing Dia. & Type: 2-inch PVC  4-inch PVC  Other \_\_\_\_\_ Measuring Point: Top of PVC, north side  Other \_\_\_\_\_  
 Aquifer: Tertiary sediments (sand, gravel, and clayey silt)  
 Well Depth (ft. below measuring point): 72.50 - Depth to Water 45.98 = 26.52 ft. water in well

### WELL EVACUATION

Evacuation Method: Submersible Pump  Disposable bailer  Spigot  Other \_\_\_\_\_

26.5 ft. water in well x \_\_\_\_\_ gal./ft. \* = one casing volume 4.3 gals. x 3 = purge volume 13.0 gals.

\* 2" well = 0.163 gal./ft. 4" well = 0.653 gal./ft. 6" well = 1.469 gal./ft. 8" well = 2.611 gal./ft. Well C feet in diameter = 5.875 x C<sup>2</sup>

Pumping rate (gpm): \_\_\_\_\_

### EVACUATION DATA

Time	Cumulative Gallons	Temp	pH	SC	ORP	DO
	4.3	8.46	7.47	428	-12.4 *	
	8.6	8.04	7.42	428	-12.4 *	9.07 *
	13.0	7.91	7.42	428	-12.8 *	8.06 *
	13.5	7.93	7.33	432	-10.9	8.01 <i>downhole Post-Purge</i>

DO measured: In-well  In water bailed  In water pumped  Other \_\_\_\_\_

### WELL SAMPLING

Sampling Method: Submersible Pump  Disposable Polyethylene Bailer  Spigot  Grab  Other \_\_\_\_\_

Sample Type: Natural  Duplicate  Other \_\_\_\_\_

Sample Collected	Parameters	Sample Container	Preservative
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	VOCs	3 - 40 ml vials	HCl
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Metals: dissolved <input checked="" type="checkbox"/> or total <input type="checkbox"/> full list <input type="checkbox"/> or reduced list <input checked="" type="checkbox"/>	500 ml poly	HNO <sub>3</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	COD, Nitrate as N	250 ml poly	H <sub>2</sub> SO <sub>4</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	pH, SC, sulfate, chloride	250 ml poly	
Yes <input type="checkbox"/> No <input type="checkbox"/>	Cyanide	500 ml poly	NaOH
Yes <input type="checkbox"/> No <input type="checkbox"/>			

Laboratory: Pace Analytical Services, Inc., Billings, Montana

Chain-of-Custody: Yes  No

<b>Meter</b>	<b>Model No.</b>	<b>Calibration Date</b>	<b>Decontamination</b>
Water level	<u>Water Line</u>		Liquinox: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
pH	<u>YSI-556</u>	<u>12/5/12</u>	Scrub: Yes <input type="checkbox"/> No <input type="checkbox"/>
SC			Potable H <sub>2</sub> O: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
ORP			Steam: Yes <input type="checkbox"/> No <input type="checkbox"/>
DO			DI water: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
			Nitric Acid: Yes <input type="checkbox"/> No <input type="checkbox"/>

Comments: \_\_\_\_\_

### GROUNDWATER SAMPLING LOG

Project: Bozeman Landfill Date: 12/4/12 @ 1645 Station No. MW-16  
 Personnel: MFP Weather: \_\_\_\_\_

Well Locked? Yes  No  Note Any Problems With Condition of Well: \_\_\_\_\_

Casing Dia. & Type: 2-inch PVC  4-inch PVC  Other \_\_\_\_\_ Measuring Point: Top of PVC, north side  Other \_\_\_\_\_

Aquifer: Tertiary sediments (sand, gravel, and clayey silt)

Well Depth (ft. below measuring point): 40.0 - Depth to Water 26.24 = 13.76 ft. water in well

#### WELL EVACUATION

Evacuation Method: Submersible Pump  Disposable bailer  Spigot  Other \_\_\_\_\_

13.76 ft. water in well x \_\_\_\_\_ gal./ft.\* = one casing volume 2.25 gals. x 3 = purge volume 6.75 gals.

\* 2" well = 0.163 gal./ft. 4" well = 0.653 gal./ft. 6" well = 1.469 gal./ft. 8" well = 2.611 gal./ft. Well C feet in diameter = 5.875 x C<sup>2</sup>

Pumping rate (gpm): \_\_\_\_\_

#### EVACUATION DATA

Time	Cumulative Gallons	Temp	pH	SC <u>45</u>	ORP <u>mV</u>	DO <u>mg/L</u>
	<u>2.25</u>	<u>10.14</u>	<u>6.74</u>	<u>984</u>	<u>1.1 *</u>	<u>5.75*</u>
	<u>4.50</u>	<u>10.17</u>	<u>6.43</u>	<u>918</u>	<u>-8.8*</u>	<u>5.95*</u>
	<u>6.80</u>	<u>10.26</u>	<u>6.64</u>	<u>908</u>	<u>-6.4*</u>	<u>5.90*</u>
	<u>7.30</u>	<u>10.36</u>	<u>6.58</u>	<u>908</u>	<u>-6.0</u>	<u>5.11</u>

Downhole Post-Purge

DO measured: In-well  In water bailed  In water pumped  Other \_\_\_\_\_

#### WELL SAMPLING

Sampling Method: Submersible Pump  Disposable Polyethylene Bailer  Spigot  Grab  Other: \_\_\_\_\_

Sample Type: Natural  Duplicate  Other: \_\_\_\_\_

VOCs only

Sample Collected	Parameters	Sample Container	Preservative
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	VOCs	3 - 40 ml vials	HCl
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Metals: dissolved <input type="checkbox"/> or total <input type="checkbox"/> full list <input type="checkbox"/> or reduced list <input type="checkbox"/>	500 ml poly	HNO <sub>3</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	COD, Nitrate as N	250 ml poly	H <sub>2</sub> SO <sub>4</sub>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	pH, SC, sulfate, chloride	250 ml poly	
Yes <input type="checkbox"/> No <input type="checkbox"/>	Cyanide	500 ml poly	NaOH
Yes <input type="checkbox"/> No <input type="checkbox"/>			

Laboratory: Pace Analytical Services, Inc., Billings, Montana

Chain-of-Custody: Yes  No

Meter	Model No.	Calibration Date	Decontamination	
Water level	<u>Water Line</u>		Liquinox: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Scrub: Yes <input type="checkbox"/> No <input type="checkbox"/>
pH	<u>YS1-SS6</u>	<u>12/4/12</u>	Potable H <sub>2</sub> O: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Steam: Yes <input type="checkbox"/> No <input type="checkbox"/>
SC			DI water: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Nitric Acid: Yes <input type="checkbox"/> No <input type="checkbox"/>
ORP				
DO				

Comments: 1635 Calibr. pH check 7.03 s.u. OK  
Refill DO sensor w/ new KCl fluid and calibrate in 100% moist air

# GROUNDWATER SAMPLING LOG

Project: Bozeman Landfill

Date: 12/5/12 @ 1010

Station No. McIlhattan Seep

Personnel: MFP

Weather: \_\_\_\_\_

Well Locked? Yes [  ] No [  ] Note Any Problems With Condition of Well: \_\_\_\_\_

Casing Dia. & Type: 2-inch PVC [  ] 4-inch PVC [  ] Other \_\_\_\_\_ Measuring Point: Top of PVC, north side [  ] Other \_\_\_\_\_

Aquifer: Tertiary sediments (sand, gravel, and clayey silt)

Well Depth (ft. below measuring point): \_\_\_\_\_ - Depth to Water Flowing Spr = \_\_\_\_\_ ft. water in well

### WELL EVACUATION

Evacuation Method: Submersible Pump [  ] Disposable bailer [  ] Spigot [  ] Other: None

\_\_\_\_\_ ft. water in well x \_\_\_\_\_ gal./ft. \* = one casing volume \_\_\_\_\_ gals. x 3 = purge volume \_\_\_\_\_ gals.

\* 2" well = 0.163 gal./ft. 4" well = 0.653 gal./ft. 6" well = 1.469 gal./ft. 8" well = 2.611 gal./ft. Well C feet in diameter = 5.875 x C<sup>2</sup>

Pumping rate (gpm): \_\_\_\_\_

### EVACUATION DATA

Time	Cumulative Gallons	Temp	pH	SC <u>45</u>	ORP <u>mV</u>	DO <u>mg/L</u>
	<u>Flowing</u>	<u>9.76</u>	<u>7.06</u>	<u>1022</u>	<u>-14.4</u>	<u>7.06</u>

DO measured: In-well [  ] In water bailed [  ] In water pumped [  ] Other \_\_\_\_\_

### WELL SAMPLING

Sampling Method: Submersible Pump [  ] Disposable Polyethylene Bailer [  ] Spigot [  ] Grab [  ] Other: \_\_\_\_\_

Sample Type: Natural [  ] Duplicate [  ] Other: \_\_\_\_\_

Sample Collected	Parameters	Sample Container	Preservative
Yes [ <input checked="" type="checkbox"/> ] No [ <input type="checkbox"/> ]	VOCs	3 - 40 ml vials	HCl
Yes [ <input checked="" type="checkbox"/> ] No [ <input type="checkbox"/> ]	Metals: dissolved [ <input checked="" type="checkbox"/> ] or total [ <input checked="" type="checkbox"/> ] full list [ <input type="checkbox"/> ] or reduced list [ <input checked="" type="checkbox"/> ]	500 ml poly	HNO <sub>3</sub>
Yes [ <input checked="" type="checkbox"/> ] No [ <input type="checkbox"/> ]	COD, Nitrate as N	250 ml poly	H <sub>2</sub> SO <sub>4</sub>
Yes [ <input checked="" type="checkbox"/> ] No [ <input type="checkbox"/> ]	pH, SC, sulfate, chloride	250 ml poly	
Yes [ <input type="checkbox"/> ] No [ <input type="checkbox"/> ]	Cyanide	500 ml poly	NaOH
Yes [ <input type="checkbox"/> ] No [ <input type="checkbox"/> ]			

Laboratory: Pace Analytical Services, Inc., Billings, Montana

Chain-of-Custody: Yes [  ] No [  ]

Meter	Model No.	Calibration Date	Decontamination
Water level	<u>YSI-556</u>	<u>12/5/12</u>	Liquinox: Yes [ <input checked="" type="checkbox"/> ] No [ <input type="checkbox"/> ]    Scrub: Yes [ <input type="checkbox"/> ] No [ <input type="checkbox"/> ]
pH			Potable H <sub>2</sub> O: Yes [ <input checked="" type="checkbox"/> ] No [ <input type="checkbox"/> ]    Steam: Yes [ <input type="checkbox"/> ] No [ <input type="checkbox"/> ]
SC			DI water: Yes [ <input checked="" type="checkbox"/> ] No [ <input type="checkbox"/> ]    Nitric Acid: Yes [ <input type="checkbox"/> ] No [ <input type="checkbox"/> ]
ORP			
DO			

Comments: \_\_\_\_\_

# GROUNDWATER SAMPLING LOG

Project: Bozeman Landfill Date: 12/4/12 @ 1230 Station No. Shop Well  
 Personnel: MFP Weather: \_\_\_\_\_ (@ ofc & shop area)  
 Well Locked? Yes [ ] No [ ] Note Any Problems With Condition of Well: None obs.  
 Casing Dia. & Type: 2-inch PVC [ ] 4-inch PVC [ ] Other \_\_\_\_\_ Measuring Point: Top of PVC, north side [ ] Other \_\_\_\_\_  
 Aquifer: Tertiary sediments (sand, gravel, and clayey silt)  
 Well Depth (ft. below measuring point): MBMG 95 - Depth to Water: MBMG 37 = 58 ft. water in well

### WELL EVACUATION

Evacuation Method: Submersible Pump [  ] Disposable bailer [ ] Spigot [ ] Other \_\_\_\_\_  
58 ft. water in well x 1.47 gal./ft. \* = one casing volume 85.3 gals. x 3 = purge volume 256 gals.  
 \* 2" well = 0.163 gal./ft. 4" well = 0.653 gal./ft. 6" well = 1.469 gal./ft. 8" well = 2.611 gal./ft. Well C feet in diameter = 5.875 x C<sup>2</sup>  
 Pumping rate (gpm): Flow rate = 2.2 gal / 15.24 sec = 8.66 gpm

### EVACUATION DATA

Time	Cumulative Gallons	Temp	pH	SC <u>MS</u>	ORP <u>mV</u>	DO <u>mg/L</u>
<u>1200</u>	<u>0</u>	<u>start pumping</u>				
<u>1230</u>	<u>256</u>	<u>9.71</u>	<u>7.09</u>	<u>626</u>	<u>-8.5</u>	<del><u>3.13</u></del> <u>3.13</u> <i>flow-through</i>

DO measured: In-well [ ] In water bailed [ ] In water pumped [  ] Other \_\_\_\_\_

### WELL SAMPLING

Sampling Method: Submersible Pump [  ] Disposable Polyethylene Bailer [ ] Spigot [ ] Grab [ ] Other: \_\_\_\_\_  
 Sample Type: Natural [  ] Duplicate [ ] Other: \_\_\_\_\_

Sample Collected	Parameters	Sample Container	Preservative
Yes [ <input checked="" type="checkbox"/> ] No [ ]	VOCs	3 - 40 ml vials	HCl
Yes [ ] No [ <input checked="" type="checkbox"/> ]	Metals: dissolved [ ] or total [ ] full list [ ] or reduced list [ ]	500 ml poly	HNO <sub>3</sub>
Yes [ ] No [ <input checked="" type="checkbox"/> ]	COD, Nitrate as N	250 ml poly	H <sub>2</sub> SO <sub>4</sub>
Yes [ ] No [ <input checked="" type="checkbox"/> ]	pH, SC, sulfate, chloride	250 ml poly	
Yes [ ] No [ <input checked="" type="checkbox"/> ]	Cyanide	500 ml poly	NaOH
Yes [ ] No [ ]			

Laboratory: Pace Analytical Services, Inc., Billings, Montana Chain-of-Custody: Yes [x] No [ ]

Meter	Model No.	Calibration Date	Decontamination	
Water level	<u>431-SSG</u>	<u>12/4/12</u>	Liquinox: Yes [ ] No [ ]	Scrub: Yes [ ] No [ ]
pH			Potable H <sub>2</sub> O: Yes [ ] No [ ]	Steam: Yes [ ] No [ ]
SC			DI water: Yes [ ] No [ ]	Nitric Acid: Yes [ ] No [ ]
ORP				
DO				

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



# GROUNDWATER SAMPLING LOG

Project: Bozeman Landfill Date: 12/6/12 @ 1215 Station No. Vet Well  
 Personnel: MFP Weather: Cont'd dry

Well Locked? Yes [ ] No [ ] Note Any Problems With Condition of Well: \_\_\_\_\_

Casing Dia. & Type: 2-inch PVC [ ] 4-inch PVC [ ] Other \_\_\_\_\_ Measuring Point: Top of PVC, north side [ ] Other \_\_\_\_\_

Aquifer: Tertiary sediments (sand, gravel, and clayey silt)

Well Depth (ft. below measuring point): \_\_\_\_\_ - Depth to Water \_\_\_\_\_ = \_\_\_\_\_ ft. water in well

### WELL EVACUATION

Evacuation Method: Submersible Pump [  ] Disposable bailer [ ] Spigot [ ] Other \_\_\_\_\_

\_\_\_\_\_ ft. water in well x \_\_\_\_\_ gal./ft. \* = one casing volume \_\_\_\_\_ gals. x 3 = purge volume \_\_\_\_\_ gals.

\* 2" well = 0.163 gal./ft. 4" well = 0.653 gal./ft. 6" well = 1.469 gal./ft. 8" well = 2.611 gal./ft. Well C feet in diameter = 5.875 x C<sup>2</sup>

Pumping rate (gpm): \_\_\_\_\_

### EVACUATION DATA

Time	Cumulative Gallons	Temp	pH	SC	ORP	DO
1110	Start Flow	1 gal/40sec	or 1 gpm			
1210	90	9.68	7.64	494	-17.5	8.04 <i>Flow Through</i>

DO measured: In-well [ ] In water bailed [ ] In water pumped [  ] Other \_\_\_\_\_

### WELL SAMPLING

Sampling Method: Submersible Pump [  ] Disposable Polyethylene Bailer [ ] Spigot [ ] Grab [ ] Other \_\_\_\_\_

Sample Type: Natural [ ] Duplicate [ ] Other \_\_\_\_\_

Sample Collected	Parameters	Sample Container	Preservative
Yes [ <input checked="" type="checkbox"/> ] No [ ]	VOCs	3 - 40 ml vials	HCl
Yes [ <input checked="" type="checkbox"/> ] No [ ]	Metals: dissolved [ <input checked="" type="checkbox"/> ] or total [ ] full list [ <input checked="" type="checkbox"/> ] or reduced list [ ]	500 ml poly	HNO <sub>3</sub>
Yes [ <input checked="" type="checkbox"/> ] No [ ]	COD, Nitrate as N	250 ml poly	H <sub>2</sub> SO <sub>4</sub>
Yes [ <input checked="" type="checkbox"/> ] No [ ]	pH, SC, sulfate, chloride	250 ml poly	
Yes [ ] No [ ]	Cyanide	500 ml poly	NaOH
Yes [ ] No [ ]			

Laboratory: Pace Analytical Services, Inc., Billings, Montana

Chain-of-Custody: Yes [x] No [ ]

Meter	Model No.	Calibration Date	Decontamination
Water level	_____	_____	Liquinox: Yes [ ] No [ ] Scrub: Yes [ ] No [ ]
pH	<u>YSI-556</u>	<u>12/6/12</u>	Potable H <sub>2</sub> O: Yes [ ] No [ ] Steam: Yes [ ] No [ ]
SC			DI water: Yes [ ] No [ ] Nitric Acid: Yes [ ] No [ ]
ORP			
DO			

*Therefore cannot purge at high flow.*

Comments: Dogs in kennel where sampling occurs. Unable to remove hose sprayer. Therefore purging at a reduced flow (compared w/ previous monitoring events).

# **APPENDIX D**

## **LABORATORY ANALYTICAL REPORT**

December 19, 2012

Mark Pearson  
Tetra Tech, Inc. - MT  
851 Bridger Dr. Suite 6  
Bozeman, MT 59715

RE: Project: Bozeman Landfill  
Pace Project No.: 10214636

Dear Mark Pearson:

Enclosed are the analytical results for sample(s) received by the laboratory on December 07, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Samantha Rupe

samantha.rupe@pacelabs.com  
Project Manager

Enclosures



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

Page 1 of 80

## CERTIFICATIONS

Project: Bozeman Landfill

Pace Project No.: 10214636

---

### Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alaska Certification #: UST-078

Alaska Certification #MN00064

Arizona Certification #: AZ-0014

Arkansas Certification #: 88-0680

California Certification #: 01155CA

Colorado Certification #Pace

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: Pace

Florida/NELAP Certification #: E87605

Georgia Certification #: 959

Hawaii Certification #Pace

Idaho Certification #: MN00064

Illinois Certification #: 200011

Kansas Certification #: E-10167

Louisiana Certification #: 03086

Louisiana Certification #: LA080009

Maine Certification #: 2007029

Maryland Certification #: 322

Michigan DEQ Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: Pace

Montana Certification #: MT CERT0092

Nebraska Certification #: Pace

Nevada Certification #: MN\_00064

New Jersey Certification #: MN-002

New York Certification #: 11647

North Carolina Certification #: 530

North Dakota Certification #: R-036

North Dakota Certification #: R-036A

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon Certification #: MN200001

Oregon Certification #: MN300001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification

Tennessee Certification #: 02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia/DCLS Certification #: 002521

Virginia/VELAP Certification #: 460163

Washington Certification #: C754

West Virginia Certification #: 382

Wisconsin Certification #: 999407970

---

### Montana Certification IDs

602 South 25th Street, Billings, MT 59101

EPA Region 8 Certification #: 8TMS-Q

Idaho Certification #: MT00012

Montana Certification #: MT CERT0040

NVLAP Certification #: 101292-0

Minnesota Dept of Health Certification #: 030-999-442

Washington Department of Ecology #: C993

---

### SAMPLE SUMMARY

Project: Bozeman Landfill

Pace Project No.: 10214636

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10214636001	LF-2	Water	12/06/12 11:45	12/07/12 10:10
10214636002	LF-3	Water	12/06/12 10:35	12/07/12 10:10
10214636003	MW-4	Water	12/04/12 15:30	12/07/12 10:10
10214636004	MW-5	Water	12/04/12 10:20	12/07/12 10:10
10214636005	MW-6	Water	12/04/12 12:40	12/07/12 10:10
10214636006	MW-6B	Water	12/04/12 11:25	12/07/12 10:10
10214636007	MW-7A	Water	12/05/12 12:30	12/07/12 10:10
10214636008	MW-8A	Water	12/04/12 14:15	12/07/12 10:10
10214636009	MW-8C	Water	12/04/12 13:50	12/07/12 10:10
10214636010	MW-9A	Water	12/04/12 15:45	12/07/12 10:10
10214636011	MW-10	Water	12/05/12 09:50	12/07/12 10:10
10214636012	MW-11	Water	12/05/12 14:30	12/07/12 10:10
10214636013	MW-12	Water	12/05/12 15:40	12/07/12 10:10
10214636014	MW-13	Water	12/05/12 11:15	12/07/12 10:10
10214636015	MW-15	Water	12/05/12 13:30	12/07/12 10:10
10214636016	MW-16	Water	12/04/12 16:45	12/07/12 10:10
10214636017	McILHATTEN SEEP	Water	12/05/12 10:10	12/07/12 10:10
10214636018	VET WELL	Water	12/06/12 12:15	12/07/12 10:10
10214636019	DUP	Water	12/05/12 11:30	12/07/12 10:10
10214636020	TRIP BLANK	Water	12/04/12 10:20	12/07/12 10:10
10214636021	SHOP WELL	Water	12/04/12 12:30	12/07/12 10:10

### REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

### SAMPLE ANALYTE COUNT

Project: Bozeman Landfill  
Pace Project No.: 10214636

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10214636001	LF-2	EPA 8260B	DJT	52
		EPA 353.2	KG1	1
10214636002	LF-3	EPA 6020	RJS	2
		EPA 8260B	DJT	52
		EPA 300.0	EJS	2
		EPA 353.2	KG1	1
10214636003	MW-4	EPA 6020	RJS	2
		EPA 8260B	DJT	52
		EPA 300.0	EJS	2
		EPA 353.2	KG1	1
10214636004	MW-5	EPA 6020	RJS	2
		EPA 8260B	DJT	52
		SM 2510B	WT1	1
		EPA 300.0	EJS	2
		EPA 353.2	KG1	1
		SM 4500-H+B	CAC	1
10214636005	MW-6	EPA 6020	RJS	2
		EPA 8260B	DJT	52
		SM 2510B	WT1	1
		EPA 300.0	EJS	2
		EPA 353.2	KG1	1
		SM 4500-H+B	CAC	1
10214636006	MW-6B	EPA 6020	RJS	2
		EPA 8260B	DJT	52
		EPA 300.0	EJS	2
		EPA 353.2	KG1	1
10214636007	MW-7A	EPA 6020	RJS	2
		EPA 8260B	DJT	52
		EPA 300.0	EJS	2
		EPA 353.2	KG1	1
10214636008	MW-8A	EPA 6020	RJS	2
		EPA 8260B	DJT	52
		SM 2510B	WT1	1
		EPA 300.0	EJS	2
		EPA 353.2	KG1	1
		SM 4500-H+B	CAC	1
10214636009	MW-8C	EPA 6020	RJS	2

### REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

### SAMPLE ANALYTE COUNT

Project: Bozeman Landfill

Pace Project No.: 10214636

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10214636010	MW-9A	EPA 8260B	DJT	52
		EPA 300.0	EJS	2
		EPA 353.2	KG1	1
		EPA 6020	RJS	2
		EPA 8260B	DJT	52
10214636011	MW-10	EPA 300.0	EJS	2
		EPA 353.2	KG1	1
		EPA 6020	RJS	2
		EPA 8260B	DJT	52
		EPA 300.0	EJS	2
10214636012	MW-11	EPA 353.2	KG1	1
		EPA 6020	RJS	2
		EPA 8260B	DJT	52
		EPA 300.0	EJS	2
		EPA 353.2	KG1	1
10214636013	MW-12	EPA 6020	RJS	2
		EPA 8260B	DJT	52
		EPA 300.0	EJS	2
		EPA 353.2	KG1	1
		EPA 6020	RJS	2
10214636014	MW-13	EPA 8260B	DJT	52
		EPA 300.0	EJS	2
		EPA 353.2	KG1	1
		EPA 6020	RJS	2
		EPA 8260B	DJT	52
10214636015	MW-15	EPA 300.0	EJS	2
		EPA 353.2	KG1	1
		EPA 6020	RJS	2
		EPA 8260B	DJT	52
		SM 2510B	WT1	1
10214636016	MW-16	EPA 300.0	EJS	2
		EPA 353.2	KG1	1
		SM 4500-H+B	CAC	1
		EPA 8260B	DJT	52
		EPA 6020	RJS	2
10214636017	McILHATTEN SEEP	EPA 8260B	DJT	52
		EPA 300.0	EJS	2
		EPA 353.2	KG1	1
		EPA 6020	RJS	15
		EPA 8260B	DJT	52
10214636018	VET WELL	EPA 300.0	EJS	2

### REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

### SAMPLE ANALYTE COUNT

Project: Bozeman Landfill

Pace Project No.: 10214636

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10214636019	DUP	EPA 353.2	KG1	1
		EPA 6020	RJS	2
		EPA 8260B	DJT	52
		EPA 300.0	EJS	2
10214636020	TRIP BLANK	EPA 353.2	KG1	1
		EPA 8260B	DJT	52
10214636021	SHOP WELL	EPA 8260B	DJT	52

### REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..



## PROJECT NARRATIVE

Project: Bozeman Landfill  
Pace Project No.: 10214636

---

**Method:** EPA 6020  
**Description:** 6020 MET ICPMS  
**Client:** Tetra Tech, Inc. - MT  
**Date:** December 19, 2012

**General Information:**

1 sample was analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3020 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/36912

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 92140863001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1351830)
  - Barium
  - Silver
- MSD (Lab ID: 1351831)
  - Silver

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1351830)
  - Iron
- MSD (Lab ID: 1351831)
  - Iron
  - Manganese

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

Page 7 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

## PROJECT NARRATIVE

Project: Bozeman Landfill  
Pace Project No.: 10214636

---

**Method:** EPA 6020  
**Description:** 6020 MET ICPMS, Dissolved  
**Client:** Tetra Tech, Inc. - MT  
**Date:** December 19, 2012

**General Information:**

16 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3020 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

Page 8 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

## PROJECT NARRATIVE

Project: Bozeman Landfill  
Pace Project No.: 10214636

---

**Method:** EPA 8260B  
**Description:** 8260B MSV Low Level  
**Client:** Tetra Tech, Inc. - MT  
**Date:** December 19, 2012

### General Information:

21 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below.

- B: Analyte was detected in the associated method blank.
- LF-2 (Lab ID: 10214636001)

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

### Additional Comments:

Analyte Comments:

QC Batch: MSV/22395

- B: Analyte was detected in the associated method blank.
- LF-2 (Lab ID: 10214636001)
  - Bromomethane

## REPORT OF LABORATORY ANALYSIS

Page 9 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

## PROJECT NARRATIVE

Project: Bozeman Landfill  
Pace Project No.: 10214636

---

**Method:** SM 2510B  
**Description:** 2510B Specific Conductance  
**Client:** Tetra Tech, Inc. - MT  
**Date:** December 19, 2012

**General Information:**

4 samples were analyzed for SM 2510B. All samples were received in acceptable condition with any exceptions noted below.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## PROJECT NARRATIVE

Project: Bozeman Landfill  
Pace Project No.: 10214636

---

**Method:** EPA 300.0  
**Description:** 300.0 IC Anions  
**Client:** Tetra Tech, Inc. - MT  
**Date:** December 19, 2012

**General Information:**

17 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## PROJECT NARRATIVE

Project: Bozeman Landfill  
Pace Project No.: 10214636

---

**Method:** EPA 353.2  
**Description:** 353.2 Nitrate + Nitrite pres.  
**Client:** Tetra Tech, Inc. - MT  
**Date:** December 19, 2012

**General Information:**

18 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MT/10914

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10214500004,10214636006

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1349422)
- Nitrogen, NO2 plus NO3

QC Batch: MT/10915

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10214636015,10214810001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1349432)
- Nitrogen, NO2 plus NO3
- MS (Lab ID: 1349434)
- Nitrogen, NO2 plus NO3

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

## REPORT OF LABORATORY ANALYSIS

Page 12 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

## PROJECT NARRATIVE

Project: Bozeman Landfill

Pace Project No.: 10214636

---

**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite pres.

**Client:** Tetra Tech, Inc. - MT

**Date:** December 19, 2012

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

Page 13 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

## PROJECT NARRATIVE

Project: Bozeman Landfill

Pace Project No.: 10214636

---

**Method:** SM 4500-H+B

**Description:** 4500H+ pH, Electrometric

**Client:** Tetra Tech, Inc. - MT

**Date:** December 19, 2012

**General Information:**

4 samples were analyzed for SM 4500-H+B. All samples were received in acceptable condition with any exceptions noted below.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

H6: Analysis initiated outside of the 15 minute EPA recommended holding time.

- MW-15 (Lab ID: 10214636015)
- MW-5 (Lab ID: 10214636004)
- MW-6 (Lab ID: 10214636005)
- MW-8A (Lab ID: 10214636008)

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.



## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

Sample: **LF-2** Lab ID: **10214636001** Collected: 12/06/12 11:45 Received: 12/07/12 10:10 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Acetone	<12.5	ug/L	25.0	12.5	1		12/12/12 01:28	67-64-1	
Acrylonitrile	<5.0	ug/L	10.0	5.0	1		12/12/12 01:28	107-13-1	
Benzene	<0.047	ug/L	0.50	0.047	1		12/12/12 01:28	71-43-2	
Bromochloromethane	<0.10	ug/L	1.0	0.10	1		12/12/12 01:28	74-97-5	
Bromodichloromethane	<0.066	ug/L	0.50	0.066	1		12/12/12 01:28	75-27-4	
Bromoform	<2.0	ug/L	4.0	2.0	1		12/12/12 01:28	75-25-2	
Bromomethane	0.37J	ug/L	4.0	0.33	1		12/12/12 01:28	74-83-9	B
2-Butanone (MEK)	<2.0	ug/L	4.0	2.0	1		12/12/12 01:28	78-93-3	
Carbon disulfide	<0.50	ug/L	1.0	0.50	1		12/12/12 01:28	75-15-0	
Carbon tetrachloride	<0.094	ug/L	1.0	0.094	1		12/12/12 01:28	56-23-5	
Chlorobenzene	<0.071	ug/L	1.0	0.071	1		12/12/12 01:28	108-90-7	
Chloroethane	<0.31	ug/L	1.0	0.31	1		12/12/12 01:28	75-00-3	
Chloroform	<0.25	ug/L	0.50	0.25	1		12/12/12 01:28	67-66-3	
Chloromethane	<0.13	ug/L	1.0	0.13	1		12/12/12 01:28	74-87-3	
1,2-Dibromo-3-chloropropane	<0.80	ug/L	4.0	0.80	1		12/12/12 01:28	96-12-8	
Dibromochloromethane	<0.084	ug/L	0.50	0.084	1		12/12/12 01:28	124-48-1	
1,2-Dibromoethane (EDB)	<0.10	ug/L	0.50	0.10	1		12/12/12 01:28	106-93-4	
Dibromomethane	<0.089	ug/L	0.50	0.089	1		12/12/12 01:28	74-95-3	
1,2-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 01:28	95-50-1	
1,4-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 01:28	106-46-7	
trans-1,4-Dichloro-2-butene	<0.27	ug/L	10.0	0.27	1		12/12/12 01:28	110-57-6	
Dichlorodifluoromethane	<0.20	ug/L	1.0	0.20	1		12/12/12 01:28	75-71-8	
1,1-Dichloroethane	<0.072	ug/L	0.50	0.072	1		12/12/12 01:28	75-34-3	
1,2-Dichloroethane	<0.053	ug/L	0.50	0.053	1		12/12/12 01:28	107-06-2	
1,1-Dichloroethene	<0.16	ug/L	0.50	0.16	1		12/12/12 01:28	75-35-4	
cis-1,2-Dichloroethene	0.15J	ug/L	0.50	0.080	1		12/12/12 01:28	156-59-2	
trans-1,2-Dichloroethene	<0.14	ug/L	0.50	0.14	1		12/12/12 01:28	156-60-5	
1,2-Dichloropropane	<0.12	ug/L	4.0	0.12	1		12/12/12 01:28	78-87-5	
cis-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 01:28	10061-01-5	
trans-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 01:28	10061-02-6	
Ethylbenzene	<0.078	ug/L	0.50	0.078	1		12/12/12 01:28	100-41-4	
2-Hexanone	<2.0	ug/L	4.0	2.0	1		12/12/12 01:28	591-78-6	
Iodomethane	<0.50	ug/L	4.0	0.50	1		12/12/12 01:28	74-88-4	
Methylene Chloride	<2.0	ug/L	4.0	2.0	1		12/12/12 01:28	75-09-2	
4-Methyl-2-pentanone (MIBK)	<2.0	ug/L	4.0	2.0	1		12/12/12 01:28	108-10-1	
Styrene	<0.075	ug/L	0.50	0.075	1		12/12/12 01:28	100-42-5	
1,1,1,2-Tetrachloroethane	<0.082	ug/L	0.50	0.082	1		12/12/12 01:28	630-20-6	
1,1,2,2-Tetrachloroethane	<0.075	ug/L	0.50	0.075	1		12/12/12 01:28	79-34-5	
Tetrachloroethene	1.1	ug/L	0.50	0.16	1		12/12/12 01:28	127-18-4	
Toluene	0.13J	ug/L	0.50	0.065	1		12/12/12 01:28	108-88-3	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/12/12 01:28	71-55-6	
1,1,2-Trichloroethane	<0.12	ug/L	0.50	0.12	1		12/12/12 01:28	79-00-5	
Trichloroethene	0.14J	ug/L	0.50	0.11	1		12/12/12 01:28	79-01-6	
Trichlorofluoromethane	<0.11	ug/L	0.50	0.11	1		12/12/12 01:28	75-69-4	
1,2,3-Trichloropropane	<0.22	ug/L	4.0	0.22	1		12/12/12 01:28	96-18-4	
Vinyl acetate	<1.9	ug/L	10.0	1.9	1		12/12/12 01:28	108-05-4	

Date: 12/19/2012 04:32 PM

### REPORT OF LABORATORY ANALYSIS

Page 15 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

### ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: LF-2**      **Lab ID: 10214636001**      Collected: 12/06/12 11:45      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Vinyl chloride	<0.16	ug/L	0.40	0.16	1		12/12/12 01:28	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		12/12/12 01:28	1330-20-7	
<b>Surrogates</b>									
Dibromofluoromethane (S)	99 %		75-125		1		12/12/12 01:28	1868-53-7	
1,2-Dichloroethane-d4 (S)	101 %		75-125		1		12/12/12 01:28	17060-07-0	
Toluene-d8 (S)	100 %		75-125		1		12/12/12 01:28	2037-26-5	
4-Bromofluorobenzene (S)	101 %		75-125		1		12/12/12 01:28	460-00-4	
<b>353.2 Nitrate + Nitrite pres.</b>		Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	3.0	mg/L	0.20	0.088	20		12/12/12 15:29		

## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: LF-3**      **Lab ID: 10214636002**      Collected: 12/06/12 10:35      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS, Dissolved</b>		Analytical Method: EPA 6020    Preparation Method: EPA 3020							
Iron, Dissolved	<0.010	mg/L	0.050	0.010	1	12/11/12 12:43	12/12/12 22:37	7439-89-6	
Manganese, Dissolved	<0.00025	mg/L	0.00050	0.00025	1	12/11/12 12:43	12/12/12 22:37	7439-96-5	
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Acetone	<12.5	ug/L	25.0	12.5	1		12/12/12 01:53	67-64-1	
Acrylonitrile	<5.0	ug/L	10.0	5.0	1		12/12/12 01:53	107-13-1	
Benzene	<0.047	ug/L	0.50	0.047	1		12/12/12 01:53	71-43-2	
Bromochloromethane	<0.10	ug/L	1.0	0.10	1		12/12/12 01:53	74-97-5	
Bromodichloromethane	<0.066	ug/L	0.50	0.066	1		12/12/12 01:53	75-27-4	
Bromoform	<2.0	ug/L	4.0	2.0	1		12/12/12 01:53	75-25-2	
Bromomethane	<0.33	ug/L	4.0	0.33	1		12/12/12 01:53	74-83-9	
2-Butanone (MEK)	<2.0	ug/L	4.0	2.0	1		12/12/12 01:53	78-93-3	
Carbon disulfide	<0.50	ug/L	1.0	0.50	1		12/12/12 01:53	75-15-0	
Carbon tetrachloride	<0.094	ug/L	1.0	0.094	1		12/12/12 01:53	56-23-5	
Chlorobenzene	<0.071	ug/L	1.0	0.071	1		12/12/12 01:53	108-90-7	
Chloroethane	<0.31	ug/L	1.0	0.31	1		12/12/12 01:53	75-00-3	
Chloroform	<0.25	ug/L	0.50	0.25	1		12/12/12 01:53	67-66-3	
Chloromethane	<0.13	ug/L	1.0	0.13	1		12/12/12 01:53	74-87-3	
1,2-Dibromo-3-chloropropane	<0.80	ug/L	4.0	0.80	1		12/12/12 01:53	96-12-8	
Dibromochloromethane	<0.084	ug/L	0.50	0.084	1		12/12/12 01:53	124-48-1	
1,2-Dibromoethane (EDB)	<0.10	ug/L	0.50	0.10	1		12/12/12 01:53	106-93-4	
Dibromomethane	<0.089	ug/L	0.50	0.089	1		12/12/12 01:53	74-95-3	
1,2-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 01:53	95-50-1	
1,4-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 01:53	106-46-7	
trans-1,4-Dichloro-2-butene	<0.27	ug/L	10.0	0.27	1		12/12/12 01:53	110-57-6	
Dichlorodifluoromethane	0.73J	ug/L	1.0	0.20	1		12/12/12 01:53	75-71-8	
1,1-Dichloroethane	0.14J	ug/L	0.50	0.072	1		12/12/12 01:53	75-34-3	
1,2-Dichloroethane	<0.053	ug/L	0.50	0.053	1		12/12/12 01:53	107-06-2	
1,1-Dichloroethene	<0.16	ug/L	0.50	0.16	1		12/12/12 01:53	75-35-4	
cis-1,2-Dichloroethene	1.8	ug/L	0.50	0.080	1		12/12/12 01:53	156-59-2	
trans-1,2-Dichloroethene	<0.14	ug/L	0.50	0.14	1		12/12/12 01:53	156-60-5	
1,2-Dichloropropane	<0.12	ug/L	4.0	0.12	1		12/12/12 01:53	78-87-5	
cis-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 01:53	10061-01-5	
trans-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 01:53	10061-02-6	
Ethylbenzene	<0.078	ug/L	0.50	0.078	1		12/12/12 01:53	100-41-4	
2-Hexanone	<2.0	ug/L	4.0	2.0	1		12/12/12 01:53	591-78-6	
Iodomethane	<0.50	ug/L	4.0	0.50	1		12/12/12 01:53	74-88-4	
Methylene Chloride	<2.0	ug/L	4.0	2.0	1		12/12/12 01:53	75-09-2	
4-Methyl-2-pentanone (MIBK)	<2.0	ug/L	4.0	2.0	1		12/12/12 01:53	108-10-1	
Styrene	<0.075	ug/L	0.50	0.075	1		12/12/12 01:53	100-42-5	
1,1,1,2-Tetrachloroethane	<0.082	ug/L	0.50	0.082	1		12/12/12 01:53	630-20-6	
1,1,2,2-Tetrachloroethane	<0.075	ug/L	0.50	0.075	1		12/12/12 01:53	79-34-5	
Tetrachloroethene	3.8	ug/L	0.50	0.16	1		12/12/12 01:53	127-18-4	
Toluene	<0.065	ug/L	0.50	0.065	1		12/12/12 01:53	108-88-3	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/12/12 01:53	71-55-6	
1,1,2-Trichloroethane	<0.12	ug/L	0.50	0.12	1		12/12/12 01:53	79-00-5	

Date: 12/19/2012 04:32 PM

### REPORT OF LABORATORY ANALYSIS

Page 17 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

### ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: LF-3**      **Lab ID: 10214636002**      Collected: 12/06/12 10:35      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Trichloroethene	<b>0.88</b>	ug/L	0.50	0.11	1		12/12/12 01:53	79-01-6	
Trichlorofluoromethane	<b>&lt;0.11</b>	ug/L	0.50	0.11	1		12/12/12 01:53	75-69-4	
1,2,3-Trichloropropane	<b>&lt;0.22</b>	ug/L	4.0	0.22	1		12/12/12 01:53	96-18-4	
Vinyl acetate	<b>&lt;1.9</b>	ug/L	10.0	1.9	1		12/12/12 01:53	108-05-4	
Vinyl chloride	<b>&lt;0.16</b>	ug/L	0.40	0.16	1		12/12/12 01:53	75-01-4	
Xylene (Total)	<b>&lt;0.15</b>	ug/L	1.5	0.15	1		12/12/12 01:53	1330-20-7	
<b>Surrogates</b>									
Dibromofluoromethane (S)	99 %		75-125		1		12/12/12 01:53	1868-53-7	
1,2-Dichloroethane-d4 (S)	101 %		75-125		1		12/12/12 01:53	17060-07-0	
Toluene-d8 (S)	100 %		75-125		1		12/12/12 01:53	2037-26-5	
4-Bromofluorobenzene (S)	101 %		75-125		1		12/12/12 01:53	460-00-4	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	<b>25.4</b>	mg/L	2.0	0.37	2		12/17/12 16:24	16887-00-6	
Sulfate	<b>15.0</b>	mg/L	2.0	0.23	2		12/17/12 16:24	14808-79-8	
<b>353.2 Nitrate + Nitrite pres.</b>		Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	<b>3.6</b>	mg/L	0.10	0.044	10		12/12/12 15:30		

## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: MW-4**      **Lab ID: 10214636003**      Collected: 12/04/12 15:30      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS, Dissolved</b>		Analytical Method: EPA 6020    Preparation Method: EPA 3020							
Iron, Dissolved	<0.010	mg/L	0.050	0.010	1	12/11/12 12:43	12/12/12 23:14	7439-89-6	
Manganese, Dissolved	<0.00025	mg/L	0.00050	0.00025	1	12/11/12 12:43	12/12/12 23:14	7439-96-5	
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Acetone	<12.5	ug/L	25.0	12.5	1		12/12/12 02:41	67-64-1	
Acrylonitrile	<5.0	ug/L	10.0	5.0	1		12/12/12 02:41	107-13-1	
Benzene	<0.047	ug/L	0.50	0.047	1		12/12/12 02:41	71-43-2	
Bromochloromethane	<0.10	ug/L	1.0	0.10	1		12/12/12 02:41	74-97-5	
Bromodichloromethane	<0.066	ug/L	0.50	0.066	1		12/12/12 02:41	75-27-4	
Bromoform	<2.0	ug/L	4.0	2.0	1		12/12/12 02:41	75-25-2	
Bromomethane	<0.33	ug/L	4.0	0.33	1		12/12/12 02:41	74-83-9	
2-Butanone (MEK)	<2.0	ug/L	4.0	2.0	1		12/12/12 02:41	78-93-3	
Carbon disulfide	<0.50	ug/L	1.0	0.50	1		12/12/12 02:41	75-15-0	
Carbon tetrachloride	<0.094	ug/L	1.0	0.094	1		12/12/12 02:41	56-23-5	
Chlorobenzene	<0.071	ug/L	1.0	0.071	1		12/12/12 02:41	108-90-7	
Chloroethane	<0.31	ug/L	1.0	0.31	1		12/12/12 02:41	75-00-3	
Chloroform	<0.25	ug/L	0.50	0.25	1		12/12/12 02:41	67-66-3	
Chloromethane	<0.13	ug/L	1.0	0.13	1		12/12/12 02:41	74-87-3	
1,2-Dibromo-3-chloropropane	<0.80	ug/L	4.0	0.80	1		12/12/12 02:41	96-12-8	
Dibromochloromethane	<0.084	ug/L	0.50	0.084	1		12/12/12 02:41	124-48-1	
1,2-Dibromoethane (EDB)	<0.10	ug/L	0.50	0.10	1		12/12/12 02:41	106-93-4	
Dibromomethane	<0.089	ug/L	0.50	0.089	1		12/12/12 02:41	74-95-3	
1,2-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 02:41	95-50-1	
1,4-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 02:41	106-46-7	
trans-1,4-Dichloro-2-butene	<0.27	ug/L	10.0	0.27	1		12/12/12 02:41	110-57-6	
Dichlorodifluoromethane	<0.20	ug/L	1.0	0.20	1		12/12/12 02:41	75-71-8	
1,1-Dichloroethane	0.29J	ug/L	0.50	0.072	1		12/12/12 02:41	75-34-3	
1,2-Dichloroethane	<0.053	ug/L	0.50	0.053	1		12/12/12 02:41	107-06-2	
1,1-Dichloroethene	<0.16	ug/L	0.50	0.16	1		12/12/12 02:41	75-35-4	
cis-1,2-Dichloroethene	0.45J	ug/L	0.50	0.080	1		12/12/12 02:41	156-59-2	
trans-1,2-Dichloroethene	<0.14	ug/L	0.50	0.14	1		12/12/12 02:41	156-60-5	
1,2-Dichloropropane	<0.12	ug/L	4.0	0.12	1		12/12/12 02:41	78-87-5	
cis-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 02:41	10061-01-5	
trans-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 02:41	10061-02-6	
Ethylbenzene	<0.078	ug/L	0.50	0.078	1		12/12/12 02:41	100-41-4	
2-Hexanone	<2.0	ug/L	4.0	2.0	1		12/12/12 02:41	591-78-6	
Iodomethane	<0.50	ug/L	4.0	0.50	1		12/12/12 02:41	74-88-4	
Methylene Chloride	<2.0	ug/L	4.0	2.0	1		12/12/12 02:41	75-09-2	
4-Methyl-2-pentanone (MIBK)	<2.0	ug/L	4.0	2.0	1		12/12/12 02:41	108-10-1	
Styrene	<0.075	ug/L	0.50	0.075	1		12/12/12 02:41	100-42-5	
1,1,1,2-Tetrachloroethane	<0.082	ug/L	0.50	0.082	1		12/12/12 02:41	630-20-6	
1,1,2,2-Tetrachloroethane	<0.075	ug/L	0.50	0.075	1		12/12/12 02:41	79-34-5	
Tetrachloroethene	1.1	ug/L	0.50	0.16	1		12/12/12 02:41	127-18-4	
Toluene	<0.065	ug/L	0.50	0.065	1		12/12/12 02:41	108-88-3	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/12/12 02:41	71-55-6	
1,1,2-Trichloroethane	<0.12	ug/L	0.50	0.12	1		12/12/12 02:41	79-00-5	

Date: 12/19/2012 04:32 PM

### REPORT OF LABORATORY ANALYSIS

Page 19 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: MW-4**      **Lab ID: 10214636003**      Collected: 12/04/12 15:30      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Trichloroethene	<b>0.79</b>	ug/L	0.50	0.11	1		12/12/12 02:41	79-01-6	
Trichlorofluoromethane	<b>&lt;0.11</b>	ug/L	0.50	0.11	1		12/12/12 02:41	75-69-4	
1,2,3-Trichloropropane	<b>&lt;0.22</b>	ug/L	4.0	0.22	1		12/12/12 02:41	96-18-4	
Vinyl acetate	<b>&lt;1.9</b>	ug/L	10.0	1.9	1		12/12/12 02:41	108-05-4	
Vinyl chloride	<b>&lt;0.16</b>	ug/L	0.40	0.16	1		12/12/12 02:41	75-01-4	
Xylene (Total)	<b>&lt;0.15</b>	ug/L	1.5	0.15	1		12/12/12 02:41	1330-20-7	
<b>Surrogates</b>									
Dibromofluoromethane (S)	100 %		75-125		1		12/12/12 02:41	1868-53-7	
1,2-Dichloroethane-d4 (S)	102 %		75-125		1		12/12/12 02:41	17060-07-0	
Toluene-d8 (S)	101 %		75-125		1		12/12/12 02:41	2037-26-5	
4-Bromofluorobenzene (S)	100 %		75-125		1		12/12/12 02:41	460-00-4	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	<b>36.2</b>	mg/L	2.0	0.37	2		12/17/12 17:27	16887-00-6	
Sulfate	<b>17.8</b>	mg/L	2.0	0.23	2		12/17/12 17:27	14808-79-8	
<b>353.2 Nitrate + Nitrite pres.</b>		Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	<b>1.8</b>	mg/L	0.10	0.044	10		12/12/12 15:32		

## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: MW-5**      **Lab ID: 10214636004**      Collected: 12/04/12 10:20      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS, Dissolved</b>		Analytical Method: EPA 6020    Preparation Method: EPA 3020							
Iron, Dissolved	<0.010	mg/L	0.050	0.010	1	12/11/12 12:43	12/12/12 23:18	7439-89-6	
Manganese, Dissolved	<0.00025	mg/L	0.00050	0.00025	1	12/11/12 12:43	12/12/12 23:18	7439-96-5	
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Acetone	<12.5	ug/L	25.0	12.5	1		12/12/12 03:06	67-64-1	
Acrylonitrile	<5.0	ug/L	10.0	5.0	1		12/12/12 03:06	107-13-1	
Benzene	<0.047	ug/L	0.50	0.047	1		12/12/12 03:06	71-43-2	
Bromochloromethane	<0.10	ug/L	1.0	0.10	1		12/12/12 03:06	74-97-5	
Bromodichloromethane	<0.066	ug/L	0.50	0.066	1		12/12/12 03:06	75-27-4	
Bromoform	<2.0	ug/L	4.0	2.0	1		12/12/12 03:06	75-25-2	
Bromomethane	<0.33	ug/L	4.0	0.33	1		12/12/12 03:06	74-83-9	
2-Butanone (MEK)	<2.0	ug/L	4.0	2.0	1		12/12/12 03:06	78-93-3	
Carbon disulfide	<0.50	ug/L	1.0	0.50	1		12/12/12 03:06	75-15-0	
Carbon tetrachloride	<0.094	ug/L	1.0	0.094	1		12/12/12 03:06	56-23-5	
Chlorobenzene	<0.071	ug/L	1.0	0.071	1		12/12/12 03:06	108-90-7	
Chloroethane	<0.31	ug/L	1.0	0.31	1		12/12/12 03:06	75-00-3	
Chloroform	<0.25	ug/L	0.50	0.25	1		12/12/12 03:06	67-66-3	
Chloromethane	<0.13	ug/L	1.0	0.13	1		12/12/12 03:06	74-87-3	
1,2-Dibromo-3-chloropropane	<0.80	ug/L	4.0	0.80	1		12/12/12 03:06	96-12-8	
Dibromochloromethane	<0.084	ug/L	0.50	0.084	1		12/12/12 03:06	124-48-1	
1,2-Dibromoethane (EDB)	<0.10	ug/L	0.50	0.10	1		12/12/12 03:06	106-93-4	
Dibromomethane	<0.089	ug/L	0.50	0.089	1		12/12/12 03:06	74-95-3	
1,2-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 03:06	95-50-1	
1,4-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 03:06	106-46-7	
trans-1,4-Dichloro-2-butene	<0.27	ug/L	10.0	0.27	1		12/12/12 03:06	110-57-6	
Dichlorodifluoromethane	<0.20	ug/L	1.0	0.20	1		12/12/12 03:06	75-71-8	
1,1-Dichloroethane	<0.072	ug/L	0.50	0.072	1		12/12/12 03:06	75-34-3	
1,2-Dichloroethane	<0.053	ug/L	0.50	0.053	1		12/12/12 03:06	107-06-2	
1,1-Dichloroethene	<0.16	ug/L	0.50	0.16	1		12/12/12 03:06	75-35-4	
cis-1,2-Dichloroethene	<0.080	ug/L	0.50	0.080	1		12/12/12 03:06	156-59-2	
trans-1,2-Dichloroethene	<0.14	ug/L	0.50	0.14	1		12/12/12 03:06	156-60-5	
1,2-Dichloropropane	<0.12	ug/L	4.0	0.12	1		12/12/12 03:06	78-87-5	
cis-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 03:06	10061-01-5	
trans-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 03:06	10061-02-6	
Ethylbenzene	<0.078	ug/L	0.50	0.078	1		12/12/12 03:06	100-41-4	
2-Hexanone	<2.0	ug/L	4.0	2.0	1		12/12/12 03:06	591-78-6	
Iodomethane	<0.50	ug/L	4.0	0.50	1		12/12/12 03:06	74-88-4	
Methylene Chloride	<2.0	ug/L	4.0	2.0	1		12/12/12 03:06	75-09-2	
4-Methyl-2-pentanone (MIBK)	<2.0	ug/L	4.0	2.0	1		12/12/12 03:06	108-10-1	
Styrene	<0.075	ug/L	0.50	0.075	1		12/12/12 03:06	100-42-5	
1,1,1,2-Tetrachloroethane	<0.082	ug/L	0.50	0.082	1		12/12/12 03:06	630-20-6	
1,1,2,2-Tetrachloroethane	<0.075	ug/L	0.50	0.075	1		12/12/12 03:06	79-34-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/12/12 03:06	127-18-4	
Toluene	0.12J	ug/L	0.50	0.065	1		12/12/12 03:06	108-88-3	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/12/12 03:06	71-55-6	
1,1,2-Trichloroethane	<0.12	ug/L	0.50	0.12	1		12/12/12 03:06	79-00-5	

Date: 12/19/2012 04:32 PM

### REPORT OF LABORATORY ANALYSIS

Page 21 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: MW-5**      **Lab ID: 10214636004**      Collected: 12/04/12 10:20      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Trichloroethene	<0.11	ug/L	0.50	0.11	1		12/12/12 03:06	79-01-6	
Trichlorofluoromethane	<0.11	ug/L	0.50	0.11	1		12/12/12 03:06	75-69-4	
1,2,3-Trichloropropane	<0.22	ug/L	4.0	0.22	1		12/12/12 03:06	96-18-4	
Vinyl acetate	<1.9	ug/L	10.0	1.9	1		12/12/12 03:06	108-05-4	
Vinyl chloride	<0.16	ug/L	0.40	0.16	1		12/12/12 03:06	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		12/12/12 03:06	1330-20-7	
<b>Surrogates</b>									
Dibromofluoromethane (S)	99 %		75-125		1		12/12/12 03:06	1868-53-7	
1,2-Dichloroethane-d4 (S)	101 %		75-125		1		12/12/12 03:06	17060-07-0	
Toluene-d8 (S)	101 %		75-125		1		12/12/12 03:06	2037-26-5	
4-Bromofluorobenzene (S)	101 %		75-125		1		12/12/12 03:06	460-00-4	
<b>2510B Specific Conductance</b>		Analytical Method: SM 2510B							
Specific Conductance	442	umhos/cm	10.0	5.0	1		12/10/12 12:32		
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	5.0	mg/L	1.0	0.18	1		12/17/12 18:30	16887-00-6	
Sulfate	9.1	mg/L	1.0	0.12	1		12/17/12 18:30	14808-79-8	
<b>353.2 Nitrate + Nitrite pres.</b>		Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	4.4	mg/L	0.10	0.044	10		12/12/12 15:34		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.4	Std. Units	0.10	0.050	1		12/07/12 15:08		H6



## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: MW-6**      **Lab ID: 10214636005**      Collected: 12/04/12 12:40      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS, Dissolved</b>		Analytical Method: EPA 6020    Preparation Method: EPA 3020							
Iron, Dissolved	<0.010	mg/L	0.050	0.010	1	12/11/12 12:43	12/12/12 23:22	7439-89-6	
Manganese, Dissolved	0.0029	mg/L	0.00050	0.00025	1	12/11/12 12:43	12/12/12 23:22	7439-96-5	
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Acetone	<12.5	ug/L	25.0	12.5	1		12/12/12 03:30	67-64-1	
Acrylonitrile	<5.0	ug/L	10.0	5.0	1		12/12/12 03:30	107-13-1	
Benzene	0.12J	ug/L	0.50	0.047	1		12/12/12 03:30	71-43-2	
Bromochloromethane	<0.10	ug/L	1.0	0.10	1		12/12/12 03:30	74-97-5	
Bromodichloromethane	<0.066	ug/L	0.50	0.066	1		12/12/12 03:30	75-27-4	
Bromoform	<2.0	ug/L	4.0	2.0	1		12/12/12 03:30	75-25-2	
Bromomethane	<0.33	ug/L	4.0	0.33	1		12/12/12 03:30	74-83-9	
2-Butanone (MEK)	<2.0	ug/L	4.0	2.0	1		12/12/12 03:30	78-93-3	
Carbon disulfide	<0.50	ug/L	1.0	0.50	1		12/12/12 03:30	75-15-0	
Carbon tetrachloride	<0.094	ug/L	1.0	0.094	1		12/12/12 03:30	56-23-5	
Chlorobenzene	<0.071	ug/L	1.0	0.071	1		12/12/12 03:30	108-90-7	
Chloroethane	<0.31	ug/L	1.0	0.31	1		12/12/12 03:30	75-00-3	
Chloroform	<0.25	ug/L	0.50	0.25	1		12/12/12 03:30	67-66-3	
Chloromethane	<0.13	ug/L	1.0	0.13	1		12/12/12 03:30	74-87-3	
1,2-Dibromo-3-chloropropane	<0.80	ug/L	4.0	0.80	1		12/12/12 03:30	96-12-8	
Dibromochloromethane	<0.084	ug/L	0.50	0.084	1		12/12/12 03:30	124-48-1	
1,2-Dibromoethane (EDB)	<0.10	ug/L	0.50	0.10	1		12/12/12 03:30	106-93-4	
Dibromomethane	<0.089	ug/L	0.50	0.089	1		12/12/12 03:30	74-95-3	
1,2-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 03:30	95-50-1	
1,4-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 03:30	106-46-7	
trans-1,4-Dichloro-2-butene	<0.27	ug/L	10.0	0.27	1		12/12/12 03:30	110-57-6	
Dichlorodifluoromethane	<0.20	ug/L	1.0	0.20	1		12/12/12 03:30	75-71-8	
1,1-Dichloroethane	0.95	ug/L	0.50	0.072	1		12/12/12 03:30	75-34-3	
1,2-Dichloroethane	<0.053	ug/L	0.50	0.053	1		12/12/12 03:30	107-06-2	
1,1-Dichloroethene	<0.16	ug/L	0.50	0.16	1		12/12/12 03:30	75-35-4	
cis-1,2-Dichloroethene	2.1	ug/L	0.50	0.080	1		12/12/12 03:30	156-59-2	
trans-1,2-Dichloroethene	<0.14	ug/L	0.50	0.14	1		12/12/12 03:30	156-60-5	
1,2-Dichloropropane	0.12J	ug/L	4.0	0.12	1		12/12/12 03:30	78-87-5	
cis-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 03:30	10061-01-5	
trans-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 03:30	10061-02-6	
Ethylbenzene	<0.078	ug/L	0.50	0.078	1		12/12/12 03:30	100-41-4	
2-Hexanone	<2.0	ug/L	4.0	2.0	1		12/12/12 03:30	591-78-6	
Iodomethane	<0.50	ug/L	4.0	0.50	1		12/12/12 03:30	74-88-4	
Methylene Chloride	<2.0	ug/L	4.0	2.0	1		12/12/12 03:30	75-09-2	
4-Methyl-2-pentanone (MIBK)	<2.0	ug/L	4.0	2.0	1		12/12/12 03:30	108-10-1	
Styrene	<0.075	ug/L	0.50	0.075	1		12/12/12 03:30	100-42-5	
1,1,1,2-Tetrachloroethane	<0.082	ug/L	0.50	0.082	1		12/12/12 03:30	630-20-6	
1,1,2,2-Tetrachloroethane	<0.075	ug/L	0.50	0.075	1		12/12/12 03:30	79-34-5	
Tetrachloroethene	0.97	ug/L	0.50	0.16	1		12/12/12 03:30	127-18-4	
Toluene	<0.065	ug/L	0.50	0.065	1		12/12/12 03:30	108-88-3	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/12/12 03:30	71-55-6	
1,1,2-Trichloroethane	<0.12	ug/L	0.50	0.12	1		12/12/12 03:30	79-00-5	

Date: 12/19/2012 04:32 PM

### REPORT OF LABORATORY ANALYSIS

Page 23 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: MW-6**      **Lab ID: 10214636005**      Collected: 12/04/12 12:40      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Trichloroethene	0.79	ug/L	0.50	0.11	1		12/12/12 03:30	79-01-6	
Trichlorofluoromethane	<0.11	ug/L	0.50	0.11	1		12/12/12 03:30	75-69-4	
1,2,3-Trichloropropane	<0.22	ug/L	4.0	0.22	1		12/12/12 03:30	96-18-4	
Vinyl acetate	<1.9	ug/L	10.0	1.9	1		12/12/12 03:30	108-05-4	
Vinyl chloride	1.5	ug/L	0.40	0.16	1		12/12/12 03:30	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		12/12/12 03:30	1330-20-7	
<b>Surrogates</b>									
Dibromofluoromethane (S)	99 %		75-125		1		12/12/12 03:30	1868-53-7	
1,2-Dichloroethane-d4 (S)	101 %		75-125		1		12/12/12 03:30	17060-07-0	
Toluene-d8 (S)	100 %		75-125		1		12/12/12 03:30	2037-26-5	
4-Bromofluorobenzene (S)	101 %		75-125		1		12/12/12 03:30	460-00-4	
<b>2510B Specific Conductance</b>		Analytical Method: SM 2510B							
Specific Conductance	898	umhos/cm	10.0	5.0	1		12/10/12 12:33		
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	18.2	mg/L	2.0	0.37	2		12/17/12 19:34	16887-00-6	
Sulfate	13.1	mg/L	2.0	0.23	2		12/17/12 19:34	14808-79-8	
<b>353.2 Nitrate + Nitrite pres.</b>		Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	1.2	mg/L	0.050	0.022	5		12/12/12 15:36		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	6.7	Std. Units	0.10	0.050	1		12/07/12 15:09		H6

## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: MW-6B**      **Lab ID: 10214636006**      Collected: 12/04/12 11:25      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS, Dissolved</b>		Analytical Method: EPA 6020    Preparation Method: EPA 3020							
Iron, Dissolved	<0.010	mg/L	0.050	0.010	1	12/11/12 12:43	12/12/12 23:27	7439-89-6	
Manganese, Dissolved	0.0018	mg/L	0.00050	0.00025	1	12/11/12 12:43	12/12/12 23:27	7439-96-5	
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Acetone	<12.5	ug/L	25.0	12.5	1		12/12/12 03:54	67-64-1	
Acrylonitrile	<5.0	ug/L	10.0	5.0	1		12/12/12 03:54	107-13-1	
Benzene	<0.047	ug/L	0.50	0.047	1		12/12/12 03:54	71-43-2	
Bromochloromethane	<0.10	ug/L	1.0	0.10	1		12/12/12 03:54	74-97-5	
Bromodichloromethane	<0.066	ug/L	0.50	0.066	1		12/12/12 03:54	75-27-4	
Bromoform	<2.0	ug/L	4.0	2.0	1		12/12/12 03:54	75-25-2	
Bromomethane	<0.33	ug/L	4.0	0.33	1		12/12/12 03:54	74-83-9	
2-Butanone (MEK)	<2.0	ug/L	4.0	2.0	1		12/12/12 03:54	78-93-3	
Carbon disulfide	<0.50	ug/L	1.0	0.50	1		12/12/12 03:54	75-15-0	
Carbon tetrachloride	<0.094	ug/L	1.0	0.094	1		12/12/12 03:54	56-23-5	
Chlorobenzene	<0.071	ug/L	1.0	0.071	1		12/12/12 03:54	108-90-7	
Chloroethane	<0.31	ug/L	1.0	0.31	1		12/12/12 03:54	75-00-3	
Chloroform	<0.25	ug/L	0.50	0.25	1		12/12/12 03:54	67-66-3	
Chloromethane	<0.13	ug/L	1.0	0.13	1		12/12/12 03:54	74-87-3	
1,2-Dibromo-3-chloropropane	<0.80	ug/L	4.0	0.80	1		12/12/12 03:54	96-12-8	
Dibromochloromethane	<0.084	ug/L	0.50	0.084	1		12/12/12 03:54	124-48-1	
1,2-Dibromoethane (EDB)	<0.10	ug/L	0.50	0.10	1		12/12/12 03:54	106-93-4	
Dibromomethane	<0.089	ug/L	0.50	0.089	1		12/12/12 03:54	74-95-3	
1,2-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 03:54	95-50-1	
1,4-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 03:54	106-46-7	
trans-1,4-Dichloro-2-butene	<0.27	ug/L	10.0	0.27	1		12/12/12 03:54	110-57-6	
Dichlorodifluoromethane	<0.20	ug/L	1.0	0.20	1		12/12/12 03:54	75-71-8	
1,1-Dichloroethane	<0.072	ug/L	0.50	0.072	1		12/12/12 03:54	75-34-3	
1,2-Dichloroethane	<0.053	ug/L	0.50	0.053	1		12/12/12 03:54	107-06-2	
1,1-Dichloroethene	<0.16	ug/L	0.50	0.16	1		12/12/12 03:54	75-35-4	
cis-1,2-Dichloroethene	<0.080	ug/L	0.50	0.080	1		12/12/12 03:54	156-59-2	
trans-1,2-Dichloroethene	<0.14	ug/L	0.50	0.14	1		12/12/12 03:54	156-60-5	
1,2-Dichloropropane	<0.12	ug/L	4.0	0.12	1		12/12/12 03:54	78-87-5	
cis-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 03:54	10061-01-5	
trans-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 03:54	10061-02-6	
Ethylbenzene	<0.078	ug/L	0.50	0.078	1		12/12/12 03:54	100-41-4	
2-Hexanone	<2.0	ug/L	4.0	2.0	1		12/12/12 03:54	591-78-6	
Iodomethane	<0.50	ug/L	4.0	0.50	1		12/12/12 03:54	74-88-4	
Methylene Chloride	<2.0	ug/L	4.0	2.0	1		12/12/12 03:54	75-09-2	
4-Methyl-2-pentanone (MIBK)	<2.0	ug/L	4.0	2.0	1		12/12/12 03:54	108-10-1	
Styrene	<0.075	ug/L	0.50	0.075	1		12/12/12 03:54	100-42-5	
1,1,1,2-Tetrachloroethane	<0.082	ug/L	0.50	0.082	1		12/12/12 03:54	630-20-6	
1,1,2,2-Tetrachloroethane	<0.075	ug/L	0.50	0.075	1		12/12/12 03:54	79-34-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/12/12 03:54	127-18-4	
Toluene	0.17J	ug/L	0.50	0.065	1		12/12/12 03:54	108-88-3	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/12/12 03:54	71-55-6	
1,1,2-Trichloroethane	<0.12	ug/L	0.50	0.12	1		12/12/12 03:54	79-00-5	

Date: 12/19/2012 04:32 PM

### REPORT OF LABORATORY ANALYSIS

Page 25 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

### ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: MW-6B**      **Lab ID: 10214636006**      Collected: 12/04/12 11:25      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Trichloroethene	<0.11	ug/L	0.50	0.11	1		12/12/12 03:54	79-01-6	
Trichlorofluoromethane	<0.11	ug/L	0.50	0.11	1		12/12/12 03:54	75-69-4	
1,2,3-Trichloropropane	<0.22	ug/L	4.0	0.22	1		12/12/12 03:54	96-18-4	
Vinyl acetate	<1.9	ug/L	10.0	1.9	1		12/12/12 03:54	108-05-4	
Vinyl chloride	<0.16	ug/L	0.40	0.16	1		12/12/12 03:54	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		12/12/12 03:54	1330-20-7	
<b>Surrogates</b>									
Dibromofluoromethane (S)	99 %		75-125		1		12/12/12 03:54	1868-53-7	
1,2-Dichloroethane-d4 (S)	101 %		75-125		1		12/12/12 03:54	17060-07-0	
Toluene-d8 (S)	100 %		75-125		1		12/12/12 03:54	2037-26-5	
4-Bromofluorobenzene (S)	101 %		75-125		1		12/12/12 03:54	460-00-4	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	1.8	mg/L	1.0	0.18	1		12/17/12 20:37	16887-00-6	
Sulfate	4.3	mg/L	1.0	0.12	1		12/17/12 20:37	14808-79-8	
<b>353.2 Nitrate + Nitrite pres.</b>		Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	0.85	mg/L	0.050	0.022	5		12/12/12 15:37		M6

### ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

Sample: MW-7A Lab ID: 10214636007 Collected: 12/05/12 12:30 Received: 12/07/12 10:10 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS, Dissolved</b>		Analytical Method: EPA 6020 Preparation Method: EPA 3020							
Iron, Dissolved	<0.010	mg/L	0.050	0.010	1	12/11/12 12:43	12/12/12 23:31	7439-89-6	
Manganese, Dissolved	0.0092	mg/L	0.00050	0.00025	1	12/11/12 12:43	12/12/12 23:31	7439-96-5	
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Acetone	<12.5	ug/L	25.0	12.5	1		12/12/12 04:18	67-64-1	
Acrylonitrile	<5.0	ug/L	10.0	5.0	1		12/12/12 04:18	107-13-1	
Benzene	0.56	ug/L	0.50	0.047	1		12/12/12 04:18	71-43-2	
Bromochloromethane	<0.10	ug/L	1.0	0.10	1		12/12/12 04:18	74-97-5	
Bromodichloromethane	<0.066	ug/L	0.50	0.066	1		12/12/12 04:18	75-27-4	
Bromoform	<2.0	ug/L	4.0	2.0	1		12/12/12 04:18	75-25-2	
Bromomethane	<0.33	ug/L	4.0	0.33	1		12/12/12 04:18	74-83-9	
2-Butanone (MEK)	<2.0	ug/L	4.0	2.0	1		12/12/12 04:18	78-93-3	
Carbon disulfide	<0.50	ug/L	1.0	0.50	1		12/12/12 04:18	75-15-0	
Carbon tetrachloride	<0.094	ug/L	1.0	0.094	1		12/12/12 04:18	56-23-5	
Chlorobenzene	<0.071	ug/L	1.0	0.071	1		12/12/12 04:18	108-90-7	
Chloroethane	<0.31	ug/L	1.0	0.31	1		12/12/12 04:18	75-00-3	
Chloroform	<0.25	ug/L	0.50	0.25	1		12/12/12 04:18	67-66-3	
Chloromethane	<0.13	ug/L	1.0	0.13	1		12/12/12 04:18	74-87-3	
1,2-Dibromo-3-chloropropane	<0.80	ug/L	4.0	0.80	1		12/12/12 04:18	96-12-8	
Dibromochloromethane	<0.084	ug/L	0.50	0.084	1		12/12/12 04:18	124-48-1	
1,2-Dibromoethane (EDB)	<0.10	ug/L	0.50	0.10	1		12/12/12 04:18	106-93-4	
Dibromomethane	<0.089	ug/L	0.50	0.089	1		12/12/12 04:18	74-95-3	
1,2-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 04:18	95-50-1	
1,4-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 04:18	106-46-7	
trans-1,4-Dichloro-2-butene	<0.27	ug/L	10.0	0.27	1		12/12/12 04:18	110-57-6	
Dichlorodifluoromethane	3.0	ug/L	1.0	0.20	1		12/12/12 04:18	75-71-8	
1,1-Dichloroethane	4.6	ug/L	0.50	0.072	1		12/12/12 04:18	75-34-3	
1,2-Dichloroethane	0.16J	ug/L	0.50	0.053	1		12/12/12 04:18	107-06-2	
1,1-Dichloroethene	<0.16	ug/L	0.50	0.16	1		12/12/12 04:18	75-35-4	
cis-1,2-Dichloroethene	0.70	ug/L	0.50	0.080	1		12/12/12 04:18	156-59-2	
trans-1,2-Dichloroethene	<0.14	ug/L	0.50	0.14	1		12/12/12 04:18	156-60-5	
1,2-Dichloropropane	<0.12	ug/L	4.0	0.12	1		12/12/12 04:18	78-87-5	
cis-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 04:18	10061-01-5	
trans-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 04:18	10061-02-6	
Ethylbenzene	<0.078	ug/L	0.50	0.078	1		12/12/12 04:18	100-41-4	
2-Hexanone	<2.0	ug/L	4.0	2.0	1		12/12/12 04:18	591-78-6	
Iodomethane	<0.50	ug/L	4.0	0.50	1		12/12/12 04:18	74-88-4	
Methylene Chloride	<2.0	ug/L	4.0	2.0	1		12/12/12 04:18	75-09-2	
4-Methyl-2-pentanone (MIBK)	<2.0	ug/L	4.0	2.0	1		12/12/12 04:18	108-10-1	
Styrene	<0.075	ug/L	0.50	0.075	1		12/12/12 04:18	100-42-5	
1,1,1,2-Tetrachloroethane	<0.082	ug/L	0.50	0.082	1		12/12/12 04:18	630-20-6	
1,1,2,2-Tetrachloroethane	<0.075	ug/L	0.50	0.075	1		12/12/12 04:18	79-34-5	
Tetrachloroethene	7.7	ug/L	0.50	0.16	1		12/12/12 04:18	127-18-4	
Toluene	<0.065	ug/L	0.50	0.065	1		12/12/12 04:18	108-88-3	
1,1,1-Trichloroethane	0.76	ug/L	0.50	0.15	1		12/12/12 04:18	71-55-6	
1,1,2-Trichloroethane	<0.12	ug/L	0.50	0.12	1		12/12/12 04:18	79-00-5	

## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: MW-7A**      **Lab ID: 10214636007**      Collected: 12/05/12 12:30      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Trichloroethene	2.0	ug/L	0.50	0.11	1		12/12/12 04:18	79-01-6	
Trichlorofluoromethane	1.0	ug/L	0.50	0.11	1		12/12/12 04:18	75-69-4	
1,2,3-Trichloropropane	<0.22	ug/L	4.0	0.22	1		12/12/12 04:18	96-18-4	
Vinyl acetate	<1.9	ug/L	10.0	1.9	1		12/12/12 04:18	108-05-4	
Vinyl chloride	0.71	ug/L	0.40	0.16	1		12/12/12 04:18	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		12/12/12 04:18	1330-20-7	
<b>Surrogates</b>									
Dibromofluoromethane (S)	98	%	75-125		1		12/12/12 04:18	1868-53-7	
1,2-Dichloroethane-d4 (S)	101	%	75-125		1		12/12/12 04:18	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1		12/12/12 04:18	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125		1		12/12/12 04:18	460-00-4	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	22.2	mg/L	2.0	0.37	2		12/17/12 21:08	16887-00-6	
Sulfate	24.2	mg/L	2.0	0.23	2		12/17/12 21:08	14808-79-8	
<b>353.2 Nitrate + Nitrite pres.</b>		Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	4.6	mg/L	0.10	0.044	10		12/12/12 15:40		

## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: MW-8A**      **Lab ID: 10214636008**      Collected: 12/04/12 14:15      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS, Dissolved</b>		Analytical Method: EPA 6020    Preparation Method: EPA 3020							
Iron, Dissolved	<b>0.018J</b>	mg/L	0.050	0.010	1	12/11/12 12:43	12/12/12 23:35	7439-89-6	
Manganese, Dissolved	<b>&lt;0.00025</b>	mg/L	0.00050	0.00025	1	12/11/12 12:43	12/12/12 23:35	7439-96-5	
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Acetone	<b>&lt;12.5</b>	ug/L	25.0	12.5	1		12/12/12 04:43	67-64-1	
Acrylonitrile	<b>&lt;5.0</b>	ug/L	10.0	5.0	1		12/12/12 04:43	107-13-1	
Benzene	<b>&lt;0.047</b>	ug/L	0.50	0.047	1		12/12/12 04:43	71-43-2	
Bromochloromethane	<b>&lt;0.10</b>	ug/L	1.0	0.10	1		12/12/12 04:43	74-97-5	
Bromodichloromethane	<b>&lt;0.066</b>	ug/L	0.50	0.066	1		12/12/12 04:43	75-27-4	
Bromoform	<b>&lt;2.0</b>	ug/L	4.0	2.0	1		12/12/12 04:43	75-25-2	
Bromomethane	<b>&lt;0.33</b>	ug/L	4.0	0.33	1		12/12/12 04:43	74-83-9	
2-Butanone (MEK)	<b>&lt;2.0</b>	ug/L	4.0	2.0	1		12/12/12 04:43	78-93-3	
Carbon disulfide	<b>&lt;0.50</b>	ug/L	1.0	0.50	1		12/12/12 04:43	75-15-0	
Carbon tetrachloride	<b>&lt;0.094</b>	ug/L	1.0	0.094	1		12/12/12 04:43	56-23-5	
Chlorobenzene	<b>&lt;0.071</b>	ug/L	1.0	0.071	1		12/12/12 04:43	108-90-7	
Chloroethane	<b>&lt;0.31</b>	ug/L	1.0	0.31	1		12/12/12 04:43	75-00-3	
Chloroform	<b>&lt;0.25</b>	ug/L	0.50	0.25	1		12/12/12 04:43	67-66-3	
Chloromethane	<b>&lt;0.13</b>	ug/L	1.0	0.13	1		12/12/12 04:43	74-87-3	
1,2-Dibromo-3-chloropropane	<b>&lt;0.80</b>	ug/L	4.0	0.80	1		12/12/12 04:43	96-12-8	
Dibromochloromethane	<b>&lt;0.084</b>	ug/L	0.50	0.084	1		12/12/12 04:43	124-48-1	
1,2-Dibromoethane (EDB)	<b>&lt;0.10</b>	ug/L	0.50	0.10	1		12/12/12 04:43	106-93-4	
Dibromomethane	<b>&lt;0.089</b>	ug/L	0.50	0.089	1		12/12/12 04:43	74-95-3	
1,2-Dichlorobenzene	<b>&lt;0.25</b>	ug/L	0.50	0.25	1		12/12/12 04:43	95-50-1	
1,4-Dichlorobenzene	<b>&lt;0.25</b>	ug/L	0.50	0.25	1		12/12/12 04:43	106-46-7	
trans-1,4-Dichloro-2-butene	<b>&lt;0.27</b>	ug/L	10.0	0.27	1		12/12/12 04:43	110-57-6	
Dichlorodifluoromethane	<b>&lt;0.20</b>	ug/L	1.0	0.20	1		12/12/12 04:43	75-71-8	
1,1-Dichloroethane	<b>&lt;0.072</b>	ug/L	0.50	0.072	1		12/12/12 04:43	75-34-3	
1,2-Dichloroethane	<b>&lt;0.053</b>	ug/L	0.50	0.053	1		12/12/12 04:43	107-06-2	
1,1-Dichloroethene	<b>&lt;0.16</b>	ug/L	0.50	0.16	1		12/12/12 04:43	75-35-4	
cis-1,2-Dichloroethene	<b>0.62</b>	ug/L	0.50	0.080	1		12/12/12 04:43	156-59-2	
trans-1,2-Dichloroethene	<b>&lt;0.14</b>	ug/L	0.50	0.14	1		12/12/12 04:43	156-60-5	
1,2-Dichloropropane	<b>&lt;0.12</b>	ug/L	4.0	0.12	1		12/12/12 04:43	78-87-5	
cis-1,3-Dichloropropene	<b>&lt;0.18</b>	ug/L	0.50	0.18	1		12/12/12 04:43	10061-01-5	
trans-1,3-Dichloropropene	<b>&lt;0.18</b>	ug/L	0.50	0.18	1		12/12/12 04:43	10061-02-6	
Ethylbenzene	<b>&lt;0.078</b>	ug/L	0.50	0.078	1		12/12/12 04:43	100-41-4	
2-Hexanone	<b>&lt;2.0</b>	ug/L	4.0	2.0	1		12/12/12 04:43	591-78-6	
Iodomethane	<b>&lt;0.50</b>	ug/L	4.0	0.50	1		12/12/12 04:43	74-88-4	
Methylene Chloride	<b>&lt;2.0</b>	ug/L	4.0	2.0	1		12/12/12 04:43	75-09-2	
4-Methyl-2-pentanone (MIBK)	<b>&lt;2.0</b>	ug/L	4.0	2.0	1		12/12/12 04:43	108-10-1	
Styrene	<b>&lt;0.075</b>	ug/L	0.50	0.075	1		12/12/12 04:43	100-42-5	
1,1,1,2-Tetrachloroethane	<b>&lt;0.082</b>	ug/L	0.50	0.082	1		12/12/12 04:43	630-20-6	
1,1,2,2-Tetrachloroethane	<b>&lt;0.075</b>	ug/L	0.50	0.075	1		12/12/12 04:43	79-34-5	
Tetrachloroethene	<b>0.65</b>	ug/L	0.50	0.16	1		12/12/12 04:43	127-18-4	
Toluene	<b>&lt;0.065</b>	ug/L	0.50	0.065	1		12/12/12 04:43	108-88-3	
1,1,1-Trichloroethane	<b>&lt;0.15</b>	ug/L	0.50	0.15	1		12/12/12 04:43	71-55-6	
1,1,2-Trichloroethane	<b>&lt;0.12</b>	ug/L	0.50	0.12	1		12/12/12 04:43	79-00-5	

Date: 12/19/2012 04:32 PM

### REPORT OF LABORATORY ANALYSIS

Page 29 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..



### ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: MW-8A**      **Lab ID: 10214636008**      Collected: 12/04/12 14:15      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Trichloroethene	<b>0.28J</b>	ug/L	0.50	0.11	1		12/12/12 04:43	79-01-6	
Trichlorofluoromethane	<b>&lt;0.11</b>	ug/L	0.50	0.11	1		12/12/12 04:43	75-69-4	
1,2,3-Trichloropropane	<b>&lt;0.22</b>	ug/L	4.0	0.22	1		12/12/12 04:43	96-18-4	
Vinyl acetate	<b>&lt;1.9</b>	ug/L	10.0	1.9	1		12/12/12 04:43	108-05-4	
Vinyl chloride	<b>&lt;0.16</b>	ug/L	0.40	0.16	1		12/12/12 04:43	75-01-4	
Xylene (Total)	<b>&lt;0.15</b>	ug/L	1.5	0.15	1		12/12/12 04:43	1330-20-7	
<b>Surrogates</b>									
Dibromofluoromethane (S)	98 %		75-125		1		12/12/12 04:43	1868-53-7	
1,2-Dichloroethane-d4 (S)	100 %		75-125		1		12/12/12 04:43	17060-07-0	
Toluene-d8 (S)	100 %		75-125		1		12/12/12 04:43	2037-26-5	
4-Bromofluorobenzene (S)	100 %		75-125		1		12/12/12 04:43	460-00-4	
<b>2510B Specific Conductance</b>		Analytical Method: SM 2510B							
Specific Conductance	<b>1280</b>	umhos/cm	10.0	5.0	1		12/10/12 12:34		
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	<b>68.8</b>	mg/L	5.0	0.92	5		12/17/12 22:43	16887-00-6	
Sulfate	<b>70.2</b>	mg/L	5.0	0.58	5		12/17/12 22:43	14808-79-8	
<b>353.2 Nitrate + Nitrite pres.</b>		Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	<b>16.0</b>	mg/L	0.50	0.22	50		12/12/12 17:36		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.1</b>	Std. Units	0.10	0.050	1		12/07/12 15:10		H6



## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: MW-8C**      **Lab ID: 10214636009**      Collected: 12/04/12 13:50      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS, Dissolved</b>		Analytical Method: EPA 6020    Preparation Method: EPA 3020							
Iron, Dissolved	<0.010	mg/L	0.050	0.010	1	12/11/12 12:43	12/12/12 23:40	7439-89-6	
Manganese, Dissolved	<0.00025	mg/L	0.00050	0.00025	1	12/11/12 12:43	12/12/12 23:40	7439-96-5	
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Acetone	<12.5	ug/L	25.0	12.5	1		12/12/12 05:07	67-64-1	
Acrylonitrile	<5.0	ug/L	10.0	5.0	1		12/12/12 05:07	107-13-1	
Benzene	<0.047	ug/L	0.50	0.047	1		12/12/12 05:07	71-43-2	
Bromochloromethane	<0.10	ug/L	1.0	0.10	1		12/12/12 05:07	74-97-5	
Bromodichloromethane	<0.066	ug/L	0.50	0.066	1		12/12/12 05:07	75-27-4	
Bromoform	<2.0	ug/L	4.0	2.0	1		12/12/12 05:07	75-25-2	
Bromomethane	<0.33	ug/L	4.0	0.33	1		12/12/12 05:07	74-83-9	
2-Butanone (MEK)	<2.0	ug/L	4.0	2.0	1		12/12/12 05:07	78-93-3	
Carbon disulfide	<0.50	ug/L	1.0	0.50	1		12/12/12 05:07	75-15-0	
Carbon tetrachloride	<0.094	ug/L	1.0	0.094	1		12/12/12 05:07	56-23-5	
Chlorobenzene	<0.071	ug/L	1.0	0.071	1		12/12/12 05:07	108-90-7	
Chloroethane	<0.31	ug/L	1.0	0.31	1		12/12/12 05:07	75-00-3	
Chloroform	<0.25	ug/L	0.50	0.25	1		12/12/12 05:07	67-66-3	
Chloromethane	<0.13	ug/L	1.0	0.13	1		12/12/12 05:07	74-87-3	
1,2-Dibromo-3-chloropropane	<0.80	ug/L	4.0	0.80	1		12/12/12 05:07	96-12-8	
Dibromochloromethane	<0.084	ug/L	0.50	0.084	1		12/12/12 05:07	124-48-1	
1,2-Dibromoethane (EDB)	<0.10	ug/L	0.50	0.10	1		12/12/12 05:07	106-93-4	
Dibromomethane	<0.089	ug/L	0.50	0.089	1		12/12/12 05:07	74-95-3	
1,2-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 05:07	95-50-1	
1,4-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 05:07	106-46-7	
trans-1,4-Dichloro-2-butene	<0.27	ug/L	10.0	0.27	1		12/12/12 05:07	110-57-6	
Dichlorodifluoromethane	<0.20	ug/L	1.0	0.20	1		12/12/12 05:07	75-71-8	
1,1-Dichloroethane	<0.072	ug/L	0.50	0.072	1		12/12/12 05:07	75-34-3	
1,2-Dichloroethane	<0.053	ug/L	0.50	0.053	1		12/12/12 05:07	107-06-2	
1,1-Dichloroethene	<0.16	ug/L	0.50	0.16	1		12/12/12 05:07	75-35-4	
cis-1,2-Dichloroethene	<0.080	ug/L	0.50	0.080	1		12/12/12 05:07	156-59-2	
trans-1,2-Dichloroethene	<0.14	ug/L	0.50	0.14	1		12/12/12 05:07	156-60-5	
1,2-Dichloropropane	<0.12	ug/L	4.0	0.12	1		12/12/12 05:07	78-87-5	
cis-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 05:07	10061-01-5	
trans-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 05:07	10061-02-6	
Ethylbenzene	<0.078	ug/L	0.50	0.078	1		12/12/12 05:07	100-41-4	
2-Hexanone	<2.0	ug/L	4.0	2.0	1		12/12/12 05:07	591-78-6	
Iodomethane	<0.50	ug/L	4.0	0.50	1		12/12/12 05:07	74-88-4	
Methylene Chloride	<2.0	ug/L	4.0	2.0	1		12/12/12 05:07	75-09-2	
4-Methyl-2-pentanone (MIBK)	<2.0	ug/L	4.0	2.0	1		12/12/12 05:07	108-10-1	
Styrene	<0.075	ug/L	0.50	0.075	1		12/12/12 05:07	100-42-5	
1,1,1,2-Tetrachloroethane	<0.082	ug/L	0.50	0.082	1		12/12/12 05:07	630-20-6	
1,1,2,2-Tetrachloroethane	<0.075	ug/L	0.50	0.075	1		12/12/12 05:07	79-34-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/12/12 05:07	127-18-4	
Toluene	0.16J	ug/L	0.50	0.065	1		12/12/12 05:07	108-88-3	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/12/12 05:07	71-55-6	
1,1,2-Trichloroethane	<0.12	ug/L	0.50	0.12	1		12/12/12 05:07	79-00-5	

Date: 12/19/2012 04:32 PM

### REPORT OF LABORATORY ANALYSIS

Page 31 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

### ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: MW-8C**      **Lab ID: 10214636009**      Collected: 12/04/12 13:50      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Trichloroethene	<0.11	ug/L	0.50	0.11	1		12/12/12 05:07	79-01-6	
Trichlorofluoromethane	<0.11	ug/L	0.50	0.11	1		12/12/12 05:07	75-69-4	
1,2,3-Trichloropropane	<0.22	ug/L	4.0	0.22	1		12/12/12 05:07	96-18-4	
Vinyl acetate	<1.9	ug/L	10.0	1.9	1		12/12/12 05:07	108-05-4	
Vinyl chloride	<0.16	ug/L	0.40	0.16	1		12/12/12 05:07	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		12/12/12 05:07	1330-20-7	
<b>Surrogates</b>									
Dibromofluoromethane (S)	98 %		75-125		1		12/12/12 05:07	1868-53-7	
1,2-Dichloroethane-d4 (S)	99 %		75-125		1		12/12/12 05:07	17060-07-0	
Toluene-d8 (S)	100 %		75-125		1		12/12/12 05:07	2037-26-5	
4-Bromofluorobenzene (S)	101 %		75-125		1		12/12/12 05:07	460-00-4	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	6.2	mg/L	1.0	0.18	1		12/17/12 23:14	16887-00-6	
Sulfate	7.5	mg/L	1.0	0.12	1		12/17/12 23:14	14808-79-8	
<b>353.2 Nitrate + Nitrite pres.</b>		Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	5.8	mg/L	0.20	0.088	20		12/12/12 15:54		

## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

Sample: MW-9A Lab ID: 10214636010 Collected: 12/04/12 15:45 Received: 12/07/12 10:10 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS, Dissolved</b>		Analytical Method: EPA 6020 Preparation Method: EPA 3020							
Iron, Dissolved	<0.010	mg/L	0.050	0.010	1	12/11/12 12:43	12/12/12 23:44	7439-89-6	
Manganese, Dissolved	0.00029J	mg/L	0.00050	0.00025	1	12/11/12 12:43	12/12/12 23:44	7439-96-5	
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Acetone	<12.5	ug/L	25.0	12.5	1		12/12/12 05:32	67-64-1	
Acrylonitrile	<5.0	ug/L	10.0	5.0	1		12/12/12 05:32	107-13-1	
Benzene	<0.047	ug/L	0.50	0.047	1		12/12/12 05:32	71-43-2	
Bromochloromethane	<0.10	ug/L	1.0	0.10	1		12/12/12 05:32	74-97-5	
Bromodichloromethane	<0.066	ug/L	0.50	0.066	1		12/12/12 05:32	75-27-4	
Bromoform	<2.0	ug/L	4.0	2.0	1		12/12/12 05:32	75-25-2	
Bromomethane	<0.33	ug/L	4.0	0.33	1		12/12/12 05:32	74-83-9	
2-Butanone (MEK)	<2.0	ug/L	4.0	2.0	1		12/12/12 05:32	78-93-3	
Carbon disulfide	<0.50	ug/L	1.0	0.50	1		12/12/12 05:32	75-15-0	
Carbon tetrachloride	<0.094	ug/L	1.0	0.094	1		12/12/12 05:32	56-23-5	
Chlorobenzene	<0.071	ug/L	1.0	0.071	1		12/12/12 05:32	108-90-7	
Chloroethane	<0.31	ug/L	1.0	0.31	1		12/12/12 05:32	75-00-3	
Chloroform	<0.25	ug/L	0.50	0.25	1		12/12/12 05:32	67-66-3	
Chloromethane	<0.13	ug/L	1.0	0.13	1		12/12/12 05:32	74-87-3	
1,2-Dibromo-3-chloropropane	<0.80	ug/L	4.0	0.80	1		12/12/12 05:32	96-12-8	
Dibromochloromethane	<0.084	ug/L	0.50	0.084	1		12/12/12 05:32	124-48-1	
1,2-Dibromoethane (EDB)	<0.10	ug/L	0.50	0.10	1		12/12/12 05:32	106-93-4	
Dibromomethane	<0.089	ug/L	0.50	0.089	1		12/12/12 05:32	74-95-3	
1,2-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 05:32	95-50-1	
1,4-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 05:32	106-46-7	
trans-1,4-Dichloro-2-butene	<0.27	ug/L	10.0	0.27	1		12/12/12 05:32	110-57-6	
Dichlorodifluoromethane	0.76J	ug/L	1.0	0.20	1		12/12/12 05:32	75-71-8	
1,1-Dichloroethane	0.31J	ug/L	0.50	0.072	1		12/12/12 05:32	75-34-3	
1,2-Dichloroethane	<0.053	ug/L	0.50	0.053	1		12/12/12 05:32	107-06-2	
1,1-Dichloroethene	<0.16	ug/L	0.50	0.16	1		12/12/12 05:32	75-35-4	
cis-1,2-Dichloroethene	0.46J	ug/L	0.50	0.080	1		12/12/12 05:32	156-59-2	
trans-1,2-Dichloroethene	<0.14	ug/L	0.50	0.14	1		12/12/12 05:32	156-60-5	
1,2-Dichloropropane	<0.12	ug/L	4.0	0.12	1		12/12/12 05:32	78-87-5	
cis-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 05:32	10061-01-5	
trans-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 05:32	10061-02-6	
Ethylbenzene	<0.078	ug/L	0.50	0.078	1		12/12/12 05:32	100-41-4	
2-Hexanone	<2.0	ug/L	4.0	2.0	1		12/12/12 05:32	591-78-6	
Iodomethane	<0.50	ug/L	4.0	0.50	1		12/12/12 05:32	74-88-4	
Methylene Chloride	<2.0	ug/L	4.0	2.0	1		12/12/12 05:32	75-09-2	
4-Methyl-2-pentanone (MIBK)	<2.0	ug/L	4.0	2.0	1		12/12/12 05:32	108-10-1	
Styrene	<0.075	ug/L	0.50	0.075	1		12/12/12 05:32	100-42-5	
1,1,1,2-Tetrachloroethane	<0.082	ug/L	0.50	0.082	1		12/12/12 05:32	630-20-6	
1,1,2,2-Tetrachloroethane	<0.075	ug/L	0.50	0.075	1		12/12/12 05:32	79-34-5	
Tetrachloroethene	1.2	ug/L	0.50	0.16	1		12/12/12 05:32	127-18-4	
Toluene	<0.065	ug/L	0.50	0.065	1		12/12/12 05:32	108-88-3	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/12/12 05:32	71-55-6	
1,1,2-Trichloroethane	<0.12	ug/L	0.50	0.12	1		12/12/12 05:32	79-00-5	

Date: 12/19/2012 04:32 PM

### REPORT OF LABORATORY ANALYSIS

Page 33 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: MW-9A**      **Lab ID: 10214636010**      Collected: 12/04/12 15:45      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Trichloroethene	<b>0.78</b>	ug/L	0.50	0.11	1		12/12/12 05:32	79-01-6	
Trichlorofluoromethane	<b>&lt;0.11</b>	ug/L	0.50	0.11	1		12/12/12 05:32	75-69-4	
1,2,3-Trichloropropane	<b>&lt;0.22</b>	ug/L	4.0	0.22	1		12/12/12 05:32	96-18-4	
Vinyl acetate	<b>&lt;1.9</b>	ug/L	10.0	1.9	1		12/12/12 05:32	108-05-4	
Vinyl chloride	<b>&lt;0.16</b>	ug/L	0.40	0.16	1		12/12/12 05:32	75-01-4	
Xylene (Total)	<b>&lt;0.15</b>	ug/L	1.5	0.15	1		12/12/12 05:32	1330-20-7	
<b>Surrogates</b>									
Dibromofluoromethane (S)	98 %		75-125		1		12/12/12 05:32	1868-53-7	
1,2-Dichloroethane-d4 (S)	100 %		75-125		1		12/12/12 05:32	17060-07-0	
Toluene-d8 (S)	100 %		75-125		1		12/12/12 05:32	2037-26-5	
4-Bromofluorobenzene (S)	100 %		75-125		1		12/12/12 05:32	460-00-4	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	<b>49.5</b>	mg/L	2.0	0.37	2		12/17/12 23:46	16887-00-6	
Sulfate	<b>20.5</b>	mg/L	2.0	0.23	2		12/17/12 23:46	14808-79-8	
<b>353.2 Nitrate + Nitrite pres.</b>		Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	<b>2.7</b>	mg/L	0.10	0.044	10		12/12/12 15:56		

## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: MW-10**      **Lab ID: 10214636011**      Collected: 12/05/12 09:50      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS, Dissolved</b>		Analytical Method: EPA 6020    Preparation Method: EPA 3020							
Iron, Dissolved	2.8	mg/L	0.050	0.010	1	12/11/12 12:43	12/13/12 00:13	7439-89-6	
Manganese, Dissolved	0.10	mg/L	0.00050	0.00025	1	12/11/12 12:43	12/13/12 00:13	7439-96-5	
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Acetone	<12.5	ug/L	25.0	12.5	1		12/12/12 05:56	67-64-1	
Acrylonitrile	<5.0	ug/L	10.0	5.0	1		12/12/12 05:56	107-13-1	
Benzene	<0.047	ug/L	0.50	0.047	1		12/12/12 05:56	71-43-2	
Bromochloromethane	<0.10	ug/L	1.0	0.10	1		12/12/12 05:56	74-97-5	
Bromodichloromethane	<0.066	ug/L	0.50	0.066	1		12/12/12 05:56	75-27-4	
Bromoform	<2.0	ug/L	4.0	2.0	1		12/12/12 05:56	75-25-2	
Bromomethane	<0.33	ug/L	4.0	0.33	1		12/12/12 05:56	74-83-9	
2-Butanone (MEK)	<2.0	ug/L	4.0	2.0	1		12/12/12 05:56	78-93-3	
Carbon disulfide	<0.50	ug/L	1.0	0.50	1		12/12/12 05:56	75-15-0	
Carbon tetrachloride	<0.094	ug/L	1.0	0.094	1		12/12/12 05:56	56-23-5	
Chlorobenzene	<0.071	ug/L	1.0	0.071	1		12/12/12 05:56	108-90-7	
Chloroethane	<0.31	ug/L	1.0	0.31	1		12/12/12 05:56	75-00-3	
Chloroform	<0.25	ug/L	0.50	0.25	1		12/12/12 05:56	67-66-3	
Chloromethane	<0.13	ug/L	1.0	0.13	1		12/12/12 05:56	74-87-3	
1,2-Dibromo-3-chloropropane	<0.80	ug/L	4.0	0.80	1		12/12/12 05:56	96-12-8	
Dibromochloromethane	<0.084	ug/L	0.50	0.084	1		12/12/12 05:56	124-48-1	
1,2-Dibromoethane (EDB)	<0.10	ug/L	0.50	0.10	1		12/12/12 05:56	106-93-4	
Dibromomethane	<0.089	ug/L	0.50	0.089	1		12/12/12 05:56	74-95-3	
1,2-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 05:56	95-50-1	
1,4-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 05:56	106-46-7	
trans-1,4-Dichloro-2-butene	<0.27	ug/L	10.0	0.27	1		12/12/12 05:56	110-57-6	
Dichlorodifluoromethane	<0.20	ug/L	1.0	0.20	1		12/12/12 05:56	75-71-8	
1,1-Dichloroethane	<0.072	ug/L	0.50	0.072	1		12/12/12 05:56	75-34-3	
1,2-Dichloroethane	<0.053	ug/L	0.50	0.053	1		12/12/12 05:56	107-06-2	
1,1-Dichloroethene	<0.16	ug/L	0.50	0.16	1		12/12/12 05:56	75-35-4	
cis-1,2-Dichloroethene	0.17J	ug/L	0.50	0.080	1		12/12/12 05:56	156-59-2	
trans-1,2-Dichloroethene	<0.14	ug/L	0.50	0.14	1		12/12/12 05:56	156-60-5	
1,2-Dichloropropane	<0.12	ug/L	4.0	0.12	1		12/12/12 05:56	78-87-5	
cis-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 05:56	10061-01-5	
trans-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 05:56	10061-02-6	
Ethylbenzene	<0.078	ug/L	0.50	0.078	1		12/12/12 05:56	100-41-4	
2-Hexanone	<2.0	ug/L	4.0	2.0	1		12/12/12 05:56	591-78-6	
Iodomethane	<0.50	ug/L	4.0	0.50	1		12/12/12 05:56	74-88-4	
Methylene Chloride	<2.0	ug/L	4.0	2.0	1		12/12/12 05:56	75-09-2	
4-Methyl-2-pentanone (MIBK)	<2.0	ug/L	4.0	2.0	1		12/12/12 05:56	108-10-1	
Styrene	<0.075	ug/L	0.50	0.075	1		12/12/12 05:56	100-42-5	
1,1,1,2-Tetrachloroethane	<0.082	ug/L	0.50	0.082	1		12/12/12 05:56	630-20-6	
1,1,2,2-Tetrachloroethane	<0.075	ug/L	0.50	0.075	1		12/12/12 05:56	79-34-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/12/12 05:56	127-18-4	
Toluene	<0.065	ug/L	0.50	0.065	1		12/12/12 05:56	108-88-3	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/12/12 05:56	71-55-6	
1,1,2-Trichloroethane	<0.12	ug/L	0.50	0.12	1		12/12/12 05:56	79-00-5	

Date: 12/19/2012 04:32 PM

### REPORT OF LABORATORY ANALYSIS

Page 35 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

### ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: MW-10**      **Lab ID: 10214636011**      Collected: 12/05/12 09:50      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Trichloroethene	<b>0.50J</b>	ug/L	0.50	0.11	1		12/12/12 05:56	79-01-6	
Trichlorofluoromethane	<b>&lt;0.11</b>	ug/L	0.50	0.11	1		12/12/12 05:56	75-69-4	
1,2,3-Trichloropropane	<b>&lt;0.22</b>	ug/L	4.0	0.22	1		12/12/12 05:56	96-18-4	
Vinyl acetate	<b>&lt;1.9</b>	ug/L	10.0	1.9	1		12/12/12 05:56	108-05-4	
Vinyl chloride	<b>&lt;0.16</b>	ug/L	0.40	0.16	1		12/12/12 05:56	75-01-4	
Xylene (Total)	<b>&lt;0.15</b>	ug/L	1.5	0.15	1		12/12/12 05:56	1330-20-7	
<b>Surrogates</b>									
Dibromofluoromethane (S)	97 %		75-125		1		12/12/12 05:56	1868-53-7	
1,2-Dichloroethane-d4 (S)	99 %		75-125		1		12/12/12 05:56	17060-07-0	
Toluene-d8 (S)	101 %		75-125		1		12/12/12 05:56	2037-26-5	
4-Bromofluorobenzene (S)	99 %		75-125		1		12/12/12 05:56	460-00-4	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	<b>70.4</b>	mg/L	3.0	0.55	3		12/18/12 00:17	16887-00-6	
Sulfate	<b>111</b>	mg/L	10.0	1.2	10		12/18/12 08:25	14808-79-8	
<b>353.2 Nitrate + Nitrite pres.</b>		Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	<b>0.010</b>	mg/L	0.010	0.0044	1		12/12/12 15:57		

## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: MW-11**      **Lab ID: 10214636012**      Collected: 12/05/12 14:30      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS, Dissolved</b>		Analytical Method: EPA 6020    Preparation Method: EPA 3020							
Iron, Dissolved	<0.010	mg/L	0.050	0.010	1	12/11/12 12:43	12/13/12 00:17	7439-89-6	
Manganese, Dissolved	<0.00025	mg/L	0.00050	0.00025	1	12/11/12 12:43	12/13/12 00:17	7439-96-5	
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Acetone	<12.5	ug/L	25.0	12.5	1		12/12/12 06:20	67-64-1	
Acrylonitrile	<5.0	ug/L	10.0	5.0	1		12/12/12 06:20	107-13-1	
Benzene	<0.047	ug/L	0.50	0.047	1		12/12/12 06:20	71-43-2	
Bromochloromethane	<0.10	ug/L	1.0	0.10	1		12/12/12 06:20	74-97-5	
Bromodichloromethane	<0.066	ug/L	0.50	0.066	1		12/12/12 06:20	75-27-4	
Bromoform	<2.0	ug/L	4.0	2.0	1		12/12/12 06:20	75-25-2	
Bromomethane	<0.33	ug/L	4.0	0.33	1		12/12/12 06:20	74-83-9	
2-Butanone (MEK)	<2.0	ug/L	4.0	2.0	1		12/12/12 06:20	78-93-3	
Carbon disulfide	<0.50	ug/L	1.0	0.50	1		12/12/12 06:20	75-15-0	
Carbon tetrachloride	<0.094	ug/L	1.0	0.094	1		12/12/12 06:20	56-23-5	
Chlorobenzene	<0.071	ug/L	1.0	0.071	1		12/12/12 06:20	108-90-7	
Chloroethane	<0.31	ug/L	1.0	0.31	1		12/12/12 06:20	75-00-3	
Chloroform	<0.25	ug/L	0.50	0.25	1		12/12/12 06:20	67-66-3	
Chloromethane	<0.13	ug/L	1.0	0.13	1		12/12/12 06:20	74-87-3	
1,2-Dibromo-3-chloropropane	<0.80	ug/L	4.0	0.80	1		12/12/12 06:20	96-12-8	
Dibromochloromethane	<0.084	ug/L	0.50	0.084	1		12/12/12 06:20	124-48-1	
1,2-Dibromoethane (EDB)	<0.10	ug/L	0.50	0.10	1		12/12/12 06:20	106-93-4	
Dibromomethane	<0.089	ug/L	0.50	0.089	1		12/12/12 06:20	74-95-3	
1,2-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 06:20	95-50-1	
1,4-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 06:20	106-46-7	
trans-1,4-Dichloro-2-butene	<0.27	ug/L	10.0	0.27	1		12/12/12 06:20	110-57-6	
Dichlorodifluoromethane	5.8	ug/L	1.0	0.20	1		12/12/12 06:20	75-71-8	
1,1-Dichloroethane	0.20J	ug/L	0.50	0.072	1		12/12/12 06:20	75-34-3	
1,2-Dichloroethane	<0.053	ug/L	0.50	0.053	1		12/12/12 06:20	107-06-2	
1,1-Dichloroethene	<0.16	ug/L	0.50	0.16	1		12/12/12 06:20	75-35-4	
cis-1,2-Dichloroethene	<0.080	ug/L	0.50	0.080	1		12/12/12 06:20	156-59-2	
trans-1,2-Dichloroethene	<0.14	ug/L	0.50	0.14	1		12/12/12 06:20	156-60-5	
1,2-Dichloropropane	<0.12	ug/L	4.0	0.12	1		12/12/12 06:20	78-87-5	
cis-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 06:20	10061-01-5	
trans-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 06:20	10061-02-6	
Ethylbenzene	<0.078	ug/L	0.50	0.078	1		12/12/12 06:20	100-41-4	
2-Hexanone	<2.0	ug/L	4.0	2.0	1		12/12/12 06:20	591-78-6	
Iodomethane	<0.50	ug/L	4.0	0.50	1		12/12/12 06:20	74-88-4	
Methylene Chloride	<2.0	ug/L	4.0	2.0	1		12/12/12 06:20	75-09-2	
4-Methyl-2-pentanone (MIBK)	<2.0	ug/L	4.0	2.0	1		12/12/12 06:20	108-10-1	
Styrene	<0.075	ug/L	0.50	0.075	1		12/12/12 06:20	100-42-5	
1,1,1,2-Tetrachloroethane	<0.082	ug/L	0.50	0.082	1		12/12/12 06:20	630-20-6	
1,1,2,2-Tetrachloroethane	<0.075	ug/L	0.50	0.075	1		12/12/12 06:20	79-34-5	
Tetrachloroethene	0.34J	ug/L	0.50	0.16	1		12/12/12 06:20	127-18-4	
Toluene	<0.065	ug/L	0.50	0.065	1		12/12/12 06:20	108-88-3	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/12/12 06:20	71-55-6	
1,1,2-Trichloroethane	<0.12	ug/L	0.50	0.12	1		12/12/12 06:20	79-00-5	

### ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: MW-11**      **Lab ID: 10214636012**      Collected: 12/05/12 14:30      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Trichloroethene	<0.11	ug/L	0.50	0.11	1		12/12/12 06:20	79-01-6	
Trichlorofluoromethane	4.2	ug/L	0.50	0.11	1		12/12/12 06:20	75-69-4	
1,2,3-Trichloropropane	<0.22	ug/L	4.0	0.22	1		12/12/12 06:20	96-18-4	
Vinyl acetate	<1.9	ug/L	10.0	1.9	1		12/12/12 06:20	108-05-4	
Vinyl chloride	<0.16	ug/L	0.40	0.16	1		12/12/12 06:20	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		12/12/12 06:20	1330-20-7	
<b>Surrogates</b>									
Dibromofluoromethane (S)	97 %		75-125		1		12/12/12 06:20	1868-53-7	
1,2-Dichloroethane-d4 (S)	100 %		75-125		1		12/12/12 06:20	17060-07-0	
Toluene-d8 (S)	101 %		75-125		1		12/12/12 06:20	2037-26-5	
4-Bromofluorobenzene (S)	100 %		75-125		1		12/12/12 06:20	460-00-4	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	32.7	mg/L	2.0	0.37	2		12/18/12 00:49	16887-00-6	
Sulfate	36.3	mg/L	2.0	0.23	2		12/18/12 00:49	14808-79-8	
<b>353.2 Nitrate + Nitrite pres.</b>		Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	7.8	mg/L	0.20	0.088	20		12/12/12 15:58		



## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: MW-12**      **Lab ID: 10214636013**      Collected: 12/05/12 15:40      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS, Dissolved</b>		Analytical Method: EPA 6020    Preparation Method: EPA 3020							
Iron, Dissolved	3.6	mg/L	0.050	0.010	1	12/11/12 12:43	12/13/12 00:21	7439-89-6	
Manganese, Dissolved	4.2	mg/L	0.010	0.0050	20	12/11/12 12:43	12/13/12 16:05	7439-96-5	
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Acetone	<12.5	ug/L	25.0	12.5	1		12/12/12 06:44	67-64-1	
Acrylonitrile	<5.0	ug/L	10.0	5.0	1		12/12/12 06:44	107-13-1	
Benzene	1.5	ug/L	0.50	0.047	1		12/12/12 06:44	71-43-2	
Bromochloromethane	<0.10	ug/L	1.0	0.10	1		12/12/12 06:44	74-97-5	
Bromodichloromethane	<0.066	ug/L	0.50	0.066	1		12/12/12 06:44	75-27-4	
Bromoform	<2.0	ug/L	4.0	2.0	1		12/12/12 06:44	75-25-2	
Bromomethane	<0.33	ug/L	4.0	0.33	1		12/12/12 06:44	74-83-9	
2-Butanone (MEK)	<2.0	ug/L	4.0	2.0	1		12/12/12 06:44	78-93-3	
Carbon disulfide	<0.50	ug/L	1.0	0.50	1		12/12/12 06:44	75-15-0	
Carbon tetrachloride	<0.094	ug/L	1.0	0.094	1		12/12/12 06:44	56-23-5	
Chlorobenzene	0.076J	ug/L	1.0	0.071	1		12/12/12 06:44	108-90-7	
Chloroethane	<0.31	ug/L	1.0	0.31	1		12/12/12 06:44	75-00-3	
Chloroform	<0.25	ug/L	0.50	0.25	1		12/12/12 06:44	67-66-3	
Chloromethane	<0.13	ug/L	1.0	0.13	1		12/12/12 06:44	74-87-3	
1,2-Dibromo-3-chloropropane	<0.80	ug/L	4.0	0.80	1		12/12/12 06:44	96-12-8	
Dibromochloromethane	<0.084	ug/L	0.50	0.084	1		12/12/12 06:44	124-48-1	
1,2-Dibromoethane (EDB)	<0.10	ug/L	0.50	0.10	1		12/12/12 06:44	106-93-4	
Dibromomethane	<0.089	ug/L	0.50	0.089	1		12/12/12 06:44	74-95-3	
1,2-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 06:44	95-50-1	
1,4-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 06:44	106-46-7	
trans-1,4-Dichloro-2-butene	<0.27	ug/L	10.0	0.27	1		12/12/12 06:44	110-57-6	
Dichlorodifluoromethane	<0.20	ug/L	1.0	0.20	1		12/12/12 06:44	75-71-8	
1,1-Dichloroethane	1.7	ug/L	0.50	0.072	1		12/12/12 06:44	75-34-3	
1,2-Dichloroethane	<0.053	ug/L	0.50	0.053	1		12/12/12 06:44	107-06-2	
1,1-Dichloroethene	<0.16	ug/L	0.50	0.16	1		12/12/12 06:44	75-35-4	
cis-1,2-Dichloroethene	9.1	ug/L	0.50	0.080	1		12/12/12 06:44	156-59-2	
trans-1,2-Dichloroethene	0.17J	ug/L	0.50	0.14	1		12/12/12 06:44	156-60-5	
1,2-Dichloropropane	0.30J	ug/L	4.0	0.12	1		12/12/12 06:44	78-87-5	
cis-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 06:44	10061-01-5	
trans-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 06:44	10061-02-6	
Ethylbenzene	<0.078	ug/L	0.50	0.078	1		12/12/12 06:44	100-41-4	
2-Hexanone	<2.0	ug/L	4.0	2.0	1		12/12/12 06:44	591-78-6	
Iodomethane	<0.50	ug/L	4.0	0.50	1		12/12/12 06:44	74-88-4	
Methylene Chloride	<2.0	ug/L	4.0	2.0	1		12/12/12 06:44	75-09-2	
4-Methyl-2-pentanone (MIBK)	<2.0	ug/L	4.0	2.0	1		12/12/12 06:44	108-10-1	
Styrene	<0.075	ug/L	0.50	0.075	1		12/12/12 06:44	100-42-5	
1,1,1,2-Tetrachloroethane	<0.082	ug/L	0.50	0.082	1		12/12/12 06:44	630-20-6	
1,1,2,2-Tetrachloroethane	<0.075	ug/L	0.50	0.075	1		12/12/12 06:44	79-34-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/12/12 06:44	127-18-4	
Toluene	0.13J	ug/L	0.50	0.065	1		12/12/12 06:44	108-88-3	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/12/12 06:44	71-55-6	
1,1,2-Trichloroethane	<0.12	ug/L	0.50	0.12	1		12/12/12 06:44	79-00-5	

Date: 12/19/2012 04:32 PM

### REPORT OF LABORATORY ANALYSIS

Page 39 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

### ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: MW-12**      **Lab ID: 10214636013**      Collected: 12/05/12 15:40      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Trichloroethene	1.5	ug/L	0.50	0.11	1		12/12/12 06:44	79-01-6	
Trichlorofluoromethane	<0.11	ug/L	0.50	0.11	1		12/12/12 06:44	75-69-4	
1,2,3-Trichloropropane	<0.22	ug/L	4.0	0.22	1		12/12/12 06:44	96-18-4	
Vinyl acetate	<1.9	ug/L	10.0	1.9	1		12/12/12 06:44	108-05-4	
Vinyl chloride	21.2	ug/L	0.40	0.16	1		12/12/12 06:44	75-01-4	
Xylene (Total)	0.19J	ug/L	1.5	0.15	1		12/12/12 06:44	1330-20-7	
<b>Surrogates</b>									
Dibromofluoromethane (S)	98	%	75-125		1		12/12/12 06:44	1868-53-7	
1,2-Dichloroethane-d4 (S)	99	%	75-125		1		12/12/12 06:44	17060-07-0	
Toluene-d8 (S)	101	%	75-125		1		12/12/12 06:44	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125		1		12/12/12 06:44	460-00-4	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	16.4	mg/L	2.0	0.37	2		12/18/12 01:20	16887-00-6	
Sulfate	10.6	mg/L	2.0	0.23	2		12/18/12 01:20	14808-79-8	
<b>353.2 Nitrate + Nitrite pres.</b>		Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	<0.0044	mg/L	0.010	0.0044	1		12/12/12 16:07		

## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: MW-13**      **Lab ID: 10214636014**      Collected: 12/05/12 11:15      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS, Dissolved</b>		Analytical Method: EPA 6020    Preparation Method: EPA 3020							
Iron, Dissolved	<b>0.027J</b>	mg/L	0.050	0.010	1	12/11/12 12:43	12/13/12 00:26	7439-89-6	
Manganese, Dissolved	<b>1.0</b>	mg/L	0.0050	0.0025	10	12/11/12 12:43	12/13/12 16:09	7439-96-5	
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Acetone	< <b>12.5</b>	ug/L	25.0	12.5	1		12/12/12 07:08	67-64-1	
Acrylonitrile	< <b>5.0</b>	ug/L	10.0	5.0	1		12/12/12 07:08	107-13-1	
Benzene	<b>0.66</b>	ug/L	0.50	0.047	1		12/12/12 07:08	71-43-2	
Bromochloromethane	< <b>0.10</b>	ug/L	1.0	0.10	1		12/12/12 07:08	74-97-5	
Bromodichloromethane	< <b>0.066</b>	ug/L	0.50	0.066	1		12/12/12 07:08	75-27-4	
Bromoform	< <b>2.0</b>	ug/L	4.0	2.0	1		12/12/12 07:08	75-25-2	
Bromomethane	< <b>0.33</b>	ug/L	4.0	0.33	1		12/12/12 07:08	74-83-9	
2-Butanone (MEK)	< <b>2.0</b>	ug/L	4.0	2.0	1		12/12/12 07:08	78-93-3	
Carbon disulfide	< <b>0.50</b>	ug/L	1.0	0.50	1		12/12/12 07:08	75-15-0	
Carbon tetrachloride	< <b>0.094</b>	ug/L	1.0	0.094	1		12/12/12 07:08	56-23-5	
Chlorobenzene	<b>0.14J</b>	ug/L	1.0	0.071	1		12/12/12 07:08	108-90-7	
Chloroethane	< <b>0.31</b>	ug/L	1.0	0.31	1		12/12/12 07:08	75-00-3	
Chloroform	< <b>0.25</b>	ug/L	0.50	0.25	1		12/12/12 07:08	67-66-3	
Chloromethane	< <b>0.13</b>	ug/L	1.0	0.13	1		12/12/12 07:08	74-87-3	
1,2-Dibromo-3-chloropropane	< <b>0.80</b>	ug/L	4.0	0.80	1		12/12/12 07:08	96-12-8	
Dibromochloromethane	< <b>0.084</b>	ug/L	0.50	0.084	1		12/12/12 07:08	124-48-1	
1,2-Dibromoethane (EDB)	< <b>0.10</b>	ug/L	0.50	0.10	1		12/12/12 07:08	106-93-4	
Dibromomethane	< <b>0.089</b>	ug/L	0.50	0.089	1		12/12/12 07:08	74-95-3	
1,2-Dichlorobenzene	< <b>0.25</b>	ug/L	0.50	0.25	1		12/12/12 07:08	95-50-1	
1,4-Dichlorobenzene	<b>0.65</b>	ug/L	0.50	0.25	1		12/12/12 07:08	106-46-7	
trans-1,4-Dichloro-2-butene	< <b>0.27</b>	ug/L	10.0	0.27	1		12/12/12 07:08	110-57-6	
Dichlorodifluoromethane	< <b>0.20</b>	ug/L	1.0	0.20	1		12/12/12 07:08	75-71-8	
1,1-Dichloroethane	<b>1.1</b>	ug/L	0.50	0.072	1		12/12/12 07:08	75-34-3	
1,2-Dichloroethane	< <b>0.053</b>	ug/L	0.50	0.053	1		12/12/12 07:08	107-06-2	
1,1-Dichloroethene	< <b>0.16</b>	ug/L	0.50	0.16	1		12/12/12 07:08	75-35-4	
cis-1,2-Dichloroethene	<b>1.1</b>	ug/L	0.50	0.080	1		12/12/12 07:08	156-59-2	
trans-1,2-Dichloroethene	<b>0.15J</b>	ug/L	0.50	0.14	1		12/12/12 07:08	156-60-5	
1,2-Dichloropropane	<b>0.32J</b>	ug/L	4.0	0.12	1		12/12/12 07:08	78-87-5	
cis-1,3-Dichloropropene	< <b>0.18</b>	ug/L	0.50	0.18	1		12/12/12 07:08	10061-01-5	
trans-1,3-Dichloropropene	< <b>0.18</b>	ug/L	0.50	0.18	1		12/12/12 07:08	10061-02-6	
Ethylbenzene	< <b>0.078</b>	ug/L	0.50	0.078	1		12/12/12 07:08	100-41-4	
2-Hexanone	< <b>2.0</b>	ug/L	4.0	2.0	1		12/12/12 07:08	591-78-6	
Iodomethane	< <b>0.50</b>	ug/L	4.0	0.50	1		12/12/12 07:08	74-88-4	
Methylene Chloride	< <b>2.0</b>	ug/L	4.0	2.0	1		12/12/12 07:08	75-09-2	
4-Methyl-2-pentanone (MIBK)	< <b>2.0</b>	ug/L	4.0	2.0	1		12/12/12 07:08	108-10-1	
Styrene	< <b>0.075</b>	ug/L	0.50	0.075	1		12/12/12 07:08	100-42-5	
1,1,1,2-Tetrachloroethane	< <b>0.082</b>	ug/L	0.50	0.082	1		12/12/12 07:08	630-20-6	
1,1,1,2,2-Tetrachloroethane	< <b>0.075</b>	ug/L	0.50	0.075	1		12/12/12 07:08	79-34-5	
Tetrachloroethene	<b>0.23J</b>	ug/L	0.50	0.16	1		12/12/12 07:08	127-18-4	
Toluene	< <b>0.065</b>	ug/L	0.50	0.065	1		12/12/12 07:08	108-88-3	
1,1,1-Trichloroethane	< <b>0.15</b>	ug/L	0.50	0.15	1		12/12/12 07:08	71-55-6	
1,1,2-Trichloroethane	< <b>0.12</b>	ug/L	0.50	0.12	1		12/12/12 07:08	79-00-5	

Date: 12/19/2012 04:32 PM

### REPORT OF LABORATORY ANALYSIS

Page 41 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

### ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: MW-13**      **Lab ID: 10214636014**      Collected: 12/05/12 11:15      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Trichloroethene	<b>0.41J</b>	ug/L	0.50	0.11	1		12/12/12 07:08	79-01-6	
Trichlorofluoromethane	<b>&lt;0.11</b>	ug/L	0.50	0.11	1		12/12/12 07:08	75-69-4	
1,2,3-Trichloropropane	<b>&lt;0.22</b>	ug/L	4.0	0.22	1		12/12/12 07:08	96-18-4	
Vinyl acetate	<b>&lt;1.9</b>	ug/L	10.0	1.9	1		12/12/12 07:08	108-05-4	
Vinyl chloride	<b>20.9</b>	ug/L	0.40	0.16	1		12/12/12 07:08	75-01-4	
Xylene (Total)	<b>&lt;0.15</b>	ug/L	1.5	0.15	1		12/12/12 07:08	1330-20-7	
<b>Surrogates</b>									
Dibromofluoromethane (S)	98 %		75-125		1		12/12/12 07:08	1868-53-7	
1,2-Dichloroethane-d4 (S)	99 %		75-125		1		12/12/12 07:08	17060-07-0	
Toluene-d8 (S)	101 %		75-125		1		12/12/12 07:08	2037-26-5	
4-Bromofluorobenzene (S)	100 %		75-125		1		12/12/12 07:08	460-00-4	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	<b>24.3</b>	mg/L	2.0	0.37	2		12/18/12 01:52	16887-00-6	
Sulfate	<b>11.9</b>	mg/L	2.0	0.23	2		12/18/12 01:52	14808-79-8	
<b>353.2 Nitrate + Nitrite pres.</b>		Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	<b>&lt;0.0044</b>	mg/L	0.010	0.0044	1		12/12/12 16:08		

### ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

Sample: MW-15 Lab ID: 10214636015 Collected: 12/05/12 13:30 Received: 12/07/12 10:10 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS, Dissolved</b>		Analytical Method: EPA 6020 Preparation Method: EPA 3020							
Iron, Dissolved	<0.010	mg/L	0.050	0.010	1	12/11/12 12:43	12/13/12 00:30	7439-89-6	
Manganese, Dissolved	<0.00025	mg/L	0.00050	0.00025	1	12/11/12 12:43	12/13/12 00:30	7439-96-5	
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Acetone	<12.5	ug/L	25.0	12.5	1		12/12/12 07:33	67-64-1	
Acrylonitrile	<5.0	ug/L	10.0	5.0	1		12/12/12 07:33	107-13-1	
Benzene	<0.047	ug/L	0.50	0.047	1		12/12/12 07:33	71-43-2	
Bromochloromethane	<0.10	ug/L	1.0	0.10	1		12/12/12 07:33	74-97-5	
Bromodichloromethane	<0.066	ug/L	0.50	0.066	1		12/12/12 07:33	75-27-4	
Bromoform	<2.0	ug/L	4.0	2.0	1		12/12/12 07:33	75-25-2	
Bromomethane	<0.33	ug/L	4.0	0.33	1		12/12/12 07:33	74-83-9	
2-Butanone (MEK)	<2.0	ug/L	4.0	2.0	1		12/12/12 07:33	78-93-3	
Carbon disulfide	<0.50	ug/L	1.0	0.50	1		12/12/12 07:33	75-15-0	
Carbon tetrachloride	<0.094	ug/L	1.0	0.094	1		12/12/12 07:33	56-23-5	
Chlorobenzene	<0.071	ug/L	1.0	0.071	1		12/12/12 07:33	108-90-7	
Chloroethane	<0.31	ug/L	1.0	0.31	1		12/12/12 07:33	75-00-3	
Chloroform	<0.25	ug/L	0.50	0.25	1		12/12/12 07:33	67-66-3	
Chloromethane	<0.13	ug/L	1.0	0.13	1		12/12/12 07:33	74-87-3	
1,2-Dibromo-3-chloropropane	<0.80	ug/L	4.0	0.80	1		12/12/12 07:33	96-12-8	
Dibromochloromethane	<0.084	ug/L	0.50	0.084	1		12/12/12 07:33	124-48-1	
1,2-Dibromoethane (EDB)	<0.10	ug/L	0.50	0.10	1		12/12/12 07:33	106-93-4	
Dibromomethane	<0.089	ug/L	0.50	0.089	1		12/12/12 07:33	74-95-3	
1,2-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 07:33	95-50-1	
1,4-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 07:33	106-46-7	
trans-1,4-Dichloro-2-butene	<0.27	ug/L	10.0	0.27	1		12/12/12 07:33	110-57-6	
Dichlorodifluoromethane	<0.20	ug/L	1.0	0.20	1		12/12/12 07:33	75-71-8	
1,1-Dichloroethane	<0.072	ug/L	0.50	0.072	1		12/12/12 07:33	75-34-3	
1,2-Dichloroethane	<0.053	ug/L	0.50	0.053	1		12/12/12 07:33	107-06-2	
1,1-Dichloroethene	<0.16	ug/L	0.50	0.16	1		12/12/12 07:33	75-35-4	
cis-1,2-Dichloroethene	<0.080	ug/L	0.50	0.080	1		12/12/12 07:33	156-59-2	
trans-1,2-Dichloroethene	<0.14	ug/L	0.50	0.14	1		12/12/12 07:33	156-60-5	
1,2-Dichloropropane	<0.12	ug/L	4.0	0.12	1		12/12/12 07:33	78-87-5	
cis-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 07:33	10061-01-5	
trans-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 07:33	10061-02-6	
Ethylbenzene	<0.078	ug/L	0.50	0.078	1		12/12/12 07:33	100-41-4	
2-Hexanone	<2.0	ug/L	4.0	2.0	1		12/12/12 07:33	591-78-6	
Iodomethane	<0.50	ug/L	4.0	0.50	1		12/12/12 07:33	74-88-4	
Methylene Chloride	<2.0	ug/L	4.0	2.0	1		12/12/12 07:33	75-09-2	
4-Methyl-2-pentanone (MIBK)	<2.0	ug/L	4.0	2.0	1		12/12/12 07:33	108-10-1	
Styrene	<0.075	ug/L	0.50	0.075	1		12/12/12 07:33	100-42-5	
1,1,1,2-Tetrachloroethane	<0.082	ug/L	0.50	0.082	1		12/12/12 07:33	630-20-6	
1,1,2,2-Tetrachloroethane	<0.075	ug/L	0.50	0.075	1		12/12/12 07:33	79-34-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/12/12 07:33	127-18-4	
Toluene	<0.065	ug/L	0.50	0.065	1		12/12/12 07:33	108-88-3	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/12/12 07:33	71-55-6	
1,1,2-Trichloroethane	<0.12	ug/L	0.50	0.12	1		12/12/12 07:33	79-00-5	

Date: 12/19/2012 04:32 PM

### REPORT OF LABORATORY ANALYSIS

Page 43 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: MW-15**      **Lab ID: 10214636015**      Collected: 12/05/12 13:30      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Trichloroethene	<0.11	ug/L	0.50	0.11	1		12/12/12 07:33	79-01-6	
Trichlorofluoromethane	<0.11	ug/L	0.50	0.11	1		12/12/12 07:33	75-69-4	
1,2,3-Trichloropropane	<0.22	ug/L	4.0	0.22	1		12/12/12 07:33	96-18-4	
Vinyl acetate	<1.9	ug/L	10.0	1.9	1		12/12/12 07:33	108-05-4	
Vinyl chloride	<0.16	ug/L	0.40	0.16	1		12/12/12 07:33	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		12/12/12 07:33	1330-20-7	
<b>Surrogates</b>									
Dibromofluoromethane (S)	97 %		75-125		1		12/12/12 07:33	1868-53-7	
1,2-Dichloroethane-d4 (S)	99 %		75-125		1		12/12/12 07:33	17060-07-0	
Toluene-d8 (S)	100 %		75-125		1		12/12/12 07:33	2037-26-5	
4-Bromofluorobenzene (S)	100 %		75-125		1		12/12/12 07:33	460-00-4	
<b>2510B Specific Conductance</b>		Analytical Method: SM 2510B							
Specific Conductance	432	umhos/cm	10.0	5.0	1		12/10/12 12:36		
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	3.9	mg/L	1.0	0.18	1		12/18/12 02:23	16887-00-6	
Sulfate	14.0	mg/L	1.0	0.12	1		12/18/12 02:23	14808-79-8	
<b>353.2 Nitrate + Nitrite pres.</b>		Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	5.4	mg/L	0.20	0.088	20		12/12/12 16:10		M6
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.3	Std. Units	0.10	0.050	1		12/07/12 15:11		H6

## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: MW-16**      **Lab ID: 10214636016**      Collected: 12/04/12 16:45      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Acetone	<12.5	ug/L	25.0	12.5	1		12/12/12 07:57	67-64-1	
Acrylonitrile	<5.0	ug/L	10.0	5.0	1		12/12/12 07:57	107-13-1	
Benzene	<0.047	ug/L	0.50	0.047	1		12/12/12 07:57	71-43-2	
Bromochloromethane	<0.10	ug/L	1.0	0.10	1		12/12/12 07:57	74-97-5	
Bromodichloromethane	<0.066	ug/L	0.50	0.066	1		12/12/12 07:57	75-27-4	
Bromoform	<2.0	ug/L	4.0	2.0	1		12/12/12 07:57	75-25-2	
Bromomethane	<0.33	ug/L	4.0	0.33	1		12/12/12 07:57	74-83-9	
2-Butanone (MEK)	<2.0	ug/L	4.0	2.0	1		12/12/12 07:57	78-93-3	
Carbon disulfide	<0.50	ug/L	1.0	0.50	1		12/12/12 07:57	75-15-0	
Carbon tetrachloride	<0.094	ug/L	1.0	0.094	1		12/12/12 07:57	56-23-5	
Chlorobenzene	<0.071	ug/L	1.0	0.071	1		12/12/12 07:57	108-90-7	
Chloroethane	<0.31	ug/L	1.0	0.31	1		12/12/12 07:57	75-00-3	
Chloroform	<0.25	ug/L	0.50	0.25	1		12/12/12 07:57	67-66-3	
Chloromethane	<0.13	ug/L	1.0	0.13	1		12/12/12 07:57	74-87-3	
1,2-Dibromo-3-chloropropane	<0.80	ug/L	4.0	0.80	1		12/12/12 07:57	96-12-8	
Dibromochloromethane	<0.084	ug/L	0.50	0.084	1		12/12/12 07:57	124-48-1	
1,2-Dibromoethane (EDB)	<0.10	ug/L	0.50	0.10	1		12/12/12 07:57	106-93-4	
Dibromomethane	<0.089	ug/L	0.50	0.089	1		12/12/12 07:57	74-95-3	
1,2-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 07:57	95-50-1	
1,4-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 07:57	106-46-7	
trans-1,4-Dichloro-2-butene	<0.27	ug/L	10.0	0.27	1		12/12/12 07:57	110-57-6	
Dichlorodifluoromethane	<0.20	ug/L	1.0	0.20	1		12/12/12 07:57	75-71-8	
1,1-Dichloroethane	1.0	ug/L	0.50	0.072	1		12/12/12 07:57	75-34-3	
1,2-Dichloroethane	<0.053	ug/L	0.50	0.053	1		12/12/12 07:57	107-06-2	
1,1-Dichloroethene	<0.16	ug/L	0.50	0.16	1		12/12/12 07:57	75-35-4	
cis-1,2-Dichloroethene	3.4	ug/L	0.50	0.080	1		12/12/12 07:57	156-59-2	
trans-1,2-Dichloroethene	<0.14	ug/L	0.50	0.14	1		12/12/12 07:57	156-60-5	
1,2-Dichloropropane	0.14J	ug/L	4.0	0.12	1		12/12/12 07:57	78-87-5	
cis-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 07:57	10061-01-5	
trans-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 07:57	10061-02-6	
Ethylbenzene	<0.078	ug/L	0.50	0.078	1		12/12/12 07:57	100-41-4	
2-Hexanone	<2.0	ug/L	4.0	2.0	1		12/12/12 07:57	591-78-6	
Iodomethane	<0.50	ug/L	4.0	0.50	1		12/12/12 07:57	74-88-4	
Methylene Chloride	<2.0	ug/L	4.0	2.0	1		12/12/12 07:57	75-09-2	
4-Methyl-2-pentanone (MIBK)	<2.0	ug/L	4.0	2.0	1		12/12/12 07:57	108-10-1	
Styrene	<0.075	ug/L	0.50	0.075	1		12/12/12 07:57	100-42-5	
1,1,1,2-Tetrachloroethane	<0.082	ug/L	0.50	0.082	1		12/12/12 07:57	630-20-6	
1,1,2,2-Tetrachloroethane	<0.075	ug/L	0.50	0.075	1		12/12/12 07:57	79-34-5	
Tetrachloroethene	1.2	ug/L	0.50	0.16	1		12/12/12 07:57	127-18-4	
Toluene	<0.065	ug/L	0.50	0.065	1		12/12/12 07:57	108-88-3	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/12/12 07:57	71-55-6	
1,1,2-Trichloroethane	<0.12	ug/L	0.50	0.12	1		12/12/12 07:57	79-00-5	
Trichloroethene	2.0	ug/L	0.50	0.11	1		12/12/12 07:57	79-01-6	
Trichlorofluoromethane	<0.11	ug/L	0.50	0.11	1		12/12/12 07:57	75-69-4	
1,2,3-Trichloropropane	<0.22	ug/L	4.0	0.22	1		12/12/12 07:57	96-18-4	
Vinyl acetate	<1.9	ug/L	10.0	1.9	1		12/12/12 07:57	108-05-4	

Date: 12/19/2012 04:32 PM

### REPORT OF LABORATORY ANALYSIS

Page 45 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: MW-16**      **Lab ID: 10214636016**      Collected: 12/04/12 16:45      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Vinyl chloride	<0.16	ug/L	0.40	0.16	1		12/12/12 07:57	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		12/12/12 07:57	1330-20-7	
<b>Surrogates</b>									
Dibromofluoromethane (S)	97 %		75-125		1		12/12/12 07:57	1868-53-7	
1,2-Dichloroethane-d4 (S)	98 %		75-125		1		12/12/12 07:57	17060-07-0	
Toluene-d8 (S)	101 %		75-125		1		12/12/12 07:57	2037-26-5	
4-Bromofluorobenzene (S)	100 %		75-125		1		12/12/12 07:57	460-00-4	



## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: McILHATTEN SEEP**      **Lab ID: 10214636017**      Collected: 12/05/12 10:10      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS, Dissolved</b>		Analytical Method: EPA 6020    Preparation Method: EPA 3020							
Iron, Dissolved	<0.010	mg/L	0.050	0.010	1	12/11/12 12:43	12/13/12 00:34	7439-89-6	
Manganese, Dissolved	0.00074	mg/L	0.00050	0.00025	1	12/11/12 12:43	12/13/12 00:34	7439-96-5	
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Acetone	<12.5	ug/L	25.0	12.5	1		12/12/12 08:21	67-64-1	
Acrylonitrile	<5.0	ug/L	10.0	5.0	1		12/12/12 08:21	107-13-1	
Benzene	<0.047	ug/L	0.50	0.047	1		12/12/12 08:21	71-43-2	
Bromochloromethane	<0.10	ug/L	1.0	0.10	1		12/12/12 08:21	74-97-5	
Bromodichloromethane	<0.066	ug/L	0.50	0.066	1		12/12/12 08:21	75-27-4	
Bromoform	<2.0	ug/L	4.0	2.0	1		12/12/12 08:21	75-25-2	
Bromomethane	<0.33	ug/L	4.0	0.33	1		12/12/12 08:21	74-83-9	
2-Butanone (MEK)	<2.0	ug/L	4.0	2.0	1		12/12/12 08:21	78-93-3	
Carbon disulfide	<0.50	ug/L	1.0	0.50	1		12/12/12 08:21	75-15-0	
Carbon tetrachloride	<0.094	ug/L	1.0	0.094	1		12/12/12 08:21	56-23-5	
Chlorobenzene	<0.071	ug/L	1.0	0.071	1		12/12/12 08:21	108-90-7	
Chloroethane	<0.31	ug/L	1.0	0.31	1		12/12/12 08:21	75-00-3	
Chloroform	<0.25	ug/L	0.50	0.25	1		12/12/12 08:21	67-66-3	
Chloromethane	<0.13	ug/L	1.0	0.13	1		12/12/12 08:21	74-87-3	
1,2-Dibromo-3-chloropropane	<0.80	ug/L	4.0	0.80	1		12/12/12 08:21	96-12-8	
Dibromochloromethane	<0.084	ug/L	0.50	0.084	1		12/12/12 08:21	124-48-1	
1,2-Dibromoethane (EDB)	<0.10	ug/L	0.50	0.10	1		12/12/12 08:21	106-93-4	
Dibromomethane	<0.089	ug/L	0.50	0.089	1		12/12/12 08:21	74-95-3	
1,2-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 08:21	95-50-1	
1,4-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 08:21	106-46-7	
trans-1,4-Dichloro-2-butene	<0.27	ug/L	10.0	0.27	1		12/12/12 08:21	110-57-6	
Dichlorodifluoromethane	<0.20	ug/L	1.0	0.20	1		12/12/12 08:21	75-71-8	
1,1-Dichloroethane	<0.072	ug/L	0.50	0.072	1		12/12/12 08:21	75-34-3	
1,2-Dichloroethane	<0.053	ug/L	0.50	0.053	1		12/12/12 08:21	107-06-2	
1,1-Dichloroethene	<0.16	ug/L	0.50	0.16	1		12/12/12 08:21	75-35-4	
cis-1,2-Dichloroethene	0.23J	ug/L	0.50	0.080	1		12/12/12 08:21	156-59-2	
trans-1,2-Dichloroethene	<0.14	ug/L	0.50	0.14	1		12/12/12 08:21	156-60-5	
1,2-Dichloropropane	<0.12	ug/L	4.0	0.12	1		12/12/12 08:21	78-87-5	
cis-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 08:21	10061-01-5	
trans-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 08:21	10061-02-6	
Ethylbenzene	<0.078	ug/L	0.50	0.078	1		12/12/12 08:21	100-41-4	
2-Hexanone	<2.0	ug/L	4.0	2.0	1		12/12/12 08:21	591-78-6	
Iodomethane	<0.50	ug/L	4.0	0.50	1		12/12/12 08:21	74-88-4	
Methylene Chloride	<2.0	ug/L	4.0	2.0	1		12/12/12 08:21	75-09-2	
4-Methyl-2-pentanone (MIBK)	<2.0	ug/L	4.0	2.0	1		12/12/12 08:21	108-10-1	
Styrene	<0.075	ug/L	0.50	0.075	1		12/12/12 08:21	100-42-5	
1,1,1,2-Tetrachloroethane	<0.082	ug/L	0.50	0.082	1		12/12/12 08:21	630-20-6	
1,1,2,2-Tetrachloroethane	<0.075	ug/L	0.50	0.075	1		12/12/12 08:21	79-34-5	
Tetrachloroethene	1.2	ug/L	0.50	0.16	1		12/12/12 08:21	127-18-4	
Toluene	<0.065	ug/L	0.50	0.065	1		12/12/12 08:21	108-88-3	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/12/12 08:21	71-55-6	
1,1,2-Trichloroethane	<0.12	ug/L	0.50	0.12	1		12/12/12 08:21	79-00-5	

### ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: McILHATTEN SEEP**      **Lab ID: 10214636017**      Collected: 12/05/12 10:10      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Trichloroethene	<b>0.32J</b>	ug/L	0.50	0.11	1		12/12/12 08:21	79-01-6	
Trichlorofluoromethane	<b>&lt;0.11</b>	ug/L	0.50	0.11	1		12/12/12 08:21	75-69-4	
1,2,3-Trichloropropane	<b>&lt;0.22</b>	ug/L	4.0	0.22	1		12/12/12 08:21	96-18-4	
Vinyl acetate	<b>&lt;1.9</b>	ug/L	10.0	1.9	1		12/12/12 08:21	108-05-4	
Vinyl chloride	<b>&lt;0.16</b>	ug/L	0.40	0.16	1		12/12/12 08:21	75-01-4	
Xylene (Total)	<b>&lt;0.15</b>	ug/L	1.5	0.15	1		12/12/12 08:21	1330-20-7	
<b>Surrogates</b>									
Dibromofluoromethane (S)	98 %		75-125		1		12/12/12 08:21	1868-53-7	
1,2-Dichloroethane-d4 (S)	99 %		75-125		1		12/12/12 08:21	17060-07-0	
Toluene-d8 (S)	100 %		75-125		1		12/12/12 08:21	2037-26-5	
4-Bromofluorobenzene (S)	99 %		75-125		1		12/12/12 08:21	460-00-4	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	<b>51.9</b>	mg/L	3.0	0.55	3		12/18/12 02:55	16887-00-6	
Sulfate	<b>65.7</b>	mg/L	3.0	0.35	3		12/18/12 02:55	14808-79-8	
<b>353.2 Nitrate + Nitrite pres.</b>		Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	<b>7.2</b>	mg/L	0.20	0.088	20		12/12/12 16:13		

### ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: VET WELL**      **Lab ID: 10214636018**      Collected: 12/06/12 12:15      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS</b>		Analytical Method: EPA 6020    Preparation Method: EPA 3020							
Arsenic	0.00070	mg/L	0.00050	0.00014	1	12/15/12 10:52	12/18/12 13:29	7440-38-2	
Barium	<0.00015	mg/L	0.00030	0.00015	1	12/15/12 10:52	12/18/12 13:29	7440-39-3	
Cadmium	<0.000028	mg/L	0.000080	0.000028	1	12/15/12 10:52	12/18/12 13:29	7440-43-9	
Chromium	0.00095	mg/L	0.00050	0.000094	1	12/15/12 10:52	12/18/12 13:29	7440-47-3	
Cobalt	<0.00025	mg/L	0.00050	0.00025	1	12/15/12 10:52	12/18/12 13:29	7440-48-4	
Copper	0.0064	mg/L	0.00050	0.00018	1	12/15/12 10:52	12/18/12 13:29	7440-50-8	
Iron	<0.010	mg/L	0.050	0.010	1	12/15/12 10:52	12/18/12 13:29	7439-89-6	
Lead	0.000084J	mg/L	0.00010	0.000018	1	12/15/12 10:52	12/18/12 13:29	7439-92-1	
Manganese	<0.00025	mg/L	0.00050	0.00025	1	12/15/12 10:52	12/18/12 13:29	7439-96-5	
Nickel	<0.00015	mg/L	0.00050	0.00015	1	12/15/12 10:52	12/18/12 13:29	7440-02-0	
Selenium	0.00084	mg/L	0.00050	0.000094	1	12/15/12 10:52	12/18/12 13:29	7782-49-2	
Silver	<0.000040	mg/L	0.00050	0.000040	1	12/15/12 10:52	12/18/12 13:29	7440-22-4	
Thallium	<0.000019	mg/L	0.00010	0.000019	1	12/15/12 10:52	12/18/12 13:29	7440-28-0	
Vanadium	0.0042	mg/L	0.00010	0.000037	1	12/15/12 10:52	12/18/12 13:29	7440-62-2	
Zinc	0.0057	mg/L	0.0050	0.0010	1	12/15/12 10:52	12/18/12 13:29	7440-66-6	
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Acetone	<12.5	ug/L	25.0	12.5	1		12/12/12 08:45	67-64-1	
Acrylonitrile	<5.0	ug/L	10.0	5.0	1		12/12/12 08:45	107-13-1	
Benzene	<0.047	ug/L	0.50	0.047	1		12/12/12 08:45	71-43-2	
Bromochloromethane	<0.10	ug/L	1.0	0.10	1		12/12/12 08:45	74-97-5	
Bromodichloromethane	<0.066	ug/L	0.50	0.066	1		12/12/12 08:45	75-27-4	
Bromoform	<2.0	ug/L	4.0	2.0	1		12/12/12 08:45	75-25-2	
Bromomethane	<0.33	ug/L	4.0	0.33	1		12/12/12 08:45	74-83-9	
2-Butanone (MEK)	<2.0	ug/L	4.0	2.0	1		12/12/12 08:45	78-93-3	
Carbon disulfide	<0.50	ug/L	1.0	0.50	1		12/12/12 08:45	75-15-0	
Carbon tetrachloride	<0.094	ug/L	1.0	0.094	1		12/12/12 08:45	56-23-5	
Chlorobenzene	<0.071	ug/L	1.0	0.071	1		12/12/12 08:45	108-90-7	
Chloroethane	<0.31	ug/L	1.0	0.31	1		12/12/12 08:45	75-00-3	
Chloroform	<0.25	ug/L	0.50	0.25	1		12/12/12 08:45	67-66-3	
Chloromethane	<0.13	ug/L	1.0	0.13	1		12/12/12 08:45	74-87-3	
1,2-Dibromo-3-chloropropane	<0.80	ug/L	4.0	0.80	1		12/12/12 08:45	96-12-8	
Dibromochloromethane	<0.084	ug/L	0.50	0.084	1		12/12/12 08:45	124-48-1	
1,2-Dibromoethane (EDB)	<0.10	ug/L	0.50	0.10	1		12/12/12 08:45	106-93-4	
Dibromomethane	<0.089	ug/L	0.50	0.089	1		12/12/12 08:45	74-95-3	
1,2-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 08:45	95-50-1	
1,4-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 08:45	106-46-7	
trans-1,4-Dichloro-2-butene	<0.27	ug/L	10.0	0.27	1		12/12/12 08:45	110-57-6	
Dichlorodifluoromethane	<0.20	ug/L	1.0	0.20	1		12/12/12 08:45	75-71-8	
1,1-Dichloroethane	<0.072	ug/L	0.50	0.072	1		12/12/12 08:45	75-34-3	
1,2-Dichloroethane	<0.053	ug/L	0.50	0.053	1		12/12/12 08:45	107-06-2	
1,1-Dichloroethene	<0.16	ug/L	0.50	0.16	1		12/12/12 08:45	75-35-4	
cis-1,2-Dichloroethene	<0.080	ug/L	0.50	0.080	1		12/12/12 08:45	156-59-2	
trans-1,2-Dichloroethene	<0.14	ug/L	0.50	0.14	1		12/12/12 08:45	156-60-5	
1,2-Dichloropropane	<0.12	ug/L	4.0	0.12	1		12/12/12 08:45	78-87-5	
cis-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 08:45	10061-01-5	

## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: VET WELL**      **Lab ID: 10214636018**      Collected: 12/06/12 12:15      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
trans-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 08:45	10061-02-6	
Ethylbenzene	<0.078	ug/L	0.50	0.078	1		12/12/12 08:45	100-41-4	
2-Hexanone	<2.0	ug/L	4.0	2.0	1		12/12/12 08:45	591-78-6	
Iodomethane	<0.50	ug/L	4.0	0.50	1		12/12/12 08:45	74-88-4	
Methylene Chloride	<2.0	ug/L	4.0	2.0	1		12/12/12 08:45	75-09-2	
4-Methyl-2-pentanone (MIBK)	<2.0	ug/L	4.0	2.0	1		12/12/12 08:45	108-10-1	
Styrene	<0.075	ug/L	0.50	0.075	1		12/12/12 08:45	100-42-5	
1,1,1,2-Tetrachloroethane	<0.082	ug/L	0.50	0.082	1		12/12/12 08:45	630-20-6	
1,1,2,2-Tetrachloroethane	<0.075	ug/L	0.50	0.075	1		12/12/12 08:45	79-34-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/12/12 08:45	127-18-4	
Toluene	<0.065	ug/L	0.50	0.065	1		12/12/12 08:45	108-88-3	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/12/12 08:45	71-55-6	
1,1,2-Trichloroethane	<0.12	ug/L	0.50	0.12	1		12/12/12 08:45	79-00-5	
Trichloroethene	<0.11	ug/L	0.50	0.11	1		12/12/12 08:45	79-01-6	
Trichlorofluoromethane	<0.11	ug/L	0.50	0.11	1		12/12/12 08:45	75-69-4	
1,2,3-Trichloropropane	<0.22	ug/L	4.0	0.22	1		12/12/12 08:45	96-18-4	
Vinyl acetate	<1.9	ug/L	10.0	1.9	1		12/12/12 08:45	108-05-4	
Vinyl chloride	<0.16	ug/L	0.40	0.16	1		12/12/12 08:45	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		12/12/12 08:45	1330-20-7	
<b>Surrogates</b>									
Dibromofluoromethane (S)	98 %		75-125		1		12/12/12 08:45	1868-53-7	
1,2-Dichloroethane-d4 (S)	99 %		75-125		1		12/12/12 08:45	17060-07-0	
Toluene-d8 (S)	100 %		75-125		1		12/12/12 08:45	2037-26-5	
4-Bromofluorobenzene (S)	99 %		75-125		1		12/12/12 08:45	460-00-4	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	11.5	mg/L	2.0	0.37	2		12/18/12 03:26	16887-00-6	
Sulfate	17.3	mg/L	2.0	0.23	2		12/18/12 03:26	14808-79-8	
<b>353.2 Nitrate + Nitrite pres.</b>		Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	4.0	mg/L	0.10	0.044	10		12/12/12 16:14		

## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: DUP**      **Lab ID: 10214636019**      Collected: 12/05/12 11:30      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS, Dissolved</b>		Analytical Method: EPA 6020    Preparation Method: EPA 3020							
Iron, Dissolved	<b>0.027J</b>	mg/L	0.050	0.010	1	12/11/12 12:43	12/12/12 23:48	7439-89-6	
Manganese, Dissolved	<b>1.1</b>	mg/L	0.0025	0.0012	5	12/11/12 12:43	12/12/12 23:53	7439-96-5	
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Acetone	<b>&lt;12.5</b>	ug/L	25.0	12.5	1		12/12/12 09:10	67-64-1	
Acrylonitrile	<b>&lt;5.0</b>	ug/L	10.0	5.0	1		12/12/12 09:10	107-13-1	
Benzene	<b>0.66</b>	ug/L	0.50	0.047	1		12/12/12 09:10	71-43-2	
Bromochloromethane	<b>&lt;0.10</b>	ug/L	1.0	0.10	1		12/12/12 09:10	74-97-5	
Bromodichloromethane	<b>&lt;0.066</b>	ug/L	0.50	0.066	1		12/12/12 09:10	75-27-4	
Bromoform	<b>&lt;2.0</b>	ug/L	4.0	2.0	1		12/12/12 09:10	75-25-2	
Bromomethane	<b>&lt;0.33</b>	ug/L	4.0	0.33	1		12/12/12 09:10	74-83-9	
2-Butanone (MEK)	<b>&lt;2.0</b>	ug/L	4.0	2.0	1		12/12/12 09:10	78-93-3	
Carbon disulfide	<b>&lt;0.50</b>	ug/L	1.0	0.50	1		12/12/12 09:10	75-15-0	
Carbon tetrachloride	<b>&lt;0.094</b>	ug/L	1.0	0.094	1		12/12/12 09:10	56-23-5	
Chlorobenzene	<b>0.14J</b>	ug/L	1.0	0.071	1		12/12/12 09:10	108-90-7	
Chloroethane	<b>&lt;0.31</b>	ug/L	1.0	0.31	1		12/12/12 09:10	75-00-3	
Chloroform	<b>&lt;0.25</b>	ug/L	0.50	0.25	1		12/12/12 09:10	67-66-3	
Chloromethane	<b>&lt;0.13</b>	ug/L	1.0	0.13	1		12/12/12 09:10	74-87-3	
1,2-Dibromo-3-chloropropane	<b>&lt;0.80</b>	ug/L	4.0	0.80	1		12/12/12 09:10	96-12-8	
Dibromochloromethane	<b>&lt;0.084</b>	ug/L	0.50	0.084	1		12/12/12 09:10	124-48-1	
1,2-Dibromoethane (EDB)	<b>&lt;0.10</b>	ug/L	0.50	0.10	1		12/12/12 09:10	106-93-4	
Dibromomethane	<b>&lt;0.089</b>	ug/L	0.50	0.089	1		12/12/12 09:10	74-95-3	
1,2-Dichlorobenzene	<b>&lt;0.25</b>	ug/L	0.50	0.25	1		12/12/12 09:10	95-50-1	
1,4-Dichlorobenzene	<b>0.61</b>	ug/L	0.50	0.25	1		12/12/12 09:10	106-46-7	
trans-1,4-Dichloro-2-butene	<b>&lt;0.27</b>	ug/L	10.0	0.27	1		12/12/12 09:10	110-57-6	
Dichlorodifluoromethane	<b>&lt;0.20</b>	ug/L	1.0	0.20	1		12/12/12 09:10	75-71-8	
1,1-Dichloroethane	<b>1.1</b>	ug/L	0.50	0.072	1		12/12/12 09:10	75-34-3	
1,2-Dichloroethane	<b>0.082J</b>	ug/L	0.50	0.053	1		12/12/12 09:10	107-06-2	
1,1-Dichloroethene	<b>&lt;0.16</b>	ug/L	0.50	0.16	1		12/12/12 09:10	75-35-4	
cis-1,2-Dichloroethene	<b>1.1</b>	ug/L	0.50	0.080	1		12/12/12 09:10	156-59-2	
trans-1,2-Dichloroethene	<b>0.19J</b>	ug/L	0.50	0.14	1		12/12/12 09:10	156-60-5	
1,2-Dichloropropane	<b>0.30J</b>	ug/L	4.0	0.12	1		12/12/12 09:10	78-87-5	
cis-1,3-Dichloropropene	<b>&lt;0.18</b>	ug/L	0.50	0.18	1		12/12/12 09:10	10061-01-5	
trans-1,3-Dichloropropene	<b>&lt;0.18</b>	ug/L	0.50	0.18	1		12/12/12 09:10	10061-02-6	
Ethylbenzene	<b>&lt;0.078</b>	ug/L	0.50	0.078	1		12/12/12 09:10	100-41-4	
2-Hexanone	<b>&lt;2.0</b>	ug/L	4.0	2.0	1		12/12/12 09:10	591-78-6	
Iodomethane	<b>&lt;0.50</b>	ug/L	4.0	0.50	1		12/12/12 09:10	74-88-4	
Methylene Chloride	<b>&lt;2.0</b>	ug/L	4.0	2.0	1		12/12/12 09:10	75-09-2	
4-Methyl-2-pentanone (MIBK)	<b>&lt;2.0</b>	ug/L	4.0	2.0	1		12/12/12 09:10	108-10-1	
Styrene	<b>&lt;0.075</b>	ug/L	0.50	0.075	1		12/12/12 09:10	100-42-5	
1,1,1,2-Tetrachloroethane	<b>&lt;0.082</b>	ug/L	0.50	0.082	1		12/12/12 09:10	630-20-6	
1,1,2,2-Tetrachloroethane	<b>&lt;0.075</b>	ug/L	0.50	0.075	1		12/12/12 09:10	79-34-5	
Tetrachloroethene	<b>0.20J</b>	ug/L	0.50	0.16	1		12/12/12 09:10	127-18-4	
Toluene	<b>&lt;0.065</b>	ug/L	0.50	0.065	1		12/12/12 09:10	108-88-3	
1,1,1-Trichloroethane	<b>&lt;0.15</b>	ug/L	0.50	0.15	1		12/12/12 09:10	71-55-6	
1,1,2-Trichloroethane	<b>&lt;0.12</b>	ug/L	0.50	0.12	1		12/12/12 09:10	79-00-5	

Date: 12/19/2012 04:32 PM

### REPORT OF LABORATORY ANALYSIS

Page 51 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: DUP**      **Lab ID: 10214636019**      Collected: 12/05/12 11:30      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Trichloroethene	<b>0.36J</b>	ug/L	0.50	0.11	1		12/12/12 09:10	79-01-6	
Trichlorofluoromethane	<b>&lt;0.11</b>	ug/L	0.50	0.11	1		12/12/12 09:10	75-69-4	
1,2,3-Trichloropropane	<b>&lt;0.22</b>	ug/L	4.0	0.22	1		12/12/12 09:10	96-18-4	
Vinyl acetate	<b>&lt;1.9</b>	ug/L	10.0	1.9	1		12/12/12 09:10	108-05-4	
Vinyl chloride	<b>20.2</b>	ug/L	0.40	0.16	1		12/12/12 09:10	75-01-4	
Xylene (Total)	<b>0.18J</b>	ug/L	1.5	0.15	1		12/12/12 09:10	1330-20-7	
<b>Surrogates</b>									
Dibromofluoromethane (S)	96 %		75-125		1		12/12/12 09:10	1868-53-7	
1,2-Dichloroethane-d4 (S)	98 %		75-125		1		12/12/12 09:10	17060-07-0	
Toluene-d8 (S)	100 %		75-125		1		12/12/12 09:10	2037-26-5	
4-Bromofluorobenzene (S)	100 %		75-125		1		12/12/12 09:10	460-00-4	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	<b>24.2</b>	mg/L	2.0	0.37	2		12/18/12 05:01	16887-00-6	
Sulfate	<b>11.9</b>	mg/L	2.0	0.23	2		12/18/12 05:01	14808-79-8	
<b>353.2 Nitrate + Nitrite pres.</b>		Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	<b>&lt;0.0044</b>	mg/L	0.010	0.0044	1		12/17/12 11:37		

## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: TRIP BLANK**      **Lab ID: 10214636020**      Collected: 12/04/12 10:20      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Acetone	<12.5	ug/L	25.0	12.5	1		12/12/12 01:04	67-64-1	
Acrylonitrile	<5.0	ug/L	10.0	5.0	1		12/12/12 01:04	107-13-1	
Benzene	<0.047	ug/L	0.50	0.047	1		12/12/12 01:04	71-43-2	
Bromochloromethane	<0.10	ug/L	1.0	0.10	1		12/12/12 01:04	74-97-5	
Bromodichloromethane	<0.066	ug/L	0.50	0.066	1		12/12/12 01:04	75-27-4	
Bromoform	<2.0	ug/L	4.0	2.0	1		12/12/12 01:04	75-25-2	
Bromomethane	<0.33	ug/L	4.0	0.33	1		12/12/12 01:04	74-83-9	
2-Butanone (MEK)	<2.0	ug/L	4.0	2.0	1		12/12/12 01:04	78-93-3	
Carbon disulfide	<0.50	ug/L	1.0	0.50	1		12/12/12 01:04	75-15-0	
Carbon tetrachloride	<0.094	ug/L	1.0	0.094	1		12/12/12 01:04	56-23-5	
Chlorobenzene	<0.071	ug/L	1.0	0.071	1		12/12/12 01:04	108-90-7	
Chloroethane	<0.31	ug/L	1.0	0.31	1		12/12/12 01:04	75-00-3	
Chloroform	<0.25	ug/L	0.50	0.25	1		12/12/12 01:04	67-66-3	
Chloromethane	<0.13	ug/L	1.0	0.13	1		12/12/12 01:04	74-87-3	
1,2-Dibromo-3-chloropropane	<0.80	ug/L	4.0	0.80	1		12/12/12 01:04	96-12-8	
Dibromochloromethane	<0.084	ug/L	0.50	0.084	1		12/12/12 01:04	124-48-1	
1,2-Dibromoethane (EDB)	<0.10	ug/L	0.50	0.10	1		12/12/12 01:04	106-93-4	
Dibromomethane	<0.089	ug/L	0.50	0.089	1		12/12/12 01:04	74-95-3	
1,2-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 01:04	95-50-1	
1,4-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/12/12 01:04	106-46-7	
trans-1,4-Dichloro-2-butene	<0.27	ug/L	10.0	0.27	1		12/12/12 01:04	110-57-6	
Dichlorodifluoromethane	<0.20	ug/L	1.0	0.20	1		12/12/12 01:04	75-71-8	
1,1-Dichloroethane	<0.072	ug/L	0.50	0.072	1		12/12/12 01:04	75-34-3	
1,2-Dichloroethane	<0.053	ug/L	0.50	0.053	1		12/12/12 01:04	107-06-2	
1,1-Dichloroethene	<0.16	ug/L	0.50	0.16	1		12/12/12 01:04	75-35-4	
cis-1,2-Dichloroethene	<0.080	ug/L	0.50	0.080	1		12/12/12 01:04	156-59-2	
trans-1,2-Dichloroethene	<0.14	ug/L	0.50	0.14	1		12/12/12 01:04	156-60-5	
1,2-Dichloropropane	<0.12	ug/L	4.0	0.12	1		12/12/12 01:04	78-87-5	
cis-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 01:04	10061-01-5	
trans-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/12/12 01:04	10061-02-6	
Ethylbenzene	<0.078	ug/L	0.50	0.078	1		12/12/12 01:04	100-41-4	
2-Hexanone	<2.0	ug/L	4.0	2.0	1		12/12/12 01:04	591-78-6	
Iodomethane	<0.50	ug/L	4.0	0.50	1		12/12/12 01:04	74-88-4	
Methylene Chloride	<2.0	ug/L	4.0	2.0	1		12/12/12 01:04	75-09-2	
4-Methyl-2-pentanone (MIBK)	<2.0	ug/L	4.0	2.0	1		12/12/12 01:04	108-10-1	
Styrene	<0.075	ug/L	0.50	0.075	1		12/12/12 01:04	100-42-5	
1,1,1,2-Tetrachloroethane	<0.082	ug/L	0.50	0.082	1		12/12/12 01:04	630-20-6	
1,1,2,2-Tetrachloroethane	<0.075	ug/L	0.50	0.075	1		12/12/12 01:04	79-34-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/12/12 01:04	127-18-4	
Toluene	<0.065	ug/L	0.50	0.065	1		12/12/12 01:04	108-88-3	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/12/12 01:04	71-55-6	
1,1,2-Trichloroethane	<0.12	ug/L	0.50	0.12	1		12/12/12 01:04	79-00-5	
Trichloroethene	<0.11	ug/L	0.50	0.11	1		12/12/12 01:04	79-01-6	
Trichlorofluoromethane	<0.11	ug/L	0.50	0.11	1		12/12/12 01:04	75-69-4	
1,2,3-Trichloropropane	<0.22	ug/L	4.0	0.22	1		12/12/12 01:04	96-18-4	
Vinyl acetate	<1.9	ug/L	10.0	1.9	1		12/12/12 01:04	108-05-4	

Date: 12/19/2012 04:32 PM

### REPORT OF LABORATORY ANALYSIS

Page 53 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..



## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

---

**Sample: TRIP BLANK**      **Lab ID: 10214636020**      Collected: 12/04/12 10:20      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Vinyl chloride	<0.16	ug/L	0.40	0.16	1		12/12/12 01:04	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		12/12/12 01:04	1330-20-7	
<b>Surrogates</b>									
Dibromofluoromethane (S)	99 %		75-125		1		12/12/12 01:04	1868-53-7	
1,2-Dichloroethane-d4 (S)	101 %		75-125		1		12/12/12 01:04	17060-07-0	
Toluene-d8 (S)	101 %		75-125		1		12/12/12 01:04	2037-26-5	
4-Bromofluorobenzene (S)	100 %		75-125		1		12/12/12 01:04	460-00-4	



## ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: SHOP WELL**      **Lab ID: 10214636021**      Collected: 12/04/12 12:30      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Acetone	<12.5	ug/L	25.0	12.5	1		12/14/12 01:07	67-64-1	
Acrylonitrile	<5.0	ug/L	10.0	5.0	1		12/14/12 01:07	107-13-1	
Benzene	<0.047	ug/L	0.50	0.047	1		12/14/12 01:07	71-43-2	
Bromochloromethane	<0.10	ug/L	1.0	0.10	1		12/14/12 01:07	74-97-5	
Bromodichloromethane	<0.066	ug/L	0.50	0.066	1		12/14/12 01:07	75-27-4	
Bromoform	<2.0	ug/L	4.0	2.0	1		12/14/12 01:07	75-25-2	
Bromomethane	<0.33	ug/L	4.0	0.33	1		12/14/12 01:07	74-83-9	
2-Butanone (MEK)	<2.0	ug/L	4.0	2.0	1		12/14/12 01:07	78-93-3	
Carbon disulfide	<0.50	ug/L	1.0	0.50	1		12/14/12 01:07	75-15-0	
Carbon tetrachloride	<0.094	ug/L	1.0	0.094	1		12/14/12 01:07	56-23-5	
Chlorobenzene	<0.071	ug/L	1.0	0.071	1		12/14/12 01:07	108-90-7	
Chloroethane	<0.31	ug/L	1.0	0.31	1		12/14/12 01:07	75-00-3	
Chloroform	0.34J	ug/L	0.50	0.25	1		12/14/12 01:07	67-66-3	
Chloromethane	0.21J	ug/L	1.0	0.13	1		12/14/12 01:07	74-87-3	
1,2-Dibromo-3-chloropropane	<0.80	ug/L	4.0	0.80	1		12/14/12 01:07	96-12-8	
Dibromochloromethane	<0.084	ug/L	4.0	0.084	1		12/14/12 01:07	124-48-1	
1,2-Dibromoethane (EDB)	<0.10	ug/L	0.50	0.10	1		12/14/12 01:07	106-93-4	
Dibromomethane	<0.089	ug/L	0.50	0.089	1		12/14/12 01:07	74-95-3	
1,2-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/14/12 01:07	95-50-1	
1,4-Dichlorobenzene	<0.25	ug/L	0.50	0.25	1		12/14/12 01:07	106-46-7	
trans-1,4-Dichloro-2-butene	<0.27	ug/L	10.0	0.27	1		12/14/12 01:07	110-57-6	
Dichlorodifluoromethane	4.4	ug/L	1.0	0.20	1		12/14/12 01:07	75-71-8	
1,1-Dichloroethane	1.7	ug/L	0.50	0.072	1		12/14/12 01:07	75-34-3	
1,2-Dichloroethane	<0.053	ug/L	0.50	0.053	1		12/14/12 01:07	107-06-2	
1,1-Dichloroethene	<0.16	ug/L	0.50	0.16	1		12/14/12 01:07	75-35-4	
cis-1,2-Dichloroethene	0.86	ug/L	0.50	0.080	1		12/14/12 01:07	156-59-2	
trans-1,2-Dichloroethene	<0.14	ug/L	0.50	0.14	1		12/14/12 01:07	156-60-5	
1,2-Dichloropropane	<0.12	ug/L	4.0	0.12	1		12/14/12 01:07	78-87-5	
cis-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/14/12 01:07	10061-01-5	
trans-1,3-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/14/12 01:07	10061-02-6	
Ethylbenzene	<0.078	ug/L	0.50	0.078	1		12/14/12 01:07	100-41-4	
2-Hexanone	<2.0	ug/L	4.0	2.0	1		12/14/12 01:07	591-78-6	
Iodomethane	<0.50	ug/L	10.0	0.50	1		12/14/12 01:07	74-88-4	
Methylene Chloride	<2.0	ug/L	4.0	2.0	1		12/14/12 01:07	75-09-2	
4-Methyl-2-pentanone (MIBK)	<2.0	ug/L	4.0	2.0	1		12/14/12 01:07	108-10-1	
Styrene	<0.075	ug/L	0.50	0.075	1		12/14/12 01:07	100-42-5	
1,1,1,2-Tetrachloroethane	<0.082	ug/L	0.50	0.082	1		12/14/12 01:07	630-20-6	
1,1,2,2-Tetrachloroethane	<0.075	ug/L	0.50	0.075	1		12/14/12 01:07	79-34-5	
Tetrachloroethene	4.5	ug/L	0.50	0.16	1		12/14/12 01:07	127-18-4	
Toluene	<0.065	ug/L	0.50	0.065	1		12/14/12 01:07	108-88-3	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/14/12 01:07	71-55-6	
1,1,2-Trichloroethane	<0.12	ug/L	0.50	0.12	1		12/14/12 01:07	79-00-5	
Trichloroethene	2.1	ug/L	0.50	0.11	1		12/14/12 01:07	79-01-6	
Trichlorofluoromethane	1.2	ug/L	0.50	0.11	1		12/14/12 01:07	75-69-4	
1,2,3-Trichloropropane	<0.22	ug/L	4.0	0.22	1		12/14/12 01:07	96-18-4	
Vinyl acetate	<1.9	ug/L	10.0	1.9	1		12/14/12 01:07	108-05-4	

Date: 12/19/2012 04:32 PM

### REPORT OF LABORATORY ANALYSIS

Page 55 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

### ANALYTICAL RESULTS

Project: Bozeman Landfill

Pace Project No.: 10214636

**Sample: SHOP WELL**      **Lab ID: 10214636021**      Collected: 12/04/12 12:30      Received: 12/07/12 10:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Vinyl chloride	<0.16	ug/L	0.40	0.16	1		12/14/12 01:07	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		12/14/12 01:07	1330-20-7	
<b>Surrogates</b>									
Dibromofluoromethane (S)	98 %		75-125		1		12/14/12 01:07	1868-53-7	
1,2-Dichloroethane-d4 (S)	99 %		75-125		1		12/14/12 01:07	17060-07-0	
Toluene-d8 (S)	100 %		75-125		1		12/14/12 01:07	2037-26-5	
4-Bromofluorobenzene (S)	101 %		75-125		1		12/14/12 01:07	460-00-4	

### QUALITY CONTROL DATA

Project: Bozeman Landfill  
Pace Project No.: 10214636

QC Batch: MPRP/36912      Analysis Method: EPA 6020  
QC Batch Method: EPA 3020      Analysis Description: 6020 MET  
Associated Lab Samples: 10214636018

METHOD BLANK: 1351828      Matrix: Water  
Associated Lab Samples: 10214636018

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/L	<0.00014	0.00050	12/18/12 13:24	
Barium	mg/L	<0.00015	0.00030	12/18/12 13:24	
Cadmium	mg/L	<0.000028	0.000080	12/18/12 13:24	
Chromium	mg/L	<0.000094	0.00050	12/18/12 13:24	
Cobalt	mg/L	<0.00025	0.00050	12/18/12 13:24	
Copper	mg/L	<0.00018	0.00050	12/18/12 13:24	
Iron	mg/L	<0.010	0.050	12/18/12 13:24	
Lead	mg/L	<0.000018	0.00010	12/18/12 13:24	
Manganese	mg/L	0.00043J	0.00050	12/18/12 13:24	
Nickel	mg/L	<0.00015	0.00050	12/18/12 13:24	
Selenium	mg/L	<0.000094	0.00050	12/18/12 13:24	
Silver	mg/L	0.00010J	0.00050	12/18/12 13:24	
Thallium	mg/L	<0.000019	0.00010	12/18/12 13:24	
Vanadium	mg/L	<0.000037	0.00010	12/18/12 13:24	
Zinc	mg/L	<0.0010	0.0050	12/18/12 13:24	

LABORATORY CONTROL SAMPLE: 1351829

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/L	.08	0.077	96	80-120	
Barium	mg/L	.08	0.078	98	80-120	
Cadmium	mg/L	.08	0.077	96	80-120	
Chromium	mg/L	.08	0.081	102	80-120	
Cobalt	mg/L	.08	0.079	99	80-120	
Copper	mg/L	.08	0.086	108	80-120	
Iron	mg/L	1	1.0	102	80-120	
Lead	mg/L	.08	0.077	96	80-120	
Manganese	mg/L	.08	0.082	102	80-120	
Nickel	mg/L	.08	0.082	103	80-120	
Selenium	mg/L	.08	0.077	97	80-120	
Silver	mg/L	.08	0.083	103	80-120	
Thallium	mg/L	.08	0.078	98	80-120	
Vanadium	mg/L	.08	0.080	100	80-120	
Zinc	mg/L	.08	0.077	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1351830      1351831

Parameter	Units	92140863001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Arsenic	mg/L	5.7 ug/L	.08	.08	0.10	0.092	121	108	75-125	11	20	

Date: 12/19/2012 04:32 PM

### REPORT OF LABORATORY ANALYSIS

Page 57 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

### QUALITY CONTROL DATA

Project: Bozeman Landfill

Pace Project No.: 10214636

Parameter	Units	92140863001		MS		MSD		MS		MSD		% Rec	Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec							
Barium	mg/L	251	.08	.08	0.39	0.35	175	122	75-125	11	20	M1				
		ug/L														
Cadmium	mg/L	ND	.08	.08	0.095	0.084	118	105	75-125	12	20					
Chromium	mg/L	4.5 ug/L	.08	.08	0.084	0.087	100	103	75-125	3	20					
Cobalt	mg/L	2.3 ug/L	.08	.08	0.098	0.090	120	109	75-125	9	20					
Copper	mg/L	1.8 ug/L	.08	.08	0.086	0.088	106	108	75-125	2	20					
Iron	mg/L	153000	1	1	153	151	25	-125	75-125	1	20	M6				
		ug/L														
Lead	mg/L	1.4 ug/L	.08	.08	0.093	0.085	115	104	75-125	10	20					
Manganese	mg/L	1050	.08	.08	1.1	1.2	111	136	75-125	2	20	M6				
		ug/L														
Nickel	mg/L	1.7 ug/L	.08	.08	0.098	0.090	120	111	75-125	8	20					
Selenium	mg/L	1.2 ug/L	.08	.08	0.094	0.087	115	107	75-125	7	20					
Silver	mg/L	ND	.08	.08	0.018	0.016	23	20	75-125	13	20	M1				
Thallium	mg/L	ND	.08	.08	0.088	0.081	109	101	75-125	8	20					
Vanadium	mg/L	13.4	.08	.08	0.094	0.094	101	101	75-125	.4	20					
		ug/L														
Zinc	mg/L	5.7 ug/L	.08	.08	0.10	0.091	120	107	75-125	11	20					

### QUALITY CONTROL DATA

Project: Bozeman Landfill

Pace Project No.: 10214636

QC Batch: MPRP/36815

Analysis Method: EPA 6020

QC Batch Method: EPA 3020

Analysis Description: 6020 MET Dissolved

Associated Lab Samples: 10214636002, 10214636003, 10214636004, 10214636005, 10214636006, 10214636007, 10214636008, 10214636009, 10214636010, 10214636011, 10214636012, 10214636013, 10214636014, 10214636015, 10214636017, 10214636019

METHOD BLANK: 1347975

Matrix: Water

Associated Lab Samples: 10214636002, 10214636003, 10214636004, 10214636005, 10214636006, 10214636007, 10214636008, 10214636009, 10214636010, 10214636011, 10214636012, 10214636013, 10214636014, 10214636015, 10214636017, 10214636019

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Iron, Dissolved	mg/L	<0.010	0.050	12/12/12 22:16	
Manganese, Dissolved	mg/L	<0.00025	0.00050	12/12/12 22:16	

LABORATORY CONTROL SAMPLE: 1347976

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Dissolved	mg/L	1	1.0	102	80-120	
Manganese, Dissolved	mg/L	.08	0.080	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1348658 1348659

Parameter	Units	10214636002		MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	
Iron, Dissolved	mg/L	<0.010	1	1	0.99	1.0	99	100	75-125	1	20	
Manganese, Dissolved	mg/L	<0.00025	.08	.08	0.078	0.078	97	97	75-125	.6	20	

### QUALITY CONTROL DATA

Project: Bozeman Landfill

Pace Project No.: 10214636

QC Batch: MSV/22395 Analysis Method: EPA 8260B  
 QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
 Associated Lab Samples: 10214636001, 10214636002, 10214636003, 10214636004, 10214636005, 10214636006, 10214636007,  
 10214636008, 10214636009, 10214636010, 10214636011, 10214636012, 10214636013, 10214636014,  
 10214636015, 10214636016, 10214636017, 10214636018, 10214636019, 10214636020

METHOD BLANK: 1348536 Matrix: Water

Associated Lab Samples: 10214636001, 10214636002, 10214636003, 10214636004, 10214636005, 10214636006, 10214636007,  
 10214636008, 10214636009, 10214636010, 10214636011, 10214636012, 10214636013, 10214636014,  
 10214636015, 10214636016, 10214636017, 10214636018, 10214636019, 10214636020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.082	0.50	12/12/12 00:40	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	12/12/12 00:40	
1,1,2,2-Tetrachloroethane	ug/L	<0.075	0.50	12/12/12 00:40	
1,1,2-Trichloroethane	ug/L	<0.12	0.50	12/12/12 00:40	
1,1-Dichloroethane	ug/L	<0.072	0.50	12/12/12 00:40	
1,1-Dichloroethene	ug/L	<0.16	0.50	12/12/12 00:40	
1,2,3-Trichloropropane	ug/L	<0.22	4.0	12/12/12 00:40	
1,2-Dibromo-3-chloropropane	ug/L	<0.80	4.0	12/12/12 00:40	
1,2-Dibromoethane (EDB)	ug/L	<0.10	0.50	12/12/12 00:40	
1,2-Dichlorobenzene	ug/L	<0.25	0.50	12/12/12 00:40	
1,2-Dichloroethane	ug/L	<0.053	0.50	12/12/12 00:40	
1,2-Dichloropropane	ug/L	<0.12	4.0	12/12/12 00:40	
1,4-Dichlorobenzene	ug/L	<0.25	0.50	12/12/12 00:40	
2-Butanone (MEK)	ug/L	<2.0	4.0	12/12/12 00:40	
2-Hexanone	ug/L	<2.0	4.0	12/12/12 00:40	
4-Methyl-2-pentanone (MIBK)	ug/L	<2.0	4.0	12/12/12 00:40	
Acetone	ug/L	<12.5	25.0	12/12/12 00:40	
Acrylonitrile	ug/L	<5.0	10.0	12/12/12 00:40	
Benzene	ug/L	<0.047	0.50	12/12/12 00:40	
Bromochloromethane	ug/L	<0.10	1.0	12/12/12 00:40	
Bromodichloromethane	ug/L	<0.066	0.50	12/12/12 00:40	
Bromoform	ug/L	<2.0	4.0	12/12/12 00:40	
Bromomethane	ug/L	0.42J	4.0	12/12/12 00:40	
Carbon disulfide	ug/L	<0.50	1.0	12/12/12 00:40	
Carbon tetrachloride	ug/L	<0.094	1.0	12/12/12 00:40	
Chlorobenzene	ug/L	<0.071	1.0	12/12/12 00:40	
Chloroethane	ug/L	<0.31	1.0	12/12/12 00:40	
Chloroform	ug/L	<0.25	0.50	12/12/12 00:40	
Chloromethane	ug/L	<0.13	1.0	12/12/12 00:40	
cis-1,2-Dichloroethene	ug/L	<0.080	0.50	12/12/12 00:40	
cis-1,3-Dichloropropene	ug/L	<0.18	0.50	12/12/12 00:40	
Dibromochloromethane	ug/L	<0.084	0.50	12/12/12 00:40	
Dibromomethane	ug/L	<0.089	0.50	12/12/12 00:40	
Dichlorodifluoromethane	ug/L	<0.20	1.0	12/12/12 00:40	
Ethylbenzene	ug/L	<0.078	0.50	12/12/12 00:40	
Iodomethane	ug/L	<0.50	4.0	12/12/12 00:40	
Methylene Chloride	ug/L	<2.0	4.0	12/12/12 00:40	
Styrene	ug/L	<0.075	0.50	12/12/12 00:40	
Tetrachloroethene	ug/L	<0.16	0.50	12/12/12 00:40	

### QUALITY CONTROL DATA

Project: Bozeman Landfill

Pace Project No.: 10214636

METHOD BLANK: 1348536

Matrix: Water

Associated Lab Samples: 10214636001, 10214636002, 10214636003, 10214636004, 10214636005, 10214636006, 10214636007, 10214636008, 10214636009, 10214636010, 10214636011, 10214636012, 10214636013, 10214636014, 10214636015, 10214636016, 10214636017, 10214636018, 10214636019, 10214636020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Toluene	ug/L	<0.065	0.50	12/12/12 00:40	
trans-1,2-Dichloroethene	ug/L	<0.14	0.50	12/12/12 00:40	
trans-1,3-Dichloropropene	ug/L	<0.18	0.50	12/12/12 00:40	
trans-1,4-Dichloro-2-butene	ug/L	<0.27	10.0	12/12/12 00:40	
Trichloroethene	ug/L	<0.11	0.50	12/12/12 00:40	
Trichlorofluoromethane	ug/L	<0.11	0.50	12/12/12 00:40	
Vinyl acetate	ug/L	<1.9	10.0	12/12/12 00:40	
Vinyl chloride	ug/L	<0.16	0.40	12/12/12 00:40	
Xylene (Total)	ug/L	<0.15	1.5	12/12/12 00:40	
1,2-Dichloroethane-d4 (S)	%	100	75-125	12/12/12 00:40	
4-Bromofluorobenzene (S)	%	100	75-125	12/12/12 00:40	
Dibromofluoromethane (S)	%	99	75-125	12/12/12 00:40	
Toluene-d8 (S)	%	101	75-125	12/12/12 00:40	

LABORATORY CONTROL SAMPLE: 1348537

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	19.8	99	75-125	
1,1,1-Trichloroethane	ug/L	20	19.2	96	75-125	
1,1,2,2-Tetrachloroethane	ug/L	20	19.0	95	70-125	
1,1,2-Trichloroethane	ug/L	20	20.9	105	75-125	
1,1-Dichloroethane	ug/L	20	19.7	98	73-125	
1,1-Dichloroethene	ug/L	20	19.3	97	68-125	
1,2,3-Trichloropropane	ug/L	20	20.2	101	74-125	
1,2-Dibromo-3-chloropropane	ug/L	20	20.2	101	68-128	
1,2-Dibromoethane (EDB)	ug/L	20	20.2	101	71-125	
1,2-Dichlorobenzene	ug/L	20	19.6	98	75-125	
1,2-Dichloroethane	ug/L	20	19.9	99	75-125	
1,2-Dichloropropane	ug/L	20	19.2	96	75-125	
1,4-Dichlorobenzene	ug/L	20	19.3	96	73-125	
2-Butanone (MEK)	ug/L	20	20.2	101	45-128	
2-Hexanone	ug/L	20	16.6	83	64-126	
4-Methyl-2-pentanone (MIBK)	ug/L	20	20.1	100	66-130	
Acetone	ug/L	50	49.0	98	52-128	
Acrylonitrile	ug/L	200	202	101	73-125	
Benzene	ug/L	20	19.0	95	74-125	
Bromochloromethane	ug/L	20	19.7	99	75-125	
Bromodichloromethane	ug/L	20	19.1	96	75-125	
Bromoform	ug/L	20	20.0	100	70-128	
Bromomethane	ug/L	20	24.1	121	59-150	
Carbon disulfide	ug/L	20	18.7	93	67-125	
Carbon tetrachloride	ug/L	20	18.7	93	76-125	
Chlorobenzene	ug/L	20	18.7	94	75-125	
Chloroethane	ug/L	20	21.5	108	74-125	

Date: 12/19/2012 04:32 PM

### REPORT OF LABORATORY ANALYSIS

Page 61 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

### QUALITY CONTROL DATA

Project: Bozeman Landfill

Pace Project No.: 10214636

LABORATORY CONTROL SAMPLE: 1348537

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloroform	ug/L	20	19.5	97	75-125	
Chloromethane	ug/L	20	21.6	108	74-125	
cis-1,2-Dichloroethene	ug/L	20	19.4	97	75-125	
cis-1,3-Dichloropropene	ug/L	20	19.0	95	75-125	
Dibromochloromethane	ug/L	20	19.8	99	75-125	
Dibromomethane	ug/L	20	19.3	96	74-125	
Dichlorodifluoromethane	ug/L	20	20.1	100	64-135	
Ethylbenzene	ug/L	20	18.6	93	75-125	
Iodomethane	ug/L	20	16.1	80	61-140	
Methylene Chloride	ug/L	20	19.8	99	69-125	
Styrene	ug/L	20	19.7	98	74-125	
Tetrachloroethene	ug/L	20	19.1	96	69-129	
Toluene	ug/L	20	18.6	93	75-125	
trans-1,2-Dichloroethene	ug/L	20	19.6	98	73-125	
trans-1,3-Dichloropropene	ug/L	20	20.0	100	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	48.8	98	75-125	
Trichloroethene	ug/L	20	19.2	96	69-125	
Trichlorofluoromethane	ug/L	20	21.3	107	75-131	
Vinyl acetate	ug/L	20	18.8	94	75-125	
Vinyl chloride	ug/L	20	21.6	108	71-125	
Xylene (Total)	ug/L	60	57.2	95	75-125	
1,2-Dichloroethane-d4 (S)	%			102	75-125	
4-Bromofluorobenzene (S)	%			100	75-125	
Dibromofluoromethane (S)	%			101	75-125	
Toluene-d8 (S)	%			100	75-125	

MATRIX SPIKE SAMPLE: 1348538

Parameter	Units	10214636001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.082	20	19.8	99	75-125	
1,1,1-Trichloroethane	ug/L	<0.15	20	21.1	105	75-138	
1,1,2,2-Tetrachloroethane	ug/L	<0.075	20	19.7	98	59-136	
1,1,2-Trichloroethane	ug/L	<0.12	20	20.7	104	75-125	
1,1-Dichloroethane	ug/L	<0.072	20	20.6	103	75-134	
1,1-Dichloroethene	ug/L	<0.16	20	21.3	107	75-140	
1,2,3-Trichloropropane	ug/L	<0.22	20	19.7	99	68-130	
1,2-Dibromo-3-chloropropane	ug/L	<0.80	20	19.2	96	64-133	
1,2-Dibromoethane (EDB)	ug/L	<0.10	20	19.9	99	75-125	
1,2-Dichlorobenzene	ug/L	<0.25	20	19.5	97	75-125	
1,2-Dichloroethane	ug/L	<0.053	20	19.5	98	72-133	
1,2-Dichloropropane	ug/L	<0.12	20	19.5	97	75-125	
1,4-Dichlorobenzene	ug/L	<0.25	20	19.3	97	75-125	
2-Butanone (MEK)	ug/L	<2.0	20	19.7	98	56-128	
2-Hexanone	ug/L	<2.0	20	15.3	76	64-126	
4-Methyl-2-pentanone (MIBK)	ug/L	<2.0	20	19.7	99	66-125	
Acetone	ug/L	<12.5	50	48.5	97	52-128	
Acrylonitrile	ug/L	<5.0	200	198	99	58-150	

Date: 12/19/2012 04:32 PM

### REPORT OF LABORATORY ANALYSIS

Page 62 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..



### QUALITY CONTROL DATA

Project: Bozeman Landfill

Pace Project No.: 10214636

MATRIX SPIKE SAMPLE: 1348538		10214636001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Benzene	ug/L	<0.047	20	20.1	100	75-136	
Bromochloromethane	ug/L	<0.10	20	19.6	98	75-128	
Bromodichloromethane	ug/L	<0.066	20	19.3	97	75-127	
Bromoform	ug/L	<2.0	20	19.4	97	63-132	
Bromomethane	ug/L	0.37J	20	25.7	127	59-150	
Carbon disulfide	ug/L	<0.50	20	20.8	104	53-128	
Carbon tetrachloride	ug/L	<0.094	20	20.9	104	75-144	
Chlorobenzene	ug/L	<0.071	20	19.3	96	75-125	
Chloroethane	ug/L	<0.31	20	23.3	117	69-150	
Chloroform	ug/L	<0.25	20	20.2	101	75-128	
Chloromethane	ug/L	<0.13	20	23.4	117	73-144	
cis-1,2-Dichloroethene	ug/L	0.15J	20	20.5	102	75-133	
cis-1,3-Dichloropropene	ug/L	<0.18	20	19.3	97	75-125	
Dibromochloromethane	ug/L	<0.084	20	19.6	98	75-125	
Dibromomethane	ug/L	<0.089	20	19.2	96	75-127	
Dichlorodifluoromethane	ug/L	<0.20	20	27.0	135	75-150	
Ethylbenzene	ug/L	<0.078	20	19.4	97	75-125	
Iodomethane	ug/L	<0.50	20	17.7	88	75-150	
Methylene Chloride	ug/L	<2.0	20	20.3	101	56-130	
Styrene	ug/L	<0.075	20	18.2	91	30-147	
Tetrachloroethene	ug/L	1.1	20	21.6	102	75-135	
Toluene	ug/L	0.13J	20	19.3	96	75-125	
trans-1,2-Dichloroethene	ug/L	<0.14	20	20.7	104	74-140	
trans-1,3-Dichloropropene	ug/L	<0.18	20	19.8	99	70-125	
trans-1,4-Dichloro-2-butene	ug/L	<0.27	50	47.6	95	49-135	
Trichloroethene	ug/L	0.14J	20	20.0	99	75-133	
Trichlorofluoromethane	ug/L	<0.11	20	25.7	129	75-150	
Vinyl acetate	ug/L	<1.9	20	21.6	108	50-150	
Vinyl chloride	ug/L	<0.16	20	24.4	122	75-150	
Xylene (Total)	ug/L	<0.15	60	58.9	98	75-125	
1,2-Dichloroethane-d4 (S)	%				103	75-125	
4-Bromofluorobenzene (S)	%				99	75-125	
Dibromofluoromethane (S)	%				102	75-125	
Toluene-d8 (S)	%				99	75-125	

SAMPLE DUPLICATE: 1348539

Parameter	Units	10214636002	Dup	RPD	Max	Qualifiers
		Result	Result		RPD	
1,1,1,2-Tetrachloroethane	ug/L	<0.082	<0.082		30	
1,1,1-Trichloroethane	ug/L	<0.15	<0.15		30	
1,1,2,2-Tetrachloroethane	ug/L	<0.075	<0.075		30	
1,1,2-Trichloroethane	ug/L	<0.12	<0.12		30	
1,1-Dichloroethane	ug/L	0.14J	0.11J		30	
1,1-Dichloroethene	ug/L	<0.16	<0.16		30	
1,2,3-Trichloropropane	ug/L	<0.22	<0.22		30	
1,2-Dibromo-3-chloropropane	ug/L	<0.80	<0.80		30	
1,2-Dibromoethane (EDB)	ug/L	<0.10	<0.10		30	

Date: 12/19/2012 04:32 PM

### REPORT OF LABORATORY ANALYSIS

Page 63 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

### QUALITY CONTROL DATA

Project: Bozeman Landfill

Pace Project No.: 10214636

SAMPLE DUPLICATE: 1348539

Parameter	Units	10214636002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2-Dichlorobenzene	ug/L	<0.25	<0.25		30	
1,2-Dichloroethane	ug/L	<0.053	<0.053		30	
1,2-Dichloropropane	ug/L	<0.12	<0.12		30	
1,4-Dichlorobenzene	ug/L	<0.25	<0.25		30	
2-Butanone (MEK)	ug/L	<2.0	<2.0		30	
2-Hexanone	ug/L	<2.0	<2.0		30	
4-Methyl-2-pentanone (MIBK)	ug/L	<2.0	<2.0		30	
Acetone	ug/L	<12.5	<12.5		30	
Acrylonitrile	ug/L	<5.0	<5.0		30	
Benzene	ug/L	<0.047	<0.047		30	
Bromochloromethane	ug/L	<0.10	<0.10		30	
Bromodichloromethane	ug/L	<0.066	<0.066		30	
Bromoform	ug/L	<2.0	<2.0		30	
Bromomethane	ug/L	<0.33	<0.33		30	
Carbon disulfide	ug/L	<0.50	<0.50		30	
Carbon tetrachloride	ug/L	<0.094	<0.094		30	
Chlorobenzene	ug/L	<0.071	<0.071		30	
Chloroethane	ug/L	<0.31	<0.31		30	
Chloroform	ug/L	<0.25	<0.25		30	
Chloromethane	ug/L	<0.13	<0.13		30	
cis-1,2-Dichloroethene	ug/L	1.8	1.8	4	30	
cis-1,3-Dichloropropene	ug/L	<0.18	<0.18		30	
Dibromochloromethane	ug/L	<0.084	<0.084		30	
Dibromomethane	ug/L	<0.089	<0.089		30	
Dichlorodifluoromethane	ug/L	0.73J	0.77J		30	
Ethylbenzene	ug/L	<0.078	<0.078		30	
Iodomethane	ug/L	<0.50	<0.50		30	
Methylene Chloride	ug/L	<2.0	<2.0		30	
Styrene	ug/L	<0.075	<0.075		30	
Tetrachloroethene	ug/L	3.8	3.9	4	30	
Toluene	ug/L	<0.065	<0.065		30	
trans-1,2-Dichloroethene	ug/L	<0.14	<0.14		30	
trans-1,3-Dichloropropene	ug/L	<0.18	<0.18		30	
trans-1,4-Dichloro-2-butene	ug/L	<0.27	<0.27		30	
Trichloroethene	ug/L	0.88	0.85	3	30	
Trichlorofluoromethane	ug/L	<0.11	<0.11		30	
Vinyl acetate	ug/L	<1.9	<1.9		30	
Vinyl chloride	ug/L	<0.16	<0.16		30	
Xylene (Total)	ug/L	<0.15	<0.15		30	
1,2-Dichloroethane-d4 (S)	%	101	101	.08		
4-Bromofluorobenzene (S)	%	101	101	.2		
Dibromofluoromethane (S)	%	99	99	.8		
Toluene-d8 (S)	%	100	101	.3		

### QUALITY CONTROL DATA

Project: Bozeman Landfill  
 Pace Project No.: 10214636

QC Batch: MSV/22435 Analysis Method: EPA 8260B  
 QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
 Associated Lab Samples: 10214636021

METHOD BLANK: 1350276 Matrix: Water  
 Associated Lab Samples: 10214636021

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.082	0.50	12/13/12 21:06	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	12/13/12 21:06	
1,1,2,2-Tetrachloroethane	ug/L	<0.075	0.50	12/13/12 21:06	
1,1,2-Trichloroethane	ug/L	<0.12	0.50	12/13/12 21:06	
1,1-Dichloroethane	ug/L	<0.072	0.50	12/13/12 21:06	
1,1-Dichloroethene	ug/L	<0.16	0.50	12/13/12 21:06	
1,2,3-Trichloropropane	ug/L	<0.22	4.0	12/13/12 21:06	
1,2-Dibromo-3-chloropropane	ug/L	<0.80	4.0	12/13/12 21:06	
1,2-Dibromoethane (EDB)	ug/L	<0.10	0.50	12/13/12 21:06	
1,2-Dichlorobenzene	ug/L	<0.25	0.50	12/13/12 21:06	
1,2-Dichloroethane	ug/L	<0.053	0.50	12/13/12 21:06	
1,2-Dichloropropane	ug/L	<0.12	4.0	12/13/12 21:06	
1,4-Dichlorobenzene	ug/L	<0.25	0.50	12/13/12 21:06	
2-Butanone (MEK)	ug/L	<2.0	4.0	12/13/12 21:06	
2-Hexanone	ug/L	<2.0	4.0	12/13/12 21:06	
4-Methyl-2-pentanone (MIBK)	ug/L	<2.0	4.0	12/13/12 21:06	
Acetone	ug/L	<12.5	25.0	12/13/12 21:06	
Acrylonitrile	ug/L	<5.0	10.0	12/13/12 21:06	
Benzene	ug/L	<0.047	0.50	12/13/12 21:06	
Bromochloromethane	ug/L	<0.10	1.0	12/13/12 21:06	
Bromodichloromethane	ug/L	<0.066	0.50	12/13/12 21:06	
Bromoform	ug/L	<2.0	4.0	12/13/12 21:06	
Bromomethane	ug/L	0.39J	4.0	12/13/12 21:06	
Carbon disulfide	ug/L	<0.50	1.0	12/13/12 21:06	
Carbon tetrachloride	ug/L	<0.094	1.0	12/13/12 21:06	
Chlorobenzene	ug/L	<0.071	1.0	12/13/12 21:06	
Chloroethane	ug/L	<0.31	1.0	12/13/12 21:06	
Chloroform	ug/L	<0.25	0.50	12/13/12 21:06	
Chloromethane	ug/L	<0.13	1.0	12/13/12 21:06	
cis-1,2-Dichloroethene	ug/L	<0.080	0.50	12/13/12 21:06	
cis-1,3-Dichloropropene	ug/L	<0.18	0.50	12/13/12 21:06	
Dibromochloromethane	ug/L	<0.084	4.0	12/13/12 21:06	
Dibromomethane	ug/L	<0.089	0.50	12/13/12 21:06	
Dichlorodifluoromethane	ug/L	<0.20	1.0	12/13/12 21:06	
Ethylbenzene	ug/L	<0.078	0.50	12/13/12 21:06	
Iodomethane	ug/L	4.1J	10.0	12/13/12 21:06	
Methylene Chloride	ug/L	<2.0	4.0	12/13/12 21:06	
Styrene	ug/L	<0.075	0.50	12/13/12 21:06	
Tetrachloroethene	ug/L	<0.16	0.50	12/13/12 21:06	
Toluene	ug/L	<0.065	0.50	12/13/12 21:06	
trans-1,2-Dichloroethene	ug/L	<0.14	0.50	12/13/12 21:06	
trans-1,3-Dichloropropene	ug/L	<0.18	0.50	12/13/12 21:06	
trans-1,4-Dichloro-2-butene	ug/L	<0.27	10.0	12/13/12 21:06	

Date: 12/19/2012 04:32 PM

### REPORT OF LABORATORY ANALYSIS

Page 65 of 80

This report shall not be reproduced, except in full,  
 without the written consent of Pace Analytical Services, Inc..

### QUALITY CONTROL DATA

Project: Bozeman Landfill

Pace Project No.: 10214636

METHOD BLANK: 1350276

Matrix: Water

Associated Lab Samples: 10214636021

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichloroethene	ug/L	<0.11	0.50	12/13/12 21:06	
Trichlorofluoromethane	ug/L	<0.11	0.50	12/13/12 21:06	
Vinyl acetate	ug/L	<1.9	10.0	12/13/12 21:06	
Vinyl chloride	ug/L	<0.16	0.40	12/13/12 21:06	
Xylene (Total)	ug/L	<0.15	1.5	12/13/12 21:06	
1,2-Dichloroethane-d4 (S)	%	99	75-125	12/13/12 21:06	
4-Bromofluorobenzene (S)	%	102	75-125	12/13/12 21:06	
Dibromofluoromethane (S)	%	99	75-125	12/13/12 21:06	
Toluene-d8 (S)	%	100	75-125	12/13/12 21:06	

LABORATORY CONTROL SAMPLE: 1350277

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	19.3	96	75-125	
1,1,1-Trichloroethane	ug/L	20	21.5	107	75-125	
1,1,2,2-Tetrachloroethane	ug/L	20	20.4	102	70-125	
1,1,2-Trichloroethane	ug/L	20	20.8	104	75-125	
1,1-Dichloroethane	ug/L	20	20.8	104	73-125	
1,1-Dichloroethene	ug/L	20	21.1	105	68-125	
1,2,3-Trichloropropane	ug/L	20	20.9	104	74-125	
1,2-Dibromo-3-chloropropane	ug/L	20	20.2	101	68-128	
1,2-Dibromoethane (EDB)	ug/L	20	21.5	108	71-125	
1,2-Dichlorobenzene	ug/L	20	20.9	105	75-125	
1,2-Dichloroethane	ug/L	20	20.6	103	75-125	
1,2-Dichloropropane	ug/L	20	20.8	104	75-125	
1,4-Dichlorobenzene	ug/L	20	20.7	104	73-125	
2-Butanone (MEK)	ug/L	20	20.6	103	45-128	
2-Hexanone	ug/L	20	18.8	94	64-126	
4-Methyl-2-pentanone (MIBK)	ug/L	20	20.8	104	66-130	
Acetone	ug/L	50	48.9	98	52-128	
Acrylonitrile	ug/L	200	212	106	73-125	
Benzene	ug/L	20	20.6	103	74-125	
Bromochloromethane	ug/L	20	20.6	103	75-125	
Bromodichloromethane	ug/L	20	19.4	97	75-125	
Bromoform	ug/L	20	18.4	92	70-128	
Bromomethane	ug/L	20	21.0	105	59-150	
Carbon disulfide	ug/L	20	20.6	103	67-125	
Carbon tetrachloride	ug/L	20	18.3	92	76-125	
Chlorobenzene	ug/L	20	20.8	104	75-125	
Chloroethane	ug/L	20	20.5	102	74-125	
Chloroform	ug/L	20	21.0	105	75-125	
Chloromethane	ug/L	20	20.2	101	74-125	
cis-1,2-Dichloroethene	ug/L	20	21.1	105	75-125	
cis-1,3-Dichloropropene	ug/L	20	19.4	97	75-125	
Dibromochloromethane	ug/L	20	18.4	92	75-125	

Date: 12/19/2012 04:32 PM

### REPORT OF LABORATORY ANALYSIS

Page 66 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

### QUALITY CONTROL DATA

Project: Bozeman Landfill

Pace Project No.: 10214636

LABORATORY CONTROL SAMPLE: 1350277

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromomethane	ug/L	20	20.8	104	74-125	
Dichlorodifluoromethane	ug/L	20	19.8	99	64-135	
Ethylbenzene	ug/L	20	20.0	100	75-125	
Iodomethane	ug/L	20	20.2	101	61-140	
Methylene Chloride	ug/L	20	19.9	99	69-125	
Styrene	ug/L	20	21.0	105	74-125	
Tetrachloroethene	ug/L	20	20.9	105	69-129	
Toluene	ug/L	20	20.4	102	75-125	
trans-1,2-Dichloroethene	ug/L	20	21.0	105	73-125	
trans-1,3-Dichloropropene	ug/L	20	18.8	94	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	51.7	103	75-125	
Trichloroethene	ug/L	20	21.9	109	69-125	
Trichlorofluoromethane	ug/L	20	19.4	97	75-131	
Vinyl acetate	ug/L	20	17.6	88	75-125	
Vinyl chloride	ug/L	20	19.6	98	71-125	
Xylene (Total)	ug/L	60	62.4	104	75-125	
1,2-Dichloroethane-d4 (S)	%			100	75-125	
4-Bromofluorobenzene (S)	%			99	75-125	
Dibromofluoromethane (S)	%			100	75-125	
Toluene-d8 (S)	%			100	75-125	

MATRIX SPIKE SAMPLE: 1350279

Parameter	Units	10214969004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	18.9	94	75-125	
1,1,1-Trichloroethane	ug/L	ND	20	22.2	111	75-138	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20.6	103	59-136	
1,1,2-Trichloroethane	ug/L	ND	20	20.6	103	75-125	
1,1-Dichloroethane	ug/L	ND	20	21.8	109	75-134	
1,1-Dichloroethene	ug/L	ND	20	22.4	112	75-140	
1,2,3-Trichloropropane	ug/L	ND	20	20.1	101	68-130	
1,2-Dibromo-3-chloropropane	ug/L	ND	20	18.5	92	64-133	
1,2-Dibromoethane (EDB)	ug/L	ND	20	20.6	103	75-125	
1,2-Dichlorobenzene	ug/L	ND	20	20.6	103	75-125	
1,2-Dichloroethane	ug/L	ND	20	20.4	102	72-133	
1,2-Dichloropropane	ug/L	ND	20	20.6	103	75-125	
1,4-Dichlorobenzene	ug/L	ND	20	20.7	104	75-125	
2-Butanone (MEK)	ug/L	ND	20	19.7	98	56-128	
2-Hexanone	ug/L	ND	20	17.4	87	64-126	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	20	19.5	98	66-125	
Acetone	ug/L	ND	50	47.9	96	52-128	
Acrylonitrile	ug/L	ND	200	199	99	58-150	
Benzene	ug/L	ND	20	20.4	102	75-136	
Bromochloromethane	ug/L	ND	20	20.5	103	75-128	
Bromodichloromethane	ug/L	ND	20	19.2	96	75-127	
Bromoform	ug/L	ND	20	17.4	87	63-132	
Bromomethane	ug/L	ND	20	21.5	107	59-150	

Date: 12/19/2012 04:32 PM

### REPORT OF LABORATORY ANALYSIS

Page 67 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

### QUALITY CONTROL DATA

Project: Bozeman Landfill

Pace Project No.: 10214636

MATRIX SPIKE SAMPLE: 1350279		10214969004	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Carbon disulfide	ug/L	ND	20	21.9	109	53-128	
Carbon tetrachloride	ug/L	ND	20	19.5	97	75-144	
Chlorobenzene	ug/L	ND	20	21.0	105	75-125	
Chloroethane	ug/L	ND	20	21.1	105	69-150	
Chloroform	ug/L	ND	20	20.9	105	75-128	
Chloromethane	ug/L	ND	20	20.4	102	73-144	
cis-1,2-Dichloroethene	ug/L	ND	20	20.9	104	75-133	
cis-1,3-Dichloropropene	ug/L	ND	20	18.8	94	75-125	
Dibromochloromethane	ug/L	ND	20	18.1	90	75-125	
Dibromomethane	ug/L	ND	20	20.3	102	75-127	
Dichlorodifluoromethane	ug/L	ND	20	24.4	122	75-150	
Ethylbenzene	ug/L	ND	20	20.2	101	75-125	
Iodomethane	ug/L	ND	20	20.5	102	75-150	
Methylene Chloride	ug/L	ND	20	19.3	96	56-130	
Styrene	ug/L	ND	20	20.6	103	30-147	
Tetrachloroethene	ug/L	ND	20	21.5	108	75-135	
Toluene	ug/L	ND	20	20.6	103	75-125	
trans-1,2-Dichloroethene	ug/L	ND	20	21.5	108	74-140	
trans-1,3-Dichloropropene	ug/L	ND	20	18.4	92	70-125	
trans-1,4-Dichloro-2-butene	ug/L	ND	50	49.4	99	49-135	
Trichloroethene	ug/L	ND	20	21.4	107	75-133	
Trichlorofluoromethane	ug/L	ND	20	21.8	109	75-150	
Vinyl acetate	ug/L	ND	20	18.6	93	50-150	
Vinyl chloride	ug/L	ND	20	21.1	105	75-150	
Xylene (Total)	ug/L	ND	60	62.8	105	75-125	
1,2-Dichloroethane-d4 (S)	%				100	75-125	
4-Bromofluorobenzene (S)	%				100	75-125	
Dibromofluoromethane (S)	%				101	75-125	
Toluene-d8 (S)	%				100	75-125	

SAMPLE DUPLICATE: 1350278

Parameter	Units	10214969003	Dup	RPD	Max	Qualifiers
		Result	Result		RPD	
1,1,1,2-Tetrachloroethane	ug/L	ND	<0.082		30	
1,1,1-Trichloroethane	ug/L	ND	<0.15		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	<0.075		30	
1,1,2-Trichloroethane	ug/L	ND	<0.12		30	
1,1-Dichloroethane	ug/L	0.65	<0.072		30	
1,1-Dichloroethene	ug/L	ND	<0.16		30	
1,2,3-Trichloropropane	ug/L	ND	<0.22		30	
1,2-Dibromo-3-chloropropane	ug/L	ND	<0.80		30	
1,2-Dibromoethane (EDB)	ug/L	ND	<0.10		30	
1,2-Dichlorobenzene	ug/L	ND	<0.25		30	
1,2-Dichloroethane	ug/L	ND	<0.053		30	
1,2-Dichloropropane	ug/L	ND	<0.12		30	
1,4-Dichlorobenzene	ug/L	ND	<0.25		30	
2-Butanone (MEK)	ug/L	ND	<2.0		30	

Date: 12/19/2012 04:32 PM

### REPORT OF LABORATORY ANALYSIS

Page 68 of 80

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

### QUALITY CONTROL DATA

Project: Bozeman Landfill

Pace Project No.: 10214636

SAMPLE DUPLICATE: 1350278

Parameter	Units	10214969003 Result	Dup Result	RPD	Max RPD	Qualifiers
2-Hexanone	ug/L	ND	<2.0		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	<2.0		30	
Acetone	ug/L	ND	<12.5		30	
Acrylonitrile	ug/L	ND	<5.0		30	
Benzene	ug/L	ND	<0.047		30	
Bromochloromethane	ug/L	ND	<0.10		30	
Bromodichloromethane	ug/L	ND	<0.066		30	
Bromoform	ug/L	ND	<2.0		30	
Bromomethane	ug/L	ND	<0.33		30	
Carbon disulfide	ug/L	ND	<0.50		30	
Carbon tetrachloride	ug/L	ND	<0.094		30	
Chlorobenzene	ug/L	ND	<0.071		30	
Chloroethane	ug/L	ND	<0.31		30	
Chloroform	ug/L	ND	<0.25		30	
Chloromethane	ug/L	ND	<0.13		30	
cis-1,2-Dichloroethene	ug/L	ND	<0.080		30	
cis-1,3-Dichloropropene	ug/L	ND	<0.18		30	
Dibromochloromethane	ug/L	ND	<0.084		30	
Dibromomethane	ug/L	ND	<0.089		30	
Dichlorodifluoromethane	ug/L	ND	<0.20		30	
Ethylbenzene	ug/L	ND	<0.078		30	
Iodomethane	ug/L	ND	<0.50		30	
Methylene Chloride	ug/L	ND	<2.0		30	
Styrene	ug/L	ND	<0.075		30	
Tetrachloroethene	ug/L	ND	<0.16		30	
Toluene	ug/L	ND	<0.065		30	
trans-1,2-Dichloroethene	ug/L	ND	<0.14		30	
trans-1,3-Dichloropropene	ug/L	ND	<0.18		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	<0.27		30	
Trichloroethene	ug/L	ND	<0.11		30	
Trichlorofluoromethane	ug/L	ND	<0.11		30	
Vinyl acetate	ug/L	ND	<1.9		30	
Vinyl chloride	ug/L	ND	<0.16		30	
Xylene (Total)	ug/L	ND	<0.15		30	
1,2-Dichloroethane-d4 (S)	%	100	99	.5		
4-Bromofluorobenzene (S)	%	100	101	1		
Dibromofluoromethane (S)	%	99	99	.08		
Toluene-d8 (S)	%	100	101	.8		

**QUALITY CONTROL DATA**

Project: Bozeman Landfill

Pace Project No.: 10214636

QC Batch: MT/10889

Analysis Method: SM 2510B

QC Batch Method: SM 2510B

Analysis Description: 2510B Specific Conductance

Associated Lab Samples: 10214636004, 10214636005, 10214636008, 10214636015

METHOD BLANK: 1347958

Matrix: Water

Associated Lab Samples: 10214636004, 10214636005, 10214636008, 10214636015

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Specific Conductance	umhos/cm	<5.0	10.0	12/10/12 12:30	

LABORATORY CONTROL SAMPLE: 1347959

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Specific Conductance	umhos/cm	1000	998	100	90-110	

SAMPLE DUPLICATE: 1347960

Parameter	Units	10214636008 Result	Dup Result	RPD	Max RPD	Qualifiers
Specific Conductance	umhos/cm	1280	1320	3	20	

SAMPLE DUPLICATE: 1347961

Parameter	Units	10214662006 Result	Dup Result	RPD	Max RPD	Qualifiers
Specific Conductance	umhos/cm	2310	2290	.9	20	



**QUALITY CONTROL DATA**

Project: Bozeman Landfill  
Pace Project No.: 10214636

QC Batch: MT/10960 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 10214636002, 10214636003, 10214636004, 10214636005, 10214636006, 10214636007, 10214636008, 10214636009, 10214636010, 10214636011, 10214636012, 10214636013, 10214636014, 10214636015, 10214636017, 10214636018, 10214636019

METHOD BLANK: 1352783 Matrix: Water

Associated Lab Samples: 10214636002, 10214636003, 10214636004, 10214636005, 10214636006, 10214636007, 10214636008, 10214636009, 10214636010, 10214636011, 10214636012, 10214636013, 10214636014, 10214636015, 10214636017, 10214636018, 10214636019

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.18	1.0	12/17/12 13:45	
Sulfate	mg/L	<0.12	1.0	12/17/12 13:45	

LABORATORY CONTROL SAMPLE: 1352784

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	10	9.2	92	90-110	
Sulfate	mg/L	10	9.7	97	90-110	

MATRIX SPIKE SAMPLE: 1352785

Parameter	Units	10214636002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	25.4	20	45.9	103	80-120	
Sulfate	mg/L	15.0	20	34.4	97	80-120	

MATRIX SPIKE SAMPLE: 1352787

Parameter	Units	10214636004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5.0	10	14.7	97	80-120	
Sulfate	mg/L	9.1	10	19.3	102	80-120	

SAMPLE DUPLICATE: 1352786

Parameter	Units	10214636003 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	36.2	36.3	.3	20	
Sulfate	mg/L	17.8	17.8	.2	20	

SAMPLE DUPLICATE: 1352788

Parameter	Units	10214636005 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	18.2	18.2	.01	20	
Sulfate	mg/L	13.1	12.9	2	20	

### QUALITY CONTROL DATA

Project: Bozeman Landfill  
Pace Project No.: 10214636

QC Batch: MT/10914 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10214636001, 10214636002, 10214636003, 10214636004, 10214636005, 10214636006, 10214636007, 10214636008

METHOD BLANK: 1349415 Matrix: Water  
Associated Lab Samples: 10214636001, 10214636002, 10214636003, 10214636004, 10214636005, 10214636006, 10214636007, 10214636008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0044	0.010	12/12/12 14:53	

METHOD BLANK: 1349417 Matrix: Water  
Associated Lab Samples: 10214636001, 10214636002, 10214636003, 10214636004, 10214636005, 10214636006, 10214636007, 10214636008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0044	0.010	12/12/12 14:56	

LABORATORY CONTROL SAMPLE: 1349416

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	.33	0.32	96	90-110	

LABORATORY CONTROL SAMPLE: 1349418

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	.33	0.31	93	90-110	

MATRIX SPIKE SAMPLE: 1349420

Parameter	Units	10214500004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	0.85	.33	1.2	90	90-110	

MATRIX SPIKE SAMPLE: 1349422

Parameter	Units	10214636006 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	0.85	.33	1.1	75	90-110	M6

**QUALITY CONTROL DATA**

Project: Bozeman Landfill

Pace Project No.: 10214636

SAMPLE DUPLICATE: 1349419

Parameter	Units	10214500001 Result	Dup Result	RPD	Max RPD	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	0.080	0.090	12	20	

SAMPLE DUPLICATE: 1349421

Parameter	Units	10214636003 Result	Dup Result	RPD	Max RPD	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1.8	1.8	0	20	

### QUALITY CONTROL DATA

Project: Bozeman Landfill  
Pace Project No.: 10214636

QC Batch: MT/10915 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10214636009, 10214636010, 10214636011, 10214636012, 10214636013, 10214636014, 10214636015, 10214636017, 10214636018

METHOD BLANK: 1349427 Matrix: Water  
Associated Lab Samples: 10214636009, 10214636010, 10214636011, 10214636012, 10214636013, 10214636014, 10214636015, 10214636017, 10214636018

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0044	0.010	12/12/12 15:49	

METHOD BLANK: 1349429 Matrix: Water  
Associated Lab Samples: 10214636009, 10214636010, 10214636011, 10214636012, 10214636013, 10214636014, 10214636015, 10214636017, 10214636018

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0044	0.010	12/12/12 15:51	

LABORATORY CONTROL SAMPLE: 1349428

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	.33	0.33	99	90-110	

LABORATORY CONTROL SAMPLE: 1349430

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	.33	0.33	99	90-110	

MATRIX SPIKE SAMPLE: 1349432

Parameter	Units	10214636015 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	5.4	.33	5.6	60	90-110	M6

MATRIX SPIKE SAMPLE: 1349434

Parameter	Units	10214810001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	7.4	.33	7.4	0	90-110	M6

**QUALITY CONTROL DATA**

Project: Bozeman Landfill

Pace Project No.: 10214636

SAMPLE DUPLICATE: 1349431

Parameter	Units	10214636012 Result	Dup Result	RPD	Max RPD	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	7.8	7.8	0	20	

SAMPLE DUPLICATE: 1349433

Parameter	Units	10214662007 Result	Dup Result	RPD	Max RPD	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	11.5	10.5	9	20	

**QUALITY CONTROL DATA**

Project: Bozeman Landfill  
Pace Project No.: 10214636

QC Batch: MT/10952      Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2      Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10214636019

METHOD BLANK: 1352487      Matrix: Water  
Associated Lab Samples: 10214636019

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0044	0.010	12/17/12 11:34	

LABORATORY CONTROL SAMPLE: 1352488

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	.33	0.31	93	90-110	

MATRIX SPIKE SAMPLE: 1352489

Parameter	Units	10214636019 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0044	.33	0.32	96	90-110	

SAMPLE DUPLICATE: 1352490

Parameter	Units	10214665001 Result	Dup Result	RPD	Max RPD	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.3	2.5	8	20	

**QUALITY CONTROL DATA**

Project: Bozeman Landfill

Pace Project No.: 10214636

QC Batch: MT/10885 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 10214636004, 10214636005, 10214636008, 10214636015

LABORATORY CONTROL SAMPLE: 1347309

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	5	5.0	100	98-102	H6

SAMPLE DUPLICATE: 1347310

Parameter	Units	10214662007 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.6	7.7	.3	3	H6

SAMPLE DUPLICATE: 1347311

Parameter	Units	10214636015 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.3	7.3	.1	3	H6

## QUALIFIERS

Project: Bozeman Landfill

Pace Project No.: 10214636

---

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

H6 Analysis initiated outside of the 15 minute EPA recommended holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.



**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Bozeman Landfill

Pace Project No.: 10214636

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10214636018	VET WELL	EPA 3020	MPRP/36912	EPA 6020	ICPM/14845
10214636002	LF-3	EPA 3020	MPRP/36815	EPA 6020	ICPM/14789
10214636003	MW-4	EPA 3020	MPRP/36815	EPA 6020	ICPM/14789
10214636004	MW-5	EPA 3020	MPRP/36815	EPA 6020	ICPM/14789
10214636005	MW-6	EPA 3020	MPRP/36815	EPA 6020	ICPM/14789
10214636006	MW-6B	EPA 3020	MPRP/36815	EPA 6020	ICPM/14789
10214636007	MW-7A	EPA 3020	MPRP/36815	EPA 6020	ICPM/14789
10214636008	MW-8A	EPA 3020	MPRP/36815	EPA 6020	ICPM/14789
10214636009	MW-8C	EPA 3020	MPRP/36815	EPA 6020	ICPM/14789
10214636010	MW-9A	EPA 3020	MPRP/36815	EPA 6020	ICPM/14789
10214636011	MW-10	EPA 3020	MPRP/36815	EPA 6020	ICPM/14789
10214636012	MW-11	EPA 3020	MPRP/36815	EPA 6020	ICPM/14789
10214636013	MW-12	EPA 3020	MPRP/36815	EPA 6020	ICPM/14789
10214636014	MW-13	EPA 3020	MPRP/36815	EPA 6020	ICPM/14789
10214636015	MW-15	EPA 3020	MPRP/36815	EPA 6020	ICPM/14789
10214636017	McILHATTEN SEEP	EPA 3020	MPRP/36815	EPA 6020	ICPM/14789
10214636019	DUP	EPA 3020	MPRP/36815	EPA 6020	ICPM/14789
10214636001	LF-2	EPA 8260B	MSV/22395		
10214636002	LF-3	EPA 8260B	MSV/22395		
10214636003	MW-4	EPA 8260B	MSV/22395		
10214636004	MW-5	EPA 8260B	MSV/22395		
10214636005	MW-6	EPA 8260B	MSV/22395		
10214636006	MW-6B	EPA 8260B	MSV/22395		
10214636007	MW-7A	EPA 8260B	MSV/22395		
10214636008	MW-8A	EPA 8260B	MSV/22395		
10214636009	MW-8C	EPA 8260B	MSV/22395		
10214636010	MW-9A	EPA 8260B	MSV/22395		
10214636011	MW-10	EPA 8260B	MSV/22395		
10214636012	MW-11	EPA 8260B	MSV/22395		
10214636013	MW-12	EPA 8260B	MSV/22395		
10214636014	MW-13	EPA 8260B	MSV/22395		
10214636015	MW-15	EPA 8260B	MSV/22395		
10214636016	MW-16	EPA 8260B	MSV/22395		
10214636017	McILHATTEN SEEP	EPA 8260B	MSV/22395		
10214636018	VET WELL	EPA 8260B	MSV/22395		
10214636019	DUP	EPA 8260B	MSV/22395		
10214636020	TRIP BLANK	EPA 8260B	MSV/22395		
10214636021	SHOP WELL	EPA 8260B	MSV/22435		
10214636004	MW-5	SM 2510B	MT/10889		
10214636005	MW-6	SM 2510B	MT/10889		
10214636008	MW-8A	SM 2510B	MT/10889		
10214636015	MW-15	SM 2510B	MT/10889		
10214636002	LF-3	EPA 300.0	MT/10960		
10214636003	MW-4	EPA 300.0	MT/10960		
10214636004	MW-5	EPA 300.0	MT/10960		
10214636005	MW-6	EPA 300.0	MT/10960		

### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bozeman Landfill  
Pace Project No.: 10214636

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10214636006	MW-6B	EPA 300.0	MT/10960		
10214636007	MW-7A	EPA 300.0	MT/10960		
10214636008	MW-8A	EPA 300.0	MT/10960		
10214636009	MW-8C	EPA 300.0	MT/10960		
10214636010	MW-9A	EPA 300.0	MT/10960		
10214636011	MW-10	EPA 300.0	MT/10960		
10214636012	MW-11	EPA 300.0	MT/10960		
10214636013	MW-12	EPA 300.0	MT/10960		
10214636014	MW-13	EPA 300.0	MT/10960		
10214636015	MW-15	EPA 300.0	MT/10960		
10214636017	McILHATTEN SEEP	EPA 300.0	MT/10960		
10214636018	VET WELL	EPA 300.0	MT/10960		
10214636019	DUP	EPA 300.0	MT/10960		
10214636001	LF-2	EPA 353.2	MT/10914		
10214636002	LF-3	EPA 353.2	MT/10914		
10214636003	MW-4	EPA 353.2	MT/10914		
10214636004	MW-5	EPA 353.2	MT/10914		
10214636005	MW-6	EPA 353.2	MT/10914		
10214636006	MW-6B	EPA 353.2	MT/10914		
10214636007	MW-7A	EPA 353.2	MT/10914		
10214636008	MW-8A	EPA 353.2	MT/10914		
10214636009	MW-8C	EPA 353.2	MT/10915		
10214636010	MW-9A	EPA 353.2	MT/10915		
10214636011	MW-10	EPA 353.2	MT/10915		
10214636012	MW-11	EPA 353.2	MT/10915		
10214636013	MW-12	EPA 353.2	MT/10915		
10214636014	MW-13	EPA 353.2	MT/10915		
10214636015	MW-15	EPA 353.2	MT/10915		
10214636017	McILHATTEN SEEP	EPA 353.2	MT/10915		
10214636018	VET WELL	EPA 353.2	MT/10915		
10214636019	DUP	EPA 353.2	MT/10952		
10214636004	MW-5	SM 4500-H+B	MT/10885		
10214636005	MW-6	SM 4500-H+B	MT/10885		
10214636008	MW-8A	SM 4500-H+B	MT/10885		
10214636015	MW-15	SM 4500-H+B	MT/10885		

# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.



Page: 1 of 2  
 1628723

**Section A**  
 Required Client Information:  
 Company: Tetra Tech  
 Address: 851 Bridger Dr., Ste 6  
Bozeman, MT 59718  
 Email To: mark.ceasari@tetratech.com  
 Phone: 532-8780 Fax:  
 Requested Due Date/TAT:

**Section B**  
 Required Project Information:  
 Report To:  
 Copy To:  
 Project Name: Bozeman Landfill  
 Project Number:

**Section C**  
 Invoice Information:  
 Attention: Mark Pearson  
 Company Name:  
 Address:  
 Pace Quote Reference:  
 Pace Project Manager: Samantha Rupe  
 Pace Profile #:  
 REGULATORY AGENCY  
 NPDES  GROUND WATER  DRINKING WATER  
 UST  RCRA  OTHER  
 Site Location STATE: MT

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE DW Drinking Water WT Waste Water WW Waste Water Product P Product SL Soil/Solid OL Oil WP Wipe AR Air TS Tissue OT Other	COLLECTED		SAMPLE TYPE (G=GRAB C=COMP)	MATRIX CODE (see valid codes to left)	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives Unpreserved H <sub>2</sub> O <sub>2</sub> HNO <sub>3</sub> HCl NaOH Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Methanol Other	Requested Analysis: Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No. / Lab I.D.
			COMPOSITE START	COMPOSITE END/GRAB								
1	LF-2		DATE: 12/6	TIME: 1145			4					001
2	LF-3		DATE: 12/6	TIME: 1035			6					002
3	MW-4		DATE: 12/4	TIME: 1530			6					003
4	MW-5		DATE: 12/4	TIME: 1020			7					004
5	MW-6		DATE: 12/4	TIME: 1240			7					005
6	MW-6B		DATE: 12/4	TIME: 1125			6					006
7	MW-7A		DATE: 12/5	TIME: 1230			6					007
8	MW-8A		DATE: 12/4	TIME: 1415			7					008
9	MW-8C		DATE: 12/4	TIME: 1350			6					009
10	MW-9A		DATE: 12/4	TIME: 1545			1					010
11	MW-10		DATE: 12/5	TIME: 950			1					011
12	MW-11		DATE: 12/5	TIME: 1430			1					012
ADDITIONAL COMMENTS: <u>3 coolers</u> <u>Mark F. Pearson</u> 12/6/12 1300 Fed Ex <u>UPS</u> 12/7/12 1010 <u>Nemo C. Gable/Spec</u> 12/7/12 1010 0104 Relinquished by Affiliation: <u>Mark F. Pearson</u> 12/6/12 1300 Fed Ex Relinquished by Affiliation: <u>Nemo C. Gable/Spec</u> 12/7/12 1010 0104 Temp in °C: <u>0/0.4</u> <u>0/0.4</u> <u>0/0.4</u> <u>0/0.4</u>												
SAMPLE CONDITIONS Received on Ice (Y/N) <u>Y</u> Custody Sealed Cooler (Y/N) <u>Y</u> Samples Intact (Y/N) <u>Y</u>												
SAMPLER NAME AND SIGNATURE PRINT Name of SAMPLER: <u>Mark Pearson</u> SIGNATURE of SAMPLER: <u>Mark Pearson</u> DATE Signed (MM/DD/YY): <u>12/6/12</u>												

ORIGINAL

\*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.



Page: 2 of 2  
 1628722

**Section A**  
 Required Client Information:  
 Company: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Email To: \_\_\_\_\_  
 Phone: \_\_\_\_\_  
 Requested Due Date/TAT: \_\_\_\_\_

**Section B**  
 Required Project Information:  
 Report To: \_\_\_\_\_  
 Copy To: \_\_\_\_\_  
 Project Name: \_\_\_\_\_  
 Project Number: \_\_\_\_\_

**Section C**  
 Invoice Information:  
 Attention: \_\_\_\_\_  
 Company Name: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Pace Quits Reference: \_\_\_\_\_  
 Pace Project Manager: \_\_\_\_\_  
 Pace Profile #: \_\_\_\_\_

**REGULATORY AGENCY**  
 NPDES  GROUND WATER  DRINKING WATER  
 UST  RCRA  OTHER \_\_\_\_\_

Site Location: \_\_\_\_\_  
 STATE: MT

ITEM #	Section D Required Client Information	MATRIX CODE (see valid codes to left)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
			COMPOSITE START	COMPOSITE END/GRAS						
1	MW-12		DATE	TIME		6	Unpreserved			013
2	MW-13		DATE	TIME		6	H <sub>2</sub> SO <sub>4</sub>			014
3	MW-15		DATE	TIME		7	HNO <sub>3</sub>			015
4	MW-16		DATE	TIME		3	NaOH			016
5	McI Hatten Seep		DATE	TIME		6	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>			017
6	Vet Well		DATE	TIME		1	HCl			018
7	Dup		DATE	TIME		2	Methanol			019
8	Trip Blank		DATE	TIME		2	Other			020
9	Shop Well		DATE	TIME		6				021

**ADDITIONAL COMMENTS**  
 3 Corralers

**RELINQUISHED BY / AFFILIATION**  
 Mark F. Pearson  
 URS

**DATE**  
 12/6/12  
 12/7/12

**TIME**  
 1300  
 1010

**ACCEPTED BY / AFFILIATION**  
 Mark Pearson  
 Normal C Corraler/Pace

**DATE**  
 12/7/12

**TIME**  
 1010

**SAMPLE CONDITIONS**  
 Received on: \_\_\_\_\_  
 Ice (Y/N): \_\_\_\_\_  
 Sealed Cooler (Y/N): \_\_\_\_\_  
 Custody (Y/N): \_\_\_\_\_  
 Samples Intact (Y/N): \_\_\_\_\_

Temp in °C: \_\_\_\_\_

**SAMPLER NAME AND SIGNATURE**  
 PRINT Name of SAMPLER: Mark Pearson  
 SIGNATURE of SAMPLER: [Signature]

**DATE SIGNED (MM/DD/YYYY):** 12/6/12

ORIGINAL

\*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.



# FULL ANALYSIS

**TABLE 3**  
**BOZEMAN LANDFILL CONSTITUENT LIST FOR ANALYSIS**  
 adopted in part from: CONSTITUENTS FOR DETECTION MONITORING ARM 17.50.1306  
 Appendix I to 40 CFR Part 258 (July 1, 2008)

<u>Inorganic Constituents:</u>	
<del>Antimony</del> - Removed - Do not analyze	<del>Selenium</del>
<del>Arsenic</del>	<del>Silver</del>
<del>Barium</del>	<del>Thallium</del>
<del>Beryllium</del> - Removed - Do not analyze	<del>Vanadium</del>
<del>Cadmium</del>	<del>Zinc</del>
<del>Chromium</del>	Chloride
<del>Cobalt</del>	Sulfate
<del>Copper</del>	Nitrate + Nitrite as N
<del>Iron</del>	pH
<del>Lead</del>	Specific Conductance
<del>Nickel</del>	
<del>Manganese</del>	

(only in wells MW-5, MW-6, MW-8A, MW-15)  
 (only in wells MW-5, MW-6, MW-8A, MW-15)

<u>Volatile Organic Constituents:</u>	
Acetone	cis-1,3-Dichloropropene
Acrylonitrile	trans-1,3-Dichloropropene
Benzene	Ethylbenzene
Bromochloromethane	2-Hexanone;Methylbutylketone
Bromodichloromethane	Methylbromide;Bromomethane
Bromoform;Tribromomethane	Methylchloride;Chloromethane
Carbondisulfide	Methylenebromide;Dibromomethane
Carbon tetrachloride	Methylenechloride;Dichloromethane
Chlorobenzene	Methylethylketone;MEK;2-Butanone
Chloroethane;Ethylchloride	Methyl iodide;Iodomethane
Chloroform;Trichloromethane	4-Methyl-2-pentanone;Methylisobutylketone
Dichlorodifluoromethane	Styrene
Dibromochloromethane;Chlorodibromomethane	1,1,1,2-Tetrachloroethane
1,2-Dibromo-3-chloropropane; DBCP	1,1,2,2-Tetrachloroethane
1,2-Dibromoethane; Ethylenedibromide; EDB	Tetrachloroethylene;Tetrachloroethene;Perchloroethylene
o-Dichlorobenzene; 1,2-Dichlorobenzene	Toluene
p-Dichlorobenzene; 1,4-Dichlorobenzene	1,1,1-Trichloroethane;Methylchloroform
trans-1,4-Dichloro-2-butene	1,1,2-Trichloroethane
1,1-Dichloroethane;Ethylidenechloride	Trichloroethylene;Trichloroethene
1,2-Dichloroethane;Ethylenedichloride	Trichlorofluoromethane;CFC-11
1,1-Dichloroethylene;1,1-Dichloroethene;Vinylidenechloride	1,2,3-Trichloropropane
cis-1,2-Dichloroethylene;cis-1,2-Dichloroethene	Vinylacetate
trans-1,2-Dichloroethylene;trans-1,2-Dichloroethene	Vinylchloride
1,2-Dichloropropane;Propylenedichloride	Xylenes

*Include Metals For Vet Well  
and analyze as total recoverable concentrations*

**FULL ANALYSIS**

**TABLE 3  
BOZEMAN LANDFILL CONSTITUENT LIST FOR ANALYSIS**  
adopted in part from: CONSTITUENTS FOR DETECTION MONITORING ARM 17.60.1306  
Appendix I to 40 CFR Part 258 (July 1, 2008)

<u>Inorganic Constituents:</u>	
Antimony - Removed - Do not analyze	Selenium
Arsenic	Silver
Barium	Thallium
Beryllium - Removed - Do not analyze	Vanadium
Cadmium	Zinc
Chromium	
Cobalt	Chloride
Copper	Sulfate
Iron	Nitrate + Nitrite as N
Lead	pH
Nickel	Specific Conductance
Manganese	

*(only in wells MW-5, MW-6, MW-8A, MW-15)  
(only in wells MW-5, MW-6, MW-8A, MW-15)*

<u>Volatile Organic Constituents:</u>	
Acetone	cis-1,3-Dichloropropene
Acrylonitrile	trans-1,3-Dichloropropene
Benzene	Ethylbenzene
Bromochloromethane	2-Hexanone;Methylbutylketone
Bromodichloromethane	Methylbromide;Bromomethane
Bromoform;Tribromomethane	Methylchloride;Chloromethane
Carbondsulfide	Methylenebromide;Dibromomethane
Carbontetrachloride	Methylenechloride;Dichloromethane
Chlorobenzene	Methylethylketone;MEK;2-Butanone
Chloroethane;Ethylchloride	Methyliodide;Iodomethane
Chloroform;Trichloromethane	4-Methyl-2-pentanone;Methylisobutylketone
Dichlorodifluoromethane	Styrene
Dibromochloromethane;Chlorodibromomethane	1,1,1,2-Tetrachloroethane
1,2-Dibromo-3-chloropropane; DBCP	1,1,2,2-Tetrachloroethane
1,2-Dibromoethane; Ethylenedibromide; EDB	Tetrachloroethylene;Tetrachloroethene;Perchloroethylene
o-Dichlorobenzene; 1,2-Dichlorobenzene	Toluene
p-Dichlorobenzene; 1,4-Dichlorobenzene	1,1,1-Trichloroethane;Methylchloroform
trans-1,4-Dichloro-2-butene	1,1,2-Trichloroethane
1,1-Dichloroethane;Ethylidenechloride	Trichloroethylene;Trichloroethene
1,2-Dichloroethane;Ethylenedichloride	Trichlorofluoromethane;CFC-11
1,1-Dichloroethylene;1,1-Dichloroethene;Vinylidenechloride	1,2,3-Trichloropropane
cis-1,2-Dichloroethylene;cis-1,2-Dichloroethene	Vinylacetate
trans-1,2-Dichloroethylene;trans-1,2-Dichloroethene	Vinylchloride
1,2-Dichloropropane;Propylenedichloride	Xylenes

**PARTIAL ANALYSIS**

**TABLE 5**  
**BOZEMAN LANDFILL CONSTITUENT LIST FOR ANALYSIS**  
 adopted in part from: **CONSTITUENTS FOR DETECTION MONITORING ARM 17.50.1306**  
 Appendix I to 40 CFR Part 258 (July 1, 2008)

<b>Inorganic Constituents:</b>	
Iron	Chloride
Manganese	Sulfate
	Nitrate + Nitrite as N
	pH (only in wells MW-5, MW-6, MW-8A, MW-15)
	Specific Conductance (only in wells MW-5, MW-6, MW-8A, MW-15)
<b>Volatile Organic Constituents:</b>	
Acetone	cis-1,3-Dichloropropene
Acrylonitrile	trans-1,3-Dichloropropene
Benzene	Ethylbenzene
Bromochloromethane	2-Hexanone;Methylbutylketone
Bromodichloromethane	Methylbromide;Bromomethane
Bromoform;Tribromomethane	Methylchloride;Chloromethane
Carbondisulfide	Methylenebromide;Dibromomethane
Carbontetrachloride	Methylenechloride;Dichloromethane
Chlorobenzene	Methylethylketone;MEK;2-Butanone
Chloroethane;Ethylchloride	Methyliodide;Iodomethane
Chloroform;Trichloromethane	4-Methyl-2-pentanone;Methylisobutylketone
Dichlorodifluoromethane	Styrene
Dibromochloromethane;Chlorodibromomethane	1,1,1,2-Tetrachloroethane
1,2-Dibromo-3-chloropropane; DBCP	1,1,2,2-Tetrachloroethane
1,2-Dibromoethane; Ethylenedibromide; EDB	Tetrachloroethylene;Tetrachloroethene;Perchloroethylene
o-Dichlorobenzene; 1,2-Dichlorobenzene	Toluene
p-Dichlorobenzene; 1,4-Dichlorobenzene	1,1,1-Trichloroethane;Methylchloroform
trans-1,4-Dichloro-2-butene	1,1,2-Trichloroethane
1,1-Dichloroethane;Ethylidenechloride	Trichloroethylene;Trichloroethene
1,2-Dichloroethane;Ethylenedichloride	Trichlorofluoromethane;CFC-11
1,1-Dichloroethylene; 1,1-Dichloroethene;Vinylidenechloride	1,2,3-Trichloropropane
cis-1,2-Dichloroethylene;cis-1,2-Dichloroethene	Vinylacetate
trans-1,2-Dichloroethylene;trans-1,2-Dichloroethene	Vinylchloride
1,2-Dichloropropane;Propylenedichloride	Xylenes





Document Name: Sample Condition Upon Receipt Form

Document Revised: 14Nov2012

Page 1 of 1

Document No.: F-MT-C-184-rev.02

Issuing Authority: Pace Montana Quality Office

Sample Condition Upon Receipt

Client Name:

Project #:

WO#: 10214636



Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace  Other:

Tracking Number: Return Air: 1Z E825 1W 894 383 5 226 / 7406/44086614

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Optional: Proj. Due Date: Proj. Name:

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: absorbent pad Temp Blank?  Yes  No

Thermometer Used:  1383045  135  NA Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read: 0.6; 0.4; 0.6

Date and Initials of Person Examining Contents: NCT 12/7/12

Cooler Temp Corrected: 0.4; 0.2; 0.4

Biological Tissue Frozen?  Yes  No

Temp should be above freezing to 6°C

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72 hr)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6. pH
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8. some sediment in containers for sample, -001, -007, -005, -008, -010, -011, -013, -014 & -016
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: H <sub>2</sub> O		
All containers needing acid/base preservation have been checked? Noncompliances are noted in 13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH <input type="checkbox"/> HCl
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH>12)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # -001 to 015, 017-019; H <sub>2</sub> SO <sub>4</sub> (1/1) -002 to 015, 017, 019; HNO <sub>3</sub> (1/1) -018; HNO <sub>3</sub> (2/2) 1ml HNO <sub>3</sub> added Lot # of added 12/7/12 @ 1345. No
Exceptions (VOA) Coliform, TOC, Oil and Grease, WI-DRO (water)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Initial when completed: NCT preservative: NA-2289010
Samples checked for dechlorination?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Headspace in VOA Vials (>6mm)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15. both TB contain HS
Trip Blank Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	16.
Trip Blank Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): pace lot # 102912-1;		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Project Manager Review: \_\_\_\_\_

Date: 12-13-12

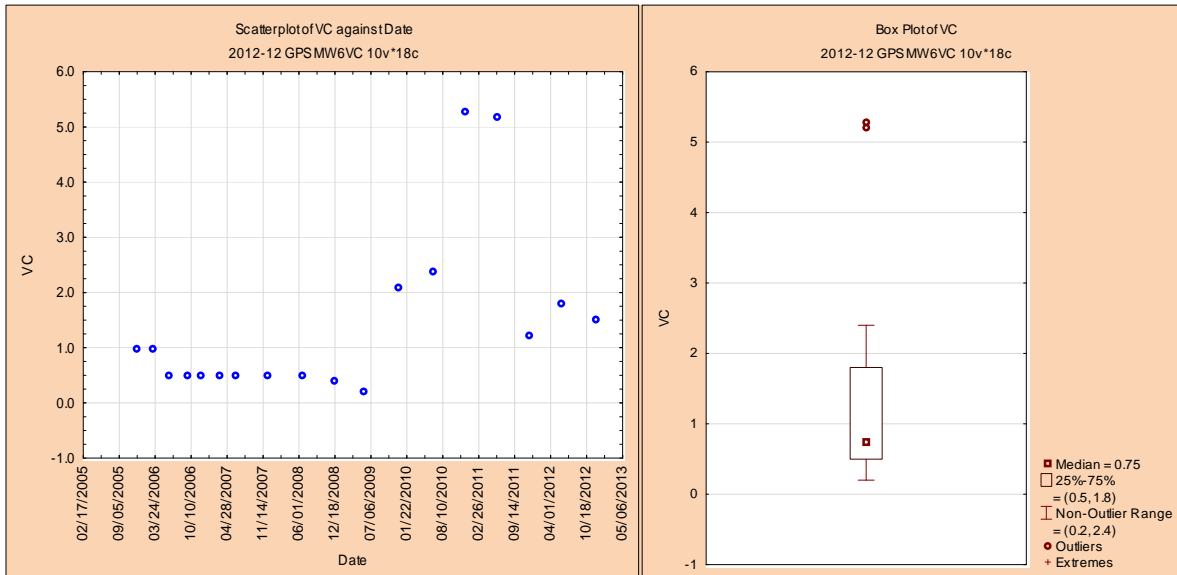
Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

# **APPENDIX E**

## **STATISTICAL EVALUATION DATA AND WORKSHEETS**

VC in MW 6 vs GPS

	1	2	3	4	5
	Well	Date	VC	VCFlag	GPS
1	MW-6	12/14/2005	1.0	U	2.0
2	MW-6	03/16/2006	1.0	U	2.0
3	MW-6	06/13/2006	0.5	U	2.0
4	MW-6	09/21/2006	0.5	U(1)	2.0
5	MW-6	12/06/2006	0.5	U	2.0
6	MW-6	03/15/2007	0.5	U	2.0
7	MW-6	06/20/2007	0.5	UJF%	2.0
8	MW-6	12/10/2007	0.5	U	2.0
9	MW-6	06/24/2008	0.5	U	2.0
10	MW-6	12/09/2008	0.4	U	2.0
11	MW-6	06/02/2009	0.2	U	2.0
12	MW-6	12/09/2009	2.1		2.0
13	MW-6	06/15/2010	2.4		2.0
14	MW-6	12/07/2010	5.3	J	2.0
15	MW-6	06/13/2011	5.2	J	2.0
16	MW-6	12/05/2011	1.2		2.0
17	MW-6	06/05/2012	1.8		2.0
18	MW-6	12/04/2012	1.5		2.0

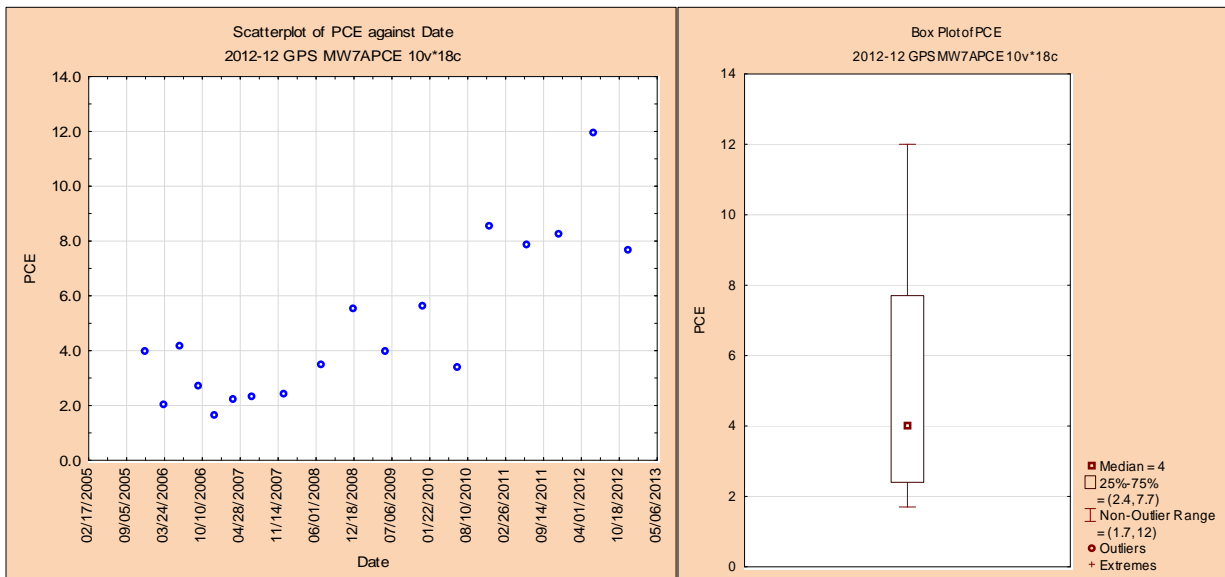


Variable	Descriptive Statistics (2012-12 GPS MW6VC)					
	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.
VC	18	1.422222	0.750000	0.200000	5.300000	1.529535

Wilcoxon Matched Pairs Test (2012-12 GPS MW6VC)				
Marked tests are significant at p < .01000				
Pair of Variables	Valid N	T	Z	p-value
VC & GPS	18	39.00000	2.025092	0.042859

PCE MW 7A vs GPS

	1	2	3	4	5
	Well	Date	PCE	PCEFlag	GPS
1	MW-7A	12/14/2005	4.0		5
2	MW-7A	03/16/2006	2.0		5
3	MW-7A	06/13/2006	4.2		5
4	MW-7A	09/21/2006	2.7		5
5	MW-7A	12/07/2006	1.7		5
6	MW-7A	03/15/2007	2.2		5
7	MW-7A	06/20/2007	2.3		5
8	MW-7A	12/10/2007	2.4		5
9	MW-7A	06/24/2008	3.5		5
10	MW-7A	12/10/2008	5.5		5
11	MW-7A	06/02/2009	4.0		5
12	MW-7A	12/09/2009	5.6		5
13	MW-7A	06/16/2010	3.4		5
14	MW-7A	12/07/2010	8.6		5
15	MW-7A	06/14/2011	7.9		5
16	MW-7A	12/06/2011	8.3		5
17	MW-7A	06/05/2012	12.0		5
18	MW-7A	12/04/2012	7.7		5

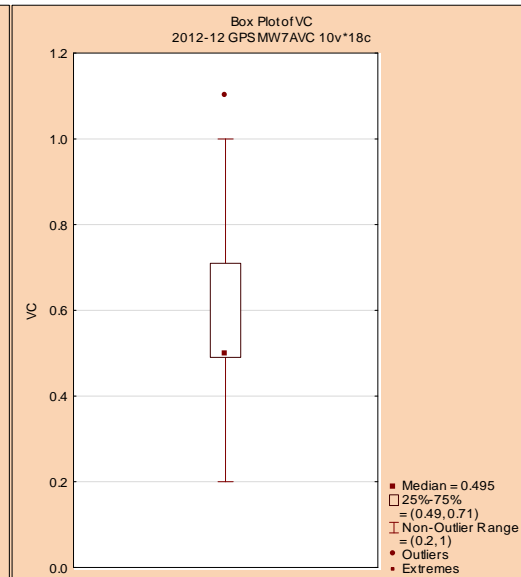
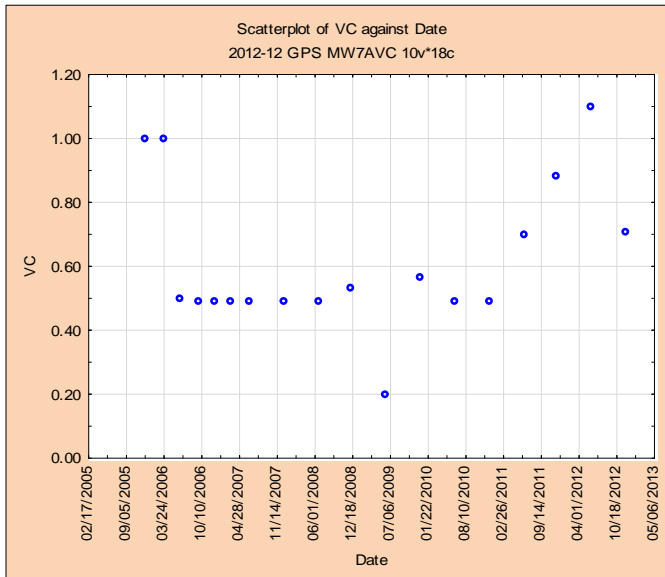


Variable	Descriptive Statistics (2012-12 GPS MW7APCE)					
	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.
PCE	18	4.888889	4.000000	1.700000	12.00000	2.904943

Pair of Variables	Wilcoxon Matched Pairs Test (2012-12 GPS MW7APCE)			
	Valid N	T	Z	p-value
PCE & GPS	18	77.50000	0.348403	0.727538

VC MW 7A vs GPS

	1	2	3	4	5
	Well	Date	VC	VCFlag	GPS
1	MW-7A	12/14/2005	1.00		2
2	MW-7A	03/16/2006	1.00		2
3	MW-7A	06/13/2006	0.50		2
4	MW-7A	09/21/2006	0.49	U	2
5	MW-7A	12/07/2006	0.49	U	2
6	MW-7A	03/15/2007	0.49	U	2
7	MW-7A	06/20/2007	0.49	U	2
8	MW-7A	12/10/2007	0.49	U	2
9	MW-7A	06/24/2008	0.49	U	2
10	MW-7A	12/10/2008	0.53		2
11	MW-7A	06/02/2009	0.20	U	2
12	MW-7A	12/09/2009	0.57		2
13	MW-7A	06/16/2010	0.49	U	2
14	MW-7A	12/07/2010	0.49	U	2
15	MW-7A	06/14/2011	0.70		2
16	MW-7A	12/06/2011	0.88		2
17	MW-7A	06/05/2012	1.10		2
18	MW-7A	12/05/2012	0.71		2

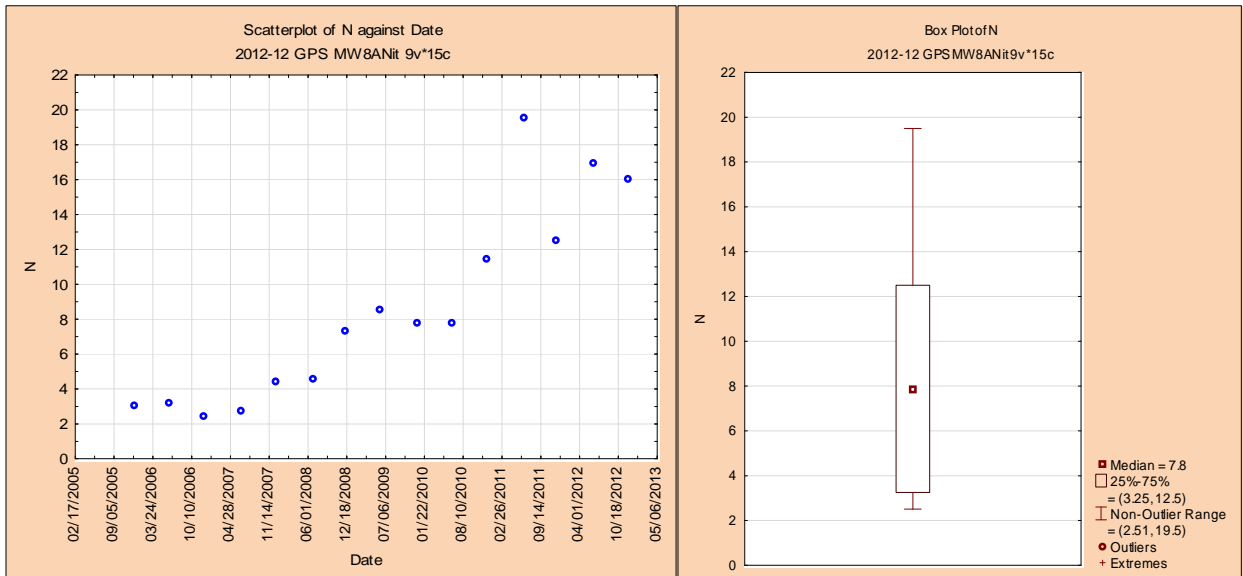


Variable	Descriptive Statistics (2012-12 GPS MW7AVC)					
	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.
VC	18	0.617222	0.495000	0.200000	1.100000	0.234867

Wilcoxon Matched Pairs Test (2012-12 GPS MW7AVC)				
Marked tests are significant at p < .01000				
Pair of Variables	Valid N	T	Z	p-value
VC & GPS	18	0.00	3.723555	0.000196

NIT MW 8A vs GPS

	1	2	3	4	5
	Var1	Date	N	N Flag	GPS
1	MW-8A	12/14/2005	3.110		10
2	MW-8A	06/13/2006	3.250		10
3	MW-8A	12/06/2006	2.510		10
4	MW-8A	06/20/2007	2.800	JF	10
5	MW-8A	12/10/2007	4.510	JF%	10
6	MW-8A	06/24/2008	4.520		10
7	MW-8A	12/09/2008	7.300		10
8	MW-8A	06/01/2009	8.500		10
9	MW-8A	12/09/2009	7.800	JF	10
10	MW-8A	06/15/2010	7.800		10
11	MW-8A	12/07/2010	11.500	J	10
12	MW-8A	06/14/2011	19.500		10
13	MW-8A	12/05/2011	12.500		10
14	MW-8A	06/04/2012	17.000		10
15	MW-8A	12/05/2012	16.000		10

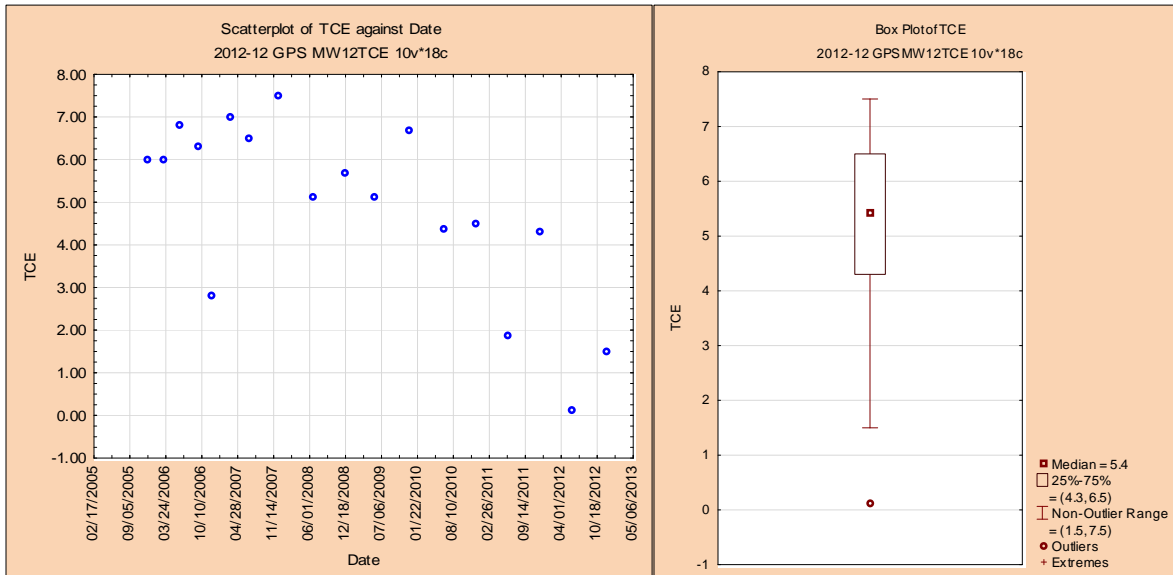


Variable	Descriptive Statistics (2012-12 GPS MW8ANit)					
	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.
N	15	8.573333	7.800000	2.510000	19.50000	5.565099

Pair of Variables		Wilcoxon Matched Pairs Test (2012-12 GPS MW8ANit)			
		Valid N	T	Z	p-value
N	& GPS	15	42.50000	0.993933	0.320256

TCE in MW 12 vs GPS

	1	2	3	4	5
	Well	Date	TCE	TCEFlag	GPS
1	MW-12	12/14/2005	6.00		5
2	MW-12	03/16/2006	6.00		5
3	MW-12	06/13/2006	6.80		5
4	MW-12	09/21/2006	6.30		5
5	MW-12	12/07/2006	2.80		5
6	MW-12	03/15/2007	7.00		5
7	MW-12	06/21/2007	6.50		5
8	MW-12	12/11/2007	7.50		5
9	MW-12	06/25/2008	5.10		5
10	MW-12	12/10/2008	5.70		5
11	MW-12	06/02/2009	5.10		5
12	MW-12	12/09/2009	6.70		5
13	MW-12	06/15/2010	4.40		5
14	MW-12	12/07/2010	4.50		5
15	MW-12	06/14/2011	1.90		5
16	MW-12	12/06/2011	4.30		5
17	MW-12	06/05/2012	0.11 U		5
18	MW-12	12/05/2012	1.50		5

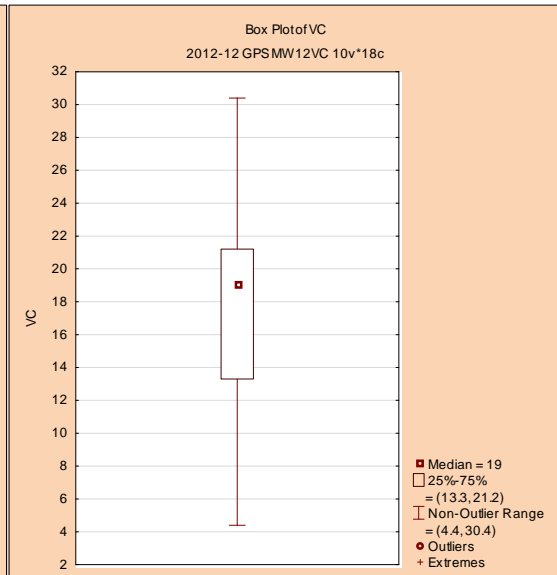
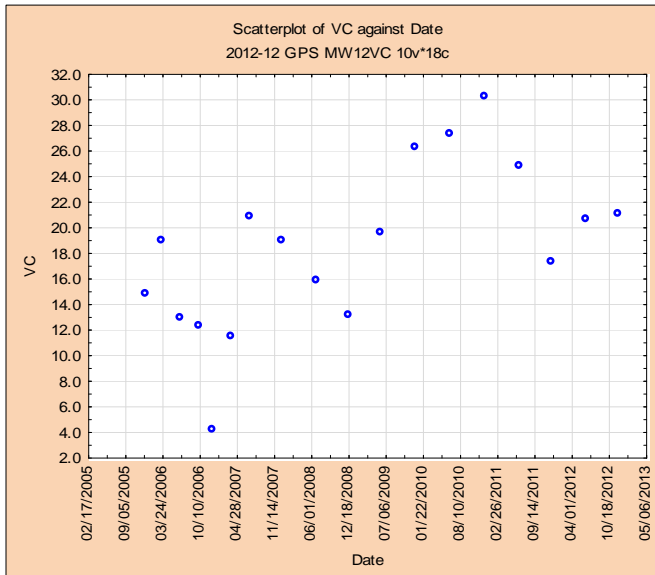


Variable	Descriptive Statistics (2012-12 GPS MW12TCE)					
	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.
TCE	18	4.900556	5.400000	0.110000	7.500000	2.091497

Wilcoxon Matched Pairs Test (2012-12 GPS MW12TCE)				
Marked tests are significant at p < .01000				
Pair of Variables	Valid N	T	Z	p-value
TCE & GPS	18	77.50000	0.348403	0.727538

VC in MW 12 vs GPS

	1	2	3	4	5
	Well	Date	VC	VCFlag	GPS
1	MW-12	12/14/2005	15.0		2
2	MW-12	03/16/2006	19.0		2
3	MW-12	06/13/2006	13.0		2
4	MW-12	09/21/2006	12.5		2
5	MW-12	12/07/2006	4.4		2
6	MW-12	03/15/2007	11.5		2
7	MW-12	06/21/2007	21.0	JF%	2
8	MW-12	12/11/2007	19.0		2
9	MW-12	06/25/2008	16.0		2
10	MW-12	12/10/2008	13.3		2
11	MW-12	06/02/2009	19.7		2
12	MW-12	12/09/2009	26.4		2
13	MW-12	06/15/2010	27.4		2
14	MW-12	12/07/2010	30.4	J	2
15	MW-12	06/14/2011	24.9	J	2
16	MW-12	12/06/2011	17.4		2
17	MW-12	06/05/2012	20.7		2
18	MW-12	12/05/2012	21.2		2



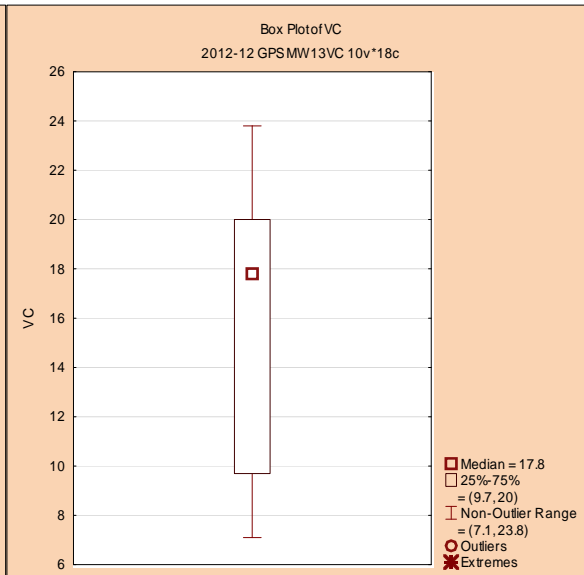
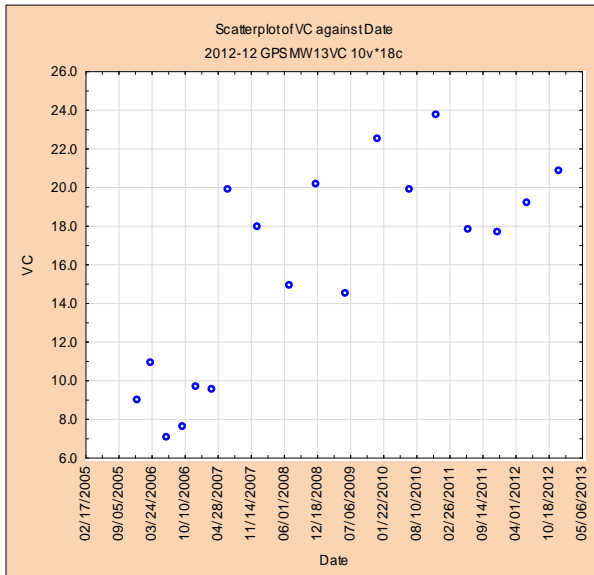
Variable	Descriptive Statistics (2012-12 GPS MW12VC)					
	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.
VC	18	18.48889	19.00000	4.400000	30.40000	6.441217

Wilcoxon Matched Pairs Test (2012-12 GPS MW12VC)				
Marked tests are significant at p <.01000				
Pair of Variables	Valid N	T	Z	p-value
VC & GPS	18	0.00	3.723555	0.000196



VC in MW 13 vs GPS

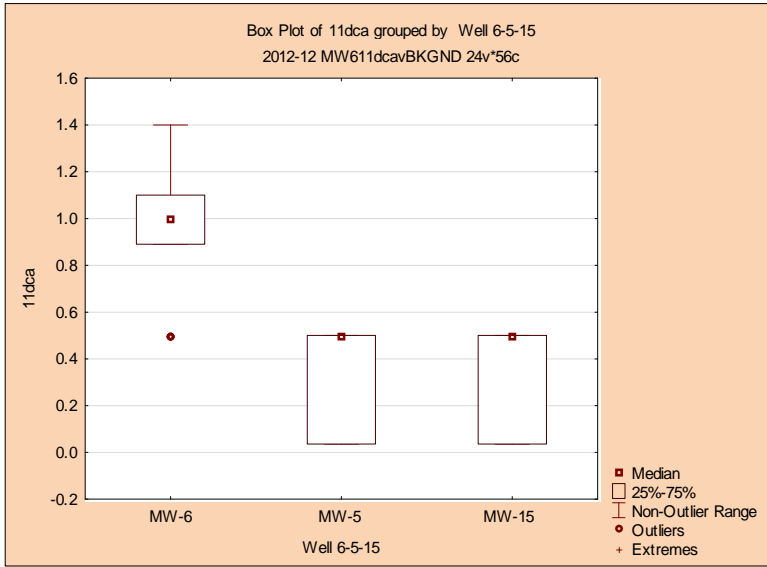
	1	2	3	4	5
	Well	Date	VC	VCFlag	GPS
1	MW-13	12/14/2005	9.0		2
2	MW-13	03/16/2006	11.0		2
3	MW-13	06/13/2006	7.1		2
4	MW-13	09/21/2006	7.6		2
5	MW-13	12/07/2006	9.7		2
6	MW-13	03/15/2007	9.6		2
7	MW-13	06/20/2007	20.0	JF%	2
8	MW-13	12/11/2007	18.0		2
9	MW-13	06/24/2008	15.0		2
10	MW-13	12/10/2008	20.2		2
11	MW-13	06/02/2009	14.6		2
12	MW-13	12/09/2009	22.5		2
13	MW-13	06/16/2010	19.9		2
14	MW-13	12/07/2010	23.8	J	2
15	MW-13	06/14/2011	17.9	J	2
16	MW-13	12/07/2011	17.7		2
17	MW-13	06/06/2012	19.3		2
18	MW-13	12/05/2012	20.9		2



Variable	Descriptive Statistics (2012-12 GPS MW13VC)					
	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.
VC	18	15.76667	17.80000	7.100000	23.80000	5.443507

Wilcoxon Matched Pairs Test (2012-12 GPS MW13VC)				
Marked tests are significant at p <.01000				
Pair of Variables	Valid N	T	Z	p-value
VC & GPS	18	0.00	3.723555	0.000196

**Mann Whitney - MW 6 11DCA vs Background**

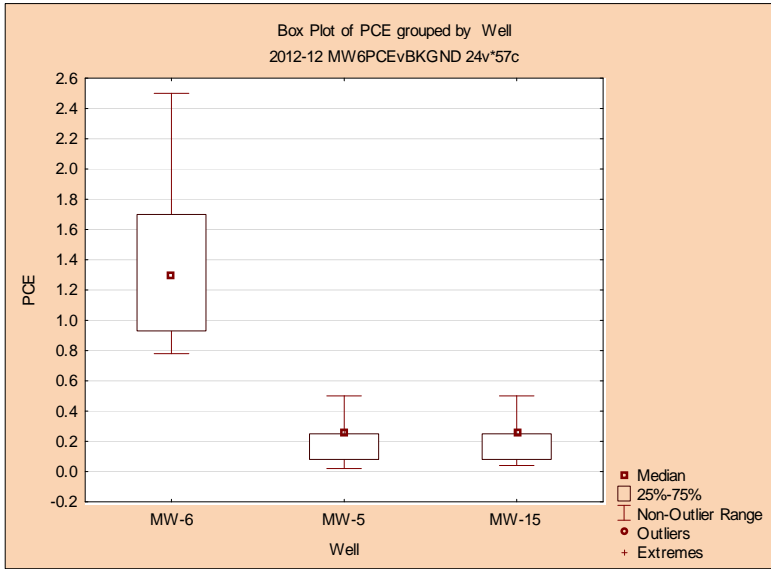


Variable	Descriptive Statistics (2012-12 MW611dcavBKGND)					
	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.
11dca6	18	0.948889	1.000000	0.500000	1.400000	0.274524
11dca5	15	0.326267	0.500000	0.036000	0.500000	0.206317
11dca15	15	0.326267	0.500000	0.036000	0.500000	0.206317

Mann-Whitney U Test (2012-12 MW611dcavBKGND)											
By variable Well6-5											
Marked tests are significant at p <.01000											
variable	Rank Sum MW-6	Rank Sum MW-5	U	Z	p-value	Z adjusted	p-value	Valid N MW-6	Valid N MW-5	2*1sided exact p	
11dca6-5	425.0000	136.0000	16.00000	4.284377	0.000018	4.411146	0.000010	18	15	0.000002	

Mann-Whitney U Test (2012-12 MW611dcavBKGND)											
By variable Well6-15											
Marked tests are significant at p <.01000											
variable	Rank Sum MW-6	Rank Sum MW-15	U	Z	p-value	Z adjusted	p-value	Valid N MW-6	Valid N MW-15	2*1sided exact p	
11dca6-15	421.0000	140.0000	20.00000	4.139756	0.000035	4.292388	0.000018	18	15	0.000005	

**Mann Whitney - MW 6 PCE vs Background**

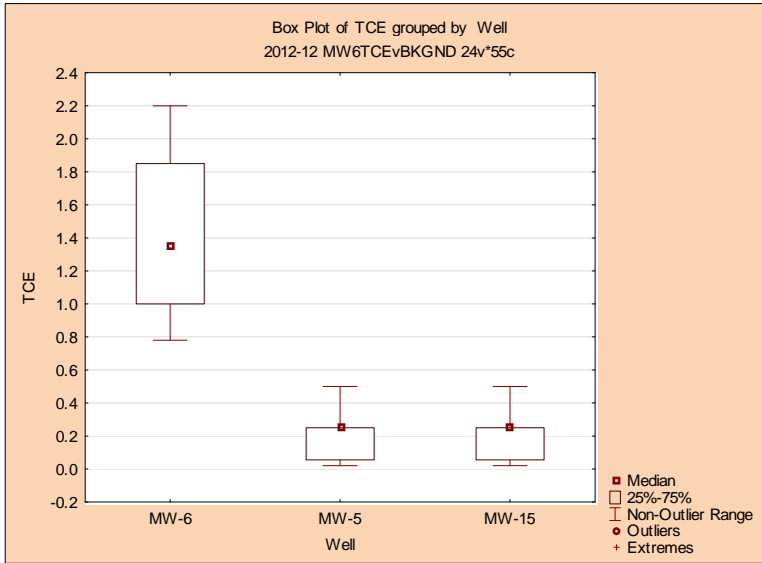


Variable	Descriptive Statistics (2012-12 MW6PCEvBKGND)					
	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.
PCE6	18	1.370000	1.300000	0.780000	2.500000	0.490762
PCE5	15	0.250700	0.250000	0.020500	0.500000	0.152798
PCE15	15	0.235400	0.250000	0.041000	0.500000	0.134213

Mann-Whitney U Test (2012-12 MW6PCEvBKGND)										
By variable WELL6-5										
Marked tests are significant at p <.01000										
variable	Rank Sum MW-6	Rank Sum MW-5	U	Z	p-value	Z adjusted	p-value	Valid N MW-6	Valid N MW-5	2*1sided exact p
PCE6-5	441.0000	120.0000	0.00	4.862858	0.000001	4.901092	0.000001	18	15	0.000000

Mann-Whitney U Test (2012-12 MW6PCEvBKGND)										
By variable WELL6-15										
Marked tests are significant at p <.01000										
variable	Rank Sum MW-6	Rank Sum MW-15	U	Z	p-value	Z adjusted	p-value	Valid N MW-6	Valid N MW-15	2*1sided exact p
PCE6-15	441.0000	120.0000	0.00	4.862858	0.000001	4.916136	0.000001	18	15	0.000000

**Mann Whitney - MW 6 TCE Vs Background**

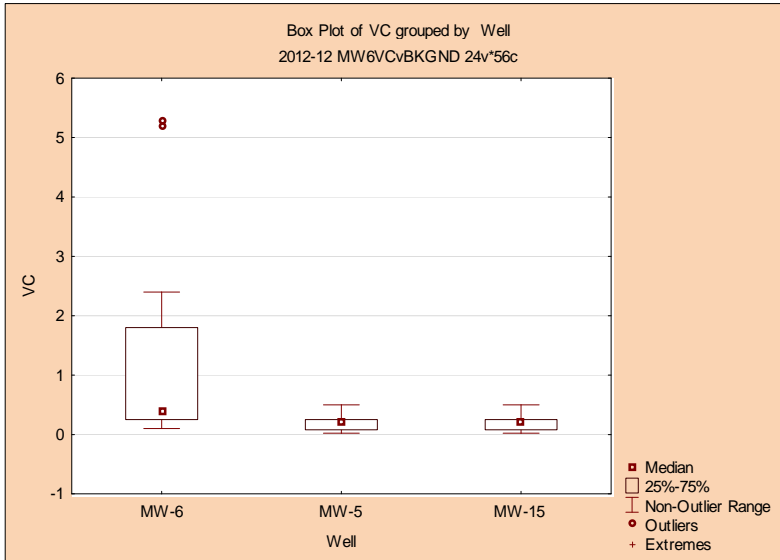


Variable	Descriptive Statistics (2012-12 MW6TCEvBKGND)					
	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.
TCE6	18	1.352778	1.200000	0.780000	2.200000	0.492100
TCE5	15	0.245700	0.250000	0.020500	0.500000	0.159008
TCE15	15	0.245700	0.250000	0.020500	0.500000	0.159008

Mann-Whitney U Test (2012-12 MW6TCEvBKGND)										
By variable WELL6-5										
Marked tests are significant at p <.01000										
variable	Rank Sum MW-6	Rank Sum MW-5	U	Z	p-value	Z adjusted	p-value	Valid N MW-6	Valid N MW-5	2*1sided exact p
TCE6-5	376.0000	120.0000	0.00	4.723652	0.000002	4.769059	0.000002	16	15	0.000000

Mann-Whitney U Test (2012-12 MW6TCEvBKGND)										
By variable WELL6-15										
Marked tests are significant at p <.01000										
variable	Rank Sum MW-6	Rank Sum MW-15	U	Z	p-value	Z adjusted	p-value	Valid N MW-6	Valid N MW-15	2*1sided exact p
TCE6-15	376.0000	120.0000	0.00	4.723652	0.000002	4.769059	0.000002	16	15	0.000000

**Mann Whitney - MW 6 VC vs Background**

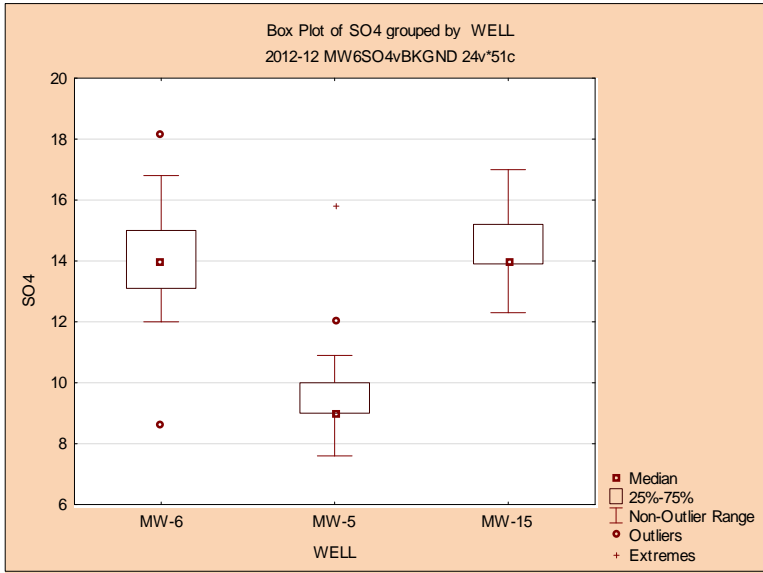


Variable	Descriptive Statistics (2012-12 MW6VCvBKGND)					
	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.
VC6	18	1.252778	0.375000	0.100000	5.300000	1.626388
VC5	13	0.185731	0.200000	0.024500	0.500000	0.127100
VC15	13	0.185731	0.200000	0.024500	0.500000	0.127100

Mann-Whitney U Test (2012-12 MW6VCvBKGND)										
By variable WELL6-5										
Marked tests are significant at p <.01000										
variable	Rank Sum MW-6	Rank Sum MW-5	U	Z	p-value	Z adjusted	p-value	Valid N MW-6	Valid N MW-5	2*1sided exact p
VC6-5	365.0000	131.0000	40.00000	3.062451	0.002196	3.158135	0.001588	18	13	0.001447

Mann-Whitney U Test (2012-12 MW6VCvBKGND)										
By variable WELL6-15										
Marked tests are significant at p <.01000										
variable	Rank Sum MW-6	Rank Sum MW-15	U	Z	p-value	Z adjusted	p-value	Valid N MW-6	Valid N MW-15	2*1sided exact p
VC6-15	365.0000	131.0000	40.00000	3.062451	0.002196	3.158135	0.001588	18	13	0.001447

**Mann Whitney - MW 6 SO4 vs Background**

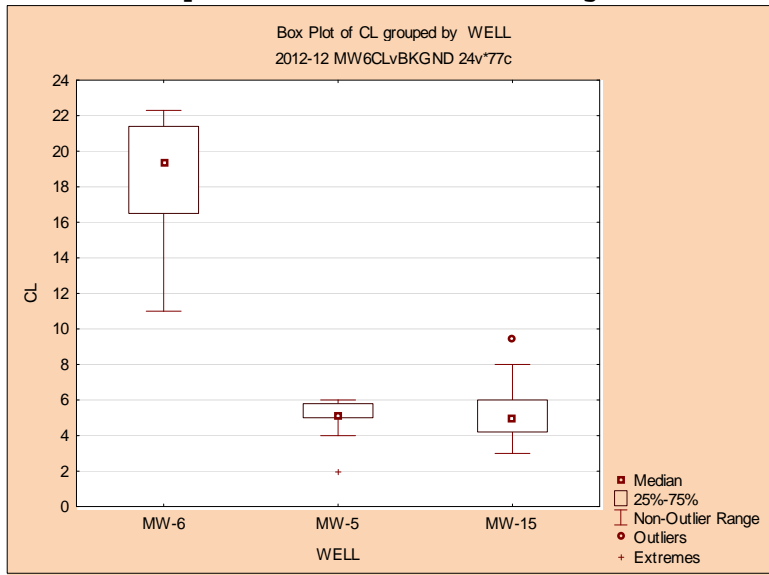


Descriptive Statistics (2012-12 MW6SO4vBKGND)						
Variable	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.
SO46	15	14.12133	14.00000	8.62000	18.20000	2.230368
SO45	15	9.81333	9.00000	7.60000	15.80000	1.931641
SO415	15	14.40667	14.00000	12.30000	17.00000	1.272493

Mann-Whitney U Test (2012-12 MW6SO4vBKGND)										
By variable WELL6-5										
Marked tests are significant at p <.01000										
variable	Rank Sum MW-6	Rank Sum MW-5	U	Z	p-value	Z adjusted	p-value	Valid N MW-6	Valid N MW-5	2*1sided exact p
SO46-5	319.5000	145.5000	25.50000	3.587853	0.000333	3.612856	0.000303	15	15	0.000113

Mann-Whitney U Test (2012-12 MW6SO4vBKGND)										
By variable WELL6-15										
Marked tests are significant at p <.01000										
variable	Rank Sum MW-6	Rank Sum MW-15	U	Z	p-value	Z adjusted	p-value	Valid N MW-6	Valid N MW-15	2*1sided exact p
SO46-15	222.0000	243.0000	102.0000	-0.414781	0.678303	-0.416966	0.676703	15	15	0.682674

**Mann Whitney - MW 6 Chloride Vs Background**

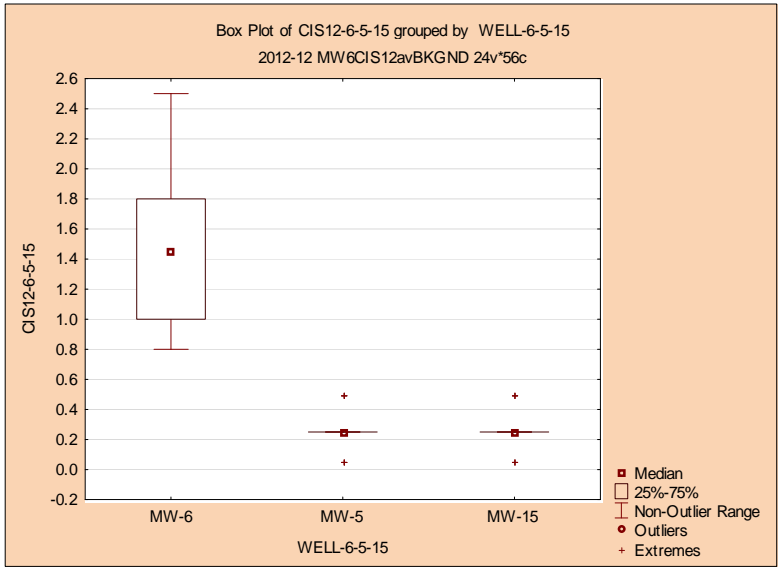


Variable	Descriptive Statistics (2012-12 MW6CLvBKGND)					
	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.
Cl6	16	18.45000	19.35000	11.00000	22.30000	3.454852
Cl5	16	5.14375	5.25000	2.00000	6.00000	1.012567
Cl15	16	5.41250	5.00000	3.00000	9.50000	1.721191

Mann-Whitney U Test (2012-12 MW6CLvBKGND)										
By variable WELL6-5										
Marked tests are significant at p <.01000										
variable	Rank Sum MW-6	Rank Sum MW-5	U	Z	p-value	Z adjusted	p-value	Valid N MW-6	Valid N MW-5	2*1sided exact p
Cl6-5	376.0000	120.0000	0.00	4.723652	0.000002	4.731768	0.000002	16	15	0.000000

Mann-Whitney U Test (2012-12 MW6CLvBKGND)										
By variable WELL6-15										
Marked tests are significant at p <.01000										
variable	Rank Sum MW-6	Rank Sum MW-15	U	Z	p-value	Z adjusted	p-value	Valid N MW-6	Valid N MW-15	2*1sided exact p
Cl6-15	376.0000	120.0000	0.00	4.723652	0.000002	4.728899	0.000002	16	15	0.000000

**Mann Whitney - MW 6 CIS vs Background**



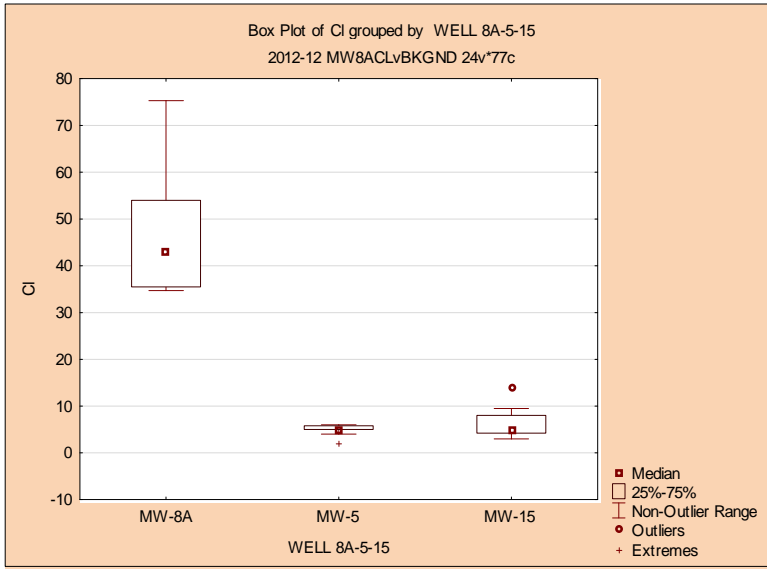
Variable	Descriptive Statistics (2012-12 MW6CIS12avBKGND)					
	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.
CIS12-6	18	1.450000	1.450000	0.800000	2.500000	0.524965
CIS12-5	15	0.244000	0.250000	0.040000	0.500000	0.161103
CIS12-15	15	0.244000	0.250000	0.040000	0.500000	0.161103

Mann-Whitney U Test (2012-12 MW6CIS12avBKGND)										
By variable Well6-5										
Marked tests are significant at p <.01000										
variable	Rank Sum MW-6	Rank Sum MW-5	U	Z	p-value	Z adjusted	p-value	Valid N MW-6	Valid N MW-5	2*1sided exact p
CIS12-6-5	441.0000	120.0000	0.00	4.862858	0.000001	4.926243	0.000001	18	15	0.000000

Mann-Whitney U Test (2012-12 MW6CIS12avBKGND)										
By variable Well6-15										
Marked tests are significant at p <.01000										
variable	Rank Sum MW-6	Rank Sum MW-15	U	Z	p-value	Z adjusted	p-value	Valid N MW-6	Valid N MW-15	2*1sided exact p
CIS12-6-15	441.0000	120.0000	0.00	4.862858	0.000001	4.926243	0.000001	18	15	0.000000



**Mann Whitney - MW 8A Chloride Vs Background**

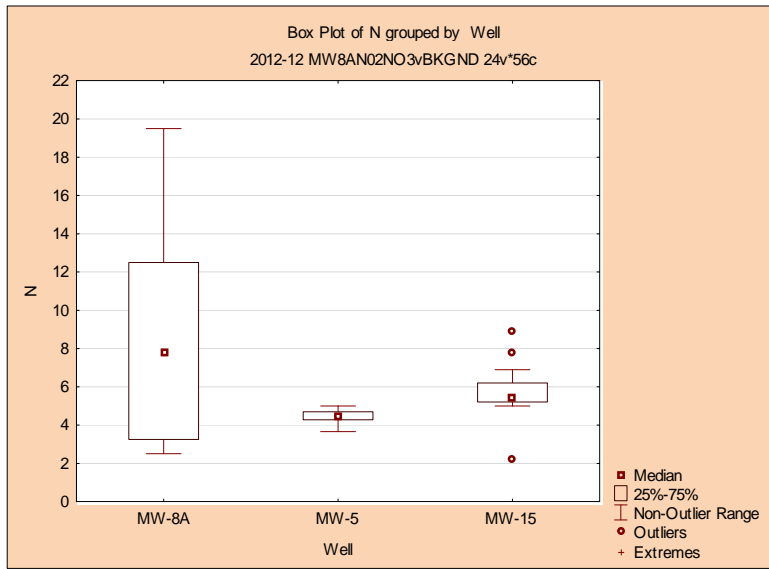


Descriptive Statistics (2012-12 MW8ACLvBKGND)						
Variable	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.
CL8A	15	47.29333	43.00000	34.70000	75.30000	13.52498
Cl5	15	5.08667	5.10000	2.00000	6.00000	1.02111
Cl15	15	6.05333	5.00000	3.00000	14.00000	2.82182

Mann-Whitney U Test (2012-12 MW8ACLvBKGND)										
By variable WELL8A-5										
Marked tests are significant at p <.01000										
variable	Rank Sum MW-8A	Rank Sum MW-5	U	Z	p-value	Z adjusted	p-value	Valid N MW-8A	Valid N MW-5	2*1sided exact p
Cl8A-5	345.0000	120.0000	0.00	4.645544	0.000003	4.652276	0.000003	15	15	0.000000

Mann-Whitney U Test (2012-12 MW8ACLvBKGND)										
By variable WELL8A-15										
Marked tests are significant at p <.01000										
variable	Rank Sum MW-8A	Rank Sum MW-15	U	Z	p-value	Z adjusted	p-value	Valid N MW-8A	Valid N MW-15	2*1sided exact p
Cl8A-15	345.0000	120.0000	0.00	4.645544	0.000003	4.649165	0.000003	15	15	0.000000

**Mann Whitney - MW 8A NO2 NO3 Vs Background**

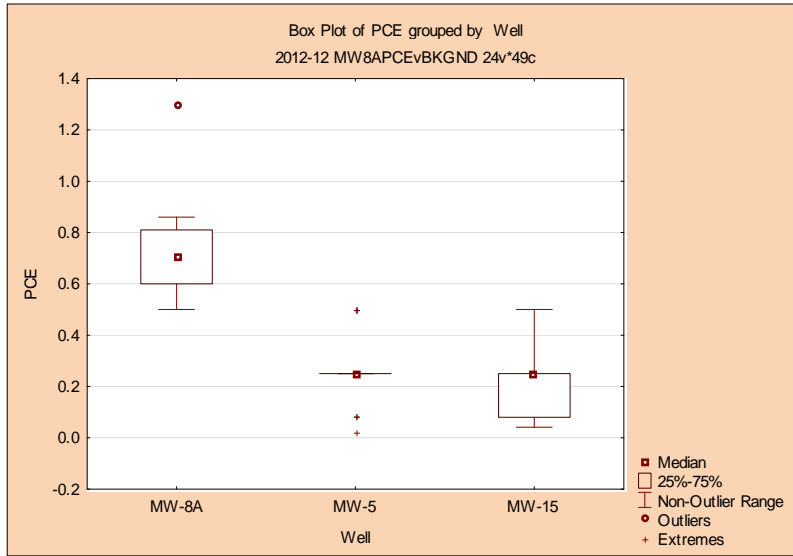


Descriptive Statistics (2012-12 MW8AN02NO3vBKGND)						
Variable	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.
N8A	15	8.573333	7.800000	2.510000	19.50000	5.565099
N5	15	4.452000	4.480000	3.660000	5.00000	0.316864
N15	15	5.732000	5.400000	2.280000	8.98000	1.472404

Mann-Whitney U Test (2012-12 MW8AN02NO3vBKGND)										
By variable WELL8A-5										
Marked tests are significant at p <.01000										
variable	Rank Sum MW-8A	Rank Sum MW-5	U	Z	p-value	Z adjusted	p-value	Valid N MW-8A	Valid N MW-5	2*1sided exact p
N8A-5	274.5000	190.5000	70.50000	1.721340	0.085190	1.722106	0.085051	15	15	0.081429

Mann-Whitney U Test (2012-12 MW8AN02NO3vBKGND)										
By variable WELL8A-15										
Marked tests are significant at p <.01000										
variable	Rank Sum MW-8A	Rank Sum MW-15	U	Z	p-value	Z adjusted	p-value	Valid N MW-8A	Valid N MW-15	2*1sided exact p
N8A-15	254.0000	211.0000	91.00000	0.871039	0.383733	0.871621	0.383416	15	15	0.389233

Mann Whitney - MW 8A PCE Vs Background

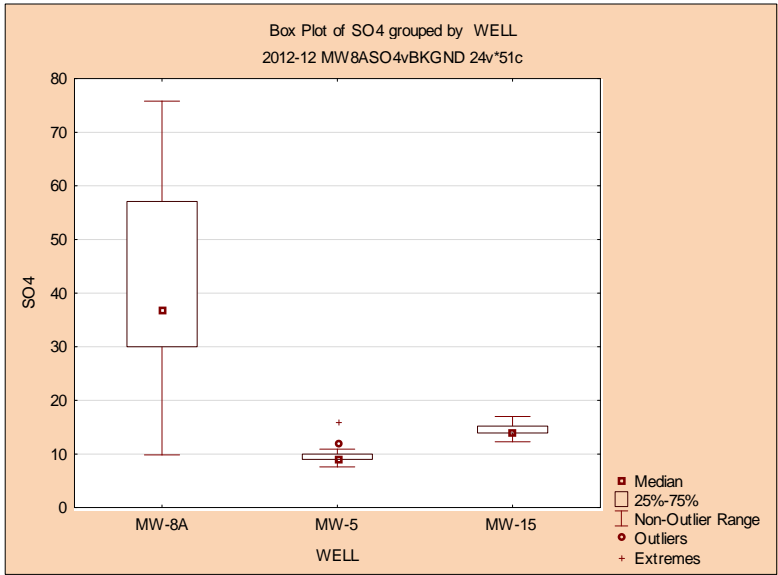


Variable	Descriptive Statistics (2012-12 MW8APCEvBKGND)					
	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.
PCE8A	15	0.727333	0.700000	0.500000	1.300000	0.197320
PCE5	15	0.250700	0.250000	0.020500	0.500000	0.152798
PCE15	15	0.235400	0.250000	0.041000	0.500000	0.134213

Mann-Whitney U Test (2012-12 MW8APCEvBKGND)											
By variable Well8A-5											
Marked tests are significant at p <.01000											
variable	Rank Sum MW-8A	Rank Sum MW-5	U	Z	p-value	Z adjusted	p-value	Valid N MW-8A	Valid N MW-5	2*1sided exact p	
PCE8A-5	342.0000	123.0000	3.000000	4.521109	0.000006	4.577987	0.000005	15	15	0.000000	

Mann-Whitney U Test (2012-12 MW8APCEvBKGND)											
By variable Well8A-15											
Marked tests are significant at p <.01000											
variable	Rank Sum MW-8A	Rank Sum MW-15	U	Z	p-value	Z adjusted	p-value	Valid N MW-8A	Valid N MW-15	2*1sided exact p	
PCE8A-15	343.0000	122.0000	2.000000	4.562587	0.000005	4.635344	0.000004	15	15	0.000000	

Mann Whitney - MW 8A SO4 Vs Background

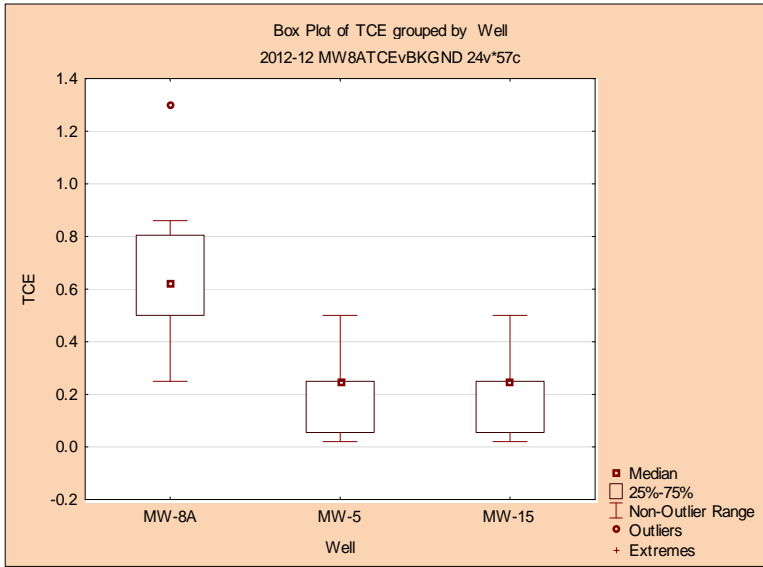


Variable	Descriptive Statistics (2012-12 MW8ASO4vBKGND)					
	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.
SO48A	15	41.17667	37.00000	9.85000	75.80000	18.21956
SO45	15	9.81333	9.00000	7.60000	15.80000	1.93164
SO415	15	14.40667	14.00000	12.30000	17.00000	1.27249

Mann-Whitney U Test (2012-12 MW8ASO4vBKGND)										
By variable WELL8A-5										
Marked tests are significant at p <.01000										
variable	Rank Sum MW-8A	Rank Sum MW-5	U	Z	p-value	Z adjusted	p-value	Valid N MW-8A	Valid N MW-5	2*1sided exact p
SO48A-5	341.0000	124.0000	4.000000	4.479631	0.000007	4.508815	0.000007	15	15	0.000000

Mann-Whitney U Test (2012-12 MW8ASO4vBKGND)										
By variable WELL8A-15										
Marked tests are significant at p <.01000										
variable	Rank Sum MW-8A	Rank Sum MW-15	U	Z	p-value	Z adjusted	p-value	Valid N MW-8A	Valid N MW-15	2*1sided exact p
SO48A-15	330.0000	135.0000	15.00000	4.023373	0.000057	4.029203	0.000056	15	15	0.000009

**Mann Whitney - MW 8A TCE Vs Background**

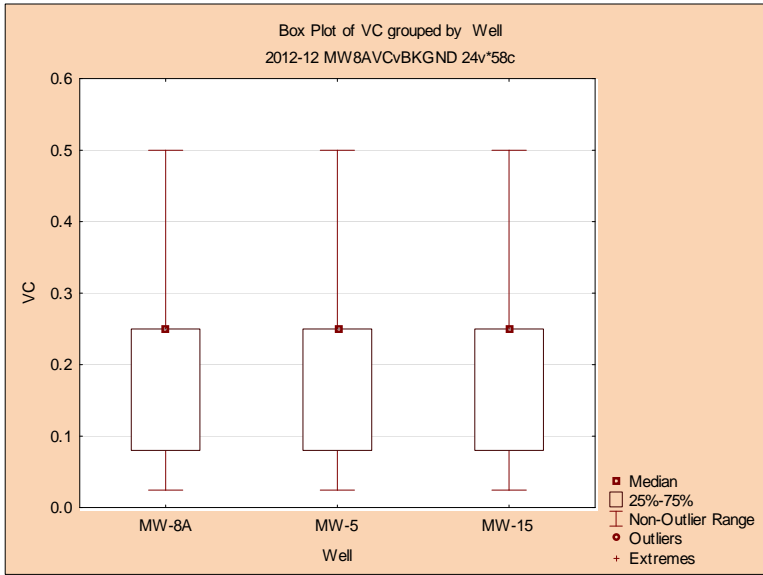


Descriptive Statistics (2012-12 MW8ATCEvBKGND)						
Variable	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.
TCE8A	16	0.636875	0.620000	0.250000	1.300000	0.264442
TCE5	15	0.245700	0.250000	0.020500	0.500000	0.159008
TCE15	15	0.245700	0.250000	0.020500	0.500000	0.159008

Mann-Whitney U Test (2012-12 MW8ATCEvBKGND)										
By variable WELL8A-5										
Marked tests are significant at p <.01000										
variable	Rank Sum MW-8A	Rank Sum MW-5	U	Z	p-value	Z adjusted	p-value	Valid N MW-8A	Valid N MW-5	2*1sided exact p
TCE8A-5	358.5000	137.5000	17.50000	4.031904	0.000055	4.097698	0.000042	16	15	0.000008

Mann-Whitney U Test (2012-12 MW8ATCEvBKGND)										
By variable WELL8A-15										
Marked tests are significant at p <.01000										
variable	Rank Sum MW-8A	Rank Sum MW-15	U	Z	p-value	Z adjusted	p-value	Valid N MW-8A	Valid N MW-15	2*1sided exact p
TCE8A-15	358.5000	137.5000	17.50000	4.031904	0.000055	4.097698	0.000042	16	15	0.000008

**Mann Whitney - MW 8A VC Vs Background**



Variable	Descriptive Statistics (2012-12 MW8AVCvBKGND)					
	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.
VC8A	15	0.210967	0.250000	0.024500	0.500000	0.143227
VC5	15	0.210967	0.250000	0.024500	0.500000	0.143227
VC15	15	0.210967	0.250000	0.024500	0.500000	0.143227

Mann-Whitney U Test (2012-12 MW8AVCvBKGND)										
By variable WELL8A-5										
Marked tests are significant at p <.01000										
variable	Rank Sum MW-8A	Rank Sum MW-5	U	Z	p-value	Z adjusted	p-value	Valid N MW-8A	Valid N MW-5	2*1sided exact p
VC8A-5	231.0000	234.0000	111.0000	-0.041478	0.966915	-0.043018	0.965687	15	15	0.967417

Mann-Whitney U Test (2012-12 MW8AVCvBKGND)										
By variable WELL8A-15										
Marked tests are significant at p <.01000										
variable	Rank Sum MW-8A	Rank Sum MW-15	U	Z	p-value	Z adjusted	p-value	Valid N MW-8A	Valid N MW-15	2*1sided exact p
VC8A-15	231.0000	234.0000	111.0000	-0.041478	0.966915	-0.043018	0.965687	15	15	0.967417