OBG

PART OF RAMBOLL

2018 ANNUAL REPORT – FINAL REPORT

# Post-Closure Groundwater Monitoring Report
# Coldwater Road Landfill
# Flint, Michigan
# MID 005 356 860

**RACER TRUST**

**Detroit, Michigan**

February 2019

OBG

Part of Ramboll

FEBRUARY 27, 2019 | CLIENT # 15388 | PROJECT # 68545

# Post-Closure Groundwater Monitoring
# Coldwater Road Landfill
# MID 005 356 860

**Flint, Michigan**

Prepared for: RACER Trust
Detroit, Michigan

BRIAN E. WHITE, PE
SENIOR VICE PRESIDENT
O'BRIEN & GERE ENGINEERS, INC.

February 27, 2019

**Mr. Richard Conforti, P.E.**
Environmental Engineer
Michigan Department of Environmental Quality
Office of Waste Management and Radiological Protection
P.O. Box 30473
Lansing, Michigan 48909-7973

RE: Post-Closure Groundwater Monitoring 2018 Annual Report
Coldwater Road Landfill, Flint, Michigan
MID 005 356 860

FILE: 15388/68545/rep

Dear **Mr. Conforti:**

On behalf of Revitalizing Auto Communities Environmental Response (RACER) Trust, O'Brien & Gere Engineers, Inc., part of Ramboll (OBG) is pleased to present the results of the annual groundwater sampling event conducted in November 2018 for the Coldwater Road Landfill site (**Figure 1**). The groundwater samples were analyzed for total organic carbon (TOC, Method 415.1), total organic halogen (TOX, Method 9020A), specific conductivity (Method 120.1), and dissolved metals (chromium (Cr), copper (Cu), nickel (Ni), zinc (Zn) Method 200.8).

The event also included field measurements for pH, specific conductivity, dissolved oxygen, oxidation reduction potential, temperature, and turbidity. Groundwater samples were collected using a Whale pump (B-18A and B-19Ar) or peristaltic pump, and the wells were purged "dry" and allowed to recharge, and the samples were collected as soon as sufficient water was present to obtain the necessary sample volume. This was done in accordance with OBG procedures and the site-specific Field Method Guide (**Appendix A**) because low-flow sampling techniques resulted in greater than 0.3 ft of drawdown in each of the shallow wells sampled during this event. Samples to be analyzed for dissolved metals were field filtered. Groundwater sampling logs are included in **Appendix B**.

Gauging and sampling were conducted on November 6, 2018. The results are presented in two separate tables: **Table 1** - Depth to Groundwater Levels in Monitoring Wells; **Table 2** - Post-Closure Monitoring - Historical Analytical Results (Physical Parameters, TOC, TOX, and Metals). Laboratory analytical reports are included in **Appendix C**.

A site location map (**Figure 1**) and monitoring well location (*i.e.*, site layout) map (**Figure 2**) are also included. Groundwater elevation (contour) maps were completed for the shallow wells (**Figure 3**) and deeper drift aquifer (**Figure 4**).

The groundwater flow direction in the perched zone includes discontinuous perched saturated zones within an otherwise clayey matrix. **Figure 3** provides interpreted contours for the groundwater elevation data collected during the November 2018 annual sampling event. Based on these contours, the groundwater flow direction in the perched zone appears to be predominantly toward the northwest.

Groundwater in the drift aquifer flows in a southerly direction as shown on **Figure 4**. The drift aquifer static water elevations were consistent with historical data. The additional site monitoring wells (not part of the landfill monitoring program) were used to aid in the creation of the groundwater contours.

For the annual sampling event groundwater samples were collected from six monitoring wells screened in discontinuous perched zones. Samples from the six drift aquifer monitoring wells (B-2D, B-20D, B-21D, B-22D, B-23Dr, and B-27D) were not collected during this event per the revised PCCP approved on November 7, 2014, and will be collected on an annual basis during future late spring/early summer sampling events typically conducted in the month of June.

A review of the analytical data presented in the attached tables indicates analytical results similar to previous sampling events, a summary of the data is provided below:

- Chromium concentrations were not detected above the method detection limit of 5 µg/L; except in monitoring well B-19Ar (6 µg/L). The results were similar or less than historic results, which ranged from below the method detection limit to 37 µg/L at B-9 (8/31/1995).
- Copper concentrations were not detected above the method detection limit of 5 µg/L; except in monitoring well B-19Ar (5 µg/L). The results were similar or less than the historic results, which ranged from below the method detection limit to 43 µg/L at B-22D (8/31/1995).
- Nickel concentrations were not detected above the method detection limit of 5 µg/L; except in monitoring wells B-9 (7 µg/L) and B-19Ar (11 µg/L). The results were similar or less than historic results, which ranged from below the method detection limit to 370 µg/L at B-22D (6/21/1995).
- Zinc concentrations were not detected above the method detection limit of 5 µg/L; except in monitoring well B-18A (7 µg/L) and B-19Ar (15 µg/L). The results were similar or less than historic results, which ranged from below the method detection limit to 150 µg/L at B-18A (6/21/1995).
- TOC concentrations ranged from 1.5 mg/L in monitoring well B-28 to 6.5 mg/L in monitoring well B-7. The results were similar or less than historic results, which ranged from below the method detection limit to 71 mg/L at B-9 (11/13/1996).
- TOX concentrations were not detected above the method detection limit of 150 µg/L; except in monitoring well B-7 (170 µg/L). The results were similar or less than historic results, which ranged from below the method detection limit to 230 µg/L at B-7 (11/30/2016). TOX samples were diluted to five times due to the nature of the sample matrix, resulting in an elevated reporting limit.
- pH concentrations ranged from 6.74 in monitoring well B-9 to 7.37 in monitoring well B-28. The results were within the range of the historic results, which ranged from 4.84 in monitoring well B-20D (12/8/2005) to 9.01 in monitoring well B-2D (6/21/1995).
- Specific conductivity ranged from 880 µs/cm in monitoring well B-28 to 3,010 µs/cm in monitoring well B-9. The results were comparable to the historic results, which ranged from 434 µs/cm in monitoring well B-2D (6/21/1995) to 3,290 µs/cm in monitoring well B-9 (11/20/2008).
- VOCs were not analyzed during this sampling event, but are analyzed during the June semi-annual sampling event each year in accordance with the approved PCCP.

A QA/QC review of the field and analytical data indicates that the data is useable for the intended purpose without deviations from quality assurance standards that would require rejection or further qualification of the data. Details of the data verification results for the groundwater monitoring data are included in **Appendix D**.

The duplicate sample results collected from monitoring well B-28 were comparable to the original sample.

There were no exceedances of the Shewart control limits (SCL) during this sampling event. The Shewart control charts are included as **Appendix E**. There were spikes for pH (7.37) in monitoring well B-28, specific conductivity (3010) in monitoring well B-9, and chromium (6 µg/L) and nickel (11 µg/L) in monitoring well B-19Ar, and a

negative (decreasing) trend for pH in B-18A. The trend was calculated using regression analysis over the last four sampling events per the Post Closure Care Plan, January 2014.

The spikes and negative trend were not confirmed by the concentrations of metals, which were either not detected (for the four primary metals [Cr, Cu, Ni, and Zn] in particular) or stable, except in monitoring well B-19Ar.

The confirmation of two or more spikes for constituents in well B-19Ar requires further evaluation of well B-19Ar and the data for the associated leak detection vault and sump closest to B-19Ar (*i.e.*, Vault A and Sump A) in accordance with Section 5.7.2 of the Post-Closure Care Plan (OBG, 2014). The analytical tables for Vault A and Sump A data are contained in **Appendix F**. A summary of the further evaluation indicated:

- The spikes of chromium and nickel appear to be the result of metals (*i.e.*, sediment) entrainment due to the high turbidity (1,000+ NTUs, above range of meter) in the sample. The well was purged dry with a whale pump, and then the sample was collected after the well recovered sufficiently to allow for sample collection (approximately 22 hours). The higher turbidity could be attributed to the PFAS investigation boring that was installed approximately 10 feet to the west of B-19Ar (September 2018), which disturbed the perched zone within the screen zone.
- The spikes could also be attributed to low concentrations detected historically in this well (*i.e.*, current concentration exceeds the mean plus one standard deviation). Chromium (6 µg/L) and nickel (11 µg/L) concentrations were consistent with historical results that have been generally non-detects; however, metals have also been detected in the past. The concentrations were below the all-time high for chromium (14 µg/L) and nickel (26 µg/L) in B-19Ar.
- There does not appear to be a correlation between B-19Ar concentrations and the chromium (below the method detection limit 5 µg/L) and nickel (16 µg/L) concentrations in Vault A, which were either not detected or stable.
- pH decreased both in Sump A (June 2018) and Well B-19Ar, but increased in Vault A during the most recent sampling event, but remain generally stable, whereas the pH has decreased slightly in Sump A overall.
- Specific conductivity increased in Sump A (June 2018), Vault A, and Well B-19Ar during the most recent sampling event, but remain generally stable and were with in historic ranges.

Therefore, the confirmed spikes in chromium and nickel in B-19Ar were not confirmed by or correlated with the concentrations of metals, Ph, or specific conductivity in the closest associated leak detection vault and sump, and do not appear to be attributable to the landfill.

Therefore, the spikes and negative trend do not suggest there was a release from the landfill and will continue to be evaluated during future sampling events. No other trends or spikes were observed during this monitoring event, and trends and spikes will continue to be monitored during future sampling events.

## B-2D ABANDONMENT

During the 2018 per- and polyfluoroalkyl substances (PFAS) investigation the presence of PFAS was detected in monitoring well B-2D, which appeared to be anomalous for the Drift aquifer monitoring wells. The MDEQ hypothesized that the seal on the well may be leaking. For years, a partial obstruction (or possibly kink) in the well casing had been encountered at about 30 to 40 feet below grade. Whether this was a separation at one of the well casing joints, or something else, the well appeared to be compromised and was taken out of service.

In accordance with Part 111 Rule 299.9612 (1)(b), methods outlined in the Post-Closure Care Plan (PCCP), and as approved in an email received November 29, 2018; monitoring well B-2D was abandoned on December 5, 2018 during the PFAS drilling activities. The monitoring well was abandon by over drilling and removing the well materials and pressure backfilling the open hole with a bentonite slurry with more than 20% solids.

Newly installed monitoring well OBG MW-16D, which is approximately 27 feet to the east of B-2D will act as a replacement well for this location based on the statistical and analytical results collected during the annual event. The results from OBG MW-16D (shown below) were similar to the historical results of well B-2D (**Table 3**) and should be considered a suitable replacement.

OBG MW-16D was analyzed for specific conductivity (Method 120.1), chloride (Method 300.0), cyanide (CN, Method 335.4), sulfate (Method 300.0), phenols (Method 420.1), volatile organic compounds (VOCs, Method 8260B), dissolved metals (chromium [Cr], copper [Cu], nickel [Ni], zinc [Zn], iron [Fe], manganese [Mn]), and total sodium ([Na], Method 200.8).

| | | Indicator Parameters | | | | | Dissolved Metals (µg/L) | | | | | | Inorganics (mg/L) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well ID | Sample Date | TOC (mg/L) | TOX (µg/L) | pH | SpC | Temp | Cr | Cu | Ni | Zn | Fe | Mn | Na | Chloride | Cyanide | Phenols | Sulfate |
| *DEQ Residential Drinking Water Criteria & RBSL* | | | | | | | *100 (A)* | *1,000 (E)* | *100 (A)* | *2,400* | | | | | | | |
| OBG MW-16D | 11/7/2018 | 3.3 | <150 | 7.60 | 657 | 9.7 | <5 | <5 | <5 | <5 | 2,870 | 47 | 18,400 | <5 | <0.005 | <0.02 | 32 |

The Shewart control charts for OBG MW-16D using this event analytical data and the B-2D results are included in **Appendix E**. There were no exceedances of the Shewart control limits. There was a negative (decreasing) trend for specific conductivity. The trend was calculated using regression analysis over the last four sampling events (three from B-2D) per the Post Closure Care Plan, January 2014. The trend will continue to be evaluated during future sampling events. No other trends or spikes (in the primary metals) were observed in OBG MW-16D.

The next sampling event (semi-annual event) is currently scheduled for June 2019. If you have any questions, please feel free to contact Clifford Yantz at (313) 333-0211.

Very truly yours,
**O'BRIEN & GERE ENGINEERS, INC.**

Brian E. White, PE
Senior Vice President

Very truly yours,
**O'BRIEN & GERE ENGINEERS, INC.**

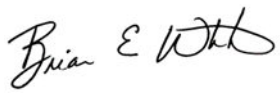
Clifford S. Yantz
Senior Hydrogeologist

**ENCLOSURES:**
Table 1 – Depth to Groundwater Levels in Monitoring Wells
Table 2 – Post-Closure Monitoring - Historical Analytical Results
Table 3 – Post-Closure Monitoring – Historical Analytical Results (Well B-2D and OBG MW-16D)
Figure 1 – Site Location Map
Figure 2 – Site Layout
Figure 3 – Shallow Groundwater Elevation Map
Figure 4 – Drift Aquifer Groundwater Elevation Map
Appendix A – Sampling Procedures
Appendix B – Groundwater Sampling Logs
Appendix C – Analytical Results
Appendix D – Groundwater Sampling Program QA/QC Summary
Appendix E – Monitoring Well Control Charts
Appendix F – Vault A and Sump A Analytical Results

cc: David Favero – RACER Trust
Kevin Schneider – OBG

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

On Behalf of RACER Trust



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Brian E. White, PE
Senior Vice President – O'Brien & Gere Engineers, Inc.

Agent for RACER Trust

Date: February 27, 2019

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cc: file

# TABLES

# TABLE 1

## RACER Trust - Coldwater Road Landfill Facility

## Depth to Groundwater Levels in Monitoring Wells

### November 5, 2018

| *Well* | *Top of Casing Elev. (ft)** | *Depth to Water(ft)* | *Static Water Elev. (ft)* |
|---|---|---|---|
| *Landfill Monitoring Wells* | | | |
| B-2D | 803.80 | 55.92 | 747.88 |
| B-7 | 813.63 | 20.83 | 792.80 |
| B-9 | 807.45 | 6.52 | 800.93 |
| B-18A | 810.85 | 24.83 | 786.02 |
| B-19A | 812.66 | 9.10 | 803.56 |
| B-19AR | 811.80 | 39.30 | 772.50 |
| B-20D | 815.14 | 71.39 | 743.75 |
| B-21D | 821.07 | 81.41 | 739.66 |
| B-22D | 822.15 | 85.30 | 736.85 |
| B-23DR | 812.12 | 81.44 | 730.68 |
| B-24R | 816.04 | 13.15 | 802.89 |
| B-27D | 812.70 | 76.51 | 736.19 |
| B-28 | 816.46 | 5.30 | 811.16 |
| OBG MW-16D | 807.43 | 59.60 | 747.83 |

**Notes**

Casing elevations were provided by Norwy & Hale Surveyors and are in feet relative to National Geodetic Vertical Datum

-- Depth to water not collected.

NA - Not available

NG - No ground water detected

Top of casing elevations were resurveyed in June 2017.

R - Indicates a replacement well location.

# TABLE 2
## RACER Trust - Coldwater Road Landfill Facility
## Post-Closure Monitoring - Historical Analytical Results
## Physical Parameters, TOC, TOX, Metals, Chloride, Cyanide, Phenols, and Sulfate

| | | Indicator Parameters | | | | | Dissolved Metals (µg/L) | | | | | | | Inorganics (mg/L) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well ID | Sample Date | TOC (mg/L) | TOX (µg/L) | pH | SpC | Temp | Cr | Cu | Ni | Zn | Fe | Mn | Na | Chloride | Cyanide | Phenols | Sulfate |
| | | | *MDEQ Residential Drinking Water Criteria & RBSLs* | | | | *100 (A)* | *1,000 (E)* | *100 (A)* | *2,400* | | | | | | | |
| | 6/21/1995 | 8.7 | 23 | 7.48 | 1509 | 13.8 | <20 | <20 | <30 | <20 | -- | -- | -- | -- | -- | -- | -- |
| | 8/31/1995 | -- | -- | -- | -- | -- | <20 | <20 | <40 | <20 | -- | -- | -- | -- | -- | -- | -- |
| | 2/9/1996 | 14.0 | 120 | -- | -- | -- | <20 | <20 | <40 | 22 | -- | -- | -- | -- | -- | -- | -- |
| | 6/19/1996 | 20.0 | <100 | 6.91 | 1,508 | 13.2 | <20 | <20 | <20 | 20 | -- | -- | -- | -- | -- | -- | -- |
| B-7 | 8/21/1996 | 55.0 | 26 | 7.59 | 1,567 | 17.1 | <20 | <20 | <20 | 60 | -- | -- | -- | -- | -- | -- | -- |
| | 11/13/1996 | 27.0 | <5 | 7.95 | 1,960 | 7.2 | <20 | <20 | <20 | 50 | -- | -- | -- | -- | -- | -- | -- |
| | 5/6/1997 | 16.0 | <100 | 7.20 | 780 | 11.0 | <10 | 10 | 14 | 10 | -- | -- | -- | -- | -- | -- | -- |
| | 11/6/1997 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 5/4/1998 | 6.0 | <5 | 6.61 | 1,270 | 10.7 | <10 | <10 | <5 | 20 | -- | -- | -- | -- | -- | -- | -- |
| | 11/5/1998 | 4.0 | <10 | 4.60 | 1,240 | 11.2 | <10 | <10 | 8 | 30 | 10 | 424 | 31,000 | -- | -- | -- | -- |
| | 12/23/1998 | -- | -- | -- | -- | -- | | -- | -- | -- | -- | -- | -- | 58 | <0.005 | <0.020 | 161 |
| | 4/26/1999 | 3.9 | <100 | 7.50 | 1,413 | 14.2 | <10 | <10 | 10 | <10 | -- | -- | -- | -- | -- | -- | -- |
| | 11/5/1999 | 5.1 | <100 | 6.50 | 1,230 | 14.2 | <10 | <10 | 8 | 30 | 260 | 313 | 41,800 | 64 | <0.005 | <0.020 | 301 |
| | 4/26/2000 | 4.8 | <100 | 7.58 | 1,450 | 10.2 | <10 | <10 | <5 | <10 | -- | -- | -- | -- | -- | -- | -- |
| Duplicate | 4/26/2000 | 5.9 | <100 | NS | NS | NS | <10 | <10 | 6 | 10 | -- | -- | -- | -- | -- | -- | -- |
| | 12/8/2000 | 4.2 | <10 | 7.05 | 1,180 | 9.5 | <10 | <10 | 20 | 10 | 50 | -- | 58,900 | 79 | <0.005 | <0.020 | 227 |
| | 5/16/2001 | 5.0 | <100 | 7.30 | 1,330 | 13.0 | <10 | <10 | 7 | <10 | -- | -- | -- | -- | -- | -- | -- |
| | 10/18/2001 | 5.3 | <100 | 7.19 | 1,210 | 12.5 | <10 | <10 | 5 | <10 | 330 | -- | 60,800 | 81 | <0.005 | NA | 205 |
| | 5/16/2002 | 3.9 | <100 | 7.19 | 1,850 | 11.9 | <10 | <10 | <5 | 10 | -- | -- | -- | -- | -- | -- | -- |
| | 11/7/2002 | NR | NR | 7.35 | 1,120 | 10.3 | <5 | <5 | 5 | 5 | 250 | <5 | 65,500 | NA | NA | NA | NA |
| | 6/4/2003 | 3.3 | <30 | 6.90 | 1,460 | 12.6 | <5 | <5 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 11/13/2003 | 3.9 | <30 | 6.90 | 1,590 | 9.6 | <5 | <5 | <5 | 5 | 190 | <5 | -- | 85 | <0.005 | <0.010 | 279 |
| | 6/30/2004 | 4.3 | 43 | 7.13 | 1,353 | 16.0 | <5 | <5 | 9 | 7 | -- | -- | -- | -- | -- | -- | -- |
| | 12/9/2004 | 4.0 | <30 | 5.32 | 1,290 | 10.8 | <5 | <5 | 7 | 14 | 180 | 74 | 71,200 | 78 | <0.005 | <0.010 | 251 |
| | 6/8/2005 | 7.0 | 86 | 7.36 | 1,121 | 10.9 | 5 | <5 | 9 | 13 | 170 | 31 | 81,900 | 80 | <0.005 | <0.010 | 254 |
| | 12/7/2005 | 7.5 | <30 | 8.70 | 1,430 | 12.2 | 10 | <4 | 6 | 20 | 150 | 50 | 85,300 | -- | -- | -- | -- |
| | 6/29/2006 | 4.3 | <30 | 7.19 | 1,470 | 11.7 | 5 | <4 | 9 | 18 | 190 | 150 | 76,900 | 73 | <0.005 | <0.010 | 270 |
| | 11/29/2006 | 4.4 | <30 | 6.88 | 1,380 | 15.3 | <5 | <4 | 9 | 11 | -- | -- | -- | -- | -- | -- | -- |
| | 6/7/2007 | 3.9 | 23.7 | 6.87 | 1,400 | 13.4 | 11 | 27 | 5 | 14 | 130 | 42 | 87,300 | 72 | <0.005 | <0.010 | 208 |
| | 11/14/2007 | 3.5 | <30 | 6.85 | 1,350 | 13.4 | 14 | 6 | 16 | 20 | -- | -- | -- | -- | -- | -- | -- |
| | 6/25/2008 | 3.8 | 72.9 | 6.90 | 1,410 | 20.7 | <5 | 3 | 6 | <5 | 350 | 10 | 94,800 | 68 | <0.005 | <0.010 | 222 |
| | 11/17/2008 | 4.6 | 20.5 | 6.80 | 1,258 | 5.5 | <5 | 3 | 5 | 17 | -- | -- | -- | -- | -- | -- | -- |
| | 6/24/2009 | 4.5 | <30 | 6.90 | 1,184 | 20.0 | <5 | 3 | <5 | 14 | 67 | 36 | 84,500 | 40 | <0.005 | <0.010 | 154 |
| | 11/17/2009 | 8 | 25.3 | 7.31 | 1,090 | 10.3 | <5 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/17/2010 | 5 | <30 | 7.04 | 1,290 | 16.3 | <5 | <4 | <5 | <5 | <20 | 47 | 86,000 | 61 | <0.005 | <0.020 | 160 |
| | 11/8/2010 | 8 | 103 | 7.16 | 997 | 13.9 | 17 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/22/2011 | 4.3 | 25 | 7.25 | 910 | 13.7 | 10 | <4 | 5 | 6 | 220 | 6 | 55,200 | 26 | <0.005 | <0.010 | 88 |
| Replicate | 6/22/2011 | -- | -- | -- | -- | -- | <5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 11/16/2011 | 5 | 28 | 7.04 | 974 | 12.8 | <5 | 6 | 8 | 11 | -- | -- | -- | -- | -- | -- | -- |
| | 6/27/2012 | 3.7 | 97 | 6.77 | 1,082 | 15.0 | <5 | <4 | <5 | <5 | <20 | 58 | 64,900 | 40 | <0.005 | <0.02 | 134 |
| | 12/6/2012 | 7.9 | <40 | 7.12 | 825 | 8.7 | <5 | 4 | <5 | 9 | -- | -- | -- | -- | -- | -- | -- |
| B-7 | 6/5/2013 | 4.5 | 6 | 7.24 | 921 | 14.0 | <5 | <4 | <5 | 24 | 30 | 13 | 27,500 | 32 | <0.005 | <0.02 | 106 |
| | 11/4/2013 | 8.7 | 16 | 7.10 | 733 | 11.6 | 14 | 6 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/25/2014 | -- | -- | 7.10 | -- | 13.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 11/18/2014 | 6.5 | 28 | 7.31 | 896 | 4.8 | <5 | 6 | 6 | 6 | -- | -- | -- | -- | -- | -- | -- |
| | 6/24/2015 | 4.2 | <30 | 6.98 | 1,019 | 16.3 | <5 | <5 | <5 | <5 | <20 | 69 | 58,900 | 36 | <0.005 | <0.02 | 122 |
| | 11/18/2015 | 3.7 | 16 | 7.06 | 1,231 | 14.7 | <5 | <5 | 7 | 7 | -- | -- | -- | -- | -- | -- | -- |
| | 6/23/2016 | 3.9 | 77 | 7.14 | 852 | 15.1 | <5 | <5 | <5 | <5 | 30 | 41 | 41,700 | 22 | <0.005 | <0.02 | 82 |
| | 11/30/2016 | 5.3 | 230 | 7.21 | 880 | 13.3 | <5 | <5 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/21/2017 | 3.9 | 12 | 6.78 | 1,092 | 11.0 | <5 | <5 | <5 | <5 | 40 | 37 | 51,700 | 41 | <0.005 | <0.02 | 155 |
| | 11/7/2017 | 6.5 | 39 | 6.94 | 841 | 10.8 | <5 | 5 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/12/2018 | 4.2 | <60 | 6.95 | 932 | 11.0 | <5 | <5 | <5 | 10 | 230 | 26 | 39,800 | 27 | <0.005 | <0.02 | 116 |
| | **11/7/2018** | **6.5** | **170** | **7.25** | **952** | **11.4** | **<5** | **<5** | **<5** | **<5** | **--** | **--** | **--** | **--** | **--** | **--** | **--** |

See notes on page 7.

# TABLE 2
## RACER Trust - Coldwater Road Landfill Facility
## Post-Closure Monitoring - Historical Analytical Results
## Physical Parameters, TOC, TOX, Metals, Chloride, Cyanide, Phenols, and Sulfate

| | | Indicator Parameters | | | | | Dissolved Metals (µg/L) | | | | | | | Inorganics (mg/L) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well ID | Sample Date | TOC (mg/L) | TOX (µg/L) | pH | SpC | Temp | Cr | Cu | Ni | Zn | Fe | Mn | Na | Chloride | Cyanide | Phenols | Sulfate |
| | | | *MDEQ Residential Drinking Water Criteria & RBSLs* | | | | *100 (A)* | *1,000 (E)* | *100 (A)* | *2,400* | | | | | | | |
| | 6/21/1995 | 3.5 | 34 | 7.68 | 2,400 | 14.6 | <20 | <20 | <30 | <20 | -- | -- | -- | -- | -- | -- | -- |
| | 8/31/1995 | 3.9 | <10 | 7.72 | 1,829 | 14.8 | 37 | 43 | <40 | <20 | -- | -- | -- | -- | -- | -- | -- |
| | 2/9/1996 | 3.1 | <10 | 7.34 | 2,860 | 8.0 | <20 | <20 | <40 | <20 | -- | -- | -- | -- | -- | -- | -- |
| | 6/19/1996 | 2.1 | <100 | 6.81 | 2,550 | 11.5 | <20 | <20 | <20 | <20 | -- | -- | -- | -- | -- | -- | -- |
| B-9 | 8/21/1996 | 2.3 | <5 | 8.04 | 2,310 | 16.4 | <20 | <20 | <20 | 70 | -- | -- | -- | -- | -- | -- | -- |
| | 11/13/1996 | 71.0 | <5 | 6.79 | 3,280 | 9.2 | <20 | <20 | <20 | 40 | -- | -- | -- | -- | -- | -- | -- |
| | 5/6/1997 | 3.0 | <100 | 6.80 | 2,600 | 10.0 | <10 | <10 | 51 | 20 | -- | -- | -- | -- | -- | -- | -- |
| | 11/6/1997 | 2.0 | <100 | 6.50 | 2,800 | 11.0 | <10 | <10 | 183 | 40 | 650 | 741 | -- | 141 | <0.005 | <0.020 | 1,178 |
| | 5/4/1998 | 3.0 | <5 | 6.58 | 2,400 | 14.5 | 10 | 10 | 18 | 40 | -- | -- | -- | -- | -- | -- | -- |
| | 11/5/1998 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | -- | -- | -- | -- |
| | 12/23/1998 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | NS | NS | NS | NS |
| | 4/26/1999 | 4.0 | <100 | 7.69 | 1,860 | 12.2 | <10 | <10 | 19 | 20 | -- | -- | -- | -- | -- | -- | -- |
| | 11/5/1999 | 2.5 | <100 | 6.75 | 2,340 | 15.4 | <10 | <10 | 20 | 30 | 610 | 1280 | 47,100 | 128 | <0.005 | <0.020 | 1,222 |
| | 4/26/2000 | 5.5 | <100 | 7.56 | 2,780 | 9.5 | <10 | <10 | 12 | 30 | -- | -- | -- | -- | -- | -- | -- |
| | 12/8/2000 | 5.0 | <10 | 7.56 | 2,400 | 7.8 | <10 | <10 | 46 | <10 | 50 | -- | 69,500 | 142 | <0.005 | <0.020 | 1,246 |
| | 5/16/2001 | 4.8 | <100 | 7.41 | 1,070 | 12.6 | <10 | <10 | 7 | 10 | -- | -- | -- | -- | -- | -- | -- |
| | 10/17/2001 | 4.0 | <100 | 7.54 | 2,130 | 10.8 | <10 | <10 | 8 | 20 | 940 | -- | 66,000 | 122 | <0.005 | NA | 1,150 |
| | 5/16/2002 | 1.9 | <100 | 7.19 | 2,470 | 11.6 | <10 | <10 | 7 | 10 | -- | -- | -- | -- | -- | -- | -- |
| | 11/7/2002 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 6/4/2003 | 2.2 | 57 | 6.78 | 2,690 | 10.7 | <5 | <5 | 15 | 13 | -- | -- | -- | -- | -- | -- | -- |
| | 11/13/2003 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 6/30/2004 | 3.8 | NS | 6.91 | 2,379 | 12.7 | <5 | 8 | 19 | 28 | -- | -- | -- | -- | -- | -- | -- |
| | 12/9/2004 | 3.0 | <30 | 5.88 | 2,480 | 11.4 | <5 | <5 | 11 | 19 | 570 | 248 | 55,900 | 149 | <0.005 | <0.010 | 1,350 |
| | 6/8/2005 | 4.0 | <30 | 7.09 | 2,116 | 10.3 | 6 | 6 | 12 | 17 | 480 | 701 | 58,300 | 128 | <0.005 | <0.010 | 1,160 |
| | 12/7/2005 | 5.0 | <30 | 8.58 | 2,830 | 11.9 | 11 | 5 | 12 | 40 | 320 | 410 | 58,500 | -- | -- | -- | -- |
| | 6/29/2006 | 1.9 | <30 | 6.82 | 2,820 | 12.4 | 6 | 6 | 13 | 19 | 390 | 330 | 63,600 | 125 | <0.005 | <0.010 | 1,150 |
| | 11/30/2006 | 2.7 | 36.7 | 7.15 | 2,830 | 12.5 | <5 | 6 | <5 | 14 | -- | -- | -- | -- | -- | -- | -- |
| | 6/5/2007 | 2.1 | <30 | 6.70 | 2,770 | 11.0 | 12 | 6 | 24 | 21 | 320 | 1,900 | 67,300 | 112 | <0.005 | <0.010 | 1,120 |
| | 11/16/2007 | 2.0 | 27.4 | 6.67 | 3,000 | 9.4 | 2 | 6 | 24 | 18 | -- | -- | -- | -- | -- | -- | -- |
| | 7/2/2008 | 1.8 | 36.4 | 6.44 | 3,060 | 19.7 | <5 | 4 | 13 | 19 | 780 | 812 | 64,200 | 133 | <0.005 | <0.010 | 1,280 |
| | 11/20/2008 | 2.2 | 15.9 | 6.35 | 3,290 | 8.1 | <5 | <1 | 13 | <5 | -- | -- | -- | -- | -- | -- | -- |
| Duplicate | 11/20/2008 | 2.0 | 127 | 6.35 | 3,280 | 8.1 | <5 | <1 | 13 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/25/2009 | 1.6 | <30 | 6.67 | 2,700 | 19.8 | <5 | <1 | <5 | <5 | 59 | 173 | 65,300 | 107 | <0.005 | <0.010 | 1,120 |
| | 11/16/2009 | 3 | 84.1 | 6.71 | 3,030 | 12.7 | <5 | <4 | 16 | 8 | -- | -- | -- | -- | -- | -- | -- |
| | 6/15/2010 | 3 | 27.5 | 6.69 | 3,030 | 13.0 | <5 | <4 | 7 | 6 | 460 | 475 | 70,700 | 117 | <0.005 | <0.020 | 1,230 |
| | 11/11/2010 | 3 | 37.5 | 6.37 | 2,910 | 12.9 | 19 | 4 | 7 | 15 | -- | -- | -- | -- | -- | -- | -- |
| | 6/22/2011 | 1.9 | <30 | 6.70 | 2,600 | 14.0 | 17 | 6 | 21 | 12 | 780 | 661 | 63,300 | 99 | <0.005 | <0.010 | 972 |
| Replicate | 6/22/2011 | -- | -- | -- | -- | -- | <5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 11/16/2011 | 2 | 50 | 7.18 | 3,060 | 12.9 | <5 | <4 | 7 | <5 | -- | -- | -- | -- | -- | -- | -- |
| B-9 | 6/26/2012 | 2 | 21 | 6.53 | 2,770 | 14.0 | <5 | <4 | 8 | <5 | 60 | 433 | 73,700 | 101 | <0.005 | <0.02 | 1,110 |
| | 12/5/2012 | 2.3 | 19 | 6.80 | 3,210 | 12.0 | <5 | 8 | 17 | 23 | -- | -- | -- | -- | -- | -- | -- |
| | 6/5/2013 | 2.1 | 15 | 7.07 | 2,660 | 12.5 | <5 | <4 | 6 | 25 | 40 | 173 | 66,400 | 106 | <0.005 | <0.02 | 1,150 |
| | 11/6/2013 | 2.2 | NS | 6.36 | 2,730 | 13.0 | 10 | 8 | 47 | 8 | -- | -- | -- | -- | -- | -- | -- |
| | 6/25/2014 | 1.9 | 25 | 6.82 | 2,650 | 11.5 | <5 | <5 | 18 | 8 | <20 | 159 | 27,100 | 108 | <0.005 | <0.02 | 1,070 |
| | 11/19/2014 | 2.1 | 29 | 6.77 | 2,670 | 8.12 | <5 | 6 | 14 | 12 | -- | -- | -- | -- | -- | -- | -- |
| | 6/24/2015 | 2.0 | 17 | 6.38 | 2,480 | 11.8 | <5 | <5 | <5 | <5 | <20 | 89 | 62,400 | 87 | <0.005 | <0.02 | 1,040 |
| | 11/18/2015 | 2.0 | <30 | 6.68 | 2,670 | 13.5 | <5 | <5 | 7 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/24/2016 | 1.9 | 150 | 6.68 | 2,190 | 12.9 | <5 | <5 | 10 | <5 | 20 | 95 | 52,800 | 71 | <0.005 | <0.02 | 776 |
| | 11/29/2016 | 1.9 | 13 | 6.77 | 2,780 | 13.9 | <5 | <5 | 8 | 9 | -- | -- | -- | -- | -- | -- | -- |
| | 6/20/2017 | 1.8 | 12 | 6.75 | 2,250 | 11.5 | <5 | <5 | 5 | <5 | 17 | 172 | 54,600 | 74 | <0.005 | <0.02 | 770 |
| | 11/7/2017 | 2.1 | <30 | 6.57 | 2,540 | 13.1 | <5 | <5 | 8 | 11 | -- | -- | -- | -- | -- | -- | -- |
| | 6/12/2018 | 1.9 | <60 | 5.78 | 2,420 | 11.6 | <5 | <5 | 6 | 8 | 20 | 89 | 55,500 | 85 | <0.005 | <0.02 | 931 |
| | **11/6/2018** | **4.9** | **<150** | **6.74** | **3,010** | **13.6** | **<5** | **<5** | **7** | **<5** | **--** | **--** | **--** | **--** | **--** | **--** | **--** |

See notes on page 7.

**TABLE 2**
**RACER Trust - Coldwater Road Landfill Facility**
**Post-Closure Monitoring - Historical Analytical Results**
**Physical Parameters, TOC, TOX, Metals, Chloride, Cyanide, Phenols, and Sulfate**

| | | Indicator Parameters | | | | | Dissolved Metals (µg/L) | | | | | | | Inorganics (mg/L) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well ID | Sample Date | TOC (mg/L) | TOX (µg/L) | pH | SpC | Temp | Cr | Cu | Ni | Zn | Fe | Mn | Na | Chloride | Cyanide | Phenols | Sulfate |
| | | | *MDEQ Residential Drinking Water Criteria & RBSLs* | | | | *100 (A)* | *1,000 (E)* | *100 (A)* | *2,400* | | | | | | | |
| | 6/21/1995 | 2.7 | <10 | 7.54 | 1,048 | 13.3 | <20 | <20 | <30 | 150 | -- | -- | -- | -- | -- | -- | -- |
| | 8/31/1995 | 3.0 | <10 | 7.91 | 989 | 13.2 | <20 | <20 | <40 | <20 | -- | -- | -- | -- | -- | -- | -- |
| | 2/9/1996 | 2.3 | <10 | 7.42 | 1,021 | 9.3 | <20 | <20 | <40 | <20 | -- | -- | -- | -- | -- | -- | -- |
| | 6/19/1996 | 1.4 | <100 | 7.04 | 944 | 13.2 | <20 | <20 | <20 | <20 | -- | -- | -- | -- | -- | -- | -- |
| **B-18A** | 8/21/1996 | 2.4 | <5 | 7.49 | 1,041 | 12.8 | <20 | <20 | <20 | 60 | -- | -- | -- | -- | -- | -- | -- |
| | 11/13/1996 | 19.0 | <5 | 7.22 | 1,331 | 6.4 | <20 | <20 | <20 | 70 | -- | -- | -- | -- | -- | -- | -- |
| | 5/6/1997 | 2.0 | <100 | 6.50 | 900 | 10.0 | <10 | <10 | 13 | 10 | -- | -- | -- | -- | -- | -- | -- |
| | 11/6/1997 | 4.0 | <100 | 6.40 | 1,100 | 10.0 | <10 | <10 | 62 | 10 | 380 | 62 | -- | 12 | <0.005 | <0.020 | 130 |
| | 5/4/1998 | 2.0 | <5 | 6.72 | 862 | 11.8 | <10 | <10 | <5 | 20 | -- | -- | -- | -- | -- | -- | -- |
| | 11/5/1998 | 1.0 | <10 | 6.00 | 1,090 | 11.8 | <10 | <10 | <5 | 10 | 240 | 128 | 46,000 | -- | -- | -- | -- |
| | 12/23/1998 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 10 | <0.005 | <0.020 | 133 |
| | 4/26/1999 | 2.1 | <100 | 8.10 | 921 | 14.0 | <10 | <10 | <5 | 20 | -- | -- | -- | -- | -- | -- | -- |
| | 11/5/1999 | 4.3 | <100 | 7.10 | 832 | 14.0 | <10 | <10 | <5 | 60 | 180 | 155 | 39,200 | 8 | <0.005 | <0.020 | 130 |
| | 4/26/2000 | 2.4 | <100 | 7.50 | 980 | 10.4 | <10 | <10 | <5 | 30 | -- | -- | -- | -- | -- | -- | -- |
| | 12/8/2000 | 2.6 | <10 | 6.96 | 990 | 9.9 | <10 | <10 | 15 | <10 | <10 | -- | 34,500 | 7 | <0.005 | <0.020 | 126 |
| Duplicate | 12/8/2000 | 2.6 | <10 | -- | -- | -- | <10 | <10 | 13 | <10 | 40 | -- | 35,100 | 7 | <0.005 | <0.020 | 112 |
| | 5/16/2001 | 2.4 | <100 | 7.91 | 1,160 | 12.9 | <10 | <10 | <5 | 10 | -- | -- | -- | -- | -- | -- | -- |
| | 10/17/2001 | 2.2 | <100 | 7.09 | 1,020 | 12.2 | <10 | <10 | <5 | <10 | 350 | -- | 35,400 | 7 | <0.005 | <0.020 | 132 |
| | 5/16/2002 | 1.5 | <100 | 7.19 | 2,080 | 12.2 | <10 | <10 | <5 | 10 | -- | -- | -- | -- | -- | -- | -- |
| | 11/7/2002 | 1.9 | <30 | 7.16 | 820 | 10.1 | <5 | <5 | <5 | <5 | 190 | 26 | 40,800 | 10 | <0.005 | <0.020 | 134 |
| | 6/4/2003 | 1.6 | <30 | 6.92 | 790 | 13.1 | <5 | <5 | <5 | 5 | -- | -- | -- | -- | -- | -- | -- |
| | 11/13/2003 | 1 | <30 | 7.68 | 1,180 | 7.1 | <5 | <5 | <5 | <5 | 160 | <5 | -- | 10 | <0.005 | <0.010 | 129 |
| Duplicate | 11/13/2003 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 11 | <0.005 | <0.010 | 130 |
| | 6/29/2004 | 1.2 | <30 | 7.19 | 863 | 12.0 | <5 | <5 | 7 | 10 | -- | -- | -- | -- | -- | -- | -- |
| | 12/9/2004 | 3 | <30 | 6.19 | 960 | 10.5 | <5 | <5 | 9 | 12 | 900 | 363 | 37,900 | 14 | <0.005 | <0.010 | 127 |
| | 6/8/2005 | 2 | <30 | 7.38 | 819 | 10.9 | <5 | <5 | 6 | 16 | 170 | 80 | 40,000 | 11 | <0.005 | <0.010 | 120 |
| | 12/8/2005 | 2.6 | <30 | 9.73 | 1,120 | 10.1 | 11 | <4 | <5 | 10 | 390 | 170 | 47,000 | -- | -- | -- | -- |
| | 6/27/2006 | 1.2 | <30 | 7.09 | 1,110 | 13.2 | 5 | 4 | <5 | 46 | 170 | 50 | 48,200 | 13 | <0.005 | <0.010 | 125 |
| | 11/30/2006 | 1.4 | 119 | 7.18 | 1,100 | 11.5 | 5 | <4 | <5 | 9 | -- | -- | -- | -- | -- | -- | -- |
| | 6/4/2007 | 1 | 19.9 | 7.01 | 1,070 | 13.2 | 9 | 3 | 3 | 14 | 110 | 22 | 51,800 | 15 | <0.005 | <0.010 | 114 |
| | 11/14/2007 | <1 | 19 | 6.91 | 1,090 | 13.7 | 1 | 2 | 6 | 11 | -- | -- | -- | -- | -- | -- | -- |
| | 6/25/2008 | 12 | 34.1 | 7.10 | 1,060 | 20.4 | <5 | 2 | <5 | 11 | 310 | <5 | 54,800 | 15 | <0.005 | <0.010 | 110 |
| | 11/18/2008 | <1 | <30 | 6.58 | 1,088 | 2.9 | <5 | <1 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/24/2009 | <1 | <30 | 7.25 | 1,060 | 26.2 | <5 | 1 | <5 | 15 | <20 | <5 | 53,100 | 16 | <0.005 | <0.010 | 111 |
| | 11/18/2009 | 2 | <30 | 6.89 | 1,070 | 11.7 | <5 | <4 | <5 | 45 | -- | -- | -- | -- | -- | -- | -- |
| | 6/17/2010 | 1 | <30 | 7.19 | 1,080 | 17.5 | <5 | <4 | <5 | 8 | <20 | <5 | 45,500 | 15 | <0.005 | <0.020 | 109 |
| | 11/10/2010 | 2 | 28 | 6.91 | 1,065 | 9.5 | 12 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/21/2011 | 1.2 | <30 | 7.16 | 1,031 | 18.8 | 10 | <4 | 5 | 12 | 240 | <5 | 46,100 | 17 | <0.005 | <0.010 | 103 |
| Replicate | 6/21/2011 | -- | -- | -- | -- | -- | <5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 11/15/2011 | 1 | 28 | 7.01 | 1,063 | 12.0 | <5 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/27/2012 | 1.2 | <40 | 6.99 | 1,057 | 14.4 | <5 | <4 | <5 | <5 | 30 | 26 | 50,000 | 18 | <0.005 | <0.02 | 103 |
| Duplicate | 6/27/2012 | 1.2 | <40 | 6.99 | 1,054 | 14.4 | <5 | <4 | <5 | 5 | 40 | 27 | 46,500 | 18 | <0.005 | <0.02 | 101 |
| | 12/6/2012 | 1.5 | <40 | 7.03 | 1,071 | 9.3 | <5 | <4 | 5 | 9 | -- | -- | -- | -- | -- | -- | -- |
| | 6/5/2013 | 1.5 | 4.7 | 7.17 | 1,040 | 14.6 | <5 | <4 | <5 | 31 | 20 | 12 | 43,900 | 19 | <0.005 | <0.02 | 110 |
| **B-18A** | 11/5/2013 | 1.4 | <10 | 7.15 | 1,063 | 12.1 | <5 | <4 | <5 | 11 | -- | -- | -- | -- | -- | -- | -- |
| | 6/24/2014 | 1.5 | <30 | 7.03 | 1,048 | 12.8 | <5 | <5 | 6 | 7 | <20 | 20 | 20,500 | 18 | <0.005 | <0.02 | 107 |
| | 11/19/2014 | 1.4 | 16 | 7.10 | 1,073 | 6.27 | <5 | <4 | 5 | 7 | -- | -- | -- | -- | -- | -- | -- |
| Duplicate | 11/19/2014 | 1.5 | <60 | 7.10 | 1,072 | 6.27 | <5 | <4 | 5 | 7 | -- | -- | -- | -- | -- | -- | -- |
| | 6/23/2015 | 1.3 | <30 | 6.95 | 1,060 | 15.5 | <5 | <5 | <5 | <5 | 30 | 10 | 43,600 | 18 | <0.005 | <0.02 | 110 |
| | 11/18/2015 | 1.4 | <30 | 7.03 | 1,065 | 12.2 | <5 | <5 | <5 | 5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/23/2016 | 1.4 | 55 | 7.08 | 1,063 | 13.8 | <5 | <5 | <5 | <5 | 30 | 7 | 42,400 | 19 | <0.005 | <0.02 | 108 |
| | 11/30/2016 | 1.2 | <30 | 7.10 | 1,059 | 11.4 | <5 | <5 | <5 | 7 | -- | -- | -- | -- | -- | -- | -- |
| | 6/20/2017 | 1.5 | <30 | 6.97 | 1,075 | 12.7 | <5 | <5 | <5 | 8 | <20 | 27 | 36,300 | 18 | <0.005 | <0.02 | 118 |
| | 11/7/2017 | 1.2 | <30 | 6.96 | 1,092 | 11.6 | <5 | <5 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/12/2018 | 1.4 | <60 | 6.90 | 1,074 | 12.4 | <5 | <5 | <5 | 10 | 160 | 41 | 32,900 | 16 | <0.005 | <0.02 | 131 |
| | **11/7/2018** | **3.0** | **<150** | **6.85** | **1,106** | **11.7** | **<5** | **<5** | **<5** | **7** | **--** | **--** | **--** | **--** | **--** | **--** | **--** |

See notes on page 7.

# TABLE 2

**RACER Trust - Coldwater Road Landfill Facility**
**Post-Closure Monitoring - Historical Analytical Results**
**Physical Parameters, TOC, TOX, Metals, Chloride, Cyanide, Phenols, and Sulfate**

| | | Indicator Parameters | | | | | Dissolved Metals (µg/L) | | | | | | | Inorganics (mg/L) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well ID | Sample Date | TOC (mg/L) | TOX (µg/L) | pH | SpC | Temp | Cr | Cu | Ni | Zn | Fe | Mn | Na | Chloride | Cyanide | Phenols | Sulfate |
| | | | *MDEQ Residential Drinking Water Criteria & RBSLs* | | | | *100 (A)* | *1,000 (E)* | *100 (A)* | *2,400* | | | | | | | |
| | 6/21/1995 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | -- | -- | -- | -- |
| | 8/31/1995 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | -- | -- | -- | -- |
| | 2/9/1996 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | -- | -- | -- | -- |
| | 6/19/1996 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | -- | -- | -- | -- |
| **B-19A** | 8/21/1996 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | -- | -- | -- | -- |
| | 11/13/1996 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | -- | -- | -- | -- |
| | 5/6/1997 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | -- | -- | -- | -- |
| | 11/6/1997 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | WD | WD | WD | WD |
| | 5/4/1998 | 3.0 | <5 | 6.84 | 1,480 | 10.1 | <10 | <10 | <5 | 30 | -- | -- | -- | -- | -- | -- | -- |
| | 11/5/1998 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | -- | -- | -- | -- |
| | 12/23/1998 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | NS | NS | NS | NS |
| | 4/26/1999 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | -- | -- | -- | -- |
| | 11/5/1999 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 4/26/2000 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | -- | -- | -- | -- |
| | 12/8/2000 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 5/16/2001 | 4.0 | <100 | 7.14 | 1,050 | 11.8 | <10 | <10 | <5 | <10 | -- | -- | -- | -- | -- | -- | -- |
| | 10/17/2001 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 5/16/2002 | 6.0 | <100 | 7.19 | 1,740 | 10.6 | <10 | <10 | <5 | 10 | -- | -- | -- | -- | -- | -- | -- |
| | 11/7/2002 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 6/4/2003 | 5.8 | <30 | 6.92 | 1,350 | 12.9 | <5 | <5 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 11/13/2003 | 3.4 | <30 | 7.59 | 1,620 | 10.2 | <5 | <5 | <5 | <5 | 20 | <5 | -- | 148 | <0.005 | <0.010 | 229 |
| | 6/29/2004 | 3.9 | <30 | 7.17 | 1,316 | 14.7 | <5 | <5 | <5 | 8 | -- | -- | -- | -- | -- | -- | -- |
| | 12/9/2004 | 5.0 | 33 | 6.24 | 1,340 | 9.9 | <5 | <5 | <5 | 9 | 240 | 11 | 111,000 | 116 | <0.005 | <0.010 | 233 |
| Duplicate | 12/9/2004 | 5.0 | <30 | -- | -- | -- | <5 | <5 | <5 | 7 | 170 | <5 | 114,000 | 116 | <0.005 | <0.010 | 233 |
| **B-19AR** | 6/7/2005 | 3.0 | <30 | 7.09 | 829 | 12.2 | <5 | <5 | 7 | <5 | 1,320 | 228 | 15,700 | 52 | <0.005 | <0.010 | 130 |
| Duplicate | 12/8/2005 | 5.5 | <30 | -- | 1,390 | -- | 10 | <4 | <5 | 20 | 160 | <20 | 81,400 | -- | -- | -- | -- |
| | 12/8/2005 | 5.3 | <30 | 7.13 | 1,390 | 12.3 | 10 | <4 | <5 | <10 | 150 | <20 | 74,800 | -- | -- | -- | -- |
| Re-sample | 2/14/2006 | -- | -- | 7.95 | 840 | 5.9 | <5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6/29/2006 | 2.7 | <30 | 7.58 | 860 | 12.0 | <5 | <4 | 12 | 21 | 240 | 210 | 22,400 | 51 | <0.005 | <0.010 | 153 |
| | 11/30/2006 | 6.2 | 33.7 | 7.18 | 1,300 | 11.4 | 5 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/7/2007 | 2 | <30 | 6.97 | 899 | 11.4 | 6 | 4 | 4 | 9 | 70 | 21 | 19,700 | 58 | <0.005 | <0.010 | 136 |
| | 11/13/2007 | 1.5 | <30 | 7.27 | 1,070 | 12.1 | 3 | 7 | 26 | 11 | -- | -- | -- | -- | -- | -- | -- |
| | 6/25/2008 | 2.4 | 38.8 | 7.13 | 1,060 | 17.4 | <5 | 3 | <5 | 16 | 380 | 9 | 18,500 | 58 | <0.005 | <0.010 | 148 |
| | 11/18/2008 | 1.3 | <30 | 7.00 | 1,052 | 8.0 | <5 | 1 | <5 | 14 | -- | -- | -- | -- | -- | -- | -- |
| | 6/24/2009 | 1.0 | <30 | 7.74 | 911 | 17.3 | <5 | 2 | <5 | <5 | 36 | <5 | 21,200 | 60 | <0.005 | <0.010 | 147 |
| | 11/19/2009 | 2 | <30 | 7.41 | 994 | 10.4 | <5 | <4 | <5 | 7 | -- | -- | -- | -- | -- | -- | -- |
| | 6/15/2010 | 2 | <30 | 7.57 | 992 | 16.1 | <5 | <4 | <5 | <5 | <20 | <5 | 19,800 | 59 | <0.005 | <0.020 | 154 |
| | 11/10/2010 | 2 | <30 | 6.91 | 1,128 | 8.7 | 12 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/22/2011 | 1.5 | <30 | 7.35 | 902 | 17.2 | 5 | <4 | 5 | <5 | 240 | <5 | 22,400 | 64 | <0.005 | <0.010 | 140 |
| Replicate | 6/22/2011 | -- | -- | -- | -- | -- | <5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 11/16/2011 | 2 | 26 | 7.06 | 1,091 | 8.4 | <5 | <4 | <5 | 5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/27/2012 | 1.5 | <40 | 7.78 | 1,005 | 13.3 | <5 | <4 | <5 | <5 | <20 | <5 | 23,200 | 62 | <0.005 | <0.02 | 145 |
| | 12/6/2012 | 1.8 | <40 | 7.36 | 1,129 | 10.2 | <5 | <4 | 5 | 6 | -- | -- | -- | -- | -- | -- | -- |
| | 6/5/2013 | 1.5 | 39 | 8.16 | 777 | 13.0 | <5 | <4 | <5 | 25 | 40 | <5 | 27,700 | 72 | <0.005 | <0.02 | 136 |
| | 11/6/2013 | 1.6 | 3.6 | 7.33 | 1,104 | 11.6 | <5 | <4 | 10 | <5 | -- | -- | -- | -- | -- | -- | -- |
| **B-19AR** | 6/23/2014 | 2.0 | 23 | 8.40 | 817 | 17.3 | <5 | <5 | 5 | <5 | <20 | <5 | 11,900 | 74 | <0.005 | <0.02 | 136 |
| | 11/20/2014 | 2.1 | 190 | 7.37 | 1,038 | 6.16 | <5 | 6 | 6 | 10 | -- | -- | -- | -- | -- | -- | -- |
| | 6/23/2015 | 1.5 | <30 | 6.77 | 1,165 | 20.2 | <5 | 6 | <5 | 26 | 30 | 50 | 28,700 | 72 | <0.005 | <0.02 | 132 |
| | 11/19/2015 | 1.4 | 17 | 6.90 | 1,170 | 10.6 | <5 | <5 | 7 | 7 | -- | -- | -- | -- | -- | -- | -- |
| | 6/27/2016 | 1.5 | 71 | 8.13 | 712 | 18.8 | <5 | <5 | <5 | <5 | 40 | <5 | 26,700 | 70 | <0.005 | <0.02 | 128 |
| | 11/30/2016 | 1.8 | 12 | 7.39 | 1,104 | 11.2 | 14 | 14 | 20 | 39 | -- | -- | -- | -- | -- | -- | -- |
| Re-sample | 1/12/2017 | -- | -- | 7.34 | -- | 11.1 | <5 | <5 | 6 | 11 | -- | -- | -- | -- | -- | -- | -- |
| | 6/21/2017 | 2.0 | 30 | 7.29 | 1,064 | 12.1 | <5 | <5 | <5 | <5 | <20 | 13 | 28,200 | 75 | <0.005 | <0.02 | 131 |
| | 11/7/2017 | 2.6 | 120 | 7.05 | 1,134 | 12.0 | <5 | <5 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/12/2018 | 1.8 | <60 | 8.63 | 688 | 12.5 | <5 | <5 | <5 | <5 | 30 | <5 | 24,700 | 81 | <0.005 | <0.02 | 135 |
| | **11/7/2018** | **5.9** | **<150** | **7.35** | **1,176** | **11.1** | **6** | **5** | **11** | **15** | **--** | **--** | **--** | **--** | **--** | **--** | **--** |

See notes on page 7.

# TABLE 2
## RACER Trust - Coldwater Road Landfill Facility
## Post-Closure Monitoring - Historical Analytical Results
## Physical Parameters, TOC, TOX, Metals, Chloride, Cyanide, Phenols, and Sulfate

| | | Indicator Parameters | | | | | Dissolved Metals (µg/L) | | | | | | | Inorganics (mg/L) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well ID | Sample Date | TOC (mg/L) | TOX (µg/L) | pH | SpC | Temp | Cr | Cu | Ni | Zn | Fe | Mn | Na | Chloride | Cyanide | Phenols | Sulfate |
| | | | *MDEQ Residential Drinking Water Criteria & RBSLs* | | | | *100 (A)* | *1,000 (E)* | *100 (A)* | *2,400* | | | | | | | |
| | 6/21/1995 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 8/31/1995 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 2/9/1996 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6/19/1996 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| B-24 | 8/21/1996 | 5.6 | <5 | 7.80 | 1,502 | 12.7 | <20 | <20 | <20 | 90 | -- | -- | -- | -- | -- | -- | -- |
| | 11/13/1996 | 20.0 | <5 | 7.09 | 2,030 | 7.8 | <20 | <20 | <20 | 50 | -- | -- | -- | -- | -- | -- | -- |
| | 5/6/1997 | 5.0 | <100 | 6.40 | 1,700 | 10.0 | <10 | <10 | 31 | 10 | -- | -- | -- | -- | -- | -- | -- |
| | 11/6/1997 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | NS | NS | NS | NS |
| | 5/4/1998 | 4.0 | <5 | 6.52 | 1,410 | 11.6 | <10 | <10 | 8 | 20 | -- | -- | -- | -- | -- | -- | -- |
| | 11/5/1998 | 4.0 | 23 | 5.50 | 1,595 | 10.4 | <10 | <10 | 9 | 20 | 60 | 120 | 27,700 | -- | -- | -- | -- |
| | 12/23/1998 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 163 | <0.005 | <0.020 | 205 |
| | 4/26/1999 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | -- | -- | -- | -- |
| | 11/5/1999 | NS | NS | 7.20 | 1,152 | 13.8 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 4/26/2000 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | -- | -- | -- | -- |
| | 12/8/2000 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 5/15/2001 | NS | NS | 6.40 | 1,450 | 12.9 | NS | NS | NS | NS | NS | NS | NS | -- | -- | -- | -- |
| | 10/17/2001 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 5/16/2002 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | -- | -- | -- | -- |
| | 11/7/2002 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 6/3/2003 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | -- | -- | -- | -- |
| | 11/13/2003 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 6/30/2004 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | -- | -- | -- | -- |
| | 12/9/2004 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| B-24R | 6/7/2005 | 8.0 | <30 | 7.27 | 857 | 10.6 | 8 | <5 | <5 | <5 | 10,600 | 448 | 27,100 | 49 | <0.005 | <0.010 | 206 |
| | 12/8/2005 | 6.6 | <30 | 5.16 | 1,120 | 11.9 | 11 | <4 | <5 | 10 | 3,180 | 210 | 28,700 | -- | -- | -- | -- |
| | 6/28/2006 | 4.7 | <30 | 7.31 | 1,080 | 11.9 | 6 | <4 | <5 | <5 | 3,760 | 210 | 27,700 | 48 | <0.005 | <0.010 | 182 |
| | 11/30/2006 | 4.8 | 30 | 7.31 | 1,100 | 11.7 | 6 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/4/2007 | 4.5 | 110 | 7.19 | 1,080 | 11.0 | 9 | 2 | 2 | 19 | 2,400 | 194 | 27,900 | 47 | <0.005 | <0.010 | 184 |
| | 11/13/2007 | 4.1 | 30.1 | 7.13 | 1,130 | 14.0 | 3 | 1 | 5 | 7 | -- | -- | -- | -- | -- | -- | -- |
| | 6/26/2008 | 4.3 | <30 | 6.99 | 1,130 | 19.0 | <5 | 1 | <5 | 8 | 3,490 | 175 | 39,600 | 46 | <0.005 | <0.010 | 189 |
| | 11/18/2008 | 3.8 | <30 | 6.76 | 1,125 | 5.3 | <5 | <1 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/24/2009 | 5.2 | <30 | 6.62 | 1,120 | 17.4 | <5 | <1 | <5 | <5 | 4,000 | 155 | 38,400 | 48 | <0.005 | <0.010 | 201 |
| | 11/18/2009 | 5 | 86.4 | 7.08 | 1,140 | 12.9 | <5 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/16/2010 | 4 | 22.7 | 7.02 | 1,150 | 16.3 | <5 | <4 | <5 | <5 | 1,880 | 222 | 39,500 | 46 | <0.005 | <0.020 | 196 |
| | 11/9/2010 | 5 | 26.8 | 6.90 | 1,136 | 13.5 | 11 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/21/2011 | 3.7 | <30 | 7.11 | 1,136 | 17.5 | 10 | <4 | 6 | <5 | 1,130 | 255 | 51,700 | 45 | <0.005 | <0.010 | 206 |
| Duplicate | 6/21/2011 | 3.7 | <30 | 7.11 | 1,137 | 17.5 | 8 | <4 | 6 | <5 | 1,070 | 255 | 52,000 | 45 | <0.005 | <0.010 | 206 |
| Replicate | 6/21/2011 | -- | -- | -- | -- | -- | <5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Dup. Replicate | 6/21/2011 | -- | -- | -- | -- | -- | <5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 11/16/2011 | 4 | 24 | 7.69 | 1,141 | 11.1 | <5 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/26/2012 | 3.5 | 16 | 6.80 | 1,219 | 13.7 | <5 | <4 | <5 | <5 | 1,200 | 242 | 72,000 | 45 | <0.005 | <0.02 | 219 |
| B-24R | 12/6/2012 | 4.2 | 48 | 6.98 | 1,204 | 10.2 | <5 | <4 | <5 | 6 | -- | -- | -- | -- | -- | -- | -- |
| | 6/3/2013 | 4 | 4.8 | 7.19 | 1,127 | 11.4 | <5 | <4 | <5 | <5 | 110 | 130 | 38,600 | 45 | <0.005 | <0.02 | 227 |
| | 11/5/2013 | 4 | 5.5 | 7.16 | 1,203 | 12.6 | <5 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| Duplicate | 11/5/2013 | 4 | <10 | 7.16 | 1,203 | 12.6 | <5 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/24/2014 | 3.7 | 16 | 7.10 | 1,202 | 13.9 | <5 | 8 | 8 | 9 | 60 | 238 | 24,300 | 45 | <0.005 | <0.02 | 243 |
| Duplicate | 6/24/2014 | 3.7 | 16 | 7.10 | 1,201 | 13.9 | <5 | <5 | 7 | <5 | 8 | 231 | 25,000 | 46 | <0.005 | <0.02 | 240 |
| | 11/19/2014 | 3.9 | 21 | 6.98 | 1,290 | 5.44 | <5 | <4 | 11 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/24/2015 | 3.5 | <30 | 7.03 | 1,235 | 15.4 | <5 | <5 | 7 | <5 | <20 | 240 | 59,600 | 44 | <0.005 | <0.02 | 261 |
| | 11/18/2015 | 3.6 | 19 | 7.03 | 1,234 | 12.9 | <5 | <5 | 5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| Duplicate | 11/18/2015 | 3.5 | 18 | 7.03 | 1,233 | 12.9 | <5 | <5 | 6 | 7 | -- | -- | -- | -- | -- | -- | -- |
| | 6/23/2016 | 3.2 | 110 | 6.88 | 1,275 | 15.0 | <5 | <5 | <5 | <5 | 320 | 210 | 67,800 | 45 | <0.005 | <0.02 | 245 |
| | 11/29/2016 | 3.4 | 12 | 7.19 | 1,220 | 10.7 | <5 | <5 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/20/2017 | 3.1 | 14 | 7.10 | 1,307 | 11.4 | <5 | <5 | <5 | <5 | <20 | 74 | 74,400 | 48 | <0.005 | <0.02 | 246 |
| | 11/7/2017 | 3.4 | <30 | 7.09 | 1,231 | 11.3 | <5 | <5 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/12/2018 | 2.9 | <60 | 7.07 | 1,280 | 11.4 | <5 | <5 | <5 | 7 | 100 | 64 | 64,500 | 47 | <0.005 | <0.02 | 240 |
| | **11/7/2018** | **3.7** | **<150** | **7.22** | **1,269** | **11.0** | **<5** | **<5** | **<5** | **<5** | -- | -- | -- | -- | -- | -- | -- |

See notes on page 7.

## TABLE 2
### RACER Trust - Coldwater Road Landfill Facility
### Post-Closure Monitoring - Historical Analytical Results
### Physical Parameters, TOC, TOX, Metals, Chloride, Cyanide, Phenols, and Sulfate

| | | Indicator Parameters | | | | | Dissolved Metals (µg/L) | | | | | | | Inorganics (mg/L) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well ID | Sample Date | TOC (mg/L) | TOX (µg/L) | pH | SpC | Temp | Cr | Cu | Ni | Zn | Fe | Mn | Na | Chloride | Cyanide | Phenols | Sulfate |
| | | | *MDEQ Residential Drinking Water Criteria & RBSLs* | | | | *100 (A)* | *1,000 (E)* | *100 (A)* | *2,400* | | | | | | | |
| | 11/21/2005 | -- | -- | 6.21 | 994 | 12.3 | -- | -- | -- | <5 | -- | -- | -- | -- | -- | -- | -- |
| Duplicate | 11/21/2005 | -- | -- | 6.21 | -- | 12.3 | -- | -- | -- | 7 | -- | -- | -- | -- | -- | -- | -- |
| | 6/27/2006 | 3 | <30 | 7.12 | 828 | 13.2 | 5 | <4 | <5 | 18 | 2,380 | 210 | 17,000 | -- | -- | -- | -- |
| | 12/1/2006 | 2.4 | <30 | 7.48 | 812 | 12.3 | <5 | <4 | <5 | 5 | -- | -- | -- | -- | -- | -- | -- |
| Duplicate | 12/1/2006 | 3.3 | <30 | 7.48 | 810 | 12.3 | <5 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| **B-28** | 6/5/2007 | 2.1 | <30 | 6.84 | 845 | 10.6 | 9 | 2 | 3 | 6 | 1,690 | 160 | 25,100 | 12 | <0.005 | <0.010 | 87 |
| | 11/15/2007 | 2.5 | 15 | 6.81 | 816 | 9.1 | 3 | 2 | 5 | 11 | -- | -- | -- | -- | -- | -- | -- |
| | 6/27/2008 | 1.8 | <30 | 6.87 | 840 | 17.6 | <5 | 1 | <5 | 5 | 370 | 84 | 16,300 | 10 | <0.005 | <0.010 | 88 |
| | 11/19/2008 | 1.1 | <30 | 6.75 | 804 | 7.0 | <5 | <1 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/24/2009 | 1.1 | <30 | 6.96 | 822 | 19.5 | <5 | <1 | <5 | <5 | 204 | 132 | 14,600 | 10 | <0.005 | <0.010 | 84 |
| | 11/18/2009 | 2 | <30 | 6.94 | 814 | 11.6 | <5 | <4 | <5 | 20 | -- | -- | -- | -- | -- | -- | -- |
| | 6/16/2010 | 2 | <30 | 7.02 | 841 | 17.6 | <5 | <4 | <5 | <5 | 790 | 173 | 19,100 | 12 | <0.005 | <0.020 | 78 |
| | 11/10/2010 | 3 | <30 | 7.05 | 813 | 13.3 | 18 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/21/2011 | 1.5 | <30 | 7.23 | 837 | 14.1 | 9 | <4 | 5 | <5 | 1,380 | 130 | 23,400 | 12 | <0.005 | <0.010 | 80 |
| Replicate | 6/21/2011 | -- | -- | -- | -- | -- | <5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 11/15/2011 | 2 | 160 | 7.17 | 823 | 12.5 | <5 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/26/2012 | 2 | <40 | 6.45 | 849 | 13.0 | <5 | <4 | <5 | <5 | 1,960 | 84 | 29,800 | 12 | <0.005 | <0.02 | 80 |
| Duplicate | 12/6/2012 | 1.6 | <40 | 7.25 | 823 | 11.4 | <5 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 12/6/2012 | 1.7 | <40 | 7.25 | 823 | 11.4 | <5 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/3/2013 | 1.5 | 10 | 6.88 | 834 | 13.1 | <5 | <4 | 5 | <5 | 1,310 | 111 | 26,000 | 12 | <0.005 | <0.02 | 87 |
| | 11/5/2013 | 1.6 | <10 | 7.26 | 842 | 12.9 | <5 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/24/2014 | 1.5 | <30 | 7.03 | 852 | 12.2 | <5 | 9 | <5 | <5 | 1,490 | 53 | 15,400 | 12 | <0.005 | <0.02 | 89 |
| Replicate | 7/28/2014 | -- | -- | -- | -- | -- | -- | <5 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 11/19/2014 | 1.6 | <60 | 7.05 | 844 | 7.48 | <5 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/22/2015 | 1.5 | <30 | 7.04 | 860 | 13.4 | <5 | <5 | <5 | <5 | 3,330 | 53 | 37,100 | 11 | <0.005 | <0.02 | 92 |
| | 11/18/2015 | 1.6 | <30 | 7.13 | 849 | 13.8 | <5 | <5 | <5 | 6 | -- | -- | -- | -- | -- | -- | -- |
| **B-28** | 6/24/2016 | 1.6 | 49 | 7.18 | 866 | 15.0 | <5 | <5 | <5 | <5 | 4,960 | 53 | 45,800 | 11 | <0.005 | <0.02 | 92 |
| | 11/29/2016 | 1.5 | <30 | 7.27 | 853 | 12.6 | <5 | <5 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| Duplicate | 11/29/2016 | 1.5 | 16 | 7.27 | 860 | 12.6 | <5 | <5 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/20/2017 | 1.6 | 18 | 7.05 | 863 | 11.4 | <5 | <5 | <5 | <5 | 80 | 35 | 30,000 | 13 | <0.005 | <0.02 | 106 |
| | 11/7/2017 | 1.6 | <30 | 7.11 | 859 | 12.5 | <5 | <5 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| Duplicate | 11/7/2017 | 1.5 | <30 | 7.11 | 867 | 12.5 | <5 | <5 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/12/2018 | 1.6 | <60 | 7.09 | 839 | 12.2 | <5 | <5 | <5 | <5 | 60 | 27 | 14,600 | 12 | <0.005 | <0.02 | 100 |
| | **11/7/2018** | **1.5** | **<150** | **7.37** | **880** | **11.8** | **<5** | **<5** | **<5** | **<5** | -- | -- | -- | -- | -- | -- | -- |
| **Duplicate** | **11/7/2018** | **1.6** | **<150** | **7.37** | **880** | **11.8** | **<5** | **<5** | **<5** | **<5** | -- | -- | -- | -- | -- | -- | -- |

See notes on page 7.

# TABLE 2

**RACER Trust - Coldwater Road Landfill Facility**
**Post-Closure Monitoring - Historical Analytical Results**
**Physical Parameters, TOC, TOX, Metals, Chloride, Cyanide, Phenols, and Sulfate**

| | | Indicator Parameters | | | | | Dissolved Metals (µg/L) | | | | | | | Inorganics (mg/L) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well ID | Sample Date | TOC (mg/L) | TOX (µg/L) | pH | SpC | Temp | Cr | Cu | Ni | Zn | Fe | Mn | Na | Chloride | Cyanide | Phenols | Sulfate |
| | | | *MDEQ Residential Drinking Water Criteria & RBSLs* | | | | *100 (A)* | *1,000 (E)* | *100 (A)* | *2,400* | | | | | | | |
| Equipment Blank | 12/10/2004 | <1 | <30 | -- | -- | -- | <5 | <5 | <5 | 11 | <20 | 13 | 810 | <2 | <0.005 | <0.010 | <2 |
| | 6/8/2005 | <1 | <30 | -- | -- | -- | <5 | <5 | <5 | <5 | <20 | <5 | 120 | <5 | <0.005 | <0.010 | <5 |
| | 12/8/2005 | <1 | <30 | -- | 5 | -- | <5 | <4 | <5 | <10 | <100 | <20 | <1000 | -- | -- | -- | -- |
| | 6/28/2006 | <1 | <30 | -- | 12 | -- | <5 | <4 | <5 | <5 | <100 | <20 | <1000 | <1 | <0.005 | <0.010 | <1 |
| | 12/1/2006 | <1 | <30 | -- | 26 | -- | <5 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/8/2007 | <1 | 26 | -- | 13 | -- | <5 | 1 | 1 | 13 | <20 | 11 | 340 | <2 | <0.005 | <0.010 | <2 |
| | 11/15/2007 | <1 | <30 | -- | 4 | -- | <5 | 1 | 1 | 9 | -- | -- | -- | -- | -- | -- | -- |
| | 6/26/2008 | <1 | <30 | -- | 3 | -- | <5 | 1 | <5 | <5 | 100 | 7 | 420 | <2 | <0.005 | <0.010 | <2 |
| | 11/19/2008 | <1 | <30 | -- | 6 | -- | <5 | 1 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/25/2009 | <1 | <30 | -- | 24 | -- | <5 | <1 | <5 | <5 | 110 | <5 | 200 | <2 | <0.005 | <0.010 | <2 |
| | 11/19/2009 | 0.7 | <30 | -- | 5 | -- | <5 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/17/2010 | 0.4 | <30 | -- | 4 | -- | <5 | <4 | <5 | <5 | <20 | <5 | <200 | <2 | <0.005 | <0.020 | <2 |
| | 11/11/2010 | 1 | <30 | -- | 1.2 | -- | <5 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/22/2011 | 0.88 | <30 | -- | 3 | -- | <5 | <4 | <5 | <5 | <20 | <5 | 460 | <2 | <0.005 | <0.010 | <2 |
| | 11/16/2011 | <1 | 4.9 | -- | 1,330 | -- | <5 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/27/2012 | <1 | <20 | -- | 3 | -- | <5 | <4 | <5 | 13 | 50 | <5 | 6350 | <2 | <0.005 | <0.02 | <2 |
| | 12/6/2012 | <1 | <40 | -- | 17.0 | -- | <5 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/6/2013 | <1 | <10 | -- | 1,370 | -- | <5 | <4 | <5 | <5 | <20 | <5 | <500 | <2 | <0.005 | <0.02 | <2 |
| | 11/6/2013 | <1 | <10 | -- | 2,350 | -- | <5 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/24/2014 | <1 | <30 | -- | 1,930 | -- | <5 | <5 | <5 | <5 | <20 | <5 | <1000 | <2.5 | <0.005 | <0.02 | <2.5 |
| | 6/24/2015 | <1 | <30 | -- | 4.09 | -- | <5 | <5 | <5 | <5 | <20 | <5 | 140 | <2 | <0.005 | <0.02 | <2 |
| | 6/24/2016 | <1 | 6.2 | -- | 2,220 | -- | <5 | <5 | <5 | <5 | <20 | <5 | <500 | <2.5 | <0.005 | <0.02 | <2 |
| | 6/22/2017 | <1 | <30 | -- | 5,780 | -- | <5 | <5 | <5 | <5 | <20 | <5 | <200 | <5 | <0.005 | <0.02 | <5 |
| | 11/7/2017 | <1 | <30 | -- | 7.07 | -- | <5 | <5 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/14/2018 | 1.2 | <60 | -- | 28.8 | -- | <5 | <5 | <5 | <5 | <20 | <5 | <250 | <2.5 | <0.005 | <0.02 | <2.5 |
| | **11/7/2018** | **39.3** | **<150** | **--** | **5.40** | **--** | **<5** | **<5** | **<5** | **<5** | **--** | **--** | **--** | **--** | **--** | **--** | **--** |

Notes

1) < = Not detected.
2) NS = Not sampled, insufficient liquid encountered.
3) NR = No Result, insufficient sample volume.
4) T = Temperature in degrees Celsius.
5) -- = Not analyzed.
6) Dup = Duplicate sample.
Exceeds MDEQ Residential Drinking Water Criteria
7) A = Criterion is the state of Michigan drinking water standard established pursuant to Section 5 of 1976 PA 399, MCL 325.1005.
8) E = Criterion is the aesthetic drinking water value, as required by Section 20120a(5) of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA)

# TABLE 3
## RACER Trust - Coldwater Road Landfill Facility
## Post-Closure Monitoring - Historical Analytical Results (Well B-2D and OBG MW-16D)
## Physical Parameters, TOC, TOX, Metals, Chloride, Cyanide, Phenols, and Sulfate

| | | Indicator Parameters | | | | | Dissolved Metals (µg/L) | | | | | | | Inorganics (mg/L) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well ID | Sample Date | TOC (mg/L) | TOX (µg/L) | pH | SpC | Temp | Cr | Cu | Ni | Zn | Fe | Mn | Na | Chloride | Cyanide | Phenols | Sulfate |
| | *MDEQ Residential Drinking Water Criteria & RBSLs* | | | | | | *100 (A)* | *1,000 (E)* | *100 (A)* | *2,400* | | | | | | | |
| | 6/21/1995 | 5.3 | <10 | 9.01 | 434 | 15.0 | <20 | <20 | <30 | <20 | -- | -- | -- | -- | -- | -- | -- |
| | 8/31/1995 | 6.3 | 130 | 8.27 | 479 | 14.4 | <20 | <20 | <40 | <20 | -- | -- | -- | -- | -- | -- | -- |
| | 2/9/1996 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6/19/1996 | 5.2 | <100 | 7.52 | 580 | 12.4 | <20 | <20 | <20 | <20 | -- | -- | -- | -- | -- | -- | -- |
| B-2D | 8/21/1996 | 7.4 | <5 | 7.69 | 641 | 13.9 | <20 | <20 | <20 | 50 | -- | -- | -- | -- | -- | -- | -- |
| | 11/13/1996 | 11.0 | <5 | 7.26 | 769 | 7.6 | <20 | <20 | <20 | 30 | -- | -- | -- | -- | -- | -- | -- |
| | 5/6/1997 | 26.0 | <100 | 6.30 | 1500 | 7.0 | 10 | <10 | 28 | 30 | -- | -- | -- | -- | -- | -- | -- |
| | 11/6/1997 | 15.0 | <100 | 6.90 | 660 | 9.0 | <10 | <10 | 39 | <10 | 280 | 577 | -- | 12 | <0.005 | <0.020 | 79 |
| | 5/4/1998 | 29.0 | 12 | 6.68 | 549 | 12.4 | <10 | <10 | <5 | <10 | -- | -- | -- | -- | -- | -- | -- |
| | 11/5/1998 | 52.0 | 18 | 4.70 | 498 | 8.6 | <10 | <10 | <5 | 10 | <10 | 17 | 33,600 | -- | -- | -- | -- |
| | 12/23/1998 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 13 | <0.005 | <0.020 | 40 |
| | 4/26/1999 | 52.0 | <100 | 8.50 | 523 | 14.5 | <10 | <10 | <5 | <10 | -- | -- | -- | -- | -- | -- | -- |
| | 11/5/1999 | 6.4 | <100 | 7.40 | 405 | 12.8 | <10 | <10 | <5 | 40 | 70 | 21 | 35,100 | 4 | <0.005 | <0.020 | 42 |
| | 4/26/2000 | 5.4 | <100 | 7.96 | 770 | 17.4 | <10 | <10 | <5 | <10 | -- | -- | -- | -- | -- | -- | -- |
| | 12/8/2000 | 5.5 | <10 | 6.68 | 610 | 9.7 | <10 | <10 | 9 | <10 | 40 | -- | 22,900 | 7 | <0.005 | <0.020 | 81 |
| | 5/15/2001 | 5.5 | <100 | 7.79 | 890 | 13.2 | <10 | <10 | <5 | <10 | -- | -- | -- | -- | -- | -- | -- |
| | 10/18/2001 | 4.1 | <100 | 7.43 | 1830 | 9.4 | <10 | <10 | <5 | <10 | 230 | -- | 12,900 | 2 | <0.005 | <0.020 | 32 |
| Duplicate | 10/18/2001 | 3.6 | <100 | 7.39 | 1780 | 7.8 | <10 | <10 | <5 | <10 | 210 | -- | 12,700 | 1 | <0.005 | <0.020 | 32 |
| | 5/16/2002 | 4.0 | <100 | 7.19 | 1000 | 11.6 | <10 | <10 | <5 | <10 | -- | -- | -- | -- | -- | -- | -- |
| | 11/7/2002 | 2.6 | <30 | 7.38 | 490 | 9.5 | <5 | <5 | <5 | <5 | 140 | 8 | 11,900 | 2 | <0.005 | <0.020 | 32 |
| Duplicate | 11/7/2002 | 2.7 | <30 | -- | -- | -- | <5 | <5 | <5 | <5 | 140 | 6 | 11,200 | 2 | <0.005 | <0.020 | 30 |
| | 6/3/2003 | 4.4 | <30 | 6.91 | 530 | 12.9 | <5 | <5 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 11/13/2003 | 2.8 | <30 | 7.97 | 630 | 7.7 | <5 | <5 | <5 | <5 | 110 | 7 | -- | 2 | <0.005 | <0.010 | 31 |
| | 6/30/2004 | 4.2 | <30 | 6.28 | 570 | 15.8 | <5 | <5 | <5 | 7 | -- | -- | -- | -- | -- | -- | -- |
| | 12/10/2004 | 2.0 | <30 | 6.83 | 550 | 10.2 | <5 | <5 | <5 | 10 | 760 | 145 | 10,700 | 2 | <0.005 | <0.010 | 35 |
| | 6/8/2005 | 2.0 | <30 | 7.95 | 620 | 11.5 | <5 | <5 | <5 | <5 | 660 | 199 | 10,900 | <5 | <0.005 | <0.010 | 34 |
| | 12/8/2005 | 3.0 | <30 | 6.89 | 642 | 10.2 | 9 | <4 | <5 | <10 | 140 | 120 | 13,300 | -- | -- | -- | -- |
| | 6/28/2006 | 6.3 | <30 | 7.41 | 671 | 12.2 | <5 | <4 | <5 | 8 | 110 | 70 | 15,000 | 2 | <0.005 | <0.010 | 50 |
| Duplicate | 6/28/2006 | 5.1 | <30 | 7.41 | 682 | 12.2 | <5 | <4 | <5 | 8 | 120 | 70 | 15,200 | 3 | <0.005 | <0.010 | 50 |
| | 11/30/2006 | 5.1 | 43.3 | 7.21 | 677 | 8.4 | <5 | <4 | <5 | 18 | -- | -- | -- | -- | -- | -- | -- |
| | 6/8/2007 | 2.4 | 69.1 | 6.78 | 644 | 14.1 | 8 | 2 | 1 | 6 | 110 | 104 | 14,800 | 4 | <0.005 | <0.010 | 44 |
| | 11/14/2007 | 5.2 | <30 | 7.06 | 783 | 14.9 | 1 | 1 | 4 | 9 | -- | -- | -- | -- | -- | -- | -- |
| | 6/25/2008 | 5.7 | <60 | 6.90 | 920 | 18.4 | <5 | 1 | 5 | 7 | 350 | 32 | 26,100 | 10 | <0.005 | <0.010 | 98 |
| | 11/20/2008 | 4.5 | <30 | 6.84 | 806 | 9.1 | <5 | <1 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/25/2009 | 5.6 | <30 | 6.95 | 924 | 23.7 | <5 | 203 | <5 | 113 | 22 | 77 | 29,700 | 10 | <0.005 | <0.010 | 104 |
| B-2D | 11/16/2009 | 4 | <30 | 7.17 | 835 | 10.2 | <5 | <4 | <5 | 6 | -- | -- | -- | -- | -- | -- | -- |
| | 6/16/2010 | 5 | <30 | 7.09 | 841 | 13.9 | <5 | <4 | <5 | <5 | 40 | 83 | 19,000 | 7 | <0.005 | <0.020 | 75 |
| | 11/10/2010 | 4 | <30 | 7.17 | 779 | 11.3 | 11 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/21/2011 | 2.9 | <30 | 6.99 | 742 | 19.3 | 9 | <4 | <5 | <5 | 250 | 55 | 16,900 | 6 | <0.005 | <0.010 | 57 |
| Replicate | 6/21/2011 | -- | -- | -- | -- | -- | <5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 11/15/2011 | 3 | 16 | 7.05 | 751 | 11.3 | <5 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/27/2012 | 2.2 | 16 | 7.00 | 714 | 12.7 | <5 | <4 | <5 | <5 | <20 | 25 | 17,300 | <5 | <0.005 | <0.02 | 43 |
| | 12/6/2012 | 2.6 | <40 | 7.47 | 714 | 10.2 | <5 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/6/2013 | 1.6 | <10 | 6.78 | 742 | 12.5 | <5 | <4 | <5 | 26 | 990 | 31 | 24,400 | <5 | <0.005 | <0.02 | 68 |
| | 11/6/2013 | 2.6 | <10 | 7.34 | 726 | 11.8 | <5 | <4 | <5 | <5 | -- | -- | -- | -- | -- | -- | -- |
| | 6/25/2014 | 2.6 | <30 | 7.27 | 717 | 12.8 | <5 | <5 | 11 | 7 | <20 | 26 | 7,280 | <5 | <0.005 | <0.02 | 48 |
| | 6/24/2015 | 2.2 | <30 | 7.12 | 621 | 12.4 | <5 | <5 | <5 | <5 | <20 | 11 | 15,100 | <5 | <0.005 | <0.02 | 41 |
| | 6/27/2016 | 2.6 | 55 | 6.42 | 730 | 17.2 | <5 | <5 | <5 | <5 | 40 | <5 | 16,100 | <5 | <0.005 | <0.02 | 50 |
| | 6/22/2017 | 2.3 | <30 | 7.09 | 691 | 12.5 | <5 | <5 | <5 | <5 | 20 | 7 | 15,500 | <5 | <0.005 | <0.02 | 44 |
| | 6/13/2018 | 2.1 | <60 | 6.85 | 679 | 14.1 | <5 | <5 | <5 | 5 | 2,640 | 162 | 13,400 | <5 | <0.005 | <0.02 | 40 |
| **OBG MW-16D** | **11/7/2018** | **3.3** | **<150** | **7.60** | **657** | **9.7** | **<5** | **<5** | **<5** | **<5** | **2,870** | **47** | **18,400** | **<5** | **<0.005** | **<0.02** | **32** |

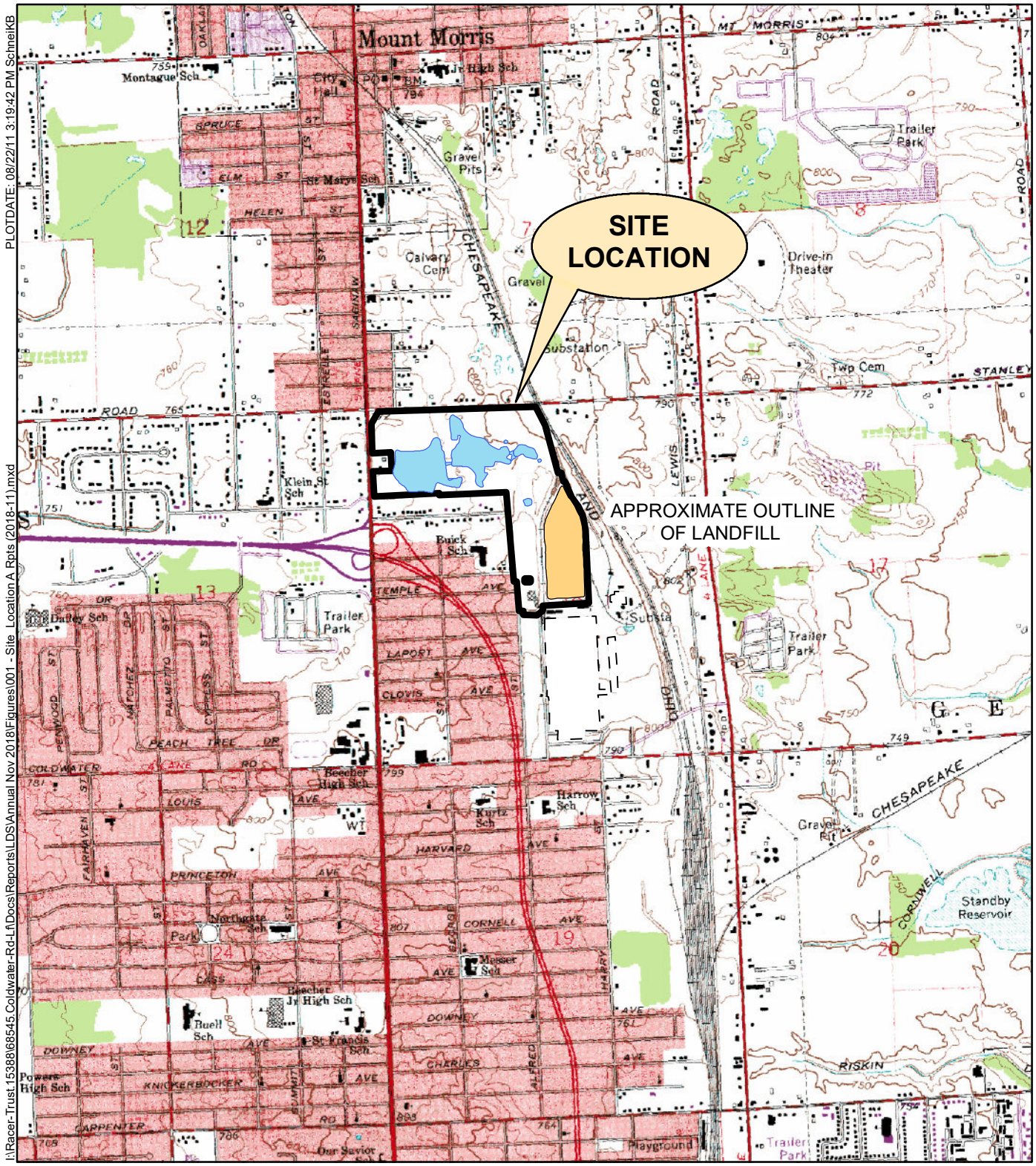
Notes

1) < = Not detected.
2) NS = Not sampled, insufficient liquid encountered.
3) NR = No Result, insufficient sample volume.
4) T = Temperature in degrees Celsius.
5) -- = Not analyzed.
6) Dup = Duplicate sample.

Exceeds MDEQ Residential Drinking Water Criteria

7) A = Criterion is the state of Michigan drinking water standard established pursuant to Section 5 of 1976 PA 399, MCL 325.1005.
8) E = Criterion is the aesthetic drinking water value, as required by Section 20120a(5) of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA)

# FIGURES





RACER TRUST
COLDWATER ROAD LANDFILL FACILITY
FLINT, MICHIGAN

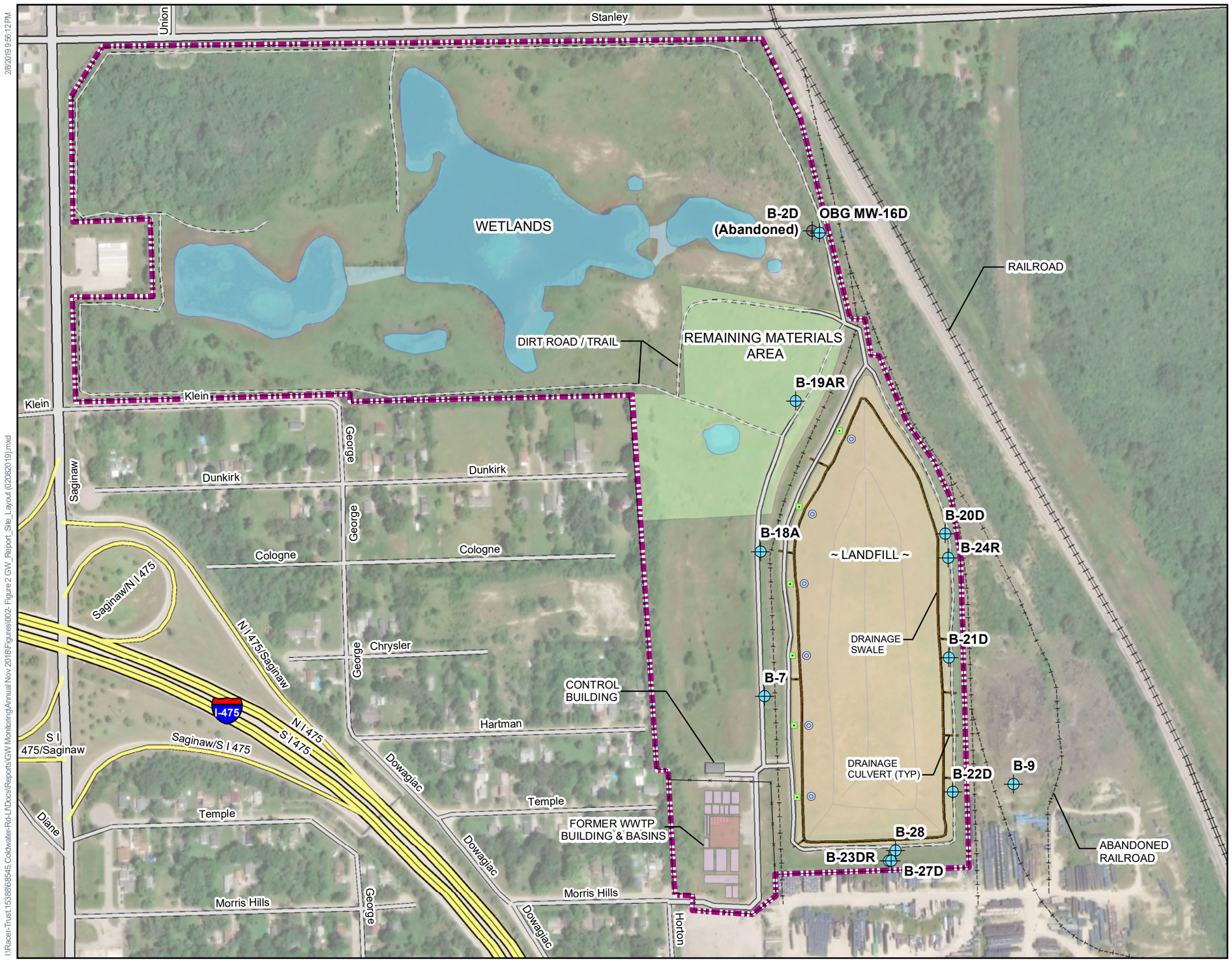
## SITE LOCATION MAP

0 1
Miles

N

15388/68545/001
JANUARY 2019

O'BRIEN & GERE ENGINEERS, INC.




28/2019 9:56:12 PM

I:\Racer-Trust.15388\68545.Coldwater-Rd-LfDocs\Reports\GW Monitoring\Annual Nov 2018\Figures\002- Figure 2 GW_Report_Site_Layout (02082019).mxd

N

## LEGEND

- LEACHATE COLLECTION SUMP
- ACCESS PORT FOR LEAK DETECTION VAULT
- MONITORING WELL
- ABANDONED MONITORING WELL
- PROPERTY BOUNDARY

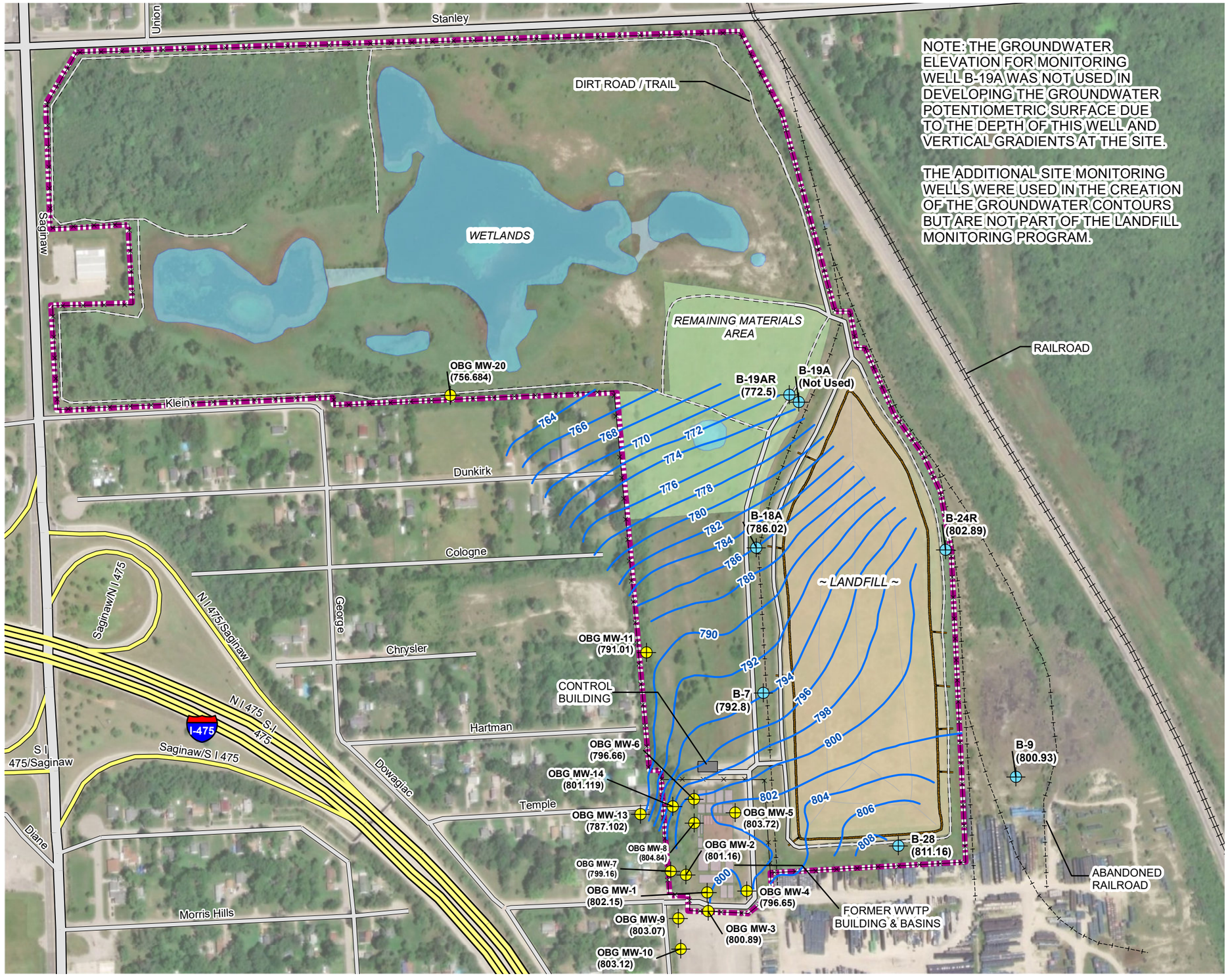
RACER TRUST
COLDWATER ROAD
LANDFILL FACILITY
FLINT, MICHIGAN

# SITE LAYOUT

0 150 300 600
Feet

FILE_NO._68545
DATE AUGUST 2018

O'BRIEN & GERE ENGINEERS, INC.




NOTE: THE GROUNDWATER ELEVATION FOR MONITORING WELL B-19A WAS NOT USED IN DEVELOPING THE GROUNDWATER POTENTIOMETRIC SURFACE DUE TO THE DEPTH OF THIS WELL AND VERTICAL GRADIENTS AT THE SITE.

THE ADDITIONAL SITE MONITORING WELLS WERE USED IN THE CREATION OF THE GROUNDWATER CONTOURS BUT ARE NOT PART OF THE LANDFILL MONITORING PROGRAM.

N

## LEGEND

- PERCHED MONITORING WELL
- ADDITIONAL SITE MONITORING WELL
- GROUNDWATER CONTOUR (NOVEMBER 5, 2018)
- (800.93) GROUNDWATER ELEVATION
- PROPERTY BOUNDARY

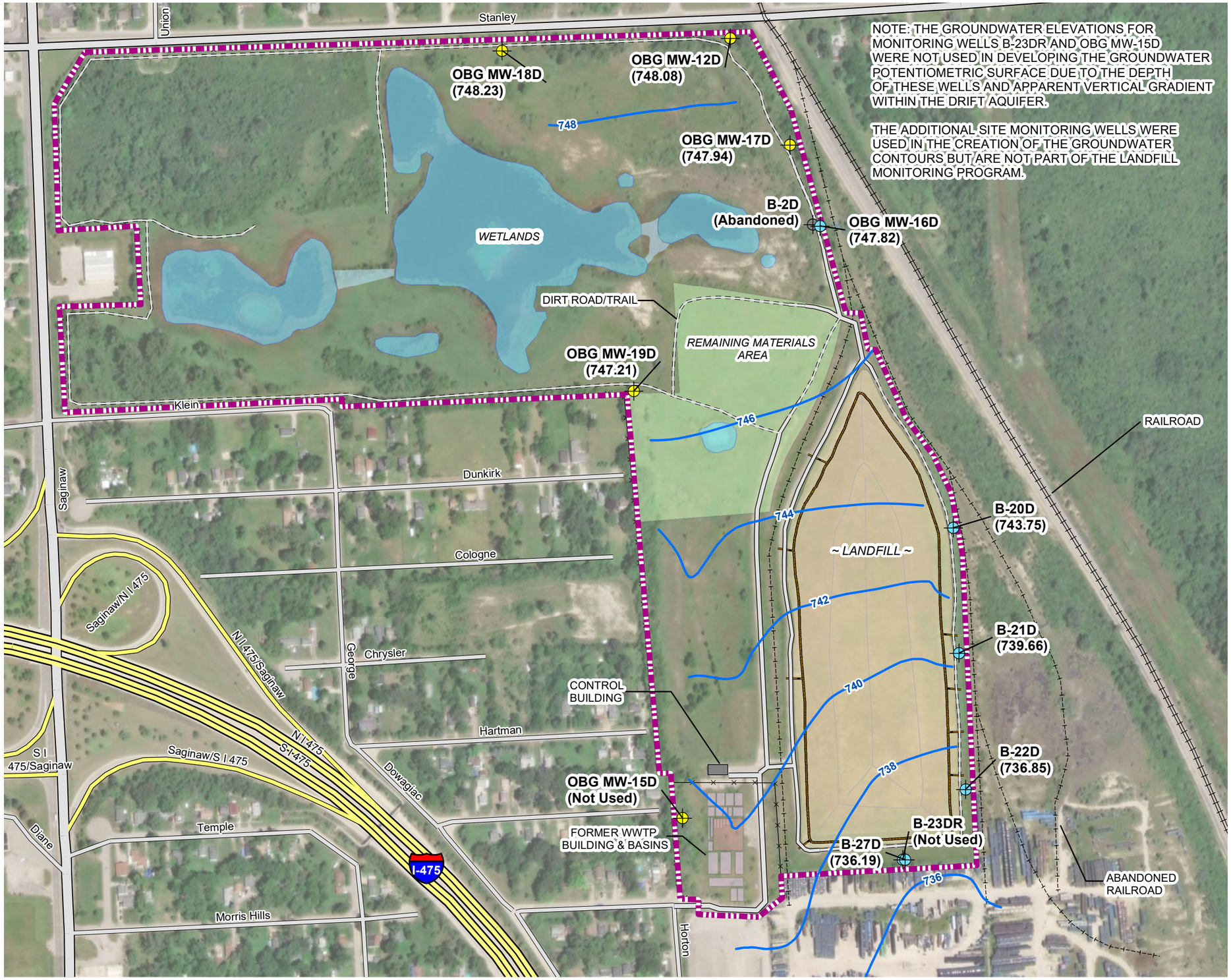
RACER TRUST
COLDWATER ROAD
LANDFILL FACILITY
FLINT, MICHIGAN

# SHALLOW GROUNDWATER ELEVATION MAP NOVEMBER 5, 2018

0 150 300 450 600
Feet

NOVEMBER 2018
15388/68545/003

O'BRIEN & GERE ENGINEERS, INC.




NOTE: THE GROUNDWATER ELEVATIONS FOR MONITORING WELLS B-23DR AND OBG MW-15D WERE NOT USED IN DEVELOPING THE GROUNDWATER POTENTIOMETRIC SURFACE DUE TO THE DEPTH OF THESE WELLS AND APPARENT VERTICAL GRADIENT WITHIN THE DRIFT AQUIFER.

THE ADDITIONAL SITE MONITORING WELLS WERE USED IN THE CREATION OF THE GROUNDWATER CONTOURS BUT ARE NOT PART OF THE LANDFILL MONITORING PROGRAM.

N

## LEGEND

- DRIFT MONITORING WELL
- ABANDONED MONITORING WELL
- ADDITIONAL SITE MONITORING WELL
- GROUNDWATER CONTOUR (NOVEMBER 5, 2018)
- (800.93) GROUNDWATER ELEVATION
- PROPERTY BOUNDARY

RACER TRUST
COLDWATER ROAD
LANDFILL FACILITY
FLINT, MICHIGAN

# DRIFT AQUIFER GROUNDWATER ELEVATION MAP NOVEMBER 5, 2018

0 150 300 450 600
Feet

NOVEMBER 2018
15388/68545/004

O'BRIEN & GERE ENGINEERS, INC.

# APPENDIX A

## *Sampling Procedures*

# TABLE OF CONTENTS

## 1 INTRODUCTION

This procedure is for the collection of groundwater samples for laboratory analysis.

The objective of most groundwater quality monitoring programs is to obtain samples that are representative of existing groundwater conditions, or samples that retain the physical and chemical properties of the groundwater within an aquifer.

One of the most important aspects of groundwater sampling is acquiring samples that are free of suspended silt, sediment, or other fine grained particulates. Fine grain materials may often have a variety of chemical components sorbed to the particle or have the ability to sorb chemicals from the aqueous phase to the particle, which will bias the subsequent analytical results.

Constituents known to have an affinity for fine-grained particulates are: polychlorinated biphenyls (PCBs), semi-volatile organic compounds (SVOCs), and inorganics. Monitoring programs where these constituents are suspected or known to be prevalent must employ sampling methods that minimize particulate presence.

The "Low Stress/Low Flow" purging and sampling method will be utilized to purge the well to allow representative water from the formation to replace the standing water within the sampling zone of the well. Experience has shown that the low stress/low flow technique typically achieves representative groundwater samples with minimal particulate interference.

Lastly, in extreme cases "ultra-low flow" techniques have been employed at select sites where low stress/low flow methods were used, yet particulate-sensitive constituents continue to bias the analytical results, or excessive drawdown is produced using standard low stress/low flow methods due to the presence of low permeability materials within a well's screened zone. Ultra-low flow techniques are conducted at purging rates below 100 ml per minute, and should only be utilized after low stress/low flow methods have been attempted (see Section 2.2 for further discussion on the purging of wells prior to sample collection).

## 2 PROCEDURAL GUIDELINES

The following describes techniques for groundwater sampling: Low Stress/Low Flow Methods.

Low stress/low flow methods will be employed when it is critical to collect groundwater samples truly representative of the groundwater present, and to minimize the impact of sediment/colloid presence.

### 2.1 PREPARATORY REQUIREMENTS

Prior to groundwater sampling, an inspection will be performed on each well. The inspection will include:

- Inspecting the concrete pad for cracks
- Inspecting the protective steel cover
- Inspecting the integrity of the PVC well casing (to the extent possible)
- Inspecting the well caps
- Inspecting the well identification markings to confirm they are legible (if illegible, re-mark)
- Inspecting the locks to assess whether they are in good working condition.

Results of the well inspection will be documented on the Groundwater Sampling Log for each well. If the inspection indicates repairs are required, these will be performed prior to the next sampling event. Corrective actions implemented to repair well(s) will also be documented on the Groundwater Sampling Log and/or the field notebook for the facility.

Groundwater purging and sampling data will be recorded on the Groundwater Sampling Log.

### 2.2 WELL PURGING AND STABILIZATION MONITORING (LOW STRESS/LOW FLOW METHOD)

The procedure for sampling the monitoring wells is as follows:

1) Sampling equipment will first be decontaminated prior to each use by the following protocol:
   - Scrub equipment thoroughly in a low-sudsing detergent solution (*e.g.*, Alconox). Pump low-sudsing detergent solution through submersible pump for approximately 5 minutes, if utilized
   - Rinse equipment thoroughly with distilled water, and pump distilled water through submersible pump, if utilized
   - Wrap equipment in plastic for handling and/or storage until next use
   - Decontamination of disposable tubing, if used, will not be necessary
2) Calibrate field instrument and document calibration activity. Calibration shall be performed in accordance with manufacturer's recommendations, and noted on the Groundwater Sampling Log
3) An electric water level probe will be used to measure the depth from the top of the casing to the top of water to the nearest 0.01-ft. The measurement will be recorded in a dedicated field notebook and Groundwater Sampling Log
4) Measure the depth from the top of casing to the bottom of the well for the initial sampling event
5) Slowly lower the pump and/or tubing into the well positioning the pump intake at the mid-point of the well screen taking care to minimize disturbing the well
6) During the purging of the well, monitor and record the field indicator parameters (pH, temperature, conductivity, oxidation-reduction (redox) reaction potential (ORP), dissolved oxygen (DO), and turbidity)

approximately every 5 minutes. Stabilization is considered achieved when the final groundwater flow rate is achieved, and three consecutive readings for each parameter are within the following limits:

| | |
|---|---|
| pH | ±0.1 pH units for three consecutive readings; |
| temperature | ±3 percent for three consecutive readings; |
| conductivity | ±3 percent for three consecutive readings; |
| ORP | ±10 millivolts (mV) for three consecutive readings; |
| DO | ±10 percent for three consecutive readings; and |
| Turbidity | ±10 percent for three consecutive readings or a final value of less than 5 nephelometric turbidity units (NTU). |

7) Verify that drawdowns of 0.3 ft or less are maintained and make adjustments as necessary. Record drawdown measurements and note adjustments in pumping rates as necessary on the Groundwater Sampling Log. If drawdowns of 0.3 ft or less cannot be maintained utilize ultra-low flow purge techniques. However, if ultra-low flow purging still results in excessive drawdown, the well will be purged "dry" and allowed to recharge, and the sample will be collected as soon as sufficient water is present to obtain the necessary sample volume

8) Obtain a sample for chemical analyses immediately upon stabilization of field parameter measurements. Field filter the sample for dissolved metals using a 0.45-micron filter prior to preserving with acid. Samples are to be collected in the order of volatility as follows: TOC/TOX (or VOCs) and dissolved metals.

If after 2 hours of purging the indicator parameters have not stabilized, as recommended in the USEPA guidance, the purging will be discontinued and the sample will be collected with an explanation of attempts to achieve stabilization.

Either a decontaminated submersible pump or peristaltic pump (for shallow wells only) may be utilized to purge each well. If a submersible pump is utilized in the purging process, then it will be decontaminated prior to and after sampling each well. Sampling equipment must be protected from the ground surface by a clean plastic sheet laid around the work area. Water from purging will not be containerized.

## 2.3 SAMPLE PRESERVATION

Sample bottles will be labeled with sample identification, collection date and time, filtration/preservative status. Sample bottles will be filled and capped securely and immediately preserved (if required) and stored at 4 degrees Celsius in a cooler.

The cooler and samples will be prepared for shipment or transport by the following procedure:

1) Prepare cooler(s) for shipment.
   - Tape drain(s) of cooler shut
   - Place mailing label with laboratory address on top of cooler(s).
2) Arrange sample containers in a manner to prevent potential sample container breakage.
3) Confirm the bottle labels are completed correctly. Place clear tape over bottle labels to prevent moisture accumulation from causing the label to peel off.
4) Seal sample containers within plastic zip-lock bags to prevent packing material from contacting samples.
5) Place packing material at the bottom of the cooler to act as a cushion for the sample containers.
6) Fill remaining spaces with packing material.

7) Confirm containers are firmly packed in cooler.

8) If ice is required to preserve the samples, cubes should be repackaged in double zip-lock bags, and placed on top of the packing material.

9) Sign COC form (or obtain signature) and indicate the time and date it was relinquished to Federal Express or other carrier, as appropriate.

10) Separate copies of COC forms. Seal proper copies within a large zip-lock bag and tape to inside lid of cooler. Retain copies of forms in-house.

11) Close lid and latch.

12) Tape cooler shut on both ends, making several complete revolutions with strapping tape.

13) Relinquish to Federal Express or other courier service. Retain airbill receipt for project records (Note: Samples will be shipped for "NEXT DAY" delivery).

If samples are delivered directly to the laboratory, or the laboratories in-house courier, by the sampling team, the packaging/shipping requirements may be omitted. COC procedures; however, must be strictly maintained.

## 2.4 SAMPLE MANAGEMENT AND CHAIN-OF-CUSTODY

COC procedures document the history of sample containers and samples from the time of preparation of sample containers through sample collection, shipment, and analysis. A sample is considered in custody if:

- The sample is in the sampler's physical possession
- The sample is secured by the sampler to prevent tampering
- The sample is secured by the sampler employee in an area that is restricted to authorized personnel.

To maintain a record of sample collection, transfer between personnel, shipment, and receipt by the laboratory, a COC record will be completed for each sample at each sampling location. Each time the samples are transferred, signatures of the person relinquishing and receiving the samples, as well as the date and time, will be documented.

Parallel field notebook/Groundwater Sampling Log and COC records will be maintained. Recorded information will include:

- Sampling Location
- Time and Date
- Sampling Method
- Method of Preservation.

Additionally, the field notebook will also include information on weather conditions, depth to water, total depth of the well, field parameter and instrument calibration records and other useful or pertinent information. The notebook will be kept at the facility or with their designated contractor.

## 2.5 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) MEASURES

Field QA/QC procedures will consist of collecting one equipment blank (if reusable equipment is used) and one duplicate sample (one additional sample from one of the wells) for each sampling event. The duplicate sample will be assigned a separate sample identification and submitted to the laboratory "blind".

The procedure for collecting an equipment blank will be to pass distilled water through the decontaminated sampling device into a laboratory-supplied sample bottles. An equipment blank sample will not be required if disposable sampling equipment is used.

## 3 REFERENCES

*USEPA Low-Flow (Minimal Drawdown) Groundwater Sampling Procedures (EPA/540/S -95/504).*

*USEPA (Region 1) Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells (EQASOP-GW 001), January 19, 2010.*

*USEPA RCRA Groundwater Monitoring: Draft Technical Guidance (EPA/530-R-93-001).*

*MDEQ RRD Operational Memorandum No. 2: Sampling and Analysis.*

# APPENDIX B

## *Groundwater Sampling Logs*

**O'Brien & Gere Engineers, Inc.** — **Standard Groundwater Sampling Log**

Date: 11/6/18 – 11/7/18
Site Name: coldwater
Location: Flint MI
Project No.: 68545
Personnel: KBS

Weather: Cloudy / wind 50's
Well #: S-7
Evacuation Method: whale Pump
Sampling Method: Purge DM

**Well Information:**

| | | |
|---|---|---|
| Depth of Well * | 29.12 | ft. |
| Depth to Water * | 20.83 / 26.79 | ft. |
| Length of Water Column | 8.29 | ft. |
| Volume of Water in Well | 1.35 | gal.(s) |
| 3X Volume of Water in Well | 4.05 | gal.(s) |

Water Volume /ft. for:
- X 2" Diameter Well = 0.163 X LWC
- 4" Diameter Well = 0.653 X LWC
- 6" Diameter Well = 1.469 X LWC

Volume removed before sampling: 3¼ gal.(s)
Did well go dry? Yes

* Measurements taken from: [X] Well Casing [ ] Protective Casing [ ] (Other, Specify)

**Instrument Calibration:** Calibrated within range

| | |
|---|---|
| pH | Yes |
| ORP | Yes |
| Conductivity | Yes |
| DO | Yes |

**Water parameters:**

| | Drawdown measured | Temperature Celsius | Conductivity mS/cm | Dissolved Oxygen mg/L | pH | ORP mV | Turbidity NTUs |
|---|---|---|---|---|---|---|---|
| initial | 22.25 | 12.5 | 0.68 | 2.84 | 7.17 | 83.9 | 117 |
| 1320 5 min | 24.90 | 13.0 | 0.62 | 0.68 | 7.01 | 85.5 | 42.1 |
| 1325 10 min | 26.75 | 13.0 | 0.68 | 2.79 | 7.06 | 87.8 | 22.1 |
| 1330 15 min | 27.35 | 12.8 | 0.68 | 1.47 | 6.97 | 90.0 | 18.3 |
| 1335 20 min | 28.60 | | | | | | |
| 25 min | | | | | | | |
| 11/7/18 30 min | 26.79 | 11.4 | 0.71 | 0.84 | 7.05 | 51.3 | 22.5 |
| 35 min | | | | | | | |
| 40 min | | | | | | | |
| 45 min | | | | | | | |
| 50 min | | | | | | | |
| 55 min | | | | | | | |
| 60 min | | | | | | | |

**Water Sample:**
Time Collected: 11/7/18 1310

| Physical Appearance at Start | | Physical Appearance at Sampling | |
|---|---|---|---|
| Color | light Gray | Color | Slightly Cloudy |
| Odor | NONE | Odor | NONE |
| Turbidity (> 100 NTU) | 117 | Turbidity (> 100 NTU) | DRY |
| Sheen/Free Product | NONE | Sheen/Free Product | NONE |

**Samples collected:**

| Analyses | # Bottles | Bottle size/type | Preservative | Field Filtered |
|---|---|---|---|---|
| TOC | 2 | 40 ml | H2SO4 | |
| TOX | 1 | ~~40 ml~~ 250 ml | H2SO4 | |
| SPC | 1 | 500 ml | — | |
| Dissolved Metals | 1 | 250 ml | HNO3 | Yes |

Notes:

**O'Brien & Gere Engineers, Inc.**

# Standard Groundwater Sampling Log

Date 11/5/18 / 11/6/18
Site Name Colonie
Location Flint
Project No. 68545
Personnel KBS

Weather cloudy 50's
Well # B-9
Evacuation Method Whale Pump
Sampling Method PURGED DRY

**Well Information:**

Depth of Well * _____ ft.
Depth to Water * 6.52 / 11.49 ft.
Length of Water Column _____ ft.
Volume of Water in Well _____ gal.(s)
3X Volume of Water in Well _____ gal.(s)

Water Volume /ft. for:
- X 2" Diameter Well = 0.163 X LWC
- ___ 4" Diameter Well = 0.653 X LWC
- ___ 6" Diameter Well = 1.469 X LWC

Volume removed before sampling 4 gal.(s)
Did well go dry? Yes

* Measurements taken from [X] Well Casing [ ] Protective Casing [ ] (Other, Specify)

**Instrument Calibration:**

Calibrated within range
- pH Yes
- ORP Yes
- Conductivity Yes
- DO Yes

**Water parameters:**

| | Drawdown measured | Temperature Celsius | Conductivity mS/cm | Dissolved Oxygen mg/L | pH | ORP mV | Turbidity NTUs |
|---|---|---|---|---|---|---|---|
| 1515 initial | 8.61 | 13.4 | 2.54 | 10.8 | 6.57 | 194.5 | 40.5 |
| 1520 5 min | 15.91 | 14.4 | 2.33 | 0.29 | 6.79 | 150.1 | 34.6 |
| 1525 10 min | 18.55 | 14.5 | 2.34 | 0.68 | 6.83 | 141.1 | 52.6 |
| 1530 15 min | 22.81 | 14.4 | 2.31 | 1.10 | 6.86 | 133.1 | 917 |
| 1531 20 min | 23.25 | | | | | | |
| 25 min | | | | | | | |
| 11/6/18 30 min | 11.49 | 13.6 | 2.15 | 4.12 | 6.74 | 74.9 | 20.2 |
| 35 min | | | | | | | |
| 40 min | | | | | | | |
| 45 min | | | | | | | |
| 50 min | | | | | | | |
| 55 min | | | | | | | |
| 60 min | | | | | | | |

**Water Sample:**
Time Collected 11/6/18 1240

| Physical Appearance at Start | | Physical Appearance at Sampling | |
|---|---|---|---|
| Color | Slightly cloudy | Color | light Gray |
| Odor | NONE | Odor | NONE |
| Turbidity (> 100 NTU) | 40.5 | Turbidity (> 100 NTU) | 917 |
| Sheen/Free Product | NONE | Sheen/Free Product | NONE |

**Samples collected:**

| Analyses | # Bottles | Bottle size/type | Preservative | Field Filtered |
|---|---|---|---|---|
| TDC | 3 | 40ml | $H_2SO_4$ | |
| TOX | 3 | 250 ml | $H_2SO_4$ | |
| SRL | 1 | ~~500 ml~~ | — | |
| Metals | 1 | 250 ml | $HNO_3$ | Yes |

Notes:

**O'Brien & Gere Engineers, Inc.** — **Standard Groundwater Sampling Log**

Date: 11/6/18 / 11/7/18
Site Name: Coldwater Rd
Location: Flint, MI
Project No.: 68545
Personnel: KBS

Weather: cloudy / Rain 50's
Well #: B-18A
Evacuation Method: while Pump
Sampling Method: Purged DRY

**Well Information:**

| | | |
|---|---|---|
| Depth of Well * | 43.49 | ft. |
| Depth to Water * | 24.83 | ft. (38.02) |
| Length of Water Column | 18.66 | ft. |
| Volume of Water in Well | 3.04 | gal.(s) |
| 3X Volume of Water in Well | 9.12 | gal.(s) |

Water Volume /ft. for:
- X 2" Diameter Well = 0.163 X LWC
- 4" Diameter Well = 0.653 X LWC
- 6" Diameter Well = 1.469 X LWC

Volume removed before sampling: 7½ gal.(s)
Did well go dry? KBS

* Measurements taken from: [X] Well Casing [ ] Protective Casing [ ] (Other, Specify)

**Instrument Calibration:** Calibrated within range

| | |
|---|---|
| pH | Yes |
| ORP | Yes |
| Conductivity | Yes |
| DO | Yes |

**Water parameters:**

| | Drawdown measured | Temperature Celsius | Conductivity mS/cm | Dissolved Oxygen mg/L | pH | ORP mV | Turbidity NTUs |
|---|---|---|---|---|---|---|---|
| initial | 26.85 | 11.3 | 0.74 | 1.49 | 6.61 | 181.2 | 87.7 |
| 935 5 min | 29.03 | 11.4 | 0.73 | 1.18 | 6.60 | 174.2 | 25.0 |
| 940 10 min | 37.40 | 11.9 | 0.493 | 0.30 | 6.78 | 195.0 | 20.3 |
| 945 15 min | 39.39 | 11.9 | 0.491 | 0.20 | 6.80 | 202.1 | 12.9 |
| 950 20 min | 40.37 | 11.6 | 0.5760 | 0.27 | 6.76 | 145.0 | 20.4 |
| 25 min | Below Pump | 11.7 | 0.494 | 0.24 | 6.85 | 137.0 | 22.9 |
| 30 min | 41.75 | | | | | | |
| 11/7/18 35 min | No readings Recorded | | on 11/7/18 | | | | |
| 40 min | | | | | | | |
| 45 min | | | | | | | |
| 50 min | | | | | | | |
| 55 min | | | | | | | |
| 60 min | | | | | | | |

**Water Sample:** Time Collected: 11/7/18 1250

| Physical Appearance at Start | | Physical Appearance at Sampling | |
|---|---|---|---|
| Color | Slightly cloudy | Color | Slightly cloudy |
| Odor | NONE | Odor | NONE |
| Turbidity (> 100 NTU) | 87.7 | Turbidity (> 100 NTU) | ~~87.7~~ |
| Sheen/Free Product | NONE | Sheen/Free Product | NONE |

**Samples collected:**

| Analyses | # Bottles | Bottle size/type | Preservative | Field Filtered |
|---|---|---|---|---|
| TOC | 2 | 40ml | H2SO4 | |
| TOX | 1 | 250 ml | H2SO4 | |
| SPL | 1 | 500 ml | — | |
| Metals | 1 | 250 ml | HNO3 | 45 |
| | | | | |
| | | | | |

Notes:

**O'Brien & Gere Engineers, Inc.** — **Standard Groundwater Sampling Log**

Date: 11/6/18 - 11/7/18
Site Name: Coldwater
Location: Flint
Project No.: 68545
Personnel: KBS

Weather:
Well #: B-19AR
Evacuation Method: whale Pump
Sampling Method: Purged DM

**Well Information:**

Depth of Well *: 47.13 ft.
Depth to Water *: 39.30 / 40.09 ft.
Length of Water Column: ft.
Volume of Water in Well: gal.(s)
3X Volume of Water in Well: gal.(s)

Water Volume /ft. for:
- X 2" Diameter Well = 0.163 X LWC
- 4" Diameter Well = 0.653 X LWC
- 6" Diameter Well = 1.469 X LWC

Volume removed before sampling: 1 1/2 gal.(s)
Did well go dry? yes

* Measurements taken from: [X] Well Casing [ ] Protective Casing [ ] (Other, Specify)

**Instrument Calibration:**

Calibrated within range
- pH: yes
- ORP: yes
- Conductivity: yes
- DO: yes

**Water parameters:**

| | Drawdown measured | Temperature Celsius | Conductivity mS/cm | Dissolved Oxygen mg/L | pH | ORP mV | Turbidity NTUs |
|---|---|---|---|---|---|---|---|
| initial | 40.87 | 16.7 | 0.79 | 1.00 | 7.11 | 40.8 | >1000 |
| 1615 5 min | 42.42 | 11.4 | 0.77 | 0.68 | 7.03 | 37.2 | 1000 |
| 10 min | | | | | | | |
| 11/7/18 15 min | 40.09 | 11.1 | 0.90 | 4.89 | 7.35 | 41.1 | 100 |
| 20 min | | | | | | | |
| 25 min | | | | | | | |
| 30 min | | | | | | | |
| 35 min | | | | | | | |
| 40 min | | | | | | | |
| 45 min | | | | | | | |
| 50 min | | | | | | | |
| 55 min | | | | | | | |
| 60 min | | | | | | | |

**Water Sample:** Time Collected: 11/7/18 1435

| Physical Appearance at Start | | Physical Appearance at Sampling | |
|---|---|---|---|
| Color | Grayish Brown | Color | Grayish Brown |
| Odor | None | Odor | None |
| Turbidity (> 100 NTU) | 1000 + | Turbidity (> 100 NTU) | 1000 + |
| Sheen/Free Product | None | Sheen/Free Product | None |

**Samples collected:**

| Analyses | # Bottles | Bottle size/type | Preservative | Field Filtered |
|---|---|---|---|---|
| TDG | 3 | 40ml | H2SO4 | |
| TOX | 1 | 250 ml | H2SO4 | |
| CPC | 1 | 250 ml | | |
| Metals | 1 | 250 ml | HNO3 | yes |
| | | | | |
| | | | | |

Notes:

**O'Brien & Gere Engineers, Inc.** — **Standard Groundwater Sampling Log**

Date 11/6/18 – 11/7/18
Site Name Flint MI
Location Coldwater
Project No. 48545
Personnel KBS

Weather Rain 50's
Well # B-24c
Evacuation Method Whale pump
Sampling Method Purged Dry

**Well Information:**

Depth of Well * 30.41 ft.
Depth to Water * 13.15 / 12.90 ft.
Length of Water Column ____ ft.
Volume of Water in Well ____ gal.(s)
3X Volume of Water in Well ____ gal.(s)

Water Volume /ft. for:
X 2" Diameter Well = 0.163 X LWC
4" Diameter Well = 0.653 X LWC
6" Diameter Well = 1.469 X LWC

Volume removed before sampling 7 1/2 gal.(s)
Did well go dry? YES

* Measurements taken from [X] Well Casing [ ] Protective Casing [ ] (Other, Specify)

**Instrument Calibration:**

Calibrated within range

| | |
|---|---|
| pH | YES |
| ORP | YES |
| Conductivity | YES |
| DO | YES |

**Water parameters:**

| | Drawdown measured | Temperature Celsius | Conductivity mS/cm | Dissolved Oxygen mg/L | pH | ORP mV | Turbidity NTUs |
|---|---|---|---|---|---|---|---|
| initial | 17.35 | 12.3 | 0.90 | 0.15 | 6.92 | 31.7 | 67.4 |
| 1540 5 min | 21.00 | 13.3 | 0.91 | 1.09 | 7.07 | 26.4 | 72.1 |
| 1545 10 min | 24.30 | 13.2 | 0.92 | 0.70 | 7.08 | 26.1 | 278 |
| 1550 15 min | 27.46 | 12.6 | 0.89 | 0.14 | 7.04 | 24.1 | 86.7 |
| 1555 20 min | 28.00 | | | | | | |
| 25 min | | | | | | | |
| 11/7/18 30 min | 12.90 | 11.0 | 0.95 | 6.31 | 7.22 | 38.0 | 50.8 |
| 35 min | | | | | | | |
| 40 min | | | | | | | |
| 45 min | | | | | | | |
| 50 min | | | | | | | |
| 55 min | | | | | | | |
| 60 min | | | | | | | |

**Water Sample**
Time Collected 11/7/18 1400

| Physical Appearance at Start | | Physical Appearance at Sampling | |
|---|---|---|---|
| Color | light Grayish brown | Color | light Grayish brown |
| Odor | NONE | Odor | NONE |
| Turbidity (> 100 NTU) | 67.4 | Turbidity (> 100 NTU) | 50.8 |
| Sheen/Free Product | NONE | Sheen/Free Product | NONE |

**Samples collected:**

| Analyses | # Bottles | Bottle size/type | Preservative | Field Filtered |
|---|---|---|---|---|
| TOC | 3 | 40 ml | H2SO4 | |
| TOX | 1 | 250 ml | H2SO4 | |
| SOC | 1 | 250 ml | H2SO4 | |
| Metals | 1 | 250 ml | HNO3 | YES |
| | | | | |
| | | | | |

Notes:

**O'Brien & Gere Engineers, Inc.**

# Standard Groundwater Sampling Log

Date 11/6/18 – 11/7/18
Site Name Coldwater
Location Flint
Project No. 68545
Personnel KBS

Weather cloudy/windy/Rain 50's
Well # B-28
Evacuation Method
Sampling Method

**Well Information:**

| | | |
|---|---|---|
| Depth of Well * | 33.02 | ft. |
| Depth to Water * | 5.30 / 5.15 | ft. |
| Length of Water Column | 27.72 | ft. |
| Volume of Water in Well | 4.51 | gal.(s) |
| 3X Volume of Water in Well | 13.55 | gal.(s) |

Water Volume /ft. for:
X 2" Diameter Well = 0.163 X LWC
4" Diameter Well = 0.653 X LWC
6" Diameter Well = 1.469 X LWC

Volume removed before sampling 10 1/4 gal.(s)
Did well go dry? KS

* Measurements taken from [X] Well Casing [ ] Protective Casing [ ] (Other, Specify)

**Instrument Calibration:**

Calibrated within range

| | |
|---|---|
| pH | KS |
| ORP | KS |
| Conductivity | KS |
| DO | KS |

**Water parameters:**

| | Drawdown measured | Temperature Celsius | Conductivity mS/cm | Dissolved Oxygen mg/L | pH | ORP mV | Turbidity NTUs |
|---|---|---|---|---|---|---|---|
| 1420 initial | 8.44 | 12.4 | 0.163 | 0.21 | 7.05 | 73.8 | 61.4 |
| 1425 5 min | 18.90 | 13.7 | 0.164 | 1.77 | 7.21 | 41.3 | 35.2 |
| 1430 10 min | 21.15 | 13.6 | 0.164 | 1.77 | 7.21 | 34.6 | 26.2 |
| 1435 15 min | 23.10 | 13.7 | 0.164 | 1.51 | 7.19 | 26.6 | 20.8 |
| 1440 20 min | 23.14 | 13.7 | 0.164 | 1.10 | 7.16 | 17.8 | 13.2 |
| 1445 25 min | 23.70 | 13.6 | 0.164 | 0.66 | 7.13 | 11.4 | 11.5 |
| 1450 30 min | 23.72 | 13.6 | 0.165 | 0.33 | 7.11 | 4.4 | 29.4 |
| 1455 35 min | 23.60 | 13.8 | 0.165 | 0.25 | 7.12 | -3.2 | 46.6 |
| 1500 40 min | 23.40 | 13.8 | 0.165 | 0.20 | 7.13 | -10.5 | 44.5 |
| 45 min | 23.30 | 13.7 | 0.165 | 0.23 | 7.14 | -14.3 | 26.4 |
| 50 min | | | | | | | |
| 11/7/18 55 min | 5.15 | 11.8 | 0.166 | 0.50 | 7.37 | 20.0 | 23.8 |
| 60 min | | | | | | | |

**Water Sample:**
Time Collected 11/7/18 1335

| Physical Appearance at Start | | Physical Appearance at Sampling | |
|---|---|---|---|
| Color | slightly cloudy | Color | Slightly cloudy |
| Odor | NONE | Odor | NONE |
| Turbidity (> 100 NTU) | 61.4 | Turbidity (> 100 NTU) | 23.8 |
| Sheen/Free Product | NONE | Sheen/Free Product | NONE |

**Samples collected:**

| Analyses | # Bottles | Bottle size/type | Preservative | Field Filtered |
|---|---|---|---|---|
| TOC | 2 | 40 ml | H2SO4 | |
| TOX | 1 | 250 ml | H2SO4 | |
| SPL Metals | 1 | 500 ml | — | |
| | 1 | 250 ml | HNO3 | yes |

Notes:
DUP-2 collected

**O'Brien & Gere Engineers, Inc.** — **Standard Groundwater Sampling Log**

Date: 11/7/18
Site Name: Coldwater
Location: Flint, MI
Project No.: 68545
Personnel: KBS

Weather:
Well #: OBG MW-16D
Evacuation Method: Bladder Pump
Sampling Method: Low Flow

**Well Information:**

| | | |
|---|---|---|
| Depth of Well * | | ft. |
| Depth to Water * | 59.64 | ft. |
| Length of Water Column | | ft. |
| Volume of Water in Well | | gal.(s) |
| 3X Volume of Water in Well | | gal.(s) |

Water Volume /ft. for:
- X 2" Diameter Well = 0.163 X LWC
- ___ 4" Diameter Well = 0.653 X LWC
- ___ 6" Diameter Well = 1.469 X LWC

Volume removed before sampling: 2 gal.(s)
Did well go dry? No

* Measurements taken from: [X] Well Casing [ ] Protective Casing [ ] (Other, Specify)

**Instrument Calibration:** Calibrated within range

| | |
|---|---|
| pH | yes |
| ORP | yes |
| Conductivity | yes |
| DO | yes |

**Water parameters:**

| | Drawdown measured | Temperature Celsius | Conductivity mS/cm | Dissolved Oxygen mg/L | pH | ORP mV | Turbidity NTUs |
|---|---|---|---|---|---|---|---|
| initial | 59.69 | 10.3 | 0.493 | 0.19 | 7.02 | -79.2 | 133 |
| 1525 5 min | | 10.0 | 0.493 | 0.33 | 7.68 | -103.1 | 91.2 |
| 1530 10 min | | 9.6 | 0.484 | 0.18 | 7.67 | -117.2 | 63.1 |
| 1535 15 min | | 9.7 | 0.484 | 0.11 | 7.65 | -126.4 | 39.9 |
| 1540 20 min | | 9.8 | 0.485 | 0.10 | 7.65 | -131.7 | 39.0 |
| 1545 25 min | | 9.7 | 0.484 | 0.10 | 7.64 | -134.5 | 32.2 |
| 1550 30 min | | 9.7 | 0.484 | 0.10 | 7.63 | -137.4 | 29.1 |
| 1555 35 min | | 9.8 | 0.484 | 0.12 | 7.61 | -140.1 | 27.0 |
| 1600 40 min | | 9.7 | 0.483 | 0.10 | 7.60 | -144.7 | 25.5 |
| 45 min | | | | | | | |
| 50 min | | | | | | | |
| 55 min | | | | | | | |
| 60 min | | | | | | | |

**Water Sample:**
Time Collected: 1605

| Physical Appearance at Start | | Physical Appearance at Sampling | |
|---|---|---|---|
| Color | Slightly light Gray | Color | clear |
| Odor | NONE | Odor | NONE |
| Turbidity (> 100 NTU) | 133 | Turbidity (> 100 NTU) | 25.5 |
| Sheen/Free Product | NONE | Sheen/Free Product | NONE |

**Samples collected:**

| Analyses | # Bottles | Bottle size/type | Preservative | Field Filtered |
|---|---|---|---|---|
| TOC | | | | |
| TOX | | | | |
| SPL | | | | |
| METALS, SODIUM | | | | |
| CHLORIDE | | | | |
| SULFATE, CHLORIDES | | | | |

Notes:

# APPENDIX C

## *Analytical Results*

# Analytical Laboratory Report

Report ID: S96486.01(01)
Generated on 12/07/2018

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@obg.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S96486.01-S96486.08
Project: RACER Coldwater Rd LF Annual Sampling
Collected Date: 11/06/2018 - 11/07/2018
Submitted Date/Time: 11/08/2018 08:15
Sampled by: Kevin Schneider
P.O. #: 11800350

Table of Contents



Maya Murshak
Technical Director

## General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

## Report Narrative

There is no additional narrative for this analytical report

**Laboratory Certifications**

| Authority | Certification ID |
|---|---|
| Michigan DEQ | #9956 |
| DOD ELAP/ISO 17025 | #69699 |
| WBENC | #2005110032 |
| Ohio VAP | #CL0002 |
| Indiana DOH | #C-MI-07 |
| New York NELAC | #11814 |
| North Carolina DENR | #680 |
| North Carolina DOH | #26702 |
| Alaska CSLAP | #17-001 |

**Qualifier Descriptions**

| Qualifier | Description |
|---|---|
| ! | Result is outside of stated limit criteria |
| B | Compound also found in associated method blank |
| E | Concentration exceeds calibration range |
| F | Analysis run outside of holding time |
| G | Estimated result due to extraction run outside of holding time |
| H | Sample submitted and run outside of holding time |
| I | Matrix interference with internal standard |
| J | Estimated value less than reporting limit, but greater than MDL |
| L | Elevated reporting limit due to low sample amount |
| M | Result reported to MDL not RDL |
| O | Analysis performed by outside laboratory. See attached report. |
| R | Preliminary result |
| S | Surrogate recovery outside of control limits |
| T | No correction for total solids |
| X | Elevated reporting limit due to matrix interference |
| Y | Elevated reporting limit due to high target concentration |
| b | Value detected less than reporting limit, but greater than MDL |
| e | Reported value estimated due to interference |
| j | Analyte also found in associated method blank |
| p | Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak. |
| x | Preserved from bulk sample |

**Glossary of Abbreviations**

| Abbreviation | Description |
|---|---|
| RL/RDL | Reporting Limit |
| MDL | Method Detection Limit |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| SW | EPA SW 846 (Soil and Wastewater) Methods |
| E | EPA Methods |
| SM | Standard Methods |
| LN | Linear |
| BR | Branched |

**Method Summary**

| Method | Version |
|---|---|
| E120.1 | EPA Method 120.1 Revision 1982 |
| E200.8 | EPA Method 200.8 Revision 5.4 |
| SM5310C | Standard Method 5310C 2011 |
| SW3015A | SW 846 Method 3015A Revision 1 February 2007 |
| SW9020B | SW 846 Method 9020B Revision 2 September 1994 |

**Sample Summary (8 samples)**

| Sample ID | Sample Tag | Matrix | Collected Date/Time |
|---|---|---|---|
| S96486.01 | B-9 | Groundwater | 11/06/18 12:40 |
| S96486.02 | B-18A | Groundwater | 11/07/18 12:50 |
| S96486.03 | B-7 | Groundwater | 11/07/18 13:10 |
| S96486.04 | B-28 | Groundwater | 11/07/18 13:35 |
| S96486.05 | B-19Ar | Groundwater | 11/07/18 14:35 |
| S96486.06 | B-24r | Groundwater | 11/07/18 14:00 |
| S96486.07 | DUP-2 | Groundwater | 11/07/18 00:01 |
| S96486.08 | EB-1 | Water | 11/07/18 16:50 |

# Analytical Laboratory Report

**Lab Sample ID: S96486.01**
Sample Tag: B-9
Collected Date/Time: 11/06/2018 12:40
Matrix: Groundwater
COC Reference: 112661

Sample Containers

| # | Type | Preservative(s) | Refrigerated? | Arrival Temp. (C) | Thermometer # |
|---|---|---|---|---|---|
| 1 | 125ml Plastic | HNO3 | Yes | 6.0 | IR |
| 2 | 40ml Glass | H2SO4 | Yes | 6.0 | IR |
| 1 | 250ml Amber | H2SO4 | Yes | 6.0 | IR |
| 1 | 125ml Plastic | None | Yes | 6.0 | IR |

***Extraction / Prep.***

| Parameter | Result | Method | Run Date | Analyst | Flags |
|---|---|---|---|---|---|
| Metal Digestion | Completed | SW3015A | 11/09/18 12:00 | CCM | |

***Inorganics***

**Method: E120.1, Run Date: 11/09/18 12:00, Analyst: JKB**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Conductivity | 3,010 | | | umhos/cm | 1 | | |

**Method: SM5310C, Run Date: 11/12/18 15:02, Analyst: JKB**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| TOC | 4.9 | 1 | | mg/L | 1 | | |

***Metals***

**Method: E200.8, Run Date: 11/09/18 13:18, Analyst: CCM**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Chromium, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-47-3 | |
| Copper, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-50-8 | |
| Nickel, Dissolved | 0.007 | 0.005 | | mg/L | 5 | 7440-02-0 | |
| Zinc, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-66-6 | |

***Organics***

**Method: SW9020B, Run Date: 12/04/18 11:46, Analyst: TA**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| TOX* | Not detected | 150 | | ug/L | 1 | | O |

O-Analysis performed by outside laboratory. See attached report.

# Analytical Laboratory Report

**Lab Sample ID: S96486.02**
Sample Tag: B-18A
Collected Date/Time: 11/07/2018 12:50
Matrix: Groundwater
COC Reference: 112661

Sample Containers

| # | Type | Preservative(s) | Refrigerated? | Arrival Temp. (C) | Thermometer # |
|---|---|---|---|---|---|
| 1 | 125ml Plastic | HNO3 | Yes | 6.0 | IR |
| 2 | 40ml Glass | H2SO4 | Yes | 6.0 | IR |
| 1 | 250ml Amber | H2SO4 | Yes | 6.0 | IR |
| 1 | 125ml Plastic | None | Yes | 6.0 | IR |

***Extraction / Prep.***

| Parameter | Result | Method | Run Date | Analyst | Flags |
|---|---|---|---|---|---|
| Metal Digestion | Completed | SW3015A | 11/09/18 12:00 | CCM | |

***Inorganics***

**Method: E120.1, Run Date: 11/09/18 12:02, Analyst: JKB**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Conductivity | 1,106 | | | umhos/cm | 1 | | |

**Method: SM5310C, Run Date: 11/12/18 16:09, Analyst: JKB**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| TOC | 3.0 | 1 | | mg/L | 1 | | |

***Metals***

**Method: E200.8, Run Date: 11/09/18 13:20, Analyst: CCM**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Chromium, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-47-3 | |
| Copper, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-50-8 | |
| Nickel, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-02-0 | |
| Zinc, Dissolved | 0.007 | 0.005 | | mg/L | 5 | 7440-66-6 | |

***Organics***

**Method: SW9020B, Run Date: 12/04/18 11:46, Analyst: TA**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| TOX* | Not detected | 150 | | ug/L | 1 | | O |

O-Analysis performed by outside laboratory. See attached report.

# Analytical Laboratory Report

**Lab Sample ID: S96486.03**
Sample Tag: B-7
Collected Date/Time: 11/07/2018 13:10
Matrix: Groundwater
COC Reference: 112661

Sample Containers

| # | Type | Preservative(s) | Refrigerated? | Arrival Temp. (C) | Thermometer # |
|---|---|---|---|---|---|
| 1 | 125ml Plastic | HNO3 | Yes | 6.0 | IR |
| 2 | 40ml Glass | H2SO4 | Yes | 6.0 | IR |
| 1 | 250ml Amber | H2SO4 | Yes | 6.0 | IR |
| 1 | 125ml Plastic | None | Yes | 6.0 | IR |

***Extraction / Prep.***

| Parameter | Result | Method | Run Date | Analyst | Flags |
|---|---|---|---|---|---|
| Metal Digestion | Completed | SW3015A | 11/09/18 12:00 | CCM | |

***Inorganics***

**Method: E120.1, Run Date: 11/09/18 12:04, Analyst: JKB**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Conductivity | 952 | | | umhos/cm | 1 | | |

**Method: SM5310C, Run Date: 11/12/18 16:32, Analyst: JKB**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| TOC | 6.5 | 1 | | mg/L | 1 | | |

***Metals***

**Method: E200.8, Run Date: 11/09/18 13:22, Analyst: CCM**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Chromium, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-47-3 | |
| Copper, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-50-8 | |
| Nickel, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-02-0 | |
| Zinc, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-66-6 | |

***Organics***

**Method: SW9020B, Run Date: 12/04/18 11:46, Analyst: TA**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| TOX* | 170 | 150 | | ug/L | 1 | | O |

O-Analysis performed by outside laboratory. See attached report.

Merit Laboratories, Inc.

# Analytical Laboratory Report

**Lab Sample ID: S96486.04**
Sample Tag: B-28
Collected Date/Time: 11/07/2018 13:35
Matrix: Groundwater
COC Reference: 112661

Sample Containers

| # | Type | Preservative(s) | Refrigerated? | Arrival Temp. (C) | Thermometer # |
|---|---|---|---|---|---|
| 1 | 125ml Plastic | HNO3 | Yes | 6.0 | IR |
| 2 | 40ml Glass | H2SO4 | Yes | 6.0 | IR |
| 1 | 250ml Amber | H2SO4 | Yes | 6.0 | IR |
| 1 | 125ml Plastic | None | Yes | 6.0 | IR |

***Extraction / Prep.***

| Parameter | Result | Method | Run Date | Analyst | Flags |
|---|---|---|---|---|---|
| Metal Digestion | Completed | SW3015A | 11/09/18 12:00 | CCM | |

***Inorganics***

**Method: E120.1, Run Date: 11/09/18 12:06, Analyst: JKB**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Conductivity | 880 | | | umhos/cm | 1 | | |

**Method: SM5310C, Run Date: 11/12/18 16:55, Analyst: JKB**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| TOC | 1.5 | 1 | | mg/L | 1 | | |

***Metals***

**Method: E200.8, Run Date: 11/09/18 13:24, Analyst: CCM**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Chromium, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-47-3 | |
| Copper, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-50-8 | |
| Nickel, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-02-0 | |
| Zinc, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-66-6 | |

***Organics***

**Method: SW9020B, Run Date: 12/04/18 11:44, Analyst: TA**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| TOX* | Not detected | 150 | | ug/L | 1 | | O |

O-Analysis performed by outside laboratory. See attached report.

# Analytical Laboratory Report

**Lab Sample ID: S96486.05**
Sample Tag: B-19Ar
Collected Date/Time: 11/07/2018 14:35
Matrix: Groundwater
COC Reference: 112661

Sample Containers

| # | Type | Preservative(s) | Refrigerated? | Arrival Temp. (C) | Thermometer # |
|---|---|---|---|---|---|
| 1 | 125ml Plastic | HNO3 | Yes | 6.0 | IR |
| 2 | 40ml Glass | H2SO4 | Yes | 6.0 | IR |
| 1 | 250ml Amber | H2SO4 | Yes | 6.0 | IR |
| 1 | 125ml Plastic | None | Yes | 6.0 | IR |

***Extraction / Prep.***

| Parameter | Result | Method | Run Date | Analyst | Flags |
|---|---|---|---|---|---|
| Metal Digestion | Completed | SW3015A | 11/09/18 12:00 | CCM | |

***Inorganics***

**Method: E120.1, Run Date: 11/09/18 12:08, Analyst: JKB**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Conductivity | 1,176 | | | umhos/cm | 1 | | |

**Method: SM5310C, Run Date: 11/12/18 17:17, Analyst: JKB**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| TOC | 5.9 | 1 | | mg/L | 1 | | |

***Metals***

**Method: E200.8, Run Date: 11/09/18 13:25, Analyst: CCM**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Chromium, Dissolved | 0.006 | 0.005 | | mg/L | 5 | 7440-47-3 | |
| Copper, Dissolved | 0.005 | 0.005 | | mg/L | 5 | 7440-50-8 | |
| Nickel, Dissolved | 0.011 | 0.005 | | mg/L | 5 | 7440-02-0 | |
| Zinc, Dissolved | 0.015 | 0.005 | | mg/L | 5 | 7440-66-6 | |

***Organics***

**Method: SW9020B, Run Date: 12/04/18 11:44, Analyst: TA**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| TOX* | Not detected | 150 | | ug/L | 1 | | O |

O-Analysis performed by outside laboratory. See attached report.

# Analytical Laboratory Report

**Lab Sample ID: S96486.06**
Sample Tag: B-24r
Collected Date/Time: 11/07/2018 14:00
Matrix: Groundwater
COC Reference: 112661

Sample Containers

| # | Type | Preservative(s) | Refrigerated? | Arrival Temp. (C) | Thermometer # |
|---|---|---|---|---|---|
| 1 | 125ml Plastic | HNO3 | Yes | 6.0 | IR |
| 2 | 40ml Glass | H2SO4 | Yes | 6.0 | IR |
| 1 | 250ml Amber | H2SO4 | Yes | 6.0 | IR |
| 1 | 125ml Plastic | None | Yes | 6.0 | IR |

***Extraction / Prep.***

| Parameter | Result | Method | Run Date | Analyst | Flags |
|---|---|---|---|---|---|
| Metal Digestion | Completed | SW3015A | 11/09/18 12:00 | CCM | |

***Inorganics***

**Method: E120.1, Run Date: 11/09/18 12:10, Analyst: JKB**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Conductivity | 1,269 | | | umhos/cm | 1 | | |

**Method: SM5310C, Run Date: 11/12/18 17:40, Analyst: JKB**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| TOC | 3.7 | 1 | | mg/L | 1 | | |

***Metals***

**Method: E200.8, Run Date: 11/09/18 13:27, Analyst: CCM**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Chromium, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-47-3 | |
| Copper, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-50-8 | |
| Nickel, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-02-0 | |
| Zinc, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-66-6 | |

***Organics***

**Method: SW9020B, Run Date: 12/04/18 11:44, Analyst: TA**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| TOX* | Not detected | 150 | | ug/L | 1 | | O |

O-Analysis performed by outside laboratory. See attached report.

# Analytical Laboratory Report

**Lab Sample ID: S96486.07**
Sample Tag: DUP-2
Collected Date/Time: 11/07/2018 00:01
Matrix: Groundwater
COC Reference: 112661

Sample Containers

| # | Type | Preservative(s) | Refrigerated? | Arrival Temp. (C) | Thermometer # |
|---|---|---|---|---|---|
| 1 | 125ml Plastic | HNO3 | Yes | 6.0 | IR |
| 2 | 40ml Glass | H2SO4 | Yes | 6.0 | IR |
| 1 | 250ml Amber | H2SO4 | Yes | 6.0 | IR |
| 1 | 125ml Plastic | None | Yes | 6.0 | IR |

***Extraction / Prep.***

| Parameter | Result | Method | Run Date | Analyst | Flags |
|---|---|---|---|---|---|
| Metal Digestion | Completed | SW3015A | 11/09/18 12:00 | CCM | |

***Inorganics***

**Method: E120.1, Run Date: 11/09/18 12:12, Analyst: JKB**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Conductivity | 880 | | | umhos/cm | 1 | | |

**Method: SM5310C, Run Date: 11/12/18 18:03, Analyst: JKB**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| TOC | 1.6 | 1 | | mg/L | 1 | | |

***Metals***

**Method: E200.8, Run Date: 11/09/18 13:29, Analyst: CCM**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Chromium, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-47-3 | |
| Copper, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-50-8 | |
| Nickel, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-02-0 | |
| Zinc, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-66-6 | |

***Organics***

**Method: SW9020B, Run Date: 12/04/18 11:44, Analyst: TA**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| TOX* | Not detected | 150 | | ug/L | 1 | | O |

O-Analysis performed by outside laboratory. See attached report.

# Analytical Laboratory Report

**Lab Sample ID: S96486.08**
Sample Tag: EB-1
Collected Date/Time: 11/07/2018 16:50
Matrix: Water
COC Reference: 112661

Sample Containers

| # | Type | Preservative(s) | Refrigerated? | Arrival Temp. (C) | Thermometer # |
|---|---|---|---|---|---|
| 1 | 125ml Plastic | HNO3 | Yes | 6.0 | IR |
| 2 | 40ml Glass | H2SO4 | Yes | 6.0 | IR |
| 1 | 250ml Amber | H2SO4 | Yes | 6.0 | IR |
| 1 | 125ml Plastic | None | Yes | 6.0 | IR |

***Extraction / Prep.***

| Parameter | Result | Method | Run Date | Analyst | Flags |
|---|---|---|---|---|---|
| Metal Digestion | Completed | SW3015A | 11/09/18 12:00 | CCM | |

***Inorganics***

**Method: E120.1, Run Date: 11/09/18 12:14, Analyst: JKB**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Conductivity | 5.40 | | | umhos/cm | 1 | | |

**Method: SM5310C, Run Date: 11/12/18 18:25, Analyst: JKB**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| TOC | 39.3 | 1 | | mg/L | 1 | | |

***Metals***

**Method: E200.8, Run Date: 11/09/18 13:31, Analyst: CCM**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Chromium, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-47-3 | |
| Copper, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-50-8 | |
| Nickel, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-02-0 | |
| Zinc, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-66-6 | |

***Organics***

**Method: SW9020B, Run Date: 12/05/18 11:04, Analyst: TA**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| TOX* | Not detected | 150 | | ug/L | 1 | | O |

O-Analysis performed by outside laboratory. See attached report.

# Merit Laboratories Login Checklist

Lab Set ID: S96486
Client: OBG02 (O'Brien & Gere Engineers, Inc.)
Project: RACER Coldwater Rd LF Annual Sampling
Submitted: 11/08/2018 08:15 Login User: SRS

Attention: Clifford Yantz
Address: O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@obg.com

| Selection | | | | Description | Note |
|---|---|---|---|---|---|
| **Sample Receiving** | | | | | |
| 01. | [X] Yes | [ ] No | [ ] N/A | Samples are received at 4C +/- 2C Thermometer # | IR 6.0 |
| 02. | [X] Yes | [ ] No | [ ] N/A | Received on ice/ cooling process begun | |
| 03. | [ ] Yes | [X] No | [ ] N/A | Samples shipped | |
| 04. | [X] Yes | [ ] No | [ ] N/A | Samples left in 24 hr. drop box | |
| 05. | [X] Yes | [ ] No | [ ] N/A | Are there custody seals/tape or is the drop box locked | |
| **Chain of Custody** | | | | | |
| 06. | [X] Yes | [ ] No | [ ] N/A | COC adequately filled out | |
| 07. | [X] Yes | [ ] No | [ ] N/A | COC signed and relinquished to the lab | |
| 08. | [X] Yes | [ ] No | [ ] N/A | Sample tag on bottles match COC | |
| 09. | [X] Yes | [ ] No | [ ] N/A | Subcontracting needed? Subcontacted to: | Test America |
| **Preservation** | | | | | |
| 10. | [X] Yes | [ ] No | [ ] N/A | Do sample have correct chemical preservation | |
| 11. | [X] Yes | [ ] No | [ ] N/A | Completed pH checks on preserved samples? (no VOAs) | |
| 12. | [ ] Yes | [X] No | [ ] N/A | Did any samples need to be preserved in the lab? | |
| **Bottle Conditions** | | | | | |
| 13. | [X] Yes | [ ] No | [ ] N/A | All bottles intact | |
| 14. | [X] Yes | [ ] No | [ ] N/A | Appropriate analytical bottles are used | |
| 15. | [X] Yes | [ ] No | [ ] N/A | Merit bottles used | |
| 16. | [X] Yes | [ ] No | [ ] N/A | Sufficient sample volume received | |
| 17. | [ ] Yes | [X] No | [ ] N/A | Samples require laboratory filtration | |
| 18. | [X] Yes | [ ] No | [ ] N/A | Samples submitted within holding time | |
| 19. | [ ] Yes | [ ] No | [X] N/A | Do water VOC or TOX bottles contain headspace | |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S96486 Initials: SRS

Client: OBG02 (O'Brien & Gere Engineers, Inc.)

Project: RACER Coldwater Rd LF Annual Sampling

Submitted: 11/08/2018 08:15 Login User:

Attention: Clifford Yantz
Address: O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@obg.com

| Lab ID | 125 ml Plastic $HNO_3$ | 250 ml Plastic $HNO_3$ | 1 L Plastic $HNO_3$ | 250 ml Plastic $H_2SO_4$ | 125 ml Amber $H_2SO_4$ | 32 oz Glass HCl | 125 ml Plastic NaOH | 125 ml Amber $PbCO_3$ NaOH | pH | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | <2 | >12 | other | ml add | new pH | |
| S96486.01 | X | | | | | | | | X | | | | | |
| S96486.02 | X | | | | | | | | X | | | | | |
| S96486.03 | X | | | | | | | | X | | | | | |
| S96486.04 | X | | | | | | | | X | | | | | |
| S96486.05 | X | | | | | | | | X | | | | | |
| S96486.06 | X | | | | | | | | X | | | | | |
| S96486.07 | X | | | | | | | | X | | | | | |
| S96486.08 | X | | | | | | | | X | | | | | |

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

112661

# CHAIN OF CUSTODY RECORD

## REPORT TO

CONTACT NAME: Clifford Yantz
COMPANY: O'Brien & Gere
ADDRESS: 2260 East ~~Lansing~~ Saginaw
CITY: East Lansing STATE: MI ZIP CODE: 48823
PHONE NO.: 313-333-0211 FAX NO.: P.O. NO.: 11800350
E-MAIL ADDRESS: clifford.yantz@obg.com QUOTE NO.:

## INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Coldwater Rd LF Annual Sampling
SAMPLER(S) - PLEASE PRINT/SIGN NAME: [signature]

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☒ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

| MERIT LAB NO. (FOR LAB USE ONLY) | YEAR DATE | YEAR TIME | SAMPLE TAG IDENTIFICATION-DESCRIPTION | MATRIX | # OF BOTTLES | # Containers & Preservatives: NONE | HCl | $HNO_3$ | $H_2SO_4$ | NaOH | MeOH | OTHER | Dissolved metals | TOC | specific conductivity | TOX | Special Instructions |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 964486.01 | 11/6/18 | 1240 | B-9 | GW | 5 | 1 | | 1 | 3 | | | | X | X | X | X | Dissolved metals were field Filtered |
| .02 | 11/7/18 | 1250 | B-18A | | | | | | | | | | X | X | X | X | |
| .03 | | 1310 | B-7 | | | | | | | | | | X | X | X | X | |
| .04 | | 1335 | B-28 | | | | | | | | | | X | X | X | X | Metals Are: |
| .05 | | 1435 | B-19Ar | | | | | | | | | | X | X | X | X | Cu, Cr, Ni, Zn |
| .06 | | 1400 | B-24r | | | | | | | | | | X | X | X | X | |
| .07 | | — | DUP-2 | | | | | | | | | | X | X | X | X | |
| .08 | | 1650 | EB-1 | QC | | | | | | | | | X | X | X | X | Equipment Blank |

PFAS

| | | | |
|---|---|---|---|
| RELINQUISHED BY: SIGNATURE/ORGANIZATION | [signature] OBG ☒ Sampler | DATE 11/7/18 | TIME 1817 |
| RECEIVED BY: SIGNATURE/ORGANIZATION | Merit Secure Locker | DATE 11/7/18 | TIME 1817 |
| RELINQUISHED BY: SIGNATURE/ORGANIZATION | Merit Dropbox | DATE 11/8/18 | TIME 815 |
| RECEIVED BY: SIGNATURE/ORGANIZATION | [signature] | DATE 11/8/18 | TIME 815 |

| | | | |
|---|---|---|---|
| RELINQUISHED BY: SIGNATURE/ORGANIZATION | | DATE | TIME |
| RECEIVED BY: SIGNATURE/ORGANIZATION | | DATE | TIME |

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 6.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Michigan
10448 Citation Drive
Suite 200
Brighton, MI 48116
Tel: (810)229-2763

TestAmerica Job ID: 190-18048-1
Client Project/Site: S96486/TOX

For:
Merit Laboratories
2680 E Lansing Drive
East Lansing, Michigan 48823

Attn: John Laverty

Patrick O'Meara

*Authorized for release by:*
*12/6/2018 6:07:51 PM*
Patrick O'Meara, Manager of Project Management
(330)966-5725
patrick.omeara@testamericainc.com

Designee for

Sue Schafer, Project Manager II
(810)229-2763
sue.schafer@testamericainc.com



*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

# Table of Contents

# Sample Summary

Client: Merit Laboratories
Project/Site: S96486/TOX

TestAmerica Job ID: 190-18048-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 190-18048-1 | 96486.01 | Water | 11/06/18 12:40 | 11/08/18 16:22 |
| 190-18048-2 | 96486.02 | Water | 11/07/18 12:50 | 11/08/18 16:22 |
| 190-18048-3 | 96486.03 | Water | 11/07/18 13:10 | 11/08/18 16:22 |
| 190-18048-4 | 96486.04 | Water | 11/07/18 13:35 | 11/08/18 16:22 |
| 190-18048-5 | 96486.05 | Water | 11/07/18 14:35 | 11/08/18 16:22 |
| 190-18048-6 | 96486.06 | Water | 11/07/18 14:00 | 11/08/18 16:22 |
| 190-18048-7 | 96486.07 | Water | 11/07/18 00:01 | 11/08/18 16:22 |
| 190-18048-8 | 96486.08 | Water | 11/07/18 16:50 | 11/08/18 16:22 |

# Case Narrative

Client: Merit Laboratories
Project/Site: S96486/TOX

TestAmerica Job ID: 190-18048-1

## Job ID: 190-18048-1

### Laboratory: TestAmerica Michigan

**Narrative**

**Job Narrative**
**190-18048-1**

**Comments**
No additional comments.

**Receipt**
The samples were received on 11/8/2018 4:22 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 11.2º C.

**General Chemistry**
Method(s) 9020B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 280-440120 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits. Total

Method(s) 9020B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 280-440171 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) 9020B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 280-440172 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) 9020B: The following samples for batch 440120 (Total Organic Halides) were diluted to 5x due to the nature of the sample matrix based on Cl pre-screen test: 96486.01 (190-18048-1) and 96486.02 (190-18048-2). Elevated reporting limits (RLs) are provided.

Method(s) 9020B: Breakthrough exceeded 10% for the following sample:(680-160399-M-13) in batch 440171 (Total Organic Halides) . The samples were run at a 2x dilution due to the nature of the sample matrix based on Cl pre-screen test. The data have been reported

Method(s) 9020B: The following samples for batch 440171 (Total Organic Halides) were diluted to 5x due to the nature of the sample matrix based on Cl pre-screen test: 96486.04 (190-18048-4), 96486.05 (190-18048-5), 96486.06 (190-18048-6) and 96486.07 (190-18048-7). Elevated reporting limits (RLs) are provided.

Method(s) 9020B: The following samples for batch 440172 (Total Organic Halides) were diluted to 5x due to the nature of the sample matrix based on Cl pre-screen test: 96486.08 (190-18048-8). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

## Client Sample ID: 96486.01
**Date Collected: 11/06/18 12:40**
**Date Received: 11/08/18 16:22**

## Lab Sample ID: 190-18048-1
**Matrix: Water**

### General Chemistry

| Analyte | Result | Qualifier | RL | | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| TOX Dup | <0.15 | | 0.15 | | mg/L | | | 12/04/18 11:46 | 1 |

## Client Sample ID: 96486.02
**Date Collected: 11/07/18 12:50**
**Date Received: 11/08/18 16:22**

## Lab Sample ID: 190-18048-2
**Matrix: Water**

### General Chemistry

| Analyte | Result | Qualifier | RL | | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| TOX Dup | <0.15 | | 0.15 | | mg/L | | | 12/04/18 11:46 | 1 |

## Client Sample ID: 96486.03
**Date Collected: 11/07/18 13:10**
**Date Received: 11/08/18 16:22**

## Lab Sample ID: 190-18048-3
**Matrix: Water**

### General Chemistry

| Analyte | Result | Qualifier | RL | | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| TOX Dup | 0.17 | | 0.15 | | mg/L | | | 12/04/18 11:46 | 1 |

## Client Sample ID: 96486.04
**Date Collected: 11/07/18 13:35**
**Date Received: 11/08/18 16:22**

## Lab Sample ID: 190-18048-4
**Matrix: Water**

### General Chemistry

| Analyte | Result | Qualifier | RL | | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| TOX Dup | <0.15 | | 0.15 | | mg/L | | | 12/04/18 11:44 | 1 |

## Client Sample ID: 96486.05
**Date Collected: 11/07/18 14:35**
**Date Received: 11/08/18 16:22**

## Lab Sample ID: 190-18048-5
**Matrix: Water**

### General Chemistry

| Analyte | Result | Qualifier | RL | | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| TOX Dup | <0.15 | | 0.15 | | mg/L | | | 12/04/18 11:44 | 1 |

## Client Sample ID: 96486.06
**Date Collected: 11/07/18 14:00**
**Date Received: 11/08/18 16:22**

## Lab Sample ID: 190-18048-6
**Matrix: Water**

### General Chemistry

| Analyte | Result | Qualifier | RL | | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| TOX Dup | <0.15 | | 0.15 | | mg/L | | | 12/04/18 11:44 | 1 |

## Client Sample ID: 96486.07
**Date Collected: 11/07/18 00:01**
**Date Received: 11/08/18 16:22**

## Lab Sample ID: 190-18048-7
**Matrix: Water**

### General Chemistry

| Analyte | Result | Qualifier | RL | | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| TOX Dup | <0.15 | | 0.15 | | mg/L | | | 12/04/18 11:44 | 1 |

# Client Sample Results

Client: Merit Laboratories
Project/Site: S96486/TOX

TestAmerica Job ID: 190-18048-1

**Client Sample ID: 96486.08**
**Date Collected: 11/07/18 16:50**
**Date Received: 11/08/18 16:22**

**Lab Sample ID: 190-18048-8**
**Matrix: Water**

## General Chemistry

| Analyte | Result | Qualifier | RL | | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| TOX Dup | <0.15 | F1 | 0.15 | | mg/L | | | 12/05/18 11:04 | 1 |

## Method: 9020B - Organic Halides, Total (TOX)

**Lab Sample ID: MB 280-440120/2**
**Matrix: Water**
**Analysis Batch: 440120**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | RL | | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| TOX Dup | <0.030 | | 0.030 | | mg/L | | | 12/04/18 11:46 | 1 |

**Lab Sample ID: LCS 280-440120/4**
**Matrix: Water**
**Analysis Batch: 440120**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TOX Result 1 | | | 0.100 | 0.0916 | | mg/L | | 92 | 78 - 114 | | |
| TOX Dup | | | 0.100 | 0.0916 | | mg/L | | 92 | 78 - 114 | | |

**Lab Sample ID: MB 280-440171/2**
**Matrix: Water**
**Analysis Batch: 440171**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | RL | | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| TOX Dup | <0.030 | | 0.030 | | mg/L | | | 12/04/18 11:44 | 1 |

**Lab Sample ID: LCS 280-440171/4**
**Matrix: Water**
**Analysis Batch: 440171**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TOX Result 1 | | | 0.100 | 0.0964 | | mg/L | | 96 | 78 - 114 | | |
| TOX Dup | | | 0.100 | 0.0964 | | mg/L | | 96 | 78 - 114 | | |

**Lab Sample ID: MB 280-440172/2**
**Matrix: Water**
**Analysis Batch: 440172**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | RL | | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| TOX Dup | <0.030 | | 0.030 | | mg/L | | | 12/05/18 11:04 | 1 |

**Lab Sample ID: LCS 280-440172/4**
**Matrix: Water**
**Analysis Batch: 440172**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TOX Result 1 | | | 0.100 | 0.102 | | mg/L | | 102 | 78 - 114 | | |
| TOX Dup | | | 0.100 | 0.102 | | mg/L | | 102 | 78 - 114 | | |

**Lab Sample ID: 190-18048-8 MS**
**Matrix: Water**
**Analysis Batch: 440172**

**Client Sample ID: 96486.08**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TOX Result 1 | <0.15 | F1 | 0.500 | <0.15 | F1 | mg/L | | 19 | 78 - 114 | | |
| TOX Dup | <0.15 | F1 | 0.500 | <0.15 | F1 | mg/L | | 0 | 78 - 114 | | |

## Method: 9020B - Organic Halides, Total (TOX) (Continued)

**Lab Sample ID: 190-18048-8 MSD**
**Matrix: Water**
**Analysis Batch: 440172**

**Client Sample ID: 96486.08**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TOX Result 1 | <0.15 | F1 | 0.500 | <0.15 | F1 | mg/L | | 19 | 78 - 114 | 2 | 23 |
| TOX Dup | <0.15 | F1 | 0.500 | <0.15 | F1 | mg/L | | 0 | 78 - 114 | NC | 23 |

## Qualifiers

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| F1 | MS and/or MSD Recovery is outside acceptance limits. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

# QC Association Summary

Client: Merit Laboratories
Project/Site: S96486/TOX

TestAmerica Job ID: 190-18048-1

## General Chemistry

### Analysis Batch: 440120

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 190-18048-1 | 96486.01 | Total/NA | Water | 9020B | |
| 190-18048-2 | 96486.02 | Total/NA | Water | 9020B | |
| 190-18048-3 | 96486.03 | Total/NA | Water | 9020B | |
| MB 280-440120/2 | Method Blank | Total/NA | Water | 9020B | |
| LCS 280-440120/4 | Lab Control Sample | Total/NA | Water | 9020B | |

### Analysis Batch: 440171

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 190-18048-4 | 96486.04 | Total/NA | Water | 9020B | |
| 190-18048-5 | 96486.05 | Total/NA | Water | 9020B | |
| 190-18048-6 | 96486.06 | Total/NA | Water | 9020B | |
| 190-18048-7 | 96486.07 | Total/NA | Water | 9020B | |
| MB 280-440171/2 | Method Blank | Total/NA | Water | 9020B | |
| LCS 280-440171/4 | Lab Control Sample | Total/NA | Water | 9020B | |

### Analysis Batch: 440172

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 190-18048-8 | 96486.08 | Total/NA | Water | 9020B | |
| MB 280-440172/2 | Method Blank | Total/NA | Water | 9020B | |
| LCS 280-440172/4 | Lab Control Sample | Total/NA | Water | 9020B | |
| 190-18048-8 MS | 96486.08 | Total/NA | Water | 9020B | |
| 190-18048-8 MSD | 96486.08 | Total/NA | Water | 9020B | |

# Lab Chronicle

Client: Merit Laboratories
Project/Site: S96486/TOX

TestAmerica Job ID: 190-18048-1

## Client Sample ID: 96486.01
**Date Collected: 11/06/18 12:40**
**Date Received: 11/08/18 16:22**

## Lab Sample ID: 190-18048-1
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9020B | | 1 | 440120 | 12/04/18 11:46 | RK | TAL DEN |

## Client Sample ID: 96486.02
**Date Collected: 11/07/18 12:50**
**Date Received: 11/08/18 16:22**

## Lab Sample ID: 190-18048-2
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9020B | | 1 | 440120 | 12/04/18 11:46 | RK | TAL DEN |

## Client Sample ID: 96486.03
**Date Collected: 11/07/18 13:10**
**Date Received: 11/08/18 16:22**

## Lab Sample ID: 190-18048-3
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9020B | | 1 | 440120 | 12/04/18 11:46 | RK | TAL DEN |

## Client Sample ID: 96486.04
**Date Collected: 11/07/18 13:35**
**Date Received: 11/08/18 16:22**

## Lab Sample ID: 190-18048-4
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9020B | | 1 | 440171 | 12/04/18 11:44 | IEU | TAL DEN |

## Client Sample ID: 96486.05
**Date Collected: 11/07/18 14:35**
**Date Received: 11/08/18 16:22**

## Lab Sample ID: 190-18048-5
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9020B | | 1 | 440171 | 12/04/18 11:44 | IEU | TAL DEN |

## Client Sample ID: 96486.06
**Date Collected: 11/07/18 14:00**
**Date Received: 11/08/18 16:22**

## Lab Sample ID: 190-18048-6
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9020B | | 1 | 440171 | 12/04/18 11:44 | IEU | TAL DEN |

# Lab Chronicle

Client: Merit Laboratories
Project/Site: S96486/TOX

TestAmerica Job ID: 190-18048-1

## Client Sample ID: 96486.07

**Date Collected: 11/07/18 00:01**
**Date Received: 11/08/18 16:22**

## Lab Sample ID: 190-18048-7

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9020B | | 1 | 440171 | 12/04/18 11:44 | IEU | TAL DEN |

## Client Sample ID: 96486.08

**Date Collected: 11/07/18 16:50**
**Date Received: 11/08/18 16:22**

## Lab Sample ID: 190-18048-8

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9020B | | 1 | 440172 | 12/05/18 11:04 | RK | TAL DEN |

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

**Analyst References:**

Lab: TAL DEN

Batch Type: Analysis

IEU = Ikem Uge

RK = Richard Kurniadi

# Accreditation/Certification Summary

Client: Merit Laboratories
Project/Site: S96486/TOX

TestAmerica Job ID: 190-18048-1

## Laboratory: TestAmerica Michigan

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| Michigan | State Program | 5 | 57 | 05-05-20 |

## Laboratory: TestAmerica Denver

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-19 |
| A2LA | ISO/IEC 17025 | | 2907.01 | 10-31-19 |
| Alabama | State Program | 4 | 40730 | 09-30-12 * |
| Alaska (UST) | State Program | 10 | UST-30 | 01-08-19 |
| Arizona | State Program | 9 | AZ0713 | 12-20-18 |
| Arkansas DEQ | State Program | 6 | 88-0687 | 06-01-19 |
| California | State Program | 9 | 2513 | 01-18-19 |
| Connecticut | State Program | 1 | PH-0686 | 09-30-20 |
| Florida | NELAP | 4 | E87667 | 06-30-19 |
| Georgia | State Program | 4 | N/A | 01-08-19 * |
| Illinois | NELAP | 5 | 200017 | 04-30-19 |
| Iowa | State Program | 7 | 370 | 12-01-18 * |
| Kansas | NELAP | 7 | E-10166 | 04-30-19 |
| Louisiana | NELAP | 6 | 02096 | 06-30-19 |
| Maine | State Program | 1 | CO0002 | 03-03-19 |
| Minnesota | NELAP | 5 | 8-999-405 | 12-31-18 |
| Nevada | State Program | 9 | CO0026 | 07-31-19 |
| New Hampshire | NELAP | 1 | 205310 | 04-28-19 |
| New Jersey | NELAP | 2 | CO004 | 06-30-19 |
| New York | NELAP | 2 | 11964 | 04-01-19 |
| North Carolina (WW/SW) | State Program | 4 | 358 | 12-31-18 |
| North Dakota | State Program | 8 | R-034 | 01-08-19 |
| Oklahoma | State Program | 6 | 8614 | 08-31-19 |
| Oregon | NELAP | 10 | 4025 | 01-08-19 |
| Pennsylvania | NELAP | 3 | 68-00664 | 07-31-19 |
| South Carolina | State Program | 4 | 72002001 | 01-08-19 |
| Texas | NELAP | 6 | T104704183-17-14 | 09-30-19 |
| US Fish & Wildlife | Federal | | | 07-31-19 |
| USDA | Federal | | | 03-26-21 |
| Utah | NELAP | 8 | CO00026 | 07-31-19 |
| Virginia | NELAP | 3 | 460232 | 06-14-19 |
| Washington | State Program | 10 | C583 | 08-03-19 |
| West Virginia DEP | State Program | 3 | 354 | 12-31-18 |
| Wisconsin | State Program | 5 | 999615430 | 08-31-19 * |
| Wyoming (UST) | A2LA | 8 | 2907.01 | 10-31-19 |

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

# Method Summary

Client: Merit Laboratories
Project/Site: S96486/TOX

TestAmerica Job ID: 190-18048-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 9020B | Organic Halides, Total (TOX) | SW846 | TAL DEN |

**Protocol References:**

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # _____ OF _____

# CHAIN OF CUSTODY RECORD

## REPORT TO

CONTACT NAME: John Laverty
COMPANY: Merit Laboratories
ADDRESS: 2680 East Lansing Drive
CITY: East Lansing STATE: MI ZIP CODE: 48823
PHONE NO.: 517-332-0167 FAX NO.: 517-332-4034 P.O. NO.:
E-MAIL ADDRESS: johnlaverty@meritlabs.com QUOTE NO.:

## INVOICE TO

CONTACT NAME: Julie Teague ☒ SAME
COMPANY: Merit Laboratories
ADDRESS: 2680 East Lansing Drive
CITY: East Lansing STATE: MI ZIP CODE: 48823
PHONE NO.: 517-332-0167 E-MAIL ADDRESS: juliet@meritlabs.com

PROJECT NO./NAME: S96486 SAMPLER(S) - PLEASE PRINT/SIGN NAME:

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☒ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other _____

Special Instructions

| MERIT LAB NO. FOR LAB USE ONLY | YEAR DATE | YEAR TIME | SAMPLE TAG IDENTIFICATION-DESCRIPTION | MATRIX | # OF BOTTLES | # Containers & Preservatives: NONE | HCl | $HNO_3$ | $H_2SO_4$ | NaOH | MeOH | OTHER | TOX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 11/6/18 | 1240 | 96486.01 | GW | 1 | | | | x | | | | ✓ |
| | 11/7/18 | 1250 | 96486.02 | GW | 1 | | | | x | | | | ✓ |
| | 11/7/18 | 1310 | 96486.03 | GW | 1 | | | | x | | | | ✓ |
| | 11/7/18 | 1335 | 96486.04 | GW | 1 | | | | x | | | | ✓ |
| | 11/7/18 | 1435 | 96486.05 | GW | 1 | | | | x | | | | ✓ |
| | 11/7/18 | 1400 | 96486.06 | GW | 1 | | | | x | | | | ✓ |
| | 11/7/18 | 0001 | 96486.07 | GW | 1 | | | | x | | | | ✓ |
| | 11/7/18 | 1650 | 96486.08 | W | 1 | | | | x | | | | ✓ |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

Subcontracted to
Test America

190-18048 Chain of Custody

| | | | |
|---|---|---|---|
| RELINQUISHED BY: SIGNATURE/ORGANIZATION | ☐ Sampler | DATE | TIME |
| RECEIVED BY: SIGNATURE/ORGANIZATION | | DATE 11/8/18 | TIME 1027 |
| RELINQUISHED BY: SIGNATURE/ORGANIZATION | | DATE | TIME |
| RECEIVED BY: SIGNATURE/ORGANIZATION | | DATE | TIME |

| | | | |
|---|---|---|---|
| RELINQUISHED BY: SIGNATURE/ORGANIZATION | | DATE | TIME |
| RECEIVED BY: SIGNATURE/ORGANIZATION | | DATE | TIME |

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES TEMP. ON ARRIVAL _____

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12



12/6/2018

TestAmerica

## Cooler/Sample Receipt

(AFTER HOURS receipt: complete gray areas. Place cooler in walk-in, place this form in Receiving in-box. Date/Time rec'd _____ Initials _____)

❑ MSDS or Known Hazard Information Supplied by Client
❑ Bottle stickers applied ❑ ELEMENT comment entered ❑ MSDS COC scanned emailed to EH&S
❑ Discrepancies
❑ Short Hold
❑ Rush ❑24hr ❑2day ❑3day ❑5day ❑other _____

Client ID Merit
Work Order # 190-18048
Receipt evaluation performed by - Initials TRH Date 11/8/18 Time 1640

**Method of Shipment:**
✓ Walk-In Client ❑ TestAmerica Field/Courier
❑ Other Client/3rd Party Courier _____
❑ Fed Ex Tracking # _____
❑ UPS Tracking # _____
❑ Other _____

**Shipping Container Type:**
❑ Cooler ❑ Box
✓ None ❑ Other _____

**Packing Materials:**
❑ Plastic Bags ❑ Foam
❑ Bubble Wrap ❑ Paper
❑ Packing Peanuts ✓ None
❑ Other _____

**Custody Seals Intact:**
❑ Yes ❑ No
✓ N/A (not used or required)

**Cooling Materials:**
❑ Ice (solid) ❑ Ice (Melted)
❑ Blue Ice ✓ None
❑ Other _____

| Bacteriological Samples | Temp (°C) Corrected | Frozen | Received within 2 hours | Sample Flagged |
|---|---|---|---|---|
| | | yes no | yes no | yes no |

C.F.

**Receipt Temperatures** ❑ Check if Additional Sheets Required

| Thermometer ID | Observed (°C) | Corrected (°C) | Temp Blank | Sample Temp | Received on same day sampled? | Acceptable?* | Cooler ID | Note Affected Samples if temperature not acceptable |
|---|---|---|---|---|---|---|---|---|
| 140252483 | | | ❑ | ❑ | ❑Yes ❑No | ❑Yes ❑No | | |
| 140252496 | | | ❑ | ❑ | ❑Yes ❑No | ❑Yes ❑No | | |
| CP313209 | 11.9 | 11.7 | ❑ | ✓ | ❑Yes ✓No | ❑Yes ❑No | | Temp >6°C |

* Receipt temperatures are considered acceptable if the samples are received on the same day they were collected & show signs that the cooling process has started. Temperature acceptance for most tests is ≤6.0°C, but not frozen. For additional information, please refer to SOP DT-SCA-004 *Sample Receipt and Login, Attachment 2 – Holding Times, Preservation and Container Requirements*

| Receipt Questions** | Y | N | n/a | "No" answers require additional comment |
|---|---|---|---|---|
| COC present & TA receipt signature, date, & time properly documented? | ✓ | | | |
| Containers & labels in good condition? *(unbroken, not leaking, appropriately filled, labels legible & attached)* | ✓ | | | |
| Appropriate containers used & adequate volume provided? | ✓ | | | Preserved Bottles Checked with pH Strips* (Yes No) |
| Number of sample containers match COC? | ✓ | | | |
| Samples received within hold time? | ✓ | | | |
| Samples submitted for GRO and Volatiles analyses (8260, 624, 524) received without headspace? | | | ✓ | |
| Was a Trip Blank received with VOA samples? | | | ✓ | |
| Were the samples free of any questionable physical conformities? For example, field duplicates or multiple bottles of the same sample do not significantly vary in appearance (color, proportion of solids, etc.) | ✓ | | | |
| Were the COC, bottle labels, and all other items free of all other discrepancies or issues that would need to be addressed with the Project Manager and/or Client? | ✓ | | | |

** May not be applicable if samples are not for compliance testing

* Excludes FOG, Volatiles, TOC Vials

**Client Contact Record**
Contact via: ❑ Phone ❑ Email ❑ Other _____ Person Contacted: _____ Date/Time: _____
❑ Discrepancy allowance agreement is on record in the client project file
Discussion/Resolution:

*Any additional documentation and clarification from client must be noted in the narrative and/or scanned into the COC directory*

Reviewed by PM Signature: [signature] Date: 11/8/18

WI Page 1 of 1

WI NO DT-SCA-WI-001 10
effective 06/11/12

**TestAmerica Michigan**
10448 Citation Drive Suite 200
Brighton, MI 48116
Phone (810) 229-2763 Fax (810) 229-0000

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: Schafer, Sue | Carrier Tracking No(s): | COC No: 190-21065.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: | E-Mail: sue.schafer@testamericainc.com | State of Origin: Michigan | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): | | Job #: 190-18048-1 |
| Address: 4955 Yarrow Street, | Due Date Requested: 11/20/2018 | | | |
| City: Arvada | TAT Requested (days): | | | |
| State, Zip: CO, 80002 | | | | |
| Phone: 303-736-0100(Tel) 303-431-7171(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: S96486/TOX | Project #: 19001249 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=Comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 9020B_Calc/ TOX in duplicate | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| 96486.01 (190-18048-1) | 11/6/18 | 12:40 Eastern | | Water | | | X | 1 | |
| 96486.02 (190-18048-2) | 11/7/18 | 12:50 Eastern | | Water | | | X | 1 | |
| 96486.03 (190-18048-3) | 11/7/18 | 13:10 Eastern | | Water | | | X | 1 | |
| 96486.04 (190-18048-4) | 11/7/18 | 13:35 Eastern | | Water | | | X | 1 | |
| 96486.05 (190-18048-5) | 11/7/18 | 14:35 Eastern | | Water | | | X | 1 | |
| 96486.06 (190-18048-6) | 11/7/18 | 14:00 Eastern | | Water | | | X | 1 | |
| 96486.07 (190-18048-7) | 11/7/18 | 00:01 Eastern | | Water | | | X | 1 | |
| 96486.08 (190-18048-8) | 11/7/18 | 16:50 Eastern | | Water | | | X | 1 | |

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

| Possible Hazard Identification: Unconfirmed | Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month): ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months |
|---|---|
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |
|---|---|---|---|

| | Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|---|
| 1 | [signature] | 11/8/18 1052 | TAL | [signature] | 11/9/18 0850 | TAMEN |
| 2 | Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| 3 | Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: ∆ Yes ∆ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 2.5 to 0.7 Thermal JAC |
|---|---|---|

Ver: 09/20/2016

# Analytical Laboratory Report

Report ID: S96485.01(01)
Generated on 12/07/2018

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
2260 E Saginaw St
East Lansing, MI 48823

Phone: 248-477-5701 FAX:
Email: Clifford.Yantz@obg.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S96485.01-S96485.02
Project: RACER Coldwater Rd LF
Collected Date: 11/07/2018
Submitted Date/Time: 11/08/2018 08:15
Sampled by: Kevin Schneider
P.O. #: 11800350

Table of Contents



Maya Murshak
Technical Director

**General Report Notes**

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

**Report Narrative**

There is no additional narrative for this analytical report

**Laboratory Certifications**

| Authority | Certification ID |
|---|---|
| Michigan DEQ | #9956 |
| DOD ELAP/ISO 17025 | #69699 |
| WBENC | #2005110032 |
| Ohio VAP | #CL0002 |
| Indiana DOH | #C-MI-07 |
| New York NELAC | #11814 |
| North Carolina DENR | #680 |
| North Carolina DOH | #26702 |
| Alaska CSLAP | #17-001 |

**Qualifier Descriptions**

| Qualifier | Description |
|---|---|
| ! | Result is outside of stated limit criteria |
| B | Compound also found in associated method blank |
| E | Concentration exceeds calibration range |
| F | Analysis run outside of holding time |
| G | Estimated result due to extraction run outside of holding time |
| H | Sample submitted and run outside of holding time |
| I | Matrix interference with internal standard |
| J | Estimated value less than reporting limit, but greater than MDL |
| L | Elevated reporting limit due to low sample amount |
| M | Result reported to MDL not RDL |
| O | Analysis performed by outside laboratory. See attached report. |
| R | Preliminary result |
| S | Surrogate recovery outside of control limits |
| T | No correction for total solids |
| X | Elevated reporting limit due to matrix interference |
| Y | Elevated reporting limit due to high target concentration |
| b | Value detected less than reporting limit, but greater than MDL |
| e | Reported value estimated due to interference |
| j | Analyte also found in associated method blank |
| p | Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak. |
| x | Preserved from bulk sample |

**Glossary of Abbreviations**

| Abbreviation | Description |
|---|---|
| RL/RDL | Reporting Limit |
| MDL | Method Detection Limit |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| SW | EPA SW 846 (Soil and Wastewater) Methods |
| E | EPA Methods |
| SM | Standard Methods |
| LN | Linear |
| BR | Branched |

**Method Summary**

| Method | Version |
|---|---|
| E120.1 | EPA Method 120.1 Revision 1982 |
| E200.8 | EPA Method 200.8 Revision 5.4 |
| E300.0 | EPA Method 300.0 Revision 2.1 |
| E335.4/SM4500-CN | EPA Method 335.4 Revision 1.0 / Standard Method 4500-CN E 20th Edition |
| E420.1 | EPA Method 420.1 Editorial Revision 1978 |
| N/A | Not Applicable |
| SM5310C | Standard Method 5310C 2011 |
| SW3015A | SW 846 Method 3015A Revision 1 February 2007 |
| SW5030C/8260C | SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003 |
| SW9020B | SW 846 Method 9020B Revision 2 September 1994 |

**Sample Summary (2 samples)**

| Sample ID | Sample Tag | Matrix | Collected Date/Time |
|---|---|---|---|
| S96485.01 | OBG MW-16D | Groundwater | 11/07/18 16:05 |
| S96485.02 | Trip Blank - 1 | Water | 11/07/18 00:01 |

**Lab Sample ID: S96485.01**
Sample Tag: OBG MW-16D
Collected Date/Time: 11/07/2018 16:05
Matrix: Groundwater
COC Reference: 112662

Sample Containers

| # | Type | Preservative(s) | Refrigerated? | Arrival Temp. (C) | Thermometer # |
|---|---|---|---|---|---|
| 2 | 125ml Plastic | HNO3 | Yes | 6.0 | IR |
| 2 | 40ml Glass | H2SO4 | Yes | 6.0 | IR |
| 1 | 250ml Amber | H2SO4 | Yes | 6.0 | IR |
| 1 | 1L Plastic | None | Yes | 6.0 | IR |
| 1 | 125ml Plastic | NaOH | Yes | 6.0 | IR |
| 3 | 40ml Glass | HCL | Yes | 6.0 | IR |
| 1 | 125ml Amber | H2SO4 | Yes | 6.0 | IR |

***Extraction / Prep.***

| Parameter | Result | Method | Run Date | Analyst | Flags |
|---|---|---|---|---|---|
| pH check for VOCs* | <2 | N/A | 11/13/18 11:00 | JML | |
| Metal Digestion | Completed | SW3015A | 11/09/18 09:00 | JRH | |
| Metal Digestion | Completed | SW3015A | 11/13/18 12:20 | CCM | |

***Inorganics***

**Method: E120.1, Run Date: 11/09/18 11:58, Analyst: JKB**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Conductivity | 657 | | | umhos/cm | 1 | | |

**Method: E300.0, Run Date: 11/08/18 13:19, Analyst: JDP**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Chloride | Not detected | 5 | 0.19 | mg/L | 5 | 16887-00-6 | |
| Sulfate | 32 | 5 | 0.21 | mg/L | 5 | 14808-79-8 | |

**Method: E335.4/SM4500-CN, Run Date: 11/12/18 11:38, Analyst: JDP**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Cyanide, Total | Not detected | 0.005 | 0.002 | mg/L | 1 | 57-12-5 | |

**Method: E420.1, Run Date: 11/13/18 16:08, Analyst: JKB**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Phenols | Not detected | 0.02 | | mg/L | 1.7 | | |

**Method: SM5310C, Run Date: 11/12/18 14:17, Analyst: JKB**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| TOC | 3.3 | 1 | | mg/L | 1 | | |

***Metals***

**Method: E200.8, Run Date: 11/09/18 11:09, Analyst: JRH**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Sodium | 18.4 | 2.5 | | mg/L | 50 | 7440-23-5 | |

**Method: E200.8, Run Date: 11/13/18 14:29, Analyst: CCM**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Chromium, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-47-3 | |
| Copper, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-50-8 | |
| Iron, Dissolved | 2.87 | 0.02 | | mg/L | 5 | 7439-89-6 | |

**Lab Sample ID: S96485.01 (continued)**
Sample Tag: OBG MW-16D

**Method: E200.8, Run Date: 11/13/18 14:29, Analyst: CCM (continued)**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Manganese, Dissolved | 0.047 | 0.005 | | mg/L | 5 | 7439-96-5 | |
| Nickel, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-02-0 | |
| Zinc, Dissolved | Not detected | 0.005 | | mg/L | 5 | 7440-66-6 | |

***Organics - Volatiles***

**Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/09/18 17:01, Analyst: JML**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Diethyl ether | Not detected | 10 | | ug/L | 1 | 60-29-7 | |
| Acetone | Not detected | 50 | | ug/L | 1 | 67-64-1 | |
| Methyl iodide | Not detected | 1 | | ug/L | 1 | 74-88-4 | |
| Carbon disulfide | Not detected | 5 | | ug/L | 1 | 75-15-0 | |
| tert-Methyl butyl ether (MTBE) | Not detected | 5 | | ug/L | 1 | 1634-04-4 | |
| Acrylonitrile | Not detected | 2 | | ug/L | 1 | 107-13-1 | |
| 2-Butanone (MEK) | Not detected | 25 | | ug/L | 1 | 78-93-3 | |
| Dichlorodifluoromethane | Not detected | 5 | | ug/L | 1 | 75-71-8 | |
| Chloromethane | Not detected | 5 | | ug/L | 1 | 74-87-3 | |
| Vinyl chloride | Not detected | 1 | | ug/L | 1 | 75-01-4 | |
| Bromomethane | Not detected | 5 | | ug/L | 1 | 74-83-9 | |
| Chloroethane | Not detected | 5 | | ug/L | 1 | 75-00-3 | |
| Trichlorofluoromethane | Not detected | 1 | | ug/L | 1 | 75-69-4 | |
| 1,1-Dichloroethene | Not detected | 1 | | ug/L | 1 | 75-35-4 | |
| Methylene chloride | Not detected | 5 | | ug/L | 1 | 75-09-2 | |
| trans-1,2-Dichloroethene | Not detected | 1 | | ug/L | 1 | 156-60-5 | |
| 1,1-Dichloroethane | Not detected | 1 | | ug/L | 1 | 75-34-3 | |
| cis-1,2-Dichloroethene | Not detected | 1 | | ug/L | 1 | 156-59-2 | |
| Tetrahydrofuran* | Not detected | 90 | | ug/L | 1 | 109-99-9 | |
| Chloroform | Not detected | 1 | | ug/L | 1 | 67-66-3 | |
| Bromochloromethane | Not detected | 1 | | ug/L | 1 | 74-97-5 | |
| 1,1,1-Trichloroethane | Not detected | 1 | | ug/L | 1 | 71-55-6 | |
| 4-Methyl-2-pentanone (MIBK) | Not detected | 50 | | ug/L | 1 | 108-10-1 | |
| 2-Hexanone | Not detected | 50 | | ug/L | 1 | 591-78-6 | |
| Carbon tetrachloride | Not detected | 1 | | ug/L | 1 | 56-23-5 | |
| Benzene | Not detected | 1 | | ug/L | 1 | 71-43-2 | |
| 1,2-Dichloroethane | Not detected | 1 | | ug/L | 1 | 107-06-2 | |
| Trichloroethene | Not detected | 1 | | ug/L | 1 | 79-01-6 | |
| 1,2-Dichloropropane | Not detected | 1 | | ug/L | 1 | 78-87-5 | |
| Bromodichloromethane | Not detected | 1 | | ug/L | 1 | 75-27-4 | |
| Dibromomethane | Not detected | 5 | | ug/L | 1 | 74-95-3 | |
| cis-1,3-Dichloropropene | Not detected | 1 | | ug/L | 1 | 10061-01-5 | |
| Toluene | Not detected | 1 | | ug/L | 1 | 108-88-3 | |
| trans-1,3-Dichloropropene | Not detected | 1 | | ug/L | 1 | 10061-02-6 | |
| 1,1,2-Trichloroethane | Not detected | 1 | | ug/L | 1 | 79-00-5 | |
| Tetrachloroethene | Not detected | 1 | | ug/L | 1 | 127-18-4 | |
| trans-1,4-Dichloro-2-butene | Not detected | 1 | | ug/L | 1 | 110-57-6 | |
| Dibromochloromethane | Not detected | 5 | | ug/L | 1 | 124-48-1 | |
| 1,2-Dibromoethane | Not detected | 1 | | ug/L | 1 | 106-93-4 | |
| Chlorobenzene | Not detected | 1 | | ug/L | 1 | 108-90-7 | |
| 1,1,1,2-Tetrachloroethane | Not detected | 1 | | ug/L | 1 | 630-20-6 | |
| Ethylbenzene | Not detected | 1 | | ug/L | 1 | 100-41-4 | |
| p,m-Xylene* | Not detected | 2 | | ug/L | 1 | | |

**Lab Sample ID: S96485.01 (continued)**
Sample Tag: OBG MW-16D

**Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/09/18 17:01, Analyst: JML (continued)**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| o-Xylene | Not detected | 1 | | ug/L | 1 | 95-47-6 | |
| Styrene | Not detected | 1 | | ug/L | 1 | 100-42-5 | |
| Isopropylbenzene | Not detected | 5 | | ug/L | 1 | 98-82-8 | |
| Bromoform | Not detected | 1 | | ug/L | 1 | 75-25-2 | |
| 1,1,2,2-Tetrachloroethane | Not detected | 1 | | ug/L | 1 | 79-34-5 | |
| 1,2,3-Trichloropropane | Not detected | 1 | | ug/L | 1 | 96-18-4 | |
| n-Propylbenzene | Not detected | 1 | | ug/L | 1 | 103-65-1 | |
| Bromobenzene | Not detected | 1 | | ug/L | 1 | 108-86-1 | |
| 1,3,5-Trimethylbenzene | Not detected | 1 | | ug/L | 1 | 108-67-8 | |
| tert-Butylbenzene | Not detected | 1 | | ug/L | 1 | 98-06-6 | |
| 1,2,4-Trimethylbenzene | Not detected | 1 | | ug/L | 1 | 95-63-6 | |
| sec-Butylbenzene | Not detected | 1 | | ug/L | 1 | 135-98-8 | |
| p-Isopropyltoluene | Not detected | 5 | | ug/L | 1 | 99-87-6 | |
| 1,3-Dichlorobenzene | Not detected | 1 | | ug/L | 1 | 541-73-1 | |
| 1,4-Dichlorobenzene | Not detected | 1 | | ug/L | 1 | 106-46-7 | |
| 1,2-Dichlorobenzene | Not detected | 1 | | ug/L | 1 | 95-50-1 | |
| 1,2,3-Trimethylbenzene | Not detected | 1 | | ug/L | 1 | 526-73-8 | |
| n-Butylbenzene | Not detected | 1 | | ug/L | 1 | 104-51-8 | |
| Hexachloroethane | Not detected | 5 | | ug/L | 1 | 67-72-1 | |
| 1,2-Dibromo-3-chloropropane | Not detected | 5 | | ug/L | 1 | 96-12-8 | |
| 1,2,4-Trichlorobenzene | Not detected | 5 | | ug/L | 1 | 120-82-1 | |
| 1,2,3-Trichlorobenzene | Not detected | 5 | | ug/L | 1 | 87-61-6 | |
| Naphthalene | Not detected | 5 | | ug/L | 1 | 91-20-3 | |
| 2-Methylnaphthalene | Not detected | 5 | | ug/L | 1 | 91-57-6 | |

***Organics***

**Method: SW9020B, Run Date: 12/04/18 11:46, Analyst: TA**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| TOX* | Not detected | 150 | | ug/L | 1 | | O |

O-Analysis performed by outside laboratory. See attached report.

**Lab Sample ID: S96485.02**
Sample Tag: Trip Blank - 1
Collected Date/Time: 11/07/2018 00:01
Matrix: Water
COC Reference: 112662

Sample Containers

| # | Type | Preservative(s) | Refrigerated? | Arrival Temp. (C) | Thermometer # |
|---|---|---|---|---|---|
| 1 | 40ml Glass | HCL | Yes | 6.0 | IR |

***Extraction / Prep.***

| Parameter | Result | Method | Run Date | Analyst | Flags |
|---|---|---|---|---|---|
| pH check for VOCs* | <2 | N/A | 11/13/18 11:00 | JML | |

***Organics - Volatiles***

**Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/09/18 14:47, Analyst: JML**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Diethyl ether | Not detected | 10 | | ug/L | 1 | 60-29-7 | |
| Acetone | Not detected | 50 | | ug/L | 1 | 67-64-1 | |
| Methyl iodide | Not detected | 1 | | ug/L | 1 | 74-88-4 | |
| Carbon disulfide | Not detected | 5 | | ug/L | 1 | 75-15-0 | |
| tert-Methyl butyl ether (MTBE) | Not detected | 5 | | ug/L | 1 | 1634-04-4 | |
| Acrylonitrile | Not detected | 2 | | ug/L | 1 | 107-13-1 | |
| 2-Butanone (MEK) | Not detected | 25 | | ug/L | 1 | 78-93-3 | |
| Dichlorodifluoromethane | Not detected | 5 | | ug/L | 1 | 75-71-8 | |
| Chloromethane | Not detected | 5 | | ug/L | 1 | 74-87-3 | |
| Vinyl chloride | Not detected | 1 | | ug/L | 1 | 75-01-4 | |
| Bromomethane | Not detected | 5 | | ug/L | 1 | 74-83-9 | |
| Chloroethane | Not detected | 5 | | ug/L | 1 | 75-00-3 | |
| Trichlorofluoromethane | Not detected | 1 | | ug/L | 1 | 75-69-4 | |
| 1,1-Dichloroethene | Not detected | 1 | | ug/L | 1 | 75-35-4 | |
| Methylene chloride | Not detected | 5 | | ug/L | 1 | 75-09-2 | |
| trans-1,2-Dichloroethene | Not detected | 1 | | ug/L | 1 | 156-60-5 | |
| 1,1-Dichloroethane | Not detected | 1 | | ug/L | 1 | 75-34-3 | |
| cis-1,2-Dichloroethene | Not detected | 1 | | ug/L | 1 | 156-59-2 | |
| Tetrahydrofuran* | Not detected | 90 | | ug/L | 1 | 109-99-9 | |
| Chloroform | Not detected | 1 | | ug/L | 1 | 67-66-3 | |
| Bromochloromethane | Not detected | 1 | | ug/L | 1 | 74-97-5 | |
| 1,1,1-Trichloroethane | Not detected | 1 | | ug/L | 1 | 71-55-6 | |
| 4-Methyl-2-pentanone (MIBK) | Not detected | 50 | | ug/L | 1 | 108-10-1 | |
| 2-Hexanone | Not detected | 50 | | ug/L | 1 | 591-78-6 | |
| Carbon tetrachloride | Not detected | 1 | | ug/L | 1 | 56-23-5 | |
| Benzene | Not detected | 1 | | ug/L | 1 | 71-43-2 | |
| 1,2-Dichloroethane | Not detected | 1 | | ug/L | 1 | 107-06-2 | |
| Trichloroethene | Not detected | 1 | | ug/L | 1 | 79-01-6 | |
| 1,2-Dichloropropane | Not detected | 1 | | ug/L | 1 | 78-87-5 | |
| Bromodichloromethane | Not detected | 1 | | ug/L | 1 | 75-27-4 | |
| Dibromomethane | Not detected | 5 | | ug/L | 1 | 74-95-3 | |
| cis-1,3-Dichloropropene | Not detected | 1 | | ug/L | 1 | 10061-01-5 | |
| Toluene | Not detected | 1 | | ug/L | 1 | 108-88-3 | |
| trans-1,3-Dichloropropene | Not detected | 1 | | ug/L | 1 | 10061-02-6 | |
| 1,1,2-Trichloroethane | Not detected | 1 | | ug/L | 1 | 79-00-5 | |
| Tetrachloroethene | Not detected | 1 | | ug/L | 1 | 127-18-4 | |
| trans-1,4-Dichloro-2-butene | Not detected | 1 | | ug/L | 1 | 110-57-6 | |

**Lab Sample ID: S96485.02 (continued)**
Sample Tag: Trip Blank - 1

**Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/09/18 14:47, Analyst: JML (continued)**

| Parameter | Result | RL | MDL | Units | Dilution | CAS# | Flags |
|---|---|---|---|---|---|---|---|
| Dibromochloromethane | Not detected | 5 | | ug/L | 1 | 124-48-1 | |
| 1,2-Dibromoethane | Not detected | 1 | | ug/L | 1 | 106-93-4 | |
| Chlorobenzene | Not detected | 1 | | ug/L | 1 | 108-90-7 | |
| 1,1,1,2-Tetrachloroethane | Not detected | 1 | | ug/L | 1 | 630-20-6 | |
| Ethylbenzene | Not detected | 1 | | ug/L | 1 | 100-41-4 | |
| p,m-Xylene* | Not detected | 2 | | ug/L | 1 | | |
| o-Xylene | Not detected | 1 | | ug/L | 1 | 95-47-6 | |
| Styrene | Not detected | 1 | | ug/L | 1 | 100-42-5 | |
| Isopropylbenzene | Not detected | 5 | | ug/L | 1 | 98-82-8 | |
| Bromoform | Not detected | 1 | | ug/L | 1 | 75-25-2 | |
| 1,1,2,2-Tetrachloroethane | Not detected | 1 | | ug/L | 1 | 79-34-5 | |
| 1,2,3-Trichloropropane | Not detected | 1 | | ug/L | 1 | 96-18-4 | |
| n-Propylbenzene | Not detected | 1 | | ug/L | 1 | 103-65-1 | |
| Bromobenzene | Not detected | 1 | | ug/L | 1 | 108-86-1 | |
| 1,3,5-Trimethylbenzene | Not detected | 1 | | ug/L | 1 | 108-67-8 | |
| tert-Butylbenzene | Not detected | 1 | | ug/L | 1 | 98-06-6 | |
| 1,2,4-Trimethylbenzene | Not detected | 1 | | ug/L | 1 | 95-63-6 | |
| sec-Butylbenzene | Not detected | 1 | | ug/L | 1 | 135-98-8 | |
| p-Isopropyltoluene | Not detected | 5 | | ug/L | 1 | 99-87-6 | |
| 1,3-Dichlorobenzene | Not detected | 1 | | ug/L | 1 | 541-73-1 | |
| 1,4-Dichlorobenzene | Not detected | 1 | | ug/L | 1 | 106-46-7 | |
| 1,2-Dichlorobenzene | Not detected | 1 | | ug/L | 1 | 95-50-1 | |
| 1,2,3-Trimethylbenzene | Not detected | 1 | | ug/L | 1 | 526-73-8 | |
| n-Butylbenzene | Not detected | 1 | | ug/L | 1 | 104-51-8 | |
| Hexachloroethane | Not detected | 5 | | ug/L | 1 | 67-72-1 | |
| 1,2-Dibromo-3-chloropropane | Not detected | 5 | | ug/L | 1 | 96-12-8 | |
| 1,2,4-Trichlorobenzene | Not detected | 5 | | ug/L | 1 | 120-82-1 | |
| 1,2,3-Trichlorobenzene | Not detected | 5 | | ug/L | 1 | 87-61-6 | |
| Naphthalene | Not detected | 5 | | ug/L | 1 | 91-20-3 | |
| 2-Methylnaphthalene | Not detected | 5 | | ug/L | 1 | 91-57-6 | |

# Merit Laboratories Login Checklist

Lab Set ID: S96485
Client: OBG02 (O'Brien & Gere Engineers, Inc.)
Project: RACER Coldwater Rd LF
Submitted: 11/08/2018 08:15 Login User: SRS

Attention: Clifford Yantz
Address: O'Brien & Gere Engineers, Inc.
2260 E Saginaw St
East Lansing, MI 48823

Phone: 248-477-5701 FAX:
Email: Clifford.Yantz@obg.com

| Selection | | | | Description | Note |
|---|---|---|---|---|---|
| **Sample Receiving** | | | | | |
| 01. | [X] Yes | [ ] No | [ ] N/A | Samples are received at 4C +/- 2C Thermometer # | IR 6.0 |
| 02. | [X] Yes | [ ] No | [ ] N/A | Received on ice/ cooling process begun | |
| 03. | [ ] Yes | [X] No | [ ] N/A | Samples shipped | |
| 04. | [X] Yes | [ ] No | [ ] N/A | Samples left in 24 hr. drop box | |
| 05. | [X] Yes | [ ] No | [ ] N/A | Are there custody seals/tape or is the drop box locked | |
| **Chain of Custody** | | | | | |
| 06. | [X] Yes | [ ] No | [ ] N/A | COC adequately filled out | |
| 07. | [X] Yes | [ ] No | [ ] N/A | COC signed and relinquished to the lab | |
| 08. | [X] Yes | [ ] No | [ ] N/A | Sample tag on bottles match COC | |
| 09. | [X] Yes | [ ] No | [ ] N/A | Subcontracting needed? Subcontacted to: | Test America |
| **Preservation** | | | | | |
| 10. | [X] Yes | [ ] No | [ ] N/A | Do sample have correct chemical preservation | |
| 11. | [X] Yes | [ ] No | [ ] N/A | Completed pH checks on preserved samples? (no VOAs) | |
| 12. | [ ] Yes | [X] No | [ ] N/A | Did any samples need to be preserved in the lab? | |
| **Bottle Conditions** | | | | | |
| 13. | [X] Yes | [ ] No | [ ] N/A | All bottles intact | |
| 14. | [X] Yes | [ ] No | [ ] N/A | Appropriate analytical bottles are used | |
| 15. | [X] Yes | [ ] No | [ ] N/A | Merit bottles used | |
| 16. | [X] Yes | [ ] No | [ ] N/A | Sufficient sample volume received | |
| 17. | [ ] Yes | [X] No | [ ] N/A | Samples require laboratory filtration | |
| 18. | [X] Yes | [ ] No | [ ] N/A | Samples submitted within holding time | |
| 19. | [ ] Yes | [X] No | [ ] N/A | Do water VOC or TOX bottles contain headspace | |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S96485 Initials: SRS

Client: OBG02 (O'Brien & Gere Engineers, Inc.)

Project: RACER Coldwater Rd LF

Submitted: 11/08/2018 08:15 Login User:

Attention: Clifford Yantz
Address: O'Brien & Gere Engineers, Inc.
2260 E Saginaw St
East Lansing, MI 48823

Phone: 248-477-5701 FAX:
Email: Clifford.Yantz@obg.com

| Lab ID | 125 ml Plastic $HNO_3$ | 250 ml Plastic $HNO_3$ | 1 L Plastic $HNO_3$ | 250 ml Plastic $H_2SO_4$ | 125 ml Amber $H_2SO_4$ | 32 oz Glass HCl | 125 ml Plastic NaOH | 125 ml Amber $PbCO_3$ NaOH | pH | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | <2 | >12 | other | ml add | new pH | |
| S96485.01 | X | | | | | | | | X | | | | | |
| S96485.01 | X | | | | | | | | X | | | | | |
| S96485.01 | | | | | X | | | | X | | | | | |
| S96485.01 | | | | | | | X | | | X | | | | |

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

112662

# CHAIN OF CUSTODY RECORD

## REPORT TO

CONTACT NAME: Clifford Yantz
COMPANY: O'Brien & Gere
ADDRESS: East Saginaw
CITY: East Lansing STATE: MI ZIP CODE: 48823
PHONE NO.: 313-333-0211 FAX NO.: P.O. NO.: 11800350
E-MAIL ADDRESS: clifford.yantz@obg.com QUOTE NO.:

## INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Coldwater Rd LF
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Kevin Summers

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☒ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

| MERIT LAB NO. (FOR LAB USE ONLY) | YEAR DATE | YEAR TIME | SAMPLE TAG IDENTIFICATION-DESCRIPTION | MATRIX | # OF BOTTLES | # Containers & Preservatives: NONE | HCl | $HNO_3$ | $H_2SO_4$ | NaOH | MeOH | OTHER | VOCs | TOC | TOX | Phenols | Cyanide | Sulfate | Specific conductivity | Dissolved Metals | Chlorides | Sodium | Special Instructions |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 960485.01 | 11/7/18 | 1605 | OBG MW-16D | GW | 11 | 1 | 3 | 2 | 4 | 1 | | | X | X | X | X | X | X | X | X | X | X | Dissolved Metals were field Filtered |
| .02 | ↓ | — | Trip Blank-1 | QC | QC | | 1 | | | | | | X | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | Metals Are Co, Cr, Ni, Zn, Fe, Mn |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | | | | | |

1605

| | | | |
|---|---|---|---|
| RELINQUISHED BY: SIGNATURE/ORGANIZATION | OBG X Sampler | DATE 11/7/18 | TIME 1617 |
| RECEIVED BY: SIGNATURE/ORGANIZATION | Merit Secure Locker | DATE 11/7/18 | TIME 1817 |
| RELINQUISHED BY: SIGNATURE/ORGANIZATION | Merit Dropbox | DATE 11/8/18 | TIME 815 |
| RECEIVED BY: SIGNATURE/ORGANIZATION | | DATE 11/8/18 | TIME 815 |

| | | | |
|---|---|---|---|
| RELINQUISHED BY: SIGNATURE/ORGANIZATION | | DATE | TIME |
| RECEIVED BY: SIGNATURE/ORGANIZATION | | DATE | TIME |

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 6.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Michigan
10448 Citation Drive
Suite 200
Brighton, MI 48116
Tel: (810)229-2763

TestAmerica Job ID: 190-18049-1
Client Project/Site: S96485/TOX

For:
Merit Laboratories
2680 E Lansing Drive
East Lansing, Michigan 48823

Attn: John Laverty

Patrick O'Meara

*Authorized for release by:*
*12/6/2018 6:10:19 PM*
Patrick O'Meara, Manager of Project Management
(330)966-5725
patrick.omeara@testamericainc.com

Designee for

Sue Schafer, Project Manager II
(810)229-2763
sue.schafer@testamericainc.com



*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

# Table of Contents

# Sample Summary

Client: Merit Laboratories
Project/Site: S96485/TOX

TestAmerica Job ID: 190-18049-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 190-18049-1 | 96485.01 | Water | 11/07/18 16:05 | 11/08/18 16:22 |

## Job ID: 190-18049-1

### Laboratory: TestAmerica Michigan

**Narrative**

**Job Narrative**
**190-18049-1**

**Comments**
No additional comments.

**Receipt**
The sample was received on 11/8/2018 4:22 PM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 11.2º C.

**General Chemistry**
Method(s) 9020B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 280-440120 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) 9020B: The following samples for batch 440120 (Total Organic Halides) were diluted to 5x due to the nature of the sample matrix based on Cl pre-screen test: 96485.01 (190-18049-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Client Sample Results

Client: Merit Laboratories
Project/Site: S96485/TOX

TestAmerica Job ID: 190-18049-1

**Client Sample ID: 96485.01**
**Date Collected: 11/07/18 16:05**
**Date Received: 11/08/18 16:22**

**Lab Sample ID: 190-18049-1**
**Matrix: Water**

## General Chemistry

| Analyte | Result | Qualifier | RL | | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| TOX Dup | <0.15 | | 0.15 | | mg/L | | | 12/04/18 11:46 | 1 |

## Method: 9020B - Organic Halides, Total (TOX)

**Lab Sample ID: MB 280-440120/2**
**Matrix: Water**
**Analysis Batch: 440120**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | RL | | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| TOX Dup | <0.030 | | 0.030 | | mg/L | | | 12/04/18 11:46 | 1 |

**Lab Sample ID: LCS 280-440120/4**
**Matrix: Water**
**Analysis Batch: 440120**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TOX Result 1 | | | 0.100 | 0.0916 | | mg/L | | 92 | 78 - 114 | | |
| TOX Dup | | | 0.100 | 0.0916 | | mg/L | | 92 | 78 - 114 | | |

Client: Merit Laboratories
Project/Site: S96485/TOX

TestAmerica Job ID: 190-18049-1

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

# QC Association Summary

Client: Merit Laboratories
Project/Site: S96485/TOX

TestAmerica Job ID: 190-18049-1

## General Chemistry

### Analysis Batch: 440120

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 190-18049-1 | 96485.01 | Total/NA | Water | 9020B | |
| MB 280-440120/2 | Method Blank | Total/NA | Water | 9020B | |
| LCS 280-440120/4 | Lab Control Sample | Total/NA | Water | 9020B | |

# Lab Chronicle

Client: Merit Laboratories
Project/Site: S96485/TOX

TestAmerica Job ID: 190-18049-1

**Client Sample ID: 96485.01**
**Date Collected: 11/07/18 16:05**
**Date Received: 11/08/18 16:22**

**Lab Sample ID: 190-18049-1**
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9020B | | 1 | 440120 | 12/04/18 11:46 | RK | TAL DEN |

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

**Analyst References:**

Lab: TAL DEN

Batch Type: Analysis

RK = Richard Kurniadi

# Accreditation/Certification Summary

Client: Merit Laboratories
Project/Site: S96485/TOX

TestAmerica Job ID: 190-18049-1

## Laboratory: TestAmerica Michigan

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| Michigan | State Program | 5 | 57 | 05-05-20 |

## Laboratory: TestAmerica Denver

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-19 |
| A2LA | ISO/IEC 17025 | | 2907.01 | 10-31-19 |
| Alabama | State Program | 4 | 40730 | 09-30-12 * |
| Alaska (UST) | State Program | 10 | UST-30 | 01-08-19 |
| Arizona | State Program | 9 | AZ0713 | 12-20-18 |
| Arkansas DEQ | State Program | 6 | 88-0687 | 06-01-19 |
| California | State Program | 9 | 2513 | 01-18-19 |
| Connecticut | State Program | 1 | PH-0686 | 09-30-20 |
| Florida | NELAP | 4 | E87667 | 06-30-19 |
| Georgia | State Program | 4 | N/A | 01-08-19 * |
| Illinois | NELAP | 5 | 200017 | 04-30-19 |
| Iowa | State Program | 7 | 370 | 12-01-18 * |
| Kansas | NELAP | 7 | E-10166 | 04-30-19 |
| Louisiana | NELAP | 6 | 02096 | 06-30-19 |
| Maine | State Program | 1 | CO0002 | 03-03-19 |
| Minnesota | NELAP | 5 | 8-999-405 | 12-31-18 |
| Nevada | State Program | 9 | CO0026 | 07-31-19 |
| New Hampshire | NELAP | 1 | 205310 | 04-28-19 |
| New Jersey | NELAP | 2 | CO004 | 06-30-19 |
| New York | NELAP | 2 | 11964 | 04-01-19 |
| North Carolina (WW/SW) | State Program | 4 | 358 | 12-31-18 |
| North Dakota | State Program | 8 | R-034 | 01-08-19 |
| Oklahoma | State Program | 6 | 8614 | 08-31-19 |
| Oregon | NELAP | 10 | 4025 | 01-08-19 |
| Pennsylvania | NELAP | 3 | 68-00664 | 07-31-19 |
| South Carolina | State Program | 4 | 72002001 | 01-08-19 |
| Texas | NELAP | 6 | T104704183-17-14 | 09-30-19 |
| US Fish & Wildlife | Federal | | | 07-31-19 |
| USDA | Federal | | | 03-26-21 |
| Utah | NELAP | 8 | CO00026 | 07-31-19 |
| Virginia | NELAP | 3 | 460232 | 06-14-19 |
| Washington | State Program | 10 | C583 | 08-03-19 |
| West Virginia DEP | State Program | 3 | 354 | 12-31-18 |
| Wisconsin | State Program | 5 | 999615430 | 08-31-19 * |
| Wyoming (UST) | A2LA | 8 | 2907.01 | 10-31-19 |

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

# Method Summary

Client: Merit Laboratories
Project/Site: S96485/TOX

TestAmerica Job ID: 190-18049-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 9020B | Organic Halides, Total (TOX) | SW846 | TAL DEN |

**Protocol References:**

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # _____ OF _____

# CHAIN OF CUSTODY RECORD

## REPORT TO

CONTACT NAME: John Laverty
COMPANY: Merit Laboratories
ADDRESS: 2680 East Lansing Drive
CITY: East Lansing STATE: MI ZIP CODE: 48823
PHONE NO.: 517-332-0167 FAX NO.: 517-332-4034 P.O. NO.:
E-MAIL ADDRESS: johnlaverty@meritlabs.com QUOTE NO.:

## INVOICE TO

☒ SAME

CONTACT NAME: Julie Teague
COMPANY: Merit Laboratories
ADDRESS: 2680 East Lansing Drive
CITY: East Lansing STATE: MI ZIP CODE: 48823
PHONE NO.: 517-332-0167 E-MAIL ADDRESS: juliet@meritlabs.com

PROJECT NO./NAME: S96485 SAMPLER(S) - PLEASE PRINT/SIGN NAME:

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☒ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other _____

Special Instructions

| MERIT LAB NO. (FOR LAB USE ONLY) | YEAR DATE | YEAR TIME | SAMPLE TAG IDENTIFICATION-DESCRIPTION | MATRIX | # OF BOTTLES | # Containers & Preservatives: NONE | HCl | $HNO_3$ | $H_2SO_4$ | NaOH | MeOH | OTHER | TOX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 11/7/18 | 1605 | 96485.01 | GW | 1 | | | | X | | | | ✓ |

190-18049 Chain of Custody

Subcontracted to
Test America

RELINQUISHED BY: SIGNATURE/ORGANIZATION _____ ☐ Sampler DATE TIME
RECEIVED BY: SIGNATURE/ORGANIZATION TAL DATE 11/8/18 TIME 1612
RELINQUISHED BY: SIGNATURE/ORGANIZATION DATE TIME
RECEIVED BY: SIGNATURE/ORGANIZATION DATE TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION DATE TIME
RECEIVED BY: SIGNATURE/ORGANIZATION DATE TIME

SEAL NO. SEAL INTACT YES☐ NO☐ INITIALS
SEAL NO. SEAL INTACT YES☐ NO☐ INITIALS

NOTES TEMP. ON ARRIVAL _____

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev: 5.18.12


12/6/2018

TestAmerica

# Cooler/Sample Receipt

(AFTER HOURS receipt: complete gray areas. Place cooler in walk-in, place this form in Receiving in-box. Date/Time rec'd _____ Initials _____)

❑ MSDS or Known Hazard Information Supplied by Client
❑ Bottle stickers applied ❑ ELEMENT comment entered ❑ MSDS COC scanned emailed to EH&S
❑ Discrepancies
❑ Short Hold
❑ Rush ❑24hr ❑2day ❑3day ❑5day ❑other _____

Client ID Merit
Work Order # 190-18049
Receipt evaluation performed by - Initials TRH Date 11/6/18 Time 1640

**Method of Shipment:**
✓ Walk-In Client ❑ TestAmerica Field/Courier
❑ Other Client/3rd Party Courier _____
❑ Fed Ex Tracking # _____
❑ UPS Tracking # _____
❑ Other _____

**Shipping Container Type:**
❑ Cooler ❑ Box
✓ None ❑ Other _____

**Packing Materials:**
❑ Plastic Bags ❑ Foam
❑ Bubble Wrap ❑ Paper
❑ Packing Peanuts ✓ None
❑ Other _____

**Custody Seals Intact:**
❑ Yes ❑ No
✓ N/A (not used or required)

**Cooling Materials:**
❑ Ice (solid) ❑ Ice (Melted)
❑ Blue Ice ✓ None
❑ Other _____

Bacteriological Samples: Temp (°C) Corrected — Frozen yes no — Received within 2 hours yes no — Sample Flagged yes no

C.F.

**Receipt Temperatures** ❑ Check if Additional Sheets Required

| Thermometer ID | Observed (°C) | Corrected (°C) | Temp Blank | Sample Temp | Received on same day sampled? | Acceptable?* | Cooler ID | Note Affected Samples if temperature not acceptable |
|---|---|---|---|---|---|---|---|---|
| 140252483 | | | ❑ | ❑ | ❑Yes ❑No | ❑Yes ❑No | | |
| 140252496 | | | ❑ | ❑ | ❑Yes ❑No | ❑Yes ❑No | | |
| CP313209 | 11.9 | 11.2 | ❑ | ✓ | ❑Yes ✓No | ❑Yes ❑No | | Temp 7.6°C |

* Receipt temperatures are considered acceptable if the samples are received on the same day they were collected & show signs that the cooling process has started. Temperature acceptance for most tests is ≤6.0°C, but not frozen. For additional information, please refer to SOP DT-SCA-004 *Sample Receipt and Login, Attachment 2 – Holding Times, Preservation and Container Requirements*

| Receipt Questions** | Y | N | n/a | "No" answers require additional comment |
|---|---|---|---|---|
| COC present & TA receipt signature, date, & time properly documented? | ✓ | | | |
| Containers & labels in good condition? *(unbroken, not leaking, appropriately filled, labels legible & attached)* | ✓ | | | |
| Appropriate containers used & adequate volume provided? | ✓ | | | Preserved Bottles Checked with pH Strips* (Yes No) |
| Number of sample containers match COC? | ✓ | | | |
| Samples received within hold time? | ✓ | | | |
| Samples submitted for GRO and Volatiles analyses (8260, 624, 524) received without headspace? | | | ✓ | |
| Was a Trip Blank received with VOA samples? | | | ✓ | |
| Were the samples free of any questionable physical conformities? For example, field duplicates or multiple bottles of the same sample do not significantly vary in appearance (color, proportion of solids, etc.) | ✓ | | | |
| Were the COC, bottle labels, and all other items free of all other discrepancies or issues that would need to be addressed with the Project Manager and/or Client? | ✓ | | | |

** May not be applicable if samples are not for compliance testing

* Excludes FOG, Volatiles, TOC Vials

**Client Contact Record**
Contact via: ❑ Phone ❑ Email ❑ Other _____ Person Contacted: _____ Date/Time: _____
❑ Discrepancy allowance agreement is on record in the client project file
Discussion/Resolution.

*Any additional documentation and clarification from client must be noted in the narrative and/or scanned into the COC directory*

Reviewed by PM Signature 11/6/18 Date

**TestAmerica Michigan**
10448 Citation Drive Suite 200
Brighton, MI 48116
Phone (810) 229-2763 Fax (810) 229-0000

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: Schafer, Sue | Carrier Tracking No(s): | COC No: 190-21066.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: | E-Mail: sue.schafer@testamericainc.com | State of Origin: Michigan | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): | | Job #: 190-18049-1 |
| Address: 4955 Yarrow Street, , | Due Date Requested: 11/20/2018 | | | |
| City: Arvada | TAT Requested (days): | | | |
| State, Zip: CO, 80002 | | | | |
| Phone: 303-736-0100(Tel) 303-431-7171(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: S96485/TOX | Project #: 19001249 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=Comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 9020B_Calc/ TOX in duplicate | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| 96485.01 (190-18049-1) | 11/7/18 | 16:05 Eastern | | Water | | | X | 1 | |

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

| Possible Hazard Identification | Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month) |
|---|---|
| Unconfirmed | ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |
|---|---|---|---|

| | Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|---|
| 1 | [signature] | 11/8/16 1052 | TAL | [signature] | 11/9/16 0850 | TAPEW |
| 2 | Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| 3 | Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 2.1 0n ice |
|---|---|---|

Ver: 09/20/2016

# APPENDIX D

## *Groundwater Sampling Program QA/QC Summary*

# APPENDIX D
# QUALITY ASSURANCE/QUALITY CONTROL SUMMARY

Data verification was independently performed by O'Brien & Gere (OBG) to assess the groundwater monitoring data quality for samples collected during the 2018 annual groundwater sampling event conducted in November 2018. Data verification was utilized to confirm the quality of the field and laboratory (Merit Laboratories, Inc. (Merit) of East Lansing, Michigan) data. The data verification included review of: (1) laboratory documentation, (2) chain-of-custody (COC) documentation, (3) target analyte results, (4) laboratory data qualifiers, if any, (5) laboratory reporting (quantitation) limits, (6) laboratory blank analysis, and (7) quality control samples, including duplicate samples.

The results of the data verification indicated the following:

- Laboratory documentation was complete.
- Chain-of-custody (COC) documentation was complete.
- Target analyte results were reported in accordance with the project requirements.
- Laboratory blank analysis matrix spike / matrix spike duplicate (MS/MSD) recoveries for TOX were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.
- Laboratory quantitation (or reporting) limits (RLs) were within the project required limits for undiluted samples.
- TOX samples were diluted to five times due to the nature of the sample matrix. Elevated RLs were reported due to sample dilution.
- No breakthroughs exceeding 10% for TOX were reported.
- The relative percent difference (RPD) for the duplicate sample results for B-28 and Dup-2 (B-28) were within acceptable limits.

Furthermore, the instrument utilized for measurement of field parameters calibrated within range (deviation from standard of less than 3 percent) for pH, oxidation reduction potential (ORP), specific conductivity (conductivity), and dissolved oxygen (DO); therefore, operated within manufacturers specifications during sample collection.

The data verification indicates that the overall usability of the groundwater monitoring data is acceptable for the intended use without further qualification or rejection of the data.

# APPENDIX E

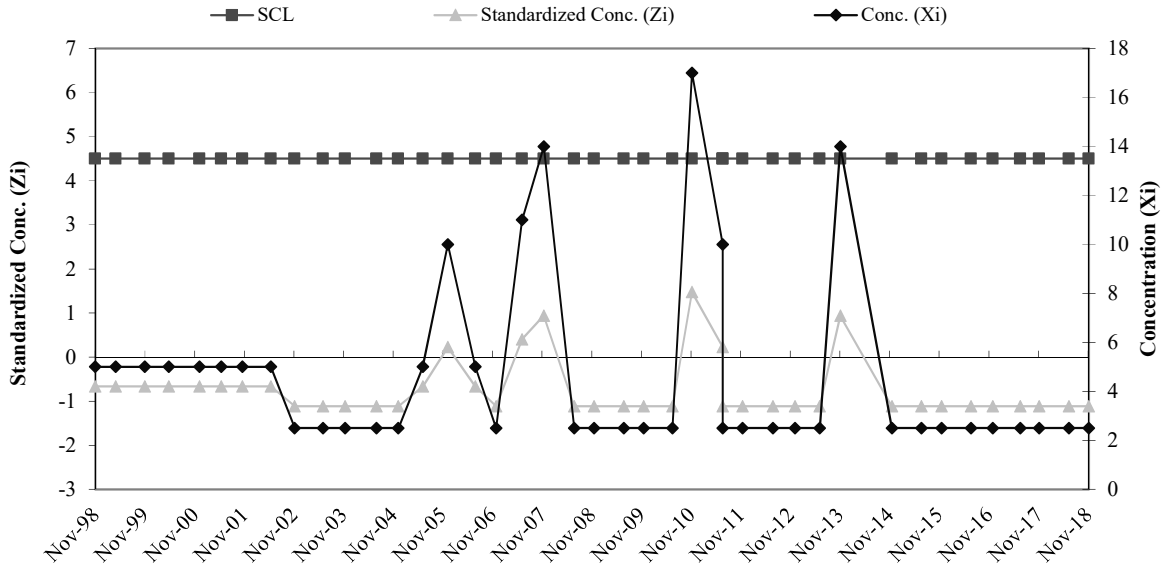
## Monitoring Well Control Charts

**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-7 Cr**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-95 | 10 | | |
| 2 | Aug-95 | 10 | | |
| 3 | Feb-96 | 10 | | |
| 4 | Jun-96 | 10 | **8.75** | **5.60** |
| 5 | Aug-96 | 10 | | |
| 6 | Nov-96 | 10 | | |
| 7 | May-97 | 5 | | |
| 8 | May-98 | 5 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) | Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|---|---|---|---|---|
| 9 | Nov-98 | 4.5 | 5 | -0.67 | 36 | Nov-11 | 4.5 | 2.5 | -1.12 |
| 10 | Apr-99 | 4.5 | 5 | -0.67 | 37 | Jun-12 | 4.5 | 2.5 | -1.12 |
| 11 | Nov-99 | 4.5 | 5 | -0.67 | 38 | Dec-12 | 4.5 | 2.5 | -1.12 |
| 12 | Apr-00 | 4.5 | 5 | -0.67 | 39 | Jun-13 | 4.5 | 2.5 | -1.12 |
| 13 | Dec-00 | 4.5 | 5 | -0.67 | 40 | Nov-13 | 4.5 | 14 | 0.94 |
| 14 | May-01 | 4.5 | 5 | -0.67 | 41 | Nov-14 | 4.5 | 2.5 | -1.12 |
| 15 | Oct-01 | 4.5 | 5 | -0.67 | 42 | Jun-15 | 4.5 | 2.5 | -1.12 |
| 16 | May-02 | 4.5 | 5 | -0.67 | 43 | Nov-15 | 4.5 | 2.5 | -1.12 |
| 17 | Nov-02 | 4.5 | 2.5 | -1.12 | 44 | Jun-16 | 4.5 | 2.5 | -1.12 |
| 18 | Jun-03 | 4.5 | 2.5 | -1.12 | 45 | Nov-16 | 4.5 | 2.5 | -1.12 |
| 19 | Nov-03 | 4.5 | 2.5 | -1.12 | 46 | Jun-17 | 4.5 | 2.5 | -1.12 |
| 20 | Jun-04 | 4.5 | 2.5 | -1.12 | 47 | Nov-17 | 4.5 | 2.5 | -1.12 |
| 21 | Dec-04 | 4.5 | 2.5 | -1.12 | 48 | Jun-18 | 4.5 | 2.5 | -1.12 |
| 22 | Jun-05 | 4.5 | 5 | -0.67 | 49 | Nov-18 | 4.5 | 2.5 | -1.12 |
| 23 | Dec-05 | 4.5 | 10 | 0.22 | | | | | |
| 24 | Jun-06 | 4.5 | 5 | -0.67 | | | | | |
| 25 | Nov-06 | 4.5 | 2.5 | -1.12 | | | | | |
| 26 | Jun-07 | 4.5 | 11 | 0.40 | | | | | |
| 27 | Nov-07 | 4.5 | 14 | 0.94 | | | | | |
| 28 | Jun-08 | 4.5 | 2.5 | -1.12 | | | | | |
| 29 | Nov-08 | 4.5 | 2.5 | -1.12 | | | | | |
| 30 | Jun-09 | 4.5 | 2.5 | -1.12 | | | | | |
| 31 | Nov-09 | 4.5 | 2.5 | -1.12 | | | | | |
| 32 | Jun-10 | 4.5 | 2.5 | -1.12 | | | | | |
| 33 | Nov-10 | 4.5 | 17 | 1.47 | | | | | |
| 34 | Jun-11 | 4.5 | 10 | 0.22 | | | | | |
| 35 | Jun-11 | 4.5 | 2.5 | -1.12 | | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

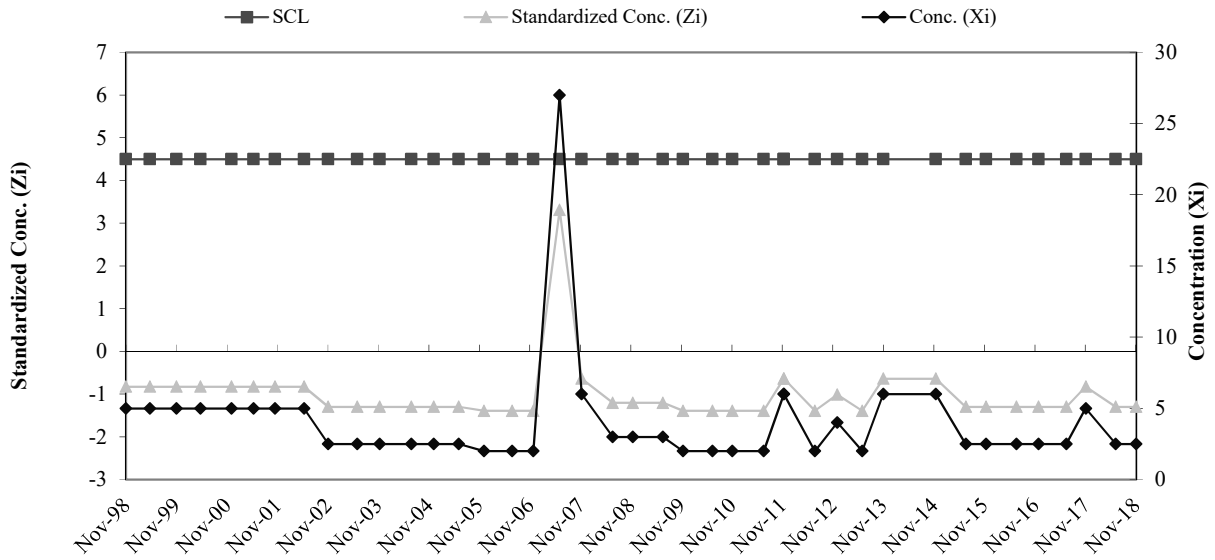


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-7 Cu**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-95 | 10 | **9.40** | **5.32** |
| 2 | Aug-95 | 10 | | |
| 3 | Feb-96 | 10 | | |
| 4 | Jun-96 | 10 | | |
| 5 | Aug-96 | 10 | | |
| 6 | Nov-96 | 10 | | |
| 7 | May-97 | 10 | | |
| 8 | May-98 | 5 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) | Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|---|---|---|---|---|
| 9 | Nov-98 | 4.5 | 5 | -0.83 | 35 | Nov-11 | 4.5 | 6 | -0.64 |
| 10 | Apr-99 | 4.5 | 5 | -0.83 | 36 | Jun-12 | 4.5 | 2 | -1.39 |
| 11 | Nov-99 | 4.5 | 5 | -0.83 | 37 | Dec-12 | 4.5 | 4 | -1.02 |
| 12 | Apr-00 | 4.5 | 5 | -0.83 | 38 | Jun-13 | 4.5 | 2 | -1.39 |
| 13 | Dec-00 | 4.5 | 5 | -0.83 | 39 | Nov-13 | 4.5 | 6 | -0.64 |
| 14 | May-01 | 4.5 | 5 | -0.83 | 40 | Nov-14 | 4.5 | 6 | -0.64 |
| 15 | Oct-01 | 4.5 | 5 | -0.83 | 41 | Jun-15 | 4.5 | 2.5 | -1.30 |
| 16 | May-02 | 4.5 | 5 | -0.83 | 42 | Nov-15 | 4.5 | 2.5 | -1.30 |
| 17 | Nov-02 | 4.5 | 2.5 | -1.30 | 43 | Jun-16 | 4.5 | 2.5 | -1.30 |
| 18 | Jun-03 | 4.5 | 2.5 | -1.30 | 44 | Nov-16 | 4.5 | 2.5 | -1.30 |
| 19 | Nov-03 | 4.5 | 2.5 | -1.30 | 45 | Jun-17 | 4.5 | 2.5 | -1.30 |
| 20 | Jun-04 | 4.5 | 2.5 | -1.30 | 46 | Nov-17 | 4.5 | 5 | -0.83 |
| 21 | Dec-04 | 4.5 | 2.5 | -1.30 | 47 | Jun-18 | 4.5 | 2.5 | -1.30 |
| 22 | Jun-05 | 4.5 | 2.5 | -1.30 | 48 | Nov-18 | 4.5 | 2.5 | -1.30 |
| 23 | Dec-05 | 4.5 | 2 | -1.39 | | | | | |
| 24 | Jun-06 | 4.5 | 2 | -1.39 | | | | | |
| 25 | Nov-06 | 4.5 | 2 | -1.39 | | | | | |
| 26 | Jun-07 | 4.5 | 27 | 3.31 | | | | | |
| 27 | Nov-07 | 4.5 | 6 | -0.64 | | | | | |
| 28 | Jun-08 | 4.5 | 3 | -1.20 | | | | | |
| 29 | Nov-08 | 4.5 | 3 | -1.20 | | | | | |
| 30 | Jun-09 | 4.5 | 3 | -1.20 | | | | | |
| 31 | Nov-09 | 4.5 | 2 | -1.39 | | | | | |
| 32 | Jun-10 | 4.5 | 2 | -1.39 | | | | | |
| 33 | Nov-10 | 4.5 | 2 | -1.39 | | | | | |
| 34 | Jun-11 | 4.5 | 2 | -1.39 | | | | | |
| 35 | Nov-11 | 4.5 | 6 | -0.64 | | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

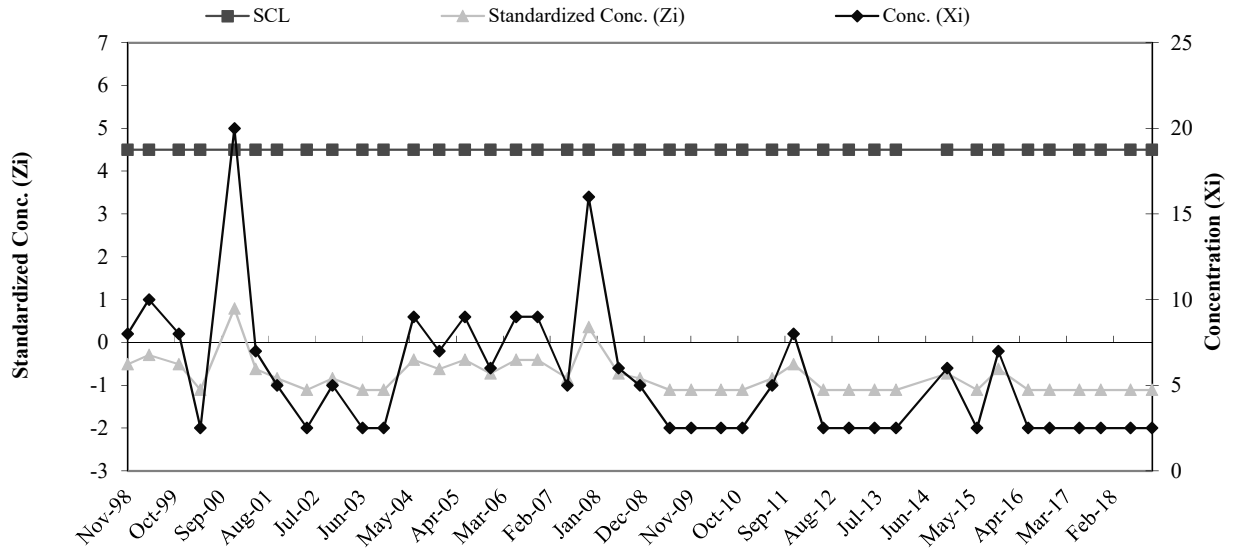


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-7 Ni**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-95 | 15 | | |
| 2 | Aug-95 | 20 | | |
| 3 | Feb-96 | 20 | | |
| 4 | Jun-96 | 10 | **12.70** | **9.19** |
| 5 | Aug-96 | 10 | | |
| 6 | Nov-96 | 20 | | |
| 7 | May-97 | 14 | | |
| 8 | May-98 | 2.5 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) | Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|---|---|---|---|---|
| 9 | Nov-98 | 4.5 | 8 | -0.51 | 35 | Nov-11 | 4.5 | 8 | -0.51 |
| 10 | Apr-99 | 4.5 | 10 | -0.29 | 36 | Jun-12 | 4.5 | 2.5 | -1.11 |
| 11 | Nov-99 | 4.5 | 8 | -0.51 | 37 | Dec-12 | 4.5 | 2.5 | -1.11 |
| 12 | Apr-00 | 4.5 | 2.5 | -1.11 | 38 | Jun-13 | 4.5 | 2.5 | -1.11 |
| 13 | Dec-00 | 4.5 | 20 | 0.79 | 39 | Nov-13 | 4.5 | 2.5 | -1.11 |
| 14 | May-01 | 4.5 | 7 | -0.62 | 40 | Nov-14 | 4.5 | 6 | -0.73 |
| 15 | Oct-01 | 4.5 | 5 | -0.84 | 41 | Jun-15 | 4.5 | 2.5 | -1.11 |
| 16 | May-02 | 4.5 | 2.5 | -1.11 | 42 | Nov-15 | 4.5 | 7 | -0.62 |
| 17 | Nov-02 | 4.5 | 5 | -0.84 | 43 | Jun-16 | 4.5 | 2.5 | -1.11 |
| 18 | Jun-03 | 4.5 | 2.5 | -1.11 | 44 | Nov-16 | 4.5 | 2.5 | -1.11 |
| 19 | Nov-03 | 4.5 | 2.5 | -1.11 | 45 | Jun-17 | 4.5 | 2.5 | -1.11 |
| 20 | Jun-04 | 4.5 | 9 | -0.40 | 46 | Nov-17 | 4.5 | 2.5 | -1.11 |
| 21 | Dec-04 | 4.5 | 7 | -0.62 | 47 | Jun-18 | 4.5 | 2.5 | -1.11 |
| 22 | Jun-05 | 4.5 | 9 | -0.40 | 48 | Nov-18 | 4.5 | 2.5 | -1.11 |
| 23 | Dec-05 | 4.5 | 6 | -0.73 | | | | | |
| 24 | Jun-06 | 4.5 | 9 | -0.40 | | | | | |
| 25 | Nov-06 | 4.5 | 9 | -0.40 | | | | | |
| 26 | Jun-07 | 4.5 | 5 | -0.84 | | | | | |
| 27 | Nov-07 | 4.5 | 16 | 0.36 | | | | | |
| 28 | Jun-08 | 4.5 | 6 | -0.73 | | | | | |
| 29 | Nov-08 | 4.5 | 5 | -0.84 | | | | | |
| 30 | Jun-09 | 4.5 | 2.5 | -1.11 | | | | | |
| 31 | Nov-09 | 4.5 | 2.5 | -1.11 | | | | | |
| 32 | Jun-10 | 4.5 | 2.5 | -1.11 | | | | | |
| 33 | Nov-10 | 4.5 | 2.5 | -1.11 | | | | | |
| 34 | Jun-11 | 4.5 | 5 | -0.84 | | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

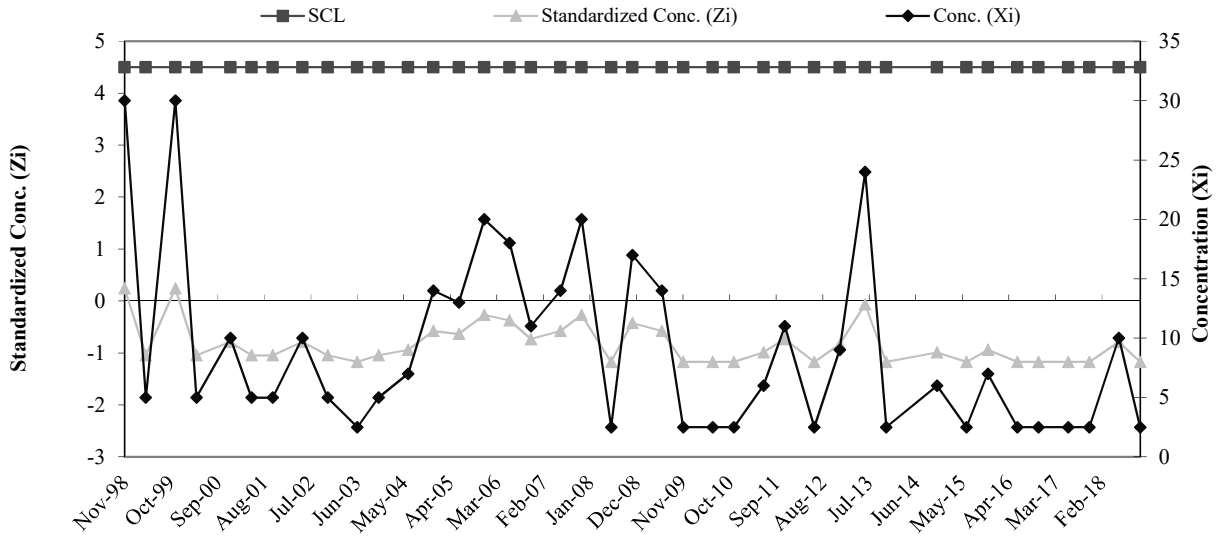


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-7 Zn**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-95 | 10 | | |
| 2 | Aug-95 | 10 | | |
| 3 | Feb-96 | 22 | | |
| 4 | Jun-96 | 20 | **25.25** | **19.40** |
| 5 | Aug-96 | 60 | | |
| 6 | Nov-96 | 50 | | |
| 7 | May-97 | 10 | | |
| 8 | May-98 | 20 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) | Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|---|---|---|---|---|
| 9 | Nov-98 | 4.5 | 30 | 0.24 | 35 | Nov-11 | 4.5 | 11 | -0.73 |
| 10 | Apr-99 | 4.5 | 5 | -1.04 | 36 | Jun-12 | 4.5 | 2.5 | -1.17 |
| 11 | Nov-99 | 4.5 | 30 | 0.24 | 37 | Dec-12 | 4.5 | 9 | -0.84 |
| 12 | Apr-00 | 4.5 | 5 | -1.04 | 38 | Jun-13 | 4.5 | 24 | -0.06 |
| 13 | Dec-00 | 4.5 | 10 | -0.79 | 39 | Nov-13 | 4.5 | 2.5 | -1.17 |
| 14 | May-01 | 4.5 | 5 | -1.04 | 40 | Nov-14 | 4.5 | 6 | -0.99 |
| 15 | Oct-01 | 4.5 | 5 | -1.04 | 41 | Jun-15 | 4.5 | 2.5 | -1.17 |
| 16 | May-02 | 4.5 | 10 | -0.79 | 42 | Nov-15 | 4.5 | 7 | -0.94 |
| 17 | Nov-02 | 4.5 | 5 | -1.04 | 43 | Jun-16 | 4.5 | 2.5 | -1.17 |
| 18 | Jun-03 | 4.5 | 2.5 | -1.17 | 44 | Nov-16 | 4.5 | 2.5 | -1.17 |
| 19 | Nov-03 | 4.5 | 5 | -1.04 | 45 | Jun-17 | 4.5 | 2.5 | -1.17 |
| 20 | Jun-04 | 4.5 | 7 | -0.94 | 46 | Nov-17 | 4.5 | 2.5 | -1.17 |
| 21 | Dec-04 | 4.5 | 14 | -0.58 | 47 | Jun-18 | 4.5 | 10 | -0.79 |
| 22 | Jun-05 | 4.5 | 13 | -0.63 | 48 | Nov-18 | 4.5 | 2.5 | -1.17 |
| 23 | Dec-05 | 4.5 | 20 | -0.27 | | | 4.5 | | |
| 24 | Jun-06 | 4.5 | 18 | -0.37 | | | | | |
| 25 | Nov-06 | 4.5 | 11 | -0.73 | | | | | |
| 26 | Jun-07 | 4.5 | 14 | -0.58 | | | | | |
| 27 | Nov-07 | 4.5 | 20 | -0.27 | | | | | |
| 28 | Jun-08 | 4.5 | 2.5 | -1.17 | | | | | |
| 29 | Nov-08 | 4.5 | 17 | -0.43 | | | | | |
| 30 | Jun-09 | 4.5 | 14 | -0.58 | | | | | |
| 31 | Nov-09 | 4.5 | 2.5 | -1.17 | | | | | |
| 32 | Jun-10 | 4.5 | 2.5 | -1.17 | | | | | |
| 33 | Nov-10 | 4.5 | 2.5 | -1.17 | | | | | |
| 34 | Jun-11 | 4.5 | 6 | -0.99 | | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

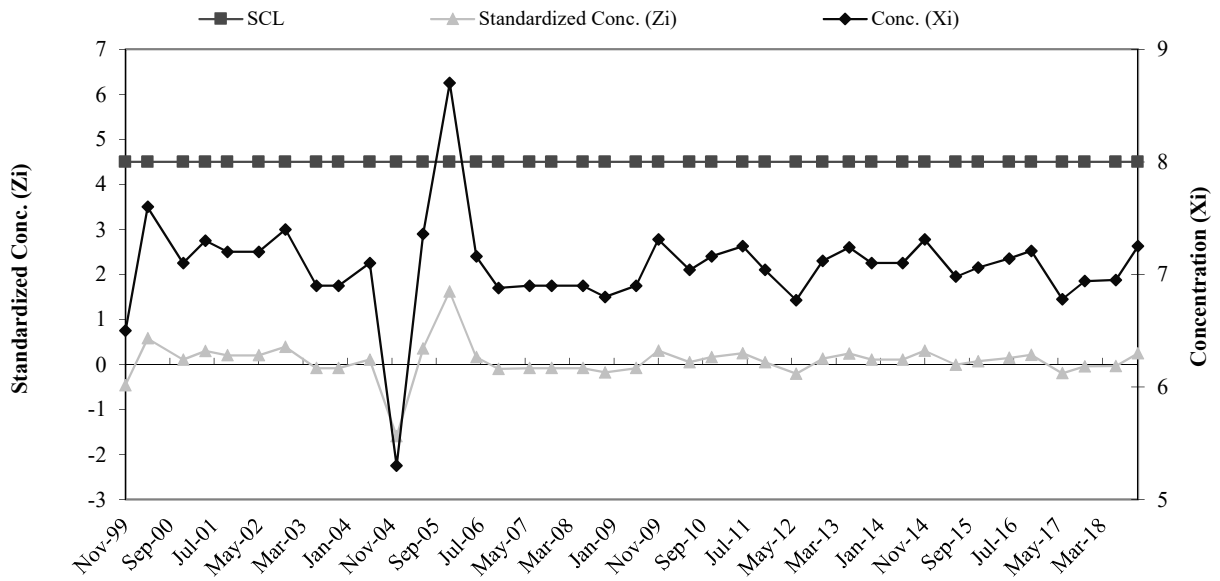


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-7 pH**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-95 | 7.5 | 6.99 | 1.06 |
| 2 | Jun-96 | 6.9 | | |
| 3 | Aug-96 | 7.6 | | |
| 4 | Nov-96 | 8.0 | | |
| 5 | May-97 | 7.2 | | |
| 6 | May-98 | 6.6 | | |
| 7 | Nov-98 | 4.6 | | |
| 8 | Apr-99 | 7.5 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) | Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|---|---|---|---|---|
| 9 | Nov-99 | 4.5 | 6.5 | -0.46 | 33 | Nov-11 | 4.5 | 7.0 | 0.05 |
| 10 | Apr-00 | 4.5 | 7.6 | 0.58 | 34 | Jun-12 | 4.5 | 6.8 | -0.21 |
| 11 | Dec-00 | 4.5 | 7.1 | 0.11 | 35 | Dec-12 | 4.5 | 7.1 | 0.13 |
| 12 | May-01 | 4.5 | 7.3 | 0.30 | 36 | Jun-13 | 4.5 | 7.2 | 0.24 |
| 13 | Oct-01 | 4.5 | 7.2 | 0.20 | 37 | Nov-13 | 4.5 | 7.1 | 0.11 |
| 14 | May-02 | 4.5 | 7.2 | 0.20 | 38 | Jun-14 | 4.5 | 7.1 | 0.11 |
| 15 | Nov-02 | 4.5 | 7.4 | 0.39 | 39 | Nov-14 | 4.5 | 7.3 | 0.30 |
| 16 | Jun-03 | 4.5 | 6.9 | -0.08 | 40 | Jun-15 | 4.5 | 7.0 | -0.01 |
| 17 | Nov-03 | 4.5 | 6.9 | -0.08 | 41 | Nov-15 | 4.5 | 7.1 | 0.07 |
| 18 | Jun-04 | 4.5 | 7.1 | 0.11 | 42 | Jun-16 | 4.5 | 7.1 | 0.14 |
| 19 | Dec-04 | 4.5 | 5.3 | -1.60 | 43 | Nov-16 | 4.5 | 7.2 | 0.21 |
| 20 | Jun-05 | 4.5 | 7.4 | 0.35 | 44 | Jun-17 | 4.5 | 6.8 | -0.20 |
| 21 | Dec-05 | 4.5 | 8.7 | 1.62 | 45 | Nov-17 | 4.5 | 6.9 | -0.04 |
| 22 | Jun-06 | 4.5 | 7.2 | 0.16 | 46 | Jun-18 | 4.5 | 7.0 | -0.04 |
| 23 | Nov-06 | 4.5 | 6.9 | -0.10 | 47 | Nov-18 | 4.5 | 7.3 | 0.25 |
| 24 | Jun-07 | 4.5 | 6.9 | -0.08 | | | | | |
| 25 | Nov-07 | 4.5 | 6.9 | -0.08 | | | | | |
| 26 | Jun-08 | 4.5 | 6.9 | -0.08 | | | | | |
| 27 | Nov-08 | 4.5 | 6.8 | -0.18 | | | | | |
| 28 | Jun-09 | 4.5 | 6.9 | -0.08 | | | | | |
| 29 | Nov-09 | 4.5 | 7.3 | 0.30 | | | | | |
| 30 | Jun-10 | 4.5 | 7.0 | 0.05 | | | | | |
| 31 | Nov-10 | 4.5 | 7.2 | 0.16 | | | | | |
| 32 | Jun-11 | 4.5 | 7.3 | 0.25 | | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

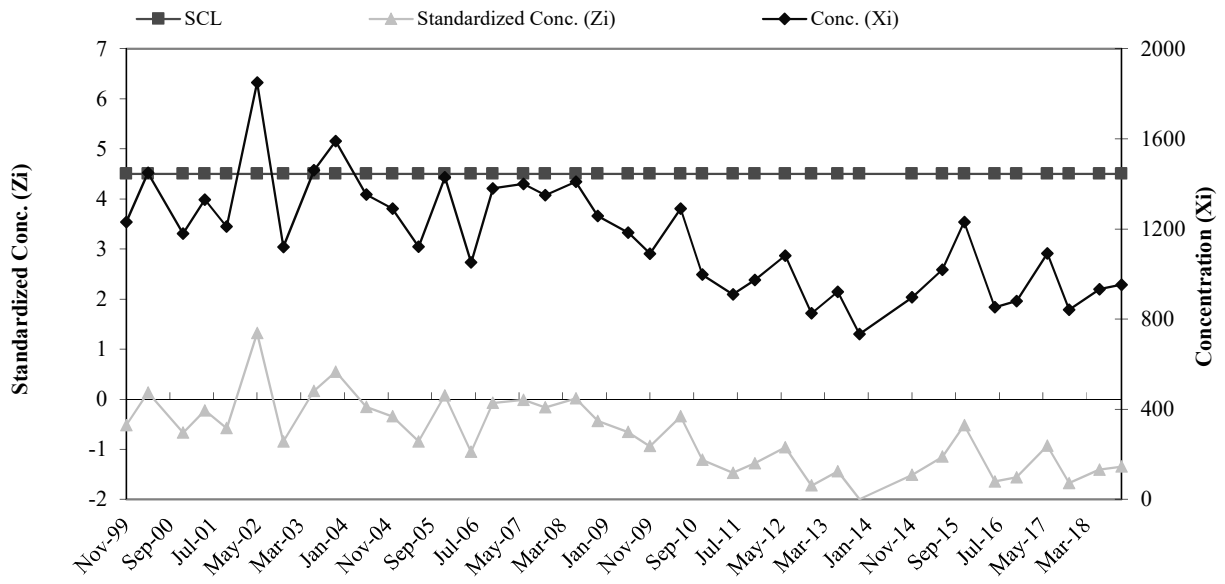


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-7 SpC**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-95 | 1509.0 | | |
| 2 | Jun-96 | 1508.0 | | |
| 3 | Aug-96 | 1567.0 | | |
| 4 | Nov-96 | 1960.0 | **1,405.88** | **336.33** |
| 5 | May-97 | 780.0 | | |
| 6 | May-98 | 1270.0 | | |
| 7 | Nov-98 | 1240.0 | | |
| 8 | Apr-99 | 1413.0 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) | Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|---|---|---|---|---|
| 9 | Nov-99 | 4.5 | 1230.0 | -0.52 | 33 | Nov-11 | 4.5 | 974.0 | -1.28 |
| 10 | Apr-00 | 4.5 | 1450.0 | 0.13 | 34 | Jun-12 | 4.5 | 1082.0 | -0.96 |
| 11 | Dec-00 | 4.5 | 1180.0 | -0.67 | 35 | Dec-12 | 4.5 | 825.0 | -1.73 |
| 12 | May-01 | 4.5 | 1330.0 | -0.23 | 36 | Jun-13 | 4.5 | 921.0 | -1.44 |
| 13 | Oct-01 | 4.5 | 1210.0 | -0.58 | 37 | Nov-13 | 4.5 | 733.0 | -2.00 |
| 14 | May-02 | 4.5 | 1850.0 | 1.32 | 38 | Nov-14 | 4.5 | 896.0 | -1.52 |
| 15 | Nov-02 | 4.5 | 1120.0 | -0.85 | 39 | Jun-15 | 4.5 | 1019.0 | -1.15 |
| 16 | Jun-03 | 4.5 | 1460.0 | 0.16 | 40 | Nov-15 | 4.5 | 1231.0 | -0.52 |
| 17 | Nov-03 | 4.5 | 1590.0 | 0.55 | 41 | Jun-16 | 4.5 | 852.0 | -1.65 |
| 18 | Jun-04 | 4.5 | 1353.0 | -0.16 | 42 | Nov-16 | 4.5 | 880.0 | -1.56 |
| 19 | Dec-04 | 4.5 | 1290.0 | -0.34 | 43 | Jun-17 | 4.5 | 1092.0 | -0.93 |
| 20 | Jun-05 | 4.5 | 1121.0 | -0.85 | 44 | Nov-17 | 4.5 | 841.0 | -1.68 |
| 21 | Dec-05 | 4.5 | 1430.0 | 0.07 | 45 | Jun-18 | 4.5 | 932.0 | -1.41 |
| 22 | Jun-06 | 4.5 | 1051.0 | -1.06 | 46 | Nov-18 | 4.5 | 952.0 | -1.35 |
| 23 | Nov-06 | 4.5 | 1380.0 | -0.08 | | | 4.5 | | |
| 24 | Jun-07 | 4.5 | 1400.0 | -0.02 | | | | | |
| 25 | Nov-07 | 4.5 | 1350.0 | -0.17 | | | | | |
| 26 | Jun-08 | 4.5 | 1410.0 | 0.01 | | | | | |
| 27 | Nov-08 | 4.5 | 1258.0 | -0.44 | | | | | |
| 28 | Jun-09 | 4.5 | 1184.0 | -0.66 | | | | | |
| 29 | Nov-09 | 4.5 | 1090.0 | -0.94 | | | | | |
| 30 | Jun-10 | 4.5 | 1290.0 | -0.34 | | | | | |
| 31 | Nov-10 | 4.5 | 997.0 | -1.22 | | | | | |
| 32 | Jun-11 | 4.5 | 910.0 | -1.47 | | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

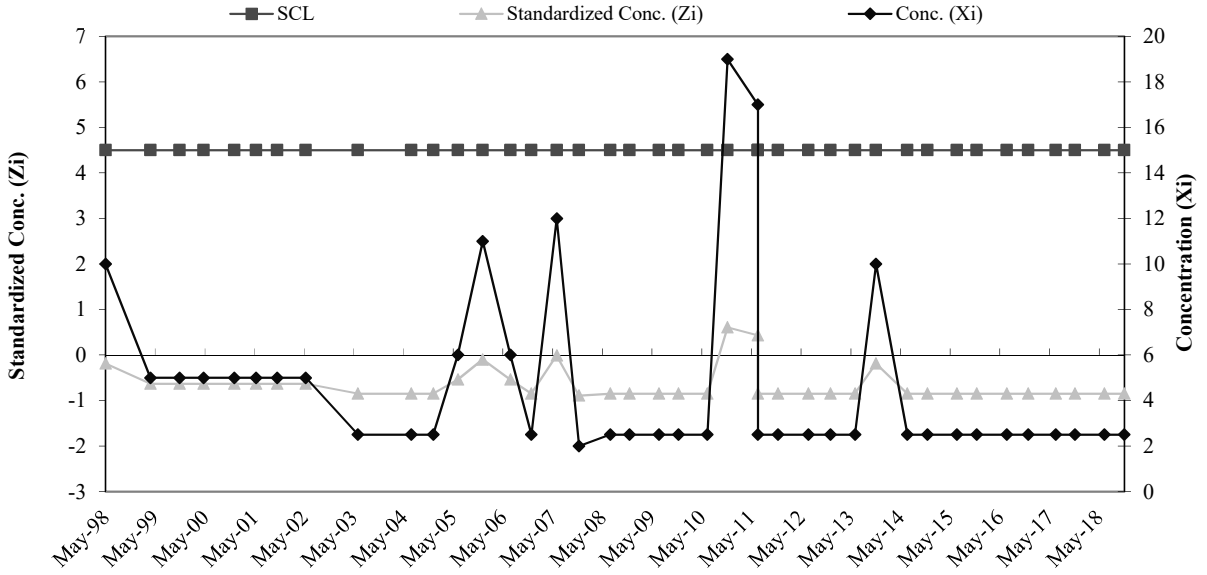


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-9 Cr**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-95 | 10 | | |
| 2 | Aug-95 | 37 | | |
| 3 | Feb-96 | 10 | | |
| 4 | Jun-96 | 10 | **12.12** | **11.34** |
| 5 | Aug-96 | 10 | | |
| 6 | Nov-96 | 10 | | |
| 7 | May-97 | 5 | | |
| 8 | Nov-97 | 5 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) | Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|---|---|---|---|---|
| 9 | May-98 | 4.5 | 10 | -0.19 | 34 | Nov-11 | 4.5 | 2.5 | -0.85 |
| 10 | Apr-99 | 4.5 | 5 | -0.63 | 35 | Jun-12 | 4.5 | 2.5 | -0.85 |
| 11 | Nov-99 | 4.5 | 5 | -0.63 | 36 | Dec-12 | 4.5 | 2.5 | -0.85 |
| 12 | Apr-00 | 4.5 | 5 | -0.63 | 37 | Jun-13 | 4.5 | 2.5 | -0.85 |
| 13 | Dec-00 | 4.5 | 5 | -0.63 | 38 | Nov-13 | 4.5 | 10 | -0.19 |
| 14 | May-01 | 4.5 | 5 | -0.63 | 39 | Jun-14 | 4.5 | 2.5 | -0.85 |
| 15 | Oct-01 | 4.5 | 5 | -0.63 | 40 | Nov-14 | 4.5 | 2.5 | -0.85 |
| 16 | May-02 | 4.5 | 5 | -0.63 | 41 | Jun-15 | 4.5 | 2.5 | -0.85 |
| 17 | Jun-03 | 4.5 | 2.5 | -0.85 | 42 | Nov-15 | 4.5 | 2.5 | -0.85 |
| 18 | Jun-04 | 4.5 | 2.5 | -0.85 | 43 | Jun-16 | 4.5 | 2.5 | -0.85 |
| 19 | Dec-04 | 4.5 | 2.5 | -0.85 | 44 | Nov-16 | 4.5 | 2.5 | -0.85 |
| 20 | Jun-05 | 4.5 | 6 | -0.54 | 45 | Jun-17 | 4.5 | 2.5 | -0.85 |
| 21 | Dec-05 | 4.5 | 11 | -0.10 | 46 | Nov-17 | 4.5 | 2.5 | -0.85 |
| 22 | Jun-06 | 4.5 | 6 | -0.54 | 47 | Jun-18 | 4.5 | 2.5 | -0.85 |
| 23 | Nov-06 | 4.5 | 2.5 | -0.85 | 48 | Nov-18 | 4.5 | 2.5 | -0.85 |
| 24 | Jun-07 | 4.5 | 12 | -0.01 | | | | | |
| 25 | Nov-07 | 4.5 | 2 | -0.89 | | | | | |
| 26 | Jul-08 | 4.5 | 2.5 | -0.85 | | | | | |
| 27 | Nov-08 | 4.5 | 2.5 | -0.85 | | | | | |
| 28 | Jun-09 | 4.5 | 2.5 | -0.85 | | | | | |
| 29 | Nov-09 | 4.5 | 2.5 | -0.85 | | | | | |
| 30 | Jun-10 | 4.5 | 2.5 | -0.85 | | | | | |
| 31 | Nov-10 | 4.5 | 19 | 0.61 | | | | | |
| 32 | Jun-11 | 4.5 | 17 | 0.43 | | | | | |
| 33 | Jun-11 | 4.5 | 2.5 | -0.85 | | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

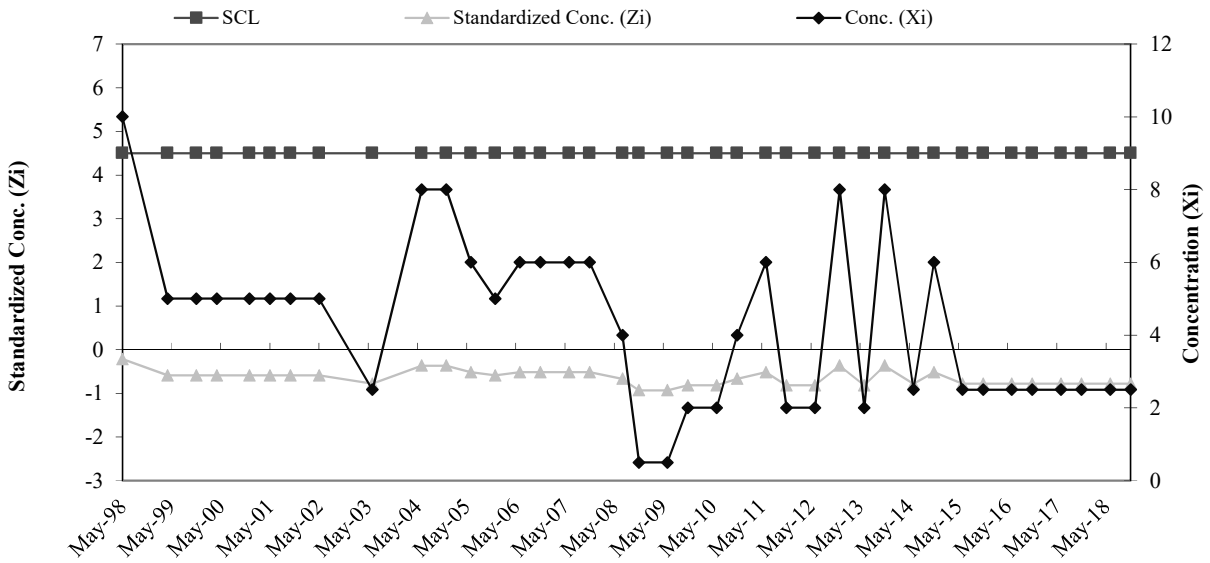


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-9 Cu**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-95 | 10 | **12.87** | **13.26** |
| 2 | Aug-95 | 43 | | |
| 3 | Feb-96 | 10 | | |
| 4 | Jun-96 | 10 | | |
| 5 | Aug-96 | 10 | | |
| 6 | Nov-96 | 10 | | |
| 7 | May-97 | 5 | | |
| 8 | Nov-97 | 5 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) | Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|---|---|---|---|---|
| 9 | May-98 | 4.5 | 10 | -0.22 | 33 | Nov-11 | 4.5 | 2 | -0.82 |
| 10 | Apr-99 | 4.5 | 5 | -0.59 | 34 | Jun-12 | 4.5 | 2 | -0.82 |
| 11 | Nov-99 | 4.5 | 5 | -0.59 | 35 | Dec-12 | 4.5 | 8 | -0.37 |
| 12 | Apr-00 | 4.5 | 5 | -0.59 | 36 | Jun-13 | 4.5 | 2 | -0.82 |
| 13 | Dec-00 | 4.5 | 5 | -0.59 | 37 | Nov-13 | 4.5 | 8 | -0.37 |
| 14 | May-01 | 4.5 | 5 | -0.59 | 38 | Jun-14 | 4.5 | 2.5 | -0.78 |
| 15 | Oct-01 | 4.5 | 5 | -0.59 | 39 | Nov-14 | 4.5 | 6 | -0.52 |
| 16 | May-02 | 4.5 | 5 | -0.59 | 40 | Jun-15 | 4.5 | 2.5 | -0.78 |
| 17 | Jun-03 | 4.5 | 2.5 | -0.78 | 41 | Nov-15 | 4.5 | 2.5 | -0.78 |
| 18 | Jun-04 | 4.5 | 8 | -0.37 | 42 | Jun-16 | 4.5 | 2.5 | -0.78 |
| 19 | Dec-04 | 4.5 | 8 | -0.37 | 43 | Nov-16 | 4.5 | 2.5 | -0.78 |
| 20 | Jun-05 | 4.5 | 6 | -0.52 | 44 | Jun-17 | 4.5 | 2.5 | -0.78 |
| 21 | Dec-05 | 4.5 | 5 | -0.59 | 45 | Nov-17 | 4.5 | 2.5 | -0.78 |
| 22 | Jun-06 | 4.5 | 6 | -0.52 | 46 | Jun-18 | 4.5 | 2.5 | -0.78 |
| 23 | Nov-06 | 4.5 | 6 | -0.52 | 47 | Nov-18 | 4.5 | 2.5 | -0.78 |
| 24 | Jun-07 | 4.5 | 6 | -0.52 | | | | | |
| 25 | Nov-07 | 4.5 | 6 | -0.52 | | | | | |
| 26 | Jul-08 | 4.5 | 4 | -0.67 | | | | | |
| 27 | Nov-08 | 4.5 | 0.5 | -0.93 | | | | | |
| 28 | Jun-09 | 4.5 | 0.5 | -0.93 | | | | | |
| 29 | Nov-09 | 4.5 | 2 | -0.82 | | | | | |
| 30 | Jun-10 | 4.5 | 2 | -0.82 | | | | | |
| 31 | Nov-10 | 4.5 | 4 | -0.67 | | | | | |
| 32 | Jun-11 | 4.5 | 6 | -0.52 | | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

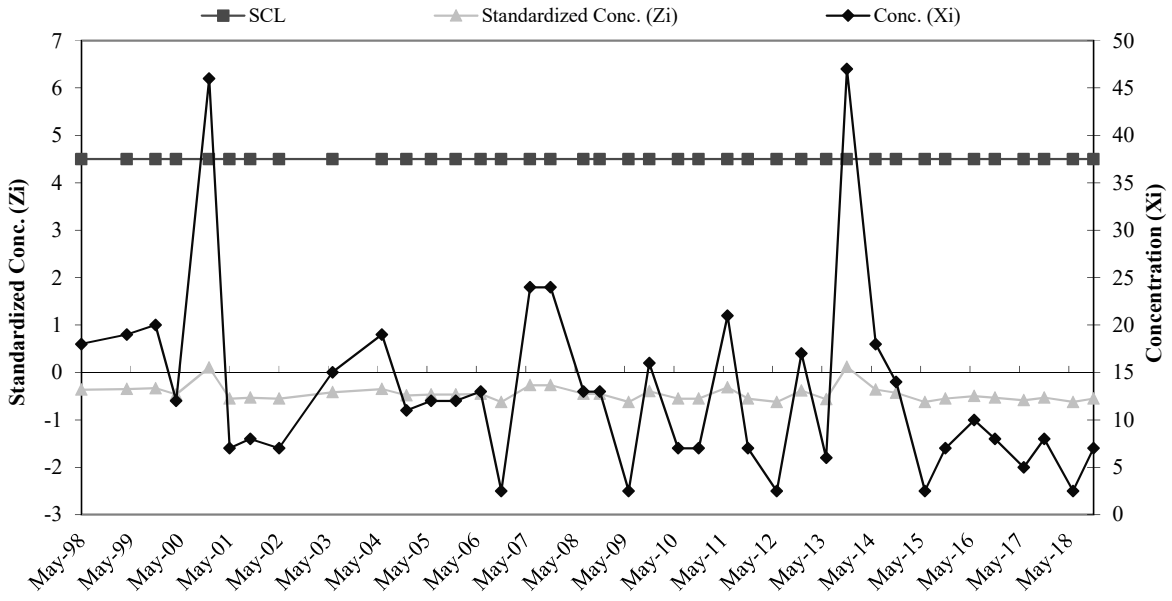


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-9 Ni**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-95 | 15 | | |
| 2 | Aug-95 | 20 | | |
| 3 | Feb-96 | 20 | | |
| 4 | Jun-96 | 10 | **39.83** | **59.86** |
| 5 | Aug-96 | 10 | | |
| 6 | Nov-96 | 10 | | |
| 7 | May-97 | 51 | | |
| 8 | Nov-97 | 183 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) | Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|---|---|---|---|---|
| 9 | May-98 | 4.5 | 18 | -0.36 | 33 | Nov-11 | 4.5 | 7 | -0.55 |
| 10 | Apr-99 | 4.5 | 19 | -0.35 | 34 | Jun-12 | 4.5 | 2.5 | -0.62 |
| 11 | Nov-99 | 4.5 | 20 | -0.33 | 35 | Dec-12 | 4.5 | 17 | -0.38 |
| 12 | Apr-00 | 4.5 | 12 | -0.46 | 36 | Jun-13 | 4.5 | 6 | -0.57 |
| 13 | Dec-00 | 4.5 | 46 | 0.10 | 37 | Nov-13 | 4.5 | 47 | 0.12 |
| 14 | May-01 | 4.5 | 7 | -0.55 | 38 | Jun-14 | 4.5 | 18 | -0.36 |
| 15 | Oct-01 | 4.5 | 8 | -0.53 | 39 | Nov-14 | 4.5 | 14 | -0.43 |
| 16 | May-02 | 4.5 | 7 | -0.55 | 40 | Jun-15 | 4.5 | 2.5 | -0.62 |
| 17 | Jun-03 | 4.5 | 15 | -0.41 | 41 | Nov-15 | 4.5 | 7 | -0.55 |
| 18 | Jun-04 | 4.5 | 19 | -0.35 | 42 | Jun-16 | 4.5 | 10 | -0.50 |
| 19 | Dec-04 | 4.5 | 11 | -0.48 | 43 | Nov-16 | 4.5 | 8 | -0.53 |
| 20 | Jun-05 | 4.5 | 12 | -0.46 | 44 | Jun-17 | 4.5 | 5 | -0.58 |
| 21 | Dec-05 | 4.5 | 12 | -0.46 | 45 | Nov-17 | 4.5 | 8 | -0.53 |
| 22 | Jun-06 | 4.5 | 13 | -0.45 | 46 | Jun-18 | 4.5 | 2.5 | -0.62 |
| 23 | Nov-06 | 4.5 | 2.5 | -0.62 | 47 | Nov-18 | 4.5 | 7 | -0.55 |
| 24 | Jun-07 | 4.5 | 24 | -0.26 | | | | | |
| 25 | Nov-07 | 4.5 | 24 | -0.26 | | | | | |
| 26 | Jul-08 | 4.5 | 13 | -0.45 | | | | | |
| 27 | Nov-08 | 4.5 | 13 | -0.45 | | | | | |
| 28 | Jun-09 | 4.5 | 2.5 | -0.62 | | | | | |
| 29 | Nov-09 | 4.5 | 16 | -0.40 | | | | | |
| 30 | Jun-10 | 4.5 | 7 | -0.55 | | | | | |
| 31 | Nov-10 | 4.5 | 7 | -0.55 | | | | | |
| 32 | Jun-11 | 4.5 | 21 | -0.31 | | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

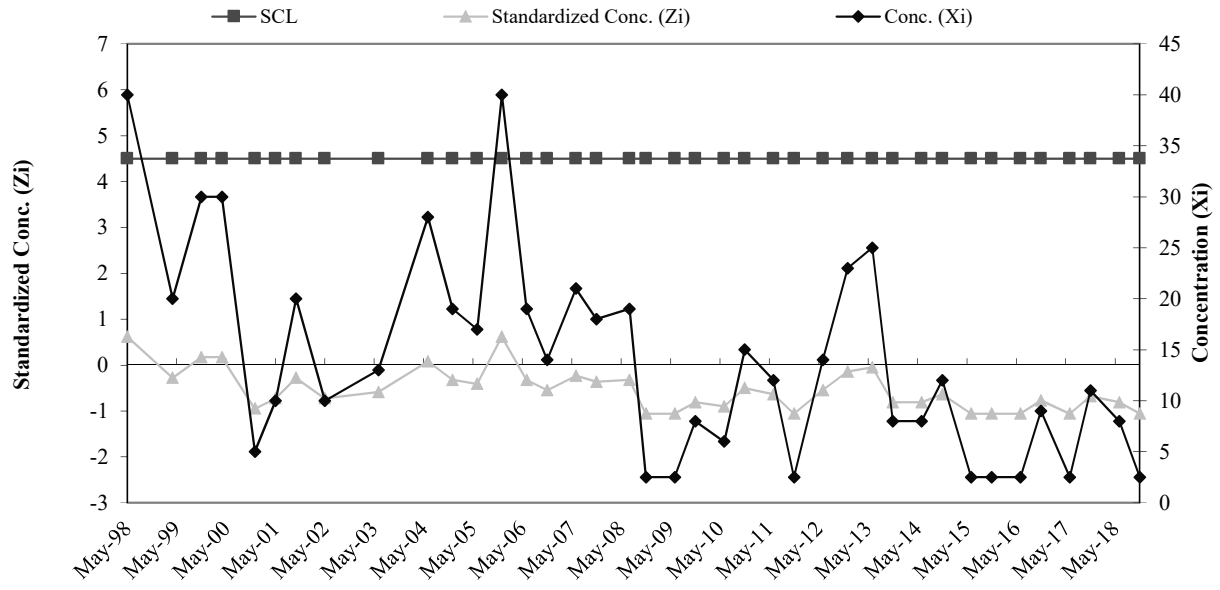


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-9 Zn**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-95 | 10 | **26.23** | **22.36** |
| 2 | Aug-95 | 10 | | |
| 3 | Feb-96 | 10 | | |
| 4 | Jun-96 | 10 | | |
| 5 | Aug-96 | 70 | | |
| 6 | Nov-96 | 40 | | |
| 7 | May-97 | 20 | | |
| 8 | Nov-97 | 40 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) | Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|---|---|---|---|---|
| 9 | May-98 | 4.5 | 40 | 0.62 | 33 | Nov-11 | 4.5 | 2.5 | -1.06 |
| 10 | Apr-99 | 4.5 | 20 | -0.28 | 34 | Jun-12 | 4.5 | 14 | -0.55 |
| 11 | Nov-99 | 4.5 | 30 | 0.17 | 35 | Dec-12 | 4.5 | 23 | -0.14 |
| 12 | Apr-00 | 4.5 | 30 | 0.17 | 36 | Jun-13 | 4.5 | 25 | -0.06 |
| 13 | Dec-00 | 4.5 | 5 | -0.95 | 37 | Nov-13 | 4.5 | 8 | -0.82 |
| 14 | May-01 | 4.5 | 10 | -0.73 | 38 | Jun-14 | 4.5 | 8 | -0.82 |
| 15 | Oct-01 | 4.5 | 20 | -0.28 | 39 | Nov-14 | 4.5 | 12 | -0.64 |
| 16 | May-02 | 4.5 | 10 | -0.73 | 40 | Jun-15 | 4.5 | 2.5 | -1.06 |
| 17 | Jun-03 | 4.5 | 13 | -0.59 | 41 | Nov-15 | 4.5 | 2.5 | -1.06 |
| 18 | Jun-04 | 4.5 | 28 | 0.08 | 42 | Jun-16 | 4.5 | 2.5 | -1.06 |
| 19 | Dec-04 | 4.5 | 19 | -0.32 | 43 | Nov-16 | 4.5 | 9 | -0.77 |
| 20 | Jun-05 | 4.5 | 17 | -0.41 | 44 | Jun-17 | 4.5 | 2.5 | -1.06 |
| 21 | Dec-05 | 4.5 | 40 | 0.62 | 45 | Nov-17 | 4.5 | 11 | -0.68 |
| 22 | Jun-06 | 4.5 | 19 | -0.32 | 46 | Jun-18 | 4.5 | 8 | -0.82 |
| 23 | Nov-06 | 4.5 | 14 | -0.55 | 47 | Nov-18 | 4.5 | 2.5 | -1.06 |
| 24 | Jun-07 | 4.5 | 21 | -0.23 | | | | | |
| 25 | Nov-07 | 4.5 | 18 | -0.37 | | | | | |
| 26 | Jul-08 | 4.5 | 19 | -0.32 | | | | | |
| 27 | Nov-08 | 4.5 | 2.5 | -1.06 | | | | | |
| 28 | Jun-09 | 4.5 | 2.5 | -1.06 | | | | | |
| 29 | Nov-09 | 4.5 | 8 | -0.82 | | | | | |
| 30 | Jun-10 | 4.5 | 6 | -0.90 | | | | | |
| 31 | Nov-10 | 4.5 | 15 | -0.50 | | | | | |
| 32 | Jun-11 | 4.5 | 12 | -0.64 | | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

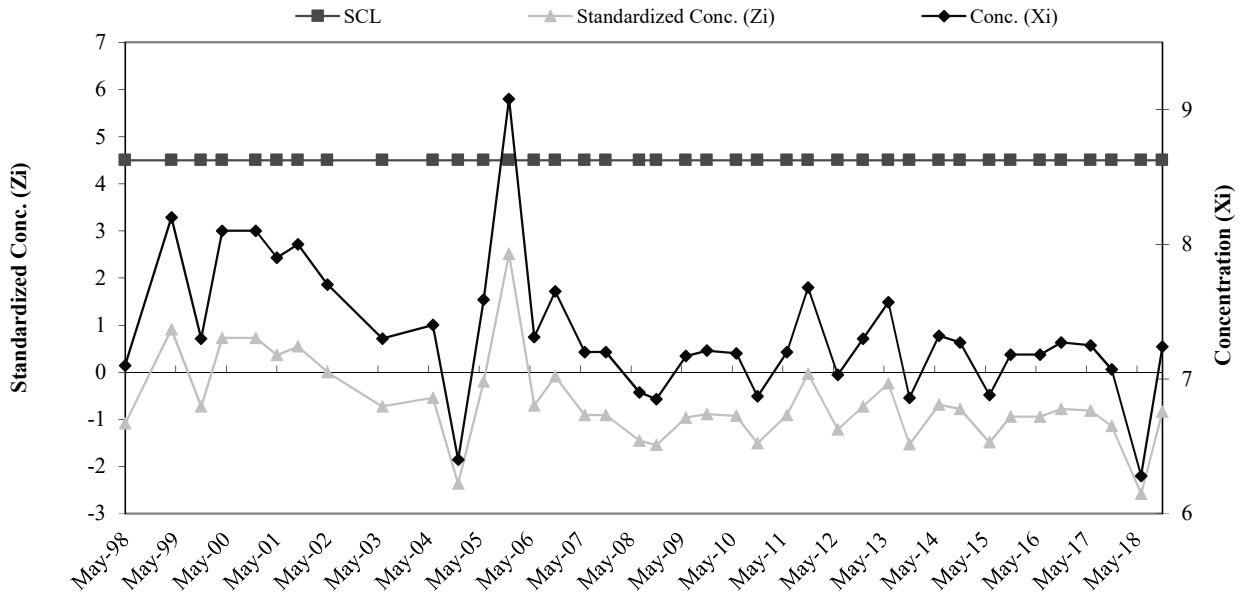


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-9 pH**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-95 | 7.7 | **7.20** | **0.55** |
| 2 | Aug-95 | 7.7 | | |
| 3 | Feb-96 | 7.3 | | |
| 4 | Jun-96 | 6.8 | | |
| 5 | Aug-96 | 8.0 | | |
| 6 | Nov-96 | 6.8 | | |
| 7 | May-97 | 6.8 | | |
| 8 | Nov-97 | 6.5 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) | Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|---|---|---|---|---|
| 9 | May-98 | 4.5 | 6.6 | -1.09 | 33 | Nov-11 | 4.5 | 7.2 | -0.04 |
| 10 | Apr-99 | 4.5 | 7.7 | 0.91 | 34 | Jun-12 | 4.5 | 6.5 | -1.22 |
| 11 | Nov-99 | 4.5 | 6.8 | -0.73 | 35 | Dec-12 | 4.5 | 6.8 | -0.73 |
| 12 | Apr-00 | 4.5 | 7.6 | 0.73 | 36 | Jun-13 | 4.5 | 7.1 | -0.24 |
| 13 | Dec-00 | 4.5 | 7.6 | 0.73 | 37 | Nov-13 | 4.5 | 6.4 | -1.53 |
| 14 | May-01 | 4.5 | 7.4 | 0.36 | 38 | Jun-14 | 4.5 | 6.8 | -0.69 |
| 15 | Oct-01 | 4.5 | 7.5 | 0.55 | 39 | Nov-14 | 4.5 | 6.8 | -0.78 |
| 16 | May-02 | 4.5 | 7.2 | 0.00 | 40 | Jun-15 | 4.5 | 6.4 | -1.49 |
| 17 | Jun-03 | 4.5 | 6.8 | -0.73 | 41 | Nov-15 | 4.5 | 6.7 | -0.94 |
| 18 | Jun-04 | 4.5 | 6.9 | -0.55 | 42 | Jun-16 | 4.5 | 6.7 | -0.94 |
| 19 | Dec-04 | 4.5 | 5.9 | -2.36 | 43 | Nov-16 | 4.5 | 6.8 | -0.78 |
| 20 | Jun-05 | 4.5 | 7.1 | -0.20 | 44 | Jun-17 | 4.5 | 6.8 | -0.82 |
| 21 | Dec-05 | 4.5 | 8.6 | 2.51 | 45 | Nov-17 | 4.5 | 6.6 | -1.14 |
| 22 | Jun-06 | 4.5 | 6.8 | -0.71 | 46 | Jun-18 | 4.5 | 5.8 | -2.58 |
| 23 | Nov-06 | 4.5 | 7.2 | -0.09 | 47 | Nov-18 | 4.5 | 6.7 | -0.84 |
| 24 | Jun-07 | 4.5 | 6.7 | -0.91 | | | | | |
| 25 | Nov-07 | 4.5 | 6.7 | -0.91 | | | | | |
| 26 | Jul-08 | 4.5 | 6.4 | -1.45 | | | | | |
| 27 | Nov-08 | 4.5 | 6.4 | -1.54 | | | | | |
| 28 | Jun-09 | 4.5 | 6.7 | -0.96 | | | | | |
| 29 | Nov-09 | 4.5 | 6.7 | -0.89 | | | | | |
| 30 | Jun-10 | 4.5 | 6.7 | -0.93 | | | | | |
| 31 | Nov-10 | 4.5 | 6.4 | -1.51 | | | | | |
| 32 | Jun-11 | 4.5 | 6.7 | -0.91 | | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

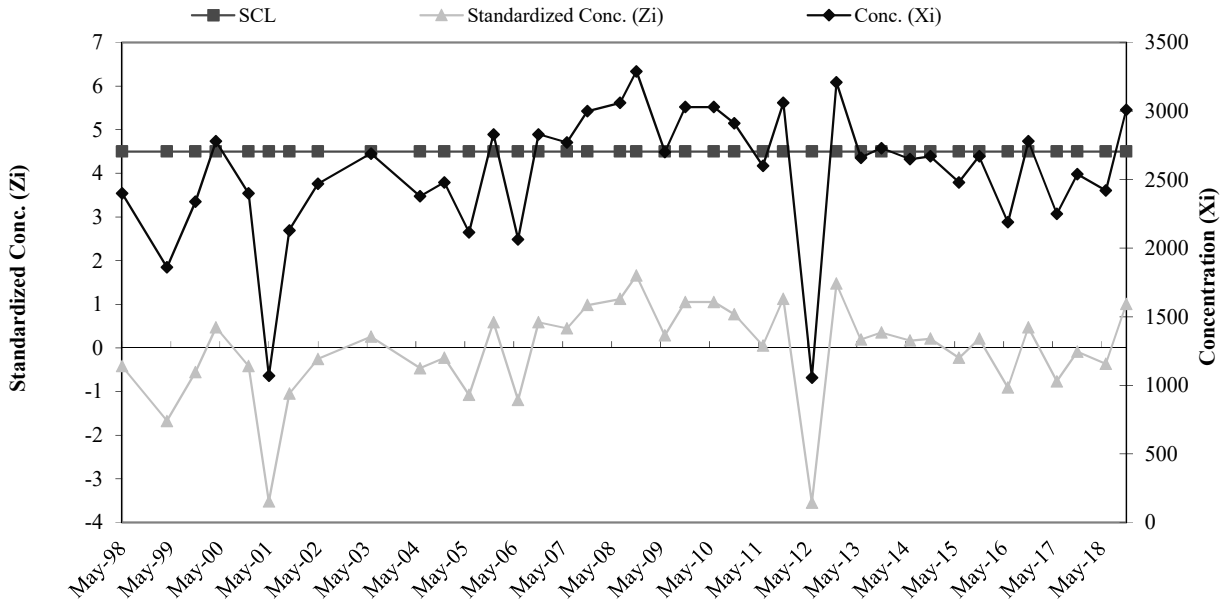


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-9 SpC**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-95 | 2400 | | |
| 2 | Aug-95 | 1829 | | |
| 3 | Feb-96 | 2860 | | |
| 4 | Jun-96 | 2550 | **2,578.63** | **428.85** |
| 5 | Aug-96 | 2310 | | |
| 6 | Nov-96 | 3280 | | |
| 7 | May-97 | 2600 | | |
| 8 | Nov-97 | 2800 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) | Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|---|---|---|---|---|
| 9 | May-98 | 4.5 | 2400 | -0.42 | 33 | Nov-11 | 4.5 | 3060 | 1.12 |
| 10 | Apr-99 | 4.5 | 1860 | -1.68 | 34 | Jun-12 | 4.5 | 1057 | -3.55 |
| 11 | Nov-99 | 4.5 | 2340 | -0.56 | 35 | Dec-12 | 4.5 | 3210 | 1.47 |
| 12 | Apr-00 | 4.5 | 2780 | 0.47 | 36 | Jun-13 | 4.5 | 2660 | 0.19 |
| 13 | Dec-00 | 4.5 | 2400 | -0.42 | 37 | Nov-13 | 4.5 | 2730 | 0.35 |
| 14 | May-01 | 4.5 | 1070 | -3.52 | 38 | Jun-14 | 4.5 | 2650 | 0.17 |
| 15 | Oct-01 | 4.5 | 2130 | -1.05 | 39 | Nov-14 | 4.5 | 2670 | 0.21 |
| 16 | May-02 | 4.5 | 2470 | -0.25 | 40 | Jun-15 | 4.5 | 2480 | -0.23 |
| 17 | Jun-03 | 4.5 | 2690 | 0.26 | 41 | Nov-15 | 4.5 | 2670 | 0.21 |
| 18 | Jun-04 | 4.5 | 2379 | -0.47 | 42 | Jun-16 | 4.5 | 2190 | -0.91 |
| 19 | Dec-04 | 4.5 | 2480 | -0.23 | 43 | Nov-16 | 4.5 | 2780 | 0.47 |
| 20 | Jun-05 | 4.5 | 2116 | -1.08 | 44 | Jun-17 | 4.5 | 2250 | -0.77 |
| 21 | Dec-05 | 4.5 | 2830 | 0.59 | 45 | Nov-17 | 4.5 | 2540 | -0.09 |
| 22 | Jun-06 | 4.5 | 2065 | -1.20 | 46 | Jun-18 | 4.5 | 2420 | -0.37 |
| 23 | Nov-06 | 4.5 | 2830 | 0.59 | 47 | Nov-18 | 4.5 | 3010 | 1.01 |
| 24 | Jun-07 | 4.5 | 2770 | 0.45 | | | | | |
| 25 | Nov-07 | 4.5 | 3000 | 0.98 | | | | | |
| 26 | Jul-08 | 4.5 | 3060 | 1.12 | | | | | |
| 27 | Nov-08 | 4.5 | 3290 | 1.66 | | | | | |
| 28 | Jun-09 | 4.5 | 2700 | 0.28 | | | | | |
| 29 | Nov-09 | 4.5 | 3030 | 1.05 | | | | | |
| 30 | Jun-10 | 4.5 | 3030 | 1.05 | | | | | |
| 31 | Nov-10 | 4.5 | 2910 | 0.77 | | | | | |
| 32 | Jun-11 | 4.5 | 2600 | 0.05 | | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

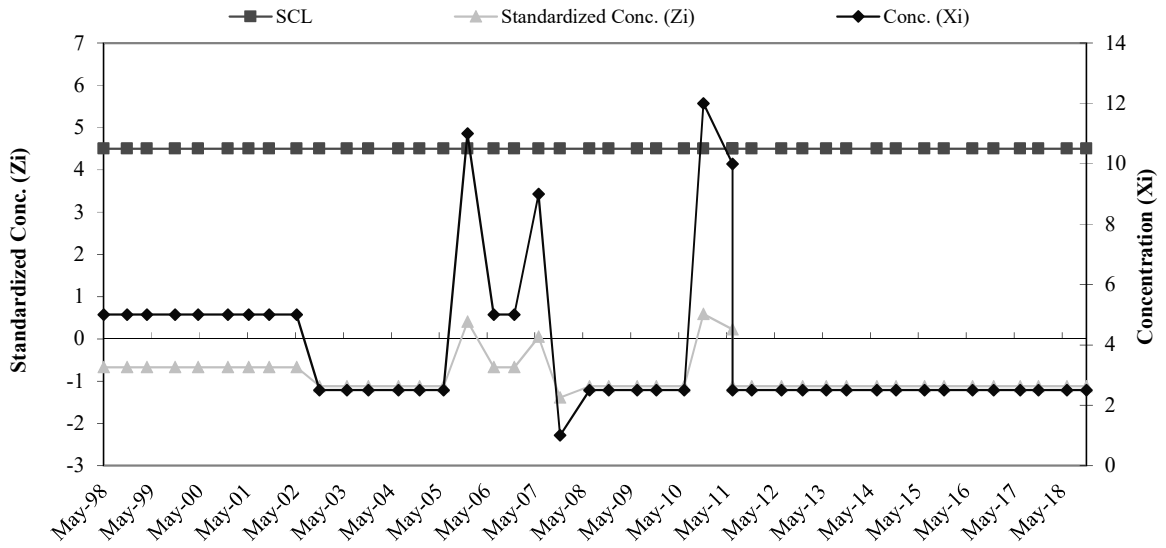


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-18a Cr**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-95 | 10 | | |
| 2 | Aug-95 | 10 | | |
| 3 | Feb-96 | 10 | | |
| 4 | Jun-96 | 10 | **8.74** | **5.57** |
| 5 | Aug-96 | 10 | | |
| 6 | Nov-96 | 10 | | |
| 7 | May-97 | 5 | | |
| 8 | Nov-97 | 5 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) | Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|---|---|---|---|---|
| 9 | May-98 | 4.5 | 5 | -0.67 | 37 | Nov-11 | 4.5 | 2.5 | -1.12 |
| 10 | Nov-98 | 4.5 | 5 | -0.67 | 38 | Jun-12 | 4.5 | 2.5 | -1.12 |
| 11 | Apr-99 | 4.5 | 5 | -0.67 | 39 | Dec-12 | 4.5 | 2.5 | -1.12 |
| 12 | Nov-99 | 4.5 | 5 | -0.67 | 40 | Jun-13 | 4.5 | 2.5 | -1.12 |
| 13 | Apr-00 | 4.5 | 5 | -0.67 | 41 | Nov-13 | 4.5 | 2.5 | -1.12 |
| 14 | Dec-00 | 4.5 | 5 | -0.67 | 42 | Jun-14 | 4.5 | 2.5 | -1.12 |
| 15 | May-01 | 4.5 | 5 | -0.67 | 43 | Nov-14 | 4.5 | 2.5 | -1.12 |
| 16 | Oct-01 | 4.5 | 5 | -0.67 | 44 | Jun-15 | 4.5 | 2.5 | -1.12 |
| 17 | May-02 | 4.5 | 5 | -0.67 | 45 | Nov-15 | 4.5 | 2.5 | -1.12 |
| 18 | Nov-02 | 4.5 | 2.5 | -1.12 | 46 | Jun-16 | 4.5 | 2.5 | -1.12 |
| 19 | Jun-03 | 4.5 | 2.5 | -1.12 | 47 | Nov-16 | 4.5 | 2.5 | -1.12 |
| 20 | Nov-03 | 4.5 | 2.5 | -1.12 | 48 | Jun-17 | 4.5 | 2.5 | -1.12 |
| 21 | Jun-04 | 4.5 | 2.5 | -1.12 | 49 | Nov-17 | 4.5 | 2.5 | -1.12 |
| 22 | Dec-04 | 4.5 | 2.5 | -1.12 | 50 | Jun-18 | 4.5 | 2.5 | -1.12 |
| 23 | Jun-05 | 4.5 | 2.5 | -1.12 | 51 | Nov-18 | 4.5 | 2.5 | -1.12 |
| 24 | Dec-05 | 4.5 | 11 | 0.41 | | | | | |
| 25 | Jun-06 | 4.5 | 5 | -0.67 | | | | | |
| 26 | Nov-06 | 4.5 | 5 | -0.67 | | | | | |
| 27 | Jun-07 | 4.5 | 9 | 0.05 | | | | | |
| 28 | Nov-07 | 4.5 | 1 | -1.39 | | | | | |
| 29 | Jun-08 | 4.5 | 2.5 | -1.12 | | | | | |
| 30 | Nov-08 | 4.5 | 2.5 | -1.12 | | | | | |
| 31 | Jun-09 | 4.5 | 2.5 | -1.12 | | | | | |
| 32 | Nov-09 | 4.5 | 2.5 | -1.12 | | | | | |
| 33 | Jun-10 | 4.5 | 2.5 | -1.12 | | | | | |
| 34 | Nov-10 | 4.5 | 12 | 0.59 | | | | | |
| 35 | Jun-11 | 4.5 | 10 | 0.23 | | | | | |
| 36 | Jun-11 | 4.5 | 2.5 | -1.12 | | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

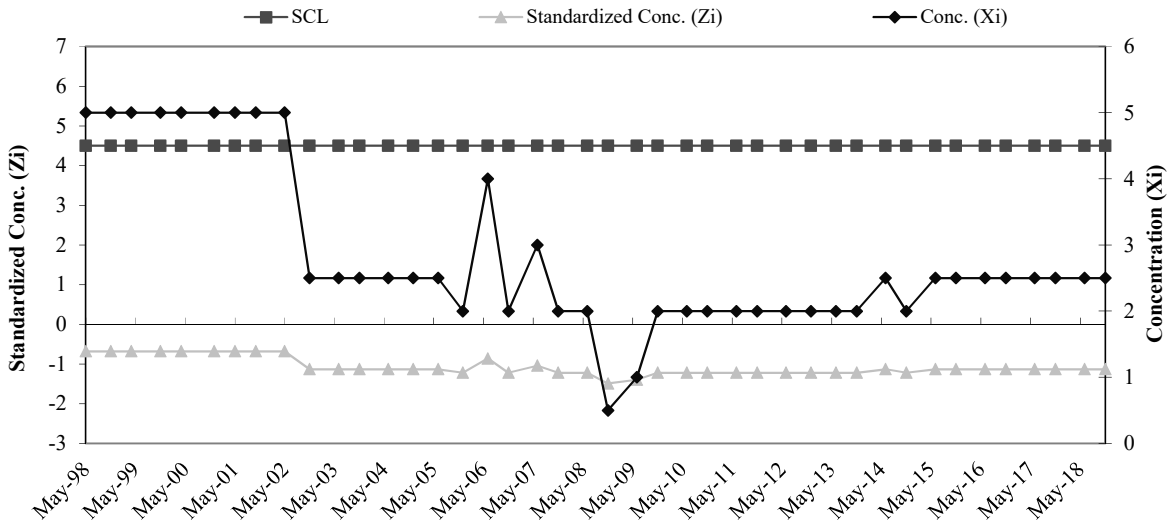


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-18a Cu**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-95 | 10 | **8.78** | **5.56** |
| 2 | Aug-95 | 10 | | |
| 3 | Feb-96 | 10 | | |
| 4 | Jun-96 | 10 | | |
| 5 | Aug-96 | 10 | | |
| 6 | Nov-96 | 10 | | |
| 7 | May-97 | 5 | | |
| 8 | Nov-97 | 5 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) | Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|---|---|---|---|---|
| 9 | May-98 | 4.5 | 5 | -0.68 | 36 | Nov-11 | 4.5 | 2 | -1.22 |
| 10 | Nov-98 | 4.5 | 5 | -0.68 | 37 | Jun-12 | 4.5 | 2 | -1.22 |
| 11 | Apr-99 | 4.5 | 5 | -0.68 | 38 | Dec-12 | 4.5 | 2 | -1.22 |
| 12 | Nov-99 | 4.5 | 5 | -0.68 | 39 | Jun-13 | 4.5 | 2 | -1.22 |
| 13 | Apr-00 | 4.5 | 5 | -0.68 | 40 | Nov-13 | 4.5 | 2 | -1.22 |
| 14 | Dec-00 | 4.5 | 5 | -0.68 | 41 | Jun-14 | 4.5 | 2.5 | -1.13 |
| 15 | May-01 | 4.5 | 5 | -0.68 | 42 | Nov-14 | 4.5 | 2 | -1.22 |
| 16 | Oct-01 | 4.5 | 5 | -0.68 | 43 | Jun-15 | 4.5 | 2.5 | -1.13 |
| 17 | May-02 | 4.5 | 5 | -0.68 | 44 | Nov-15 | 4.5 | 2.5 | -1.13 |
| 18 | Nov-02 | 4.5 | 2.5 | -1.13 | 45 | Jun-16 | 4.5 | 2.5 | -1.13 |
| 19 | Jun-03 | 4.5 | 2.5 | -1.13 | 46 | Nov-16 | 4.5 | 2.5 | -1.13 |
| 20 | Nov-03 | 4.5 | 2.5 | -1.13 | 47 | Jun-17 | 4.5 | 2.5 | -1.13 |
| 21 | Jun-04 | 4.5 | 2.5 | -1.13 | 48 | Nov-17 | 4.5 | 2.5 | -1.13 |
| 22 | Dec-04 | 4.5 | 2.5 | -1.13 | 49 | Jun-18 | 4.5 | 2.5 | -1.13 |
| 23 | Jun-05 | 4.5 | 2.5 | -1.13 | 50 | Nov-18 | 4.5 | 2.5 | -1.13 |
| 24 | Dec-05 | 4.5 | 2 | -1.22 | | | | | |
| 25 | Jun-06 | 4.5 | 4 | -0.86 | | | | | |
| 26 | Nov-06 | 4.5 | 2 | -1.22 | | | | | |
| 27 | Jun-07 | 4.5 | 3 | -1.04 | | | | | |
| 28 | Nov-07 | 4.5 | 2 | -1.22 | | | | | |
| 29 | Jun-08 | 4.5 | 2 | -1.22 | | | | | |
| 30 | Nov-08 | 4.5 | 0.5 | -1.49 | | | | | |
| 31 | Jun-09 | 4.5 | 1 | -1.40 | | | | | |
| 32 | Nov-09 | 4.5 | 2 | -1.22 | | | | | |
| 33 | Jun-10 | 4.5 | 2 | -1.22 | | | | | |
| 34 | Nov-10 | 4.5 | 2 | -1.22 | | | | | |
| 35 | Jun-11 | 4.5 | 2 | -1.22 | | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

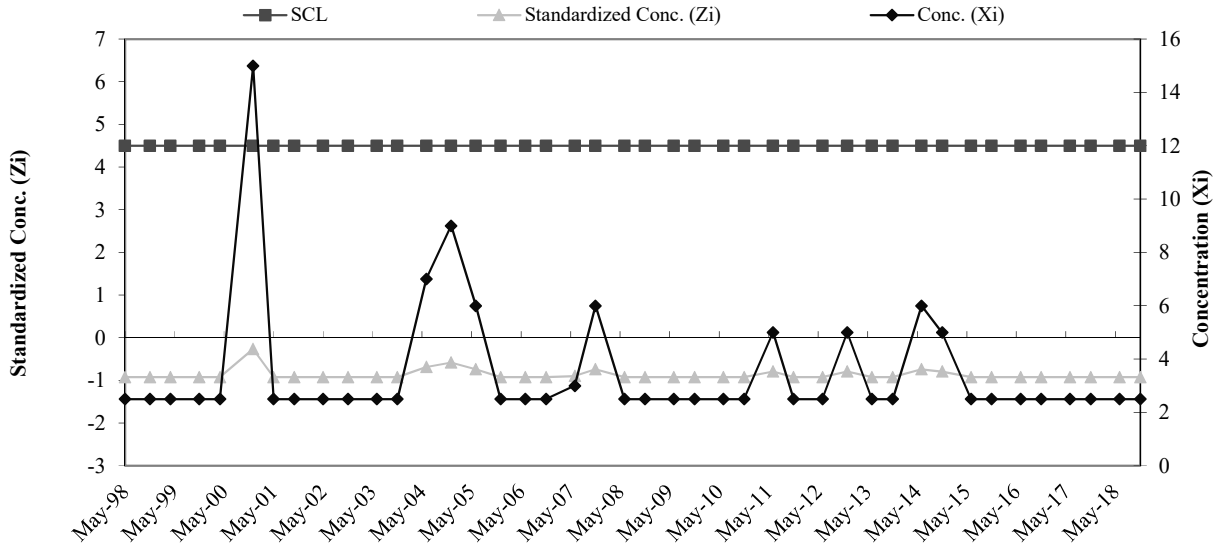


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-18a Ni**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-95 | 15 | | |
| 2 | Aug-95 | 20 | | |
| 3 | Feb-96 | 20 | | |
| 4 | Jun-96 | 10 | **20.01** | **18.96** |
| 5 | Aug-96 | 10 | | |
| 6 | Nov-96 | 10 | | |
| 7 | May-97 | 13 | | |
| 8 | Nov-97 | 62 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) | Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|---|---|---|---|---|
| 9 | May-98 | 4.5 | 2.5 | -0.92 | 36 | Nov-11 | 4.5 | 2.5 | -0.92 |
| 10 | Nov-98 | 4.5 | 2.5 | -0.92 | 37 | Jun-12 | 4.5 | 2.5 | -0.92 |
| 11 | Apr-99 | 4.5 | 2.5 | -0.92 | 38 | Dec-12 | 4.5 | 5 | -0.79 |
| 12 | Nov-99 | 4.5 | 2.5 | -0.92 | 39 | Jun-13 | 4.5 | 2.5 | -0.92 |
| 13 | Apr-00 | 4.5 | 2.5 | -0.92 | 40 | Nov-13 | 4.5 | 2.5 | -0.92 |
| 14 | Dec-00 | 4.5 | 15 | -0.26 | 41 | Jun-14 | 4.5 | 6 | -0.74 |
| 15 | May-01 | 4.5 | 2.5 | -0.92 | 42 | Nov-14 | 4.5 | 5 | -0.79 |
| 16 | Oct-01 | 4.5 | 2.5 | -0.92 | 43 | Jun-15 | 4.5 | 2.5 | -0.92 |
| 17 | May-02 | 4.5 | 2.5 | -0.92 | 44 | Nov-15 | 4.5 | 2.5 | -0.92 |
| 18 | Nov-02 | 4.5 | 2.5 | -0.92 | 45 | Jun-16 | 4.5 | 2.5 | -0.92 |
| 19 | Jun-03 | 4.5 | 2.5 | -0.92 | 46 | Nov-16 | 4.5 | 2.5 | -0.92 |
| 20 | Nov-03 | 4.5 | 2.5 | -0.92 | 47 | Jun-17 | 4.5 | 2.5 | -0.92 |
| 21 | Jun-04 | 4.5 | 7 | -0.69 | 48 | Nov-17 | 4.5 | 2.5 | -0.92 |
| 22 | Dec-04 | 4.5 | 9 | -0.58 | 49 | Jun-18 | 4.5 | 2.5 | -0.92 |
| 23 | Jun-05 | 4.5 | 6 | -0.74 | 50 | Nov-18 | 4.5 | 2.5 | -0.92 |
| 24 | Dec-05 | 4.5 | 2.5 | -0.92 | | | | | |
| 25 | Jun-06 | 4.5 | 2.5 | -0.92 | | | | | |
| 26 | Nov-06 | 4.5 | 2.5 | -0.92 | | | | | |
| 27 | Jun-07 | 4.5 | 3 | -0.90 | | | | | |
| 28 | Nov-07 | 4.5 | 6 | -0.74 | | | | | |
| 29 | Jun-08 | 4.5 | 2.5 | -0.92 | | | | | |
| 30 | Nov-08 | 4.5 | 2.5 | -0.92 | | | | | |
| 31 | Jun-09 | 4.5 | 2.5 | -0.92 | | | | | |
| 32 | Nov-09 | 4.5 | 2.5 | -0.92 | | | | | |
| 33 | Jun-10 | 4.5 | 2.5 | -0.92 | | | | | |
| 34 | Nov-10 | 4.5 | 2.5 | -0.92 | | | | | |
| 35 | Jun-11 | 4.5 | 5 | -0.79 | | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

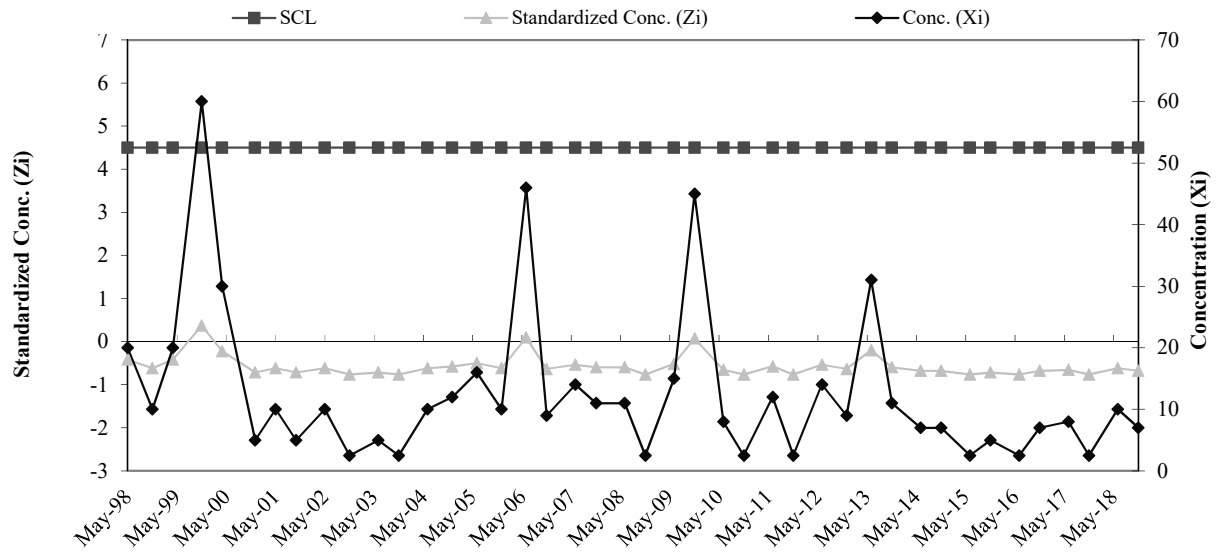


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-18a Zn**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-95 | 150 | | |
| 2 | Aug-95 | 10 | | |
| 3 | Feb-96 | 10 | | |
| 4 | Jun-96 | 10 | **41.25** | **50.67** |
| 5 | Aug-96 | 60 | | |
| 6 | Nov-96 | 70 | | |
| 7 | May-97 | 10 | | |
| 8 | Nov-97 | 10 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) | Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|---|---|---|---|---|
| 9 | May-98 | 4.5 | 20 | -0.42 | 36 | Nov-11 | 4.5 | 2.5 | -0.76 |
| 10 | Nov-98 | 4.5 | 10 | -0.62 | 37 | Jun-12 | 4.5 | 14 | -0.54 |
| 11 | Apr-99 | 4.5 | 20 | -0.42 | 38 | Dec-12 | 4.5 | 9 | -0.64 |
| 12 | Nov-99 | 4.5 | 60 | 0.37 | 39 | Jun-13 | 4.5 | 31 | -0.20 |
| 13 | Apr-00 | 4.5 | 30 | -0.22 | 40 | Nov-13 | 4.5 | 11 | -0.60 |
| 14 | Dec-00 | 4.5 | 5 | -0.72 | 41 | Jun-14 | 4.5 | 7 | -0.68 |
| 15 | May-01 | 4.5 | 10 | -0.62 | 42 | Nov-14 | 4.5 | 7 | -0.68 |
| 16 | Oct-01 | 4.5 | 5 | -0.72 | 43 | Jun-15 | 4.5 | 2.5 | -0.76 |
| 17 | May-02 | 4.5 | 10 | -0.62 | 44 | Nov-15 | 4.5 | 5 | -0.72 |
| 18 | Nov-02 | 4.5 | 2.5 | -0.76 | 45 | Jun-16 | 4.5 | 2.5 | -0.76 |
| 19 | Jun-03 | 4.5 | 5 | -0.72 | 46 | Nov-16 | 4.5 | 7 | -0.68 |
| 20 | Nov-03 | 4.5 | 2.5 | -0.76 | 47 | Jun-17 | 4.5 | 8 | -0.66 |
| 21 | Jun-04 | 4.5 | 10 | -0.62 | 48 | Nov-17 | 4.5 | 2.5 | -0.76 |
| 22 | Dec-04 | 4.5 | 12 | -0.58 | 49 | Jun-18 | 4.5 | 10 | -0.62 |
| 23 | Jun-05 | 4.5 | 16 | -0.50 | 50 | Nov-18 | 4.5 | 7 | -0.68 |
| 24 | Dec-05 | 4.5 | 10 | -0.62 | | | | | |
| 25 | Jun-06 | 4.5 | 46 | 0.09 | | | | | |
| 26 | Nov-06 | 4.5 | 9 | -0.64 | | | | | |
| 27 | Jun-07 | 4.5 | 14 | -0.54 | | | | | |
| 28 | Nov-07 | 4.5 | 11 | -0.60 | | | | | |
| 29 | Jun-08 | 4.5 | 11 | -0.60 | | | | | |
| 30 | Nov-08 | 4.5 | 2.5 | -0.76 | | | | | |
| 31 | Jun-09 | 4.5 | 15 | -0.52 | | | | | |
| 32 | Nov-09 | 4.5 | 45 | 0.07 | | | | | |
| 33 | Jun-10 | 4.5 | 8 | -0.66 | | | | | |
| 34 | Nov-10 | 4.5 | 2.5 | -0.76 | | | | | |
| 35 | Jun-11 | 4.5 | 12 | -0.58 | | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

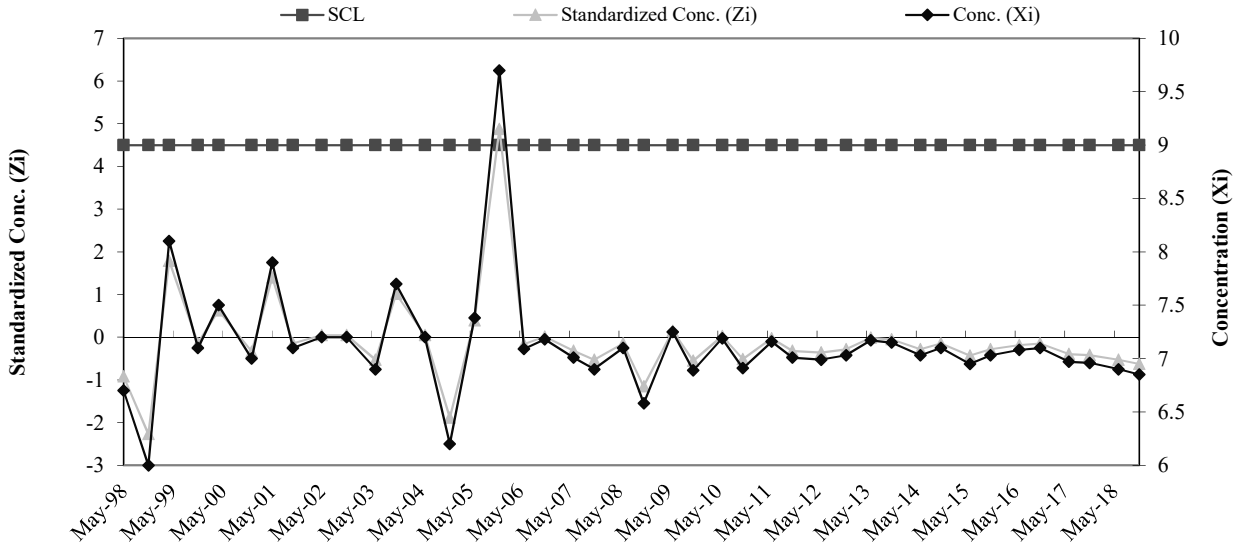


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-18a pH**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-95 | 7.5 | **7.18** | **0.52** |
| 2 | Aug-95 | 7.9 | | |
| 3 | Feb-96 | 7.4 | | |
| 4 | Jun-96 | 7.0 | | |
| 5 | Aug-96 | 7.5 | | |
| 6 | Nov-96 | 7.2 | | |
| 7 | May-97 | 6.5 | | |
| 8 | Nov-97 | 6.4 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) | Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|---|---|---|---|---|
| 9 | May-98 | 4.5 | 6.7 | -0.92 | 36 | Nov-11 | 4.5 | 7.0 | -0.32 |
| 10 | Nov-98 | 4.5 | 6.0 | -2.27 | 37 | Jun-12 | 4.5 | 7.0 | -0.36 |
| 11 | Apr-99 | 4.5 | 8.1 | 1.79 | 38 | Dec-12 | 4.5 | 7.0 | -0.28 |
| 12 | Nov-99 | 4.5 | 7.1 | -0.14 | 39 | Jun-13 | 4.5 | 7.2 | -0.01 |
| 13 | Apr-00 | 4.5 | 7.5 | 0.63 | 40 | Nov-13 | 4.5 | 7.2 | -0.05 |
| 14 | Dec-00 | 4.5 | 7.0 | -0.34 | 41 | Jun-14 | 4.5 | 7.0 | -0.28 |
| 15 | May-01 | 4.5 | 7.9 | 1.40 | 42 | Nov-14 | 4.5 | 7.1 | -0.14 |
| 16 | Oct-01 | 4.5 | 7.1 | -0.14 | 43 | Jun-15 | 4.5 | 7.0 | -0.43 |
| 17 | May-02 | 4.5 | 7.2 | 0.05 | 44 | Nov-15 | 4.5 | 7.0 | -0.28 |
| 18 | Nov-02 | 4.5 | 7.2 | 0.05 | 45 | Jun-16 | 4.5 | 7.1 | -0.18 |
| 19 | Jun-03 | 4.5 | 6.9 | -0.53 | 46 | Nov-16 | 4.5 | 7.1 | -0.14 |
| 20 | Nov-03 | 4.5 | 7.7 | 1.01 | 47 | Jun-17 | 4.5 | 7.0 | -0.40 |
| 21 | Jun-04 | 4.5 | 7.2 | 0.05 | 48 | Nov-17 | 4.5 | 7.0 | -0.42 |
| 22 | Dec-04 | 4.5 | 6.2 | -1.88 | 49 | Jun-18 | 4.5 | 6.9 | -0.53 |
| 23 | Jun-05 | 4.5 | 7.4 | 0.40 | 50 | Nov-18 | 4.5 | 6.9 | -0.63 |
| 24 | Dec-05 | 4.5 | 9.7 | 4.88 | | | | | |
| 25 | Jun-06 | 4.5 | 7.1 | -0.16 | | | | | |
| 26 | Nov-06 | 4.5 | 7.2 | 0.01 | | | | | |
| 27 | Jun-07 | 4.5 | 7.0 | -0.32 | | | | | |
| 28 | Nov-07 | 4.5 | 6.9 | -0.53 | | | | | |
| 29 | Jun-08 | 4.5 | 7.1 | -0.14 | | | | | |
| 30 | Nov-08 | 4.5 | 6.6 | -1.15 | | | | | |
| 31 | Jun-09 | 4.5 | 7.3 | 0.14 | | | | | |
| 32 | Nov-09 | 4.5 | 6.9 | -0.55 | | | | | |
| 33 | Jun-10 | 4.5 | 7.2 | 0.03 | | | | | |
| 34 | Nov-10 | 4.5 | 6.9 | -0.51 | | | | | |
| 35 | Jun-11 | 4.5 | 7.2 | -0.03 | | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

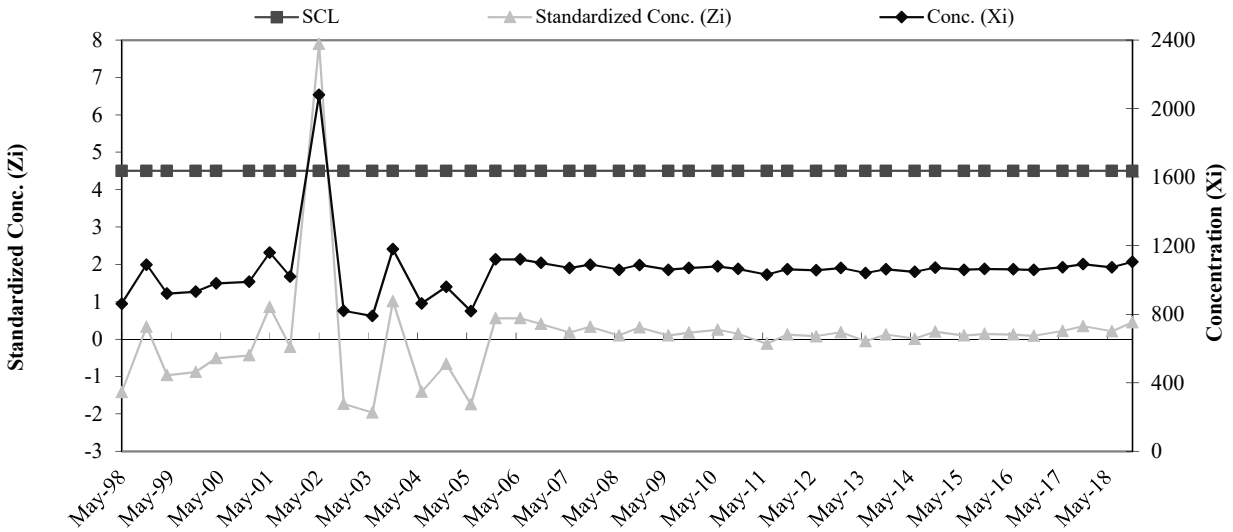


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-18a SpC**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-95 | 1048 | | |
| 2 | Aug-95 | 989 | | |
| 3 | Feb-96 | 1021 | | |
| 4 | Jun-96 | 944.0 | **1,046.75** | **130.80** |
| 5 | Aug-96 | 1041 | | |
| 6 | Nov-96 | 1331 | | |
| 7 | May-97 | 900 | | |
| 8 | Nov-97 | 1100 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) | Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|---|---|---|---|---|
| 9 | May-98 | 4.5 | 862 | -1.41 | 36 | Nov-11 | 4.5 | 1063 | 0.12 |
| 10 | Nov-98 | 4.5 | 1090.0 | 0.33 | 37 | Jun-12 | 4.5 | 1057 | 0.08 |
| 11 | Apr-99 | 4.5 | 921 | -0.96 | 38 | Dec-12 | 4.5 | 1071 | 0.19 |
| 12 | Nov-99 | 4.5 | 932 | -0.88 | 39 | Jun-13 | 4.5 | 1040 | -0.05 |
| 13 | Apr-00 | 4.5 | 980 | -0.51 | 40 | Nov-13 | 4.5 | 1063 | 0.12 |
| 14 | Dec-00 | 4.5 | 990.0 | -0.43 | 41 | Jun-14 | 4.5 | 1048 | 0.01 |
| 15 | May-01 | 4.5 | 1160 | 0.87 | 42 | Nov-14 | 4.5 | 1073 | 0.20 |
| 16 | Oct-01 | 4.5 | 1020 | -0.20 | 43 | Jun-15 | 4.5 | 1060 | 0.10 |
| 17 | May-02 | 4.5 | 2080 | 7.90 | 44 | Nov-15 | 4.5 | 1065 | 0.14 |
| 18 | Nov-02 | 4.5 | 820 | -1.73 | 45 | Jun-16 | 4.5 | 1063 | 0.12 |
| 19 | Jun-03 | 4.5 | 790 | -1.96 | 46 | Nov-16 | 4.5 | 1059 | 0.09 |
| 20 | Nov-03 | 4.5 | 1180 | 1.02 | 47 | Jun-17 | 4.5 | 1075 | 0.22 |
| 21 | Jun-04 | 4.5 | 863 | -1.40 | 48 | Nov-17 | 4.5 | 1092 | 0.35 |
| 22 | Dec-04 | 4.5 | 960 | -0.66 | 49 | Jun-18 | 4.5 | 1074 | 0.21 |
| 23 | Jun-05 | 4.5 | 819 | -1.74 | 50 | Nov-18 | 4.5 | 1106 | 0.45 |
| 24 | Dec-05 | 4.5 | 1120 | 0.56 | | | | | |
| 25 | Jun-06 | 4.5 | 1120 | 0.56 | | | | | |
| 26 | Nov-06 | 4.5 | 1100 | 0.41 | | | | | |
| 27 | Jun-07 | 4.5 | 1070 | 0.18 | | | | | |
| 28 | Nov-07 | 4.5 | 1090 | 0.33 | | | | | |
| 29 | Jun-08 | 4.5 | 1060 | 0.10 | | | | | |
| 30 | Nov-08 | 4.5 | 1088 | 0.32 | | | | | |
| 31 | Jun-09 | 4.5 | 1060 | 0.10 | | | | | |
| 32 | Nov-09 | 4.5 | 1070 | 0.18 | | | | | |
| 33 | Jun-10 | 4.5 | 1080 | 0.25 | | | | | |
| 34 | Nov-10 | 4.5 | 1065 | 0.14 | | | | | |
| 35 | Jun-11 | 4.5 | 1031 | -0.12 | | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

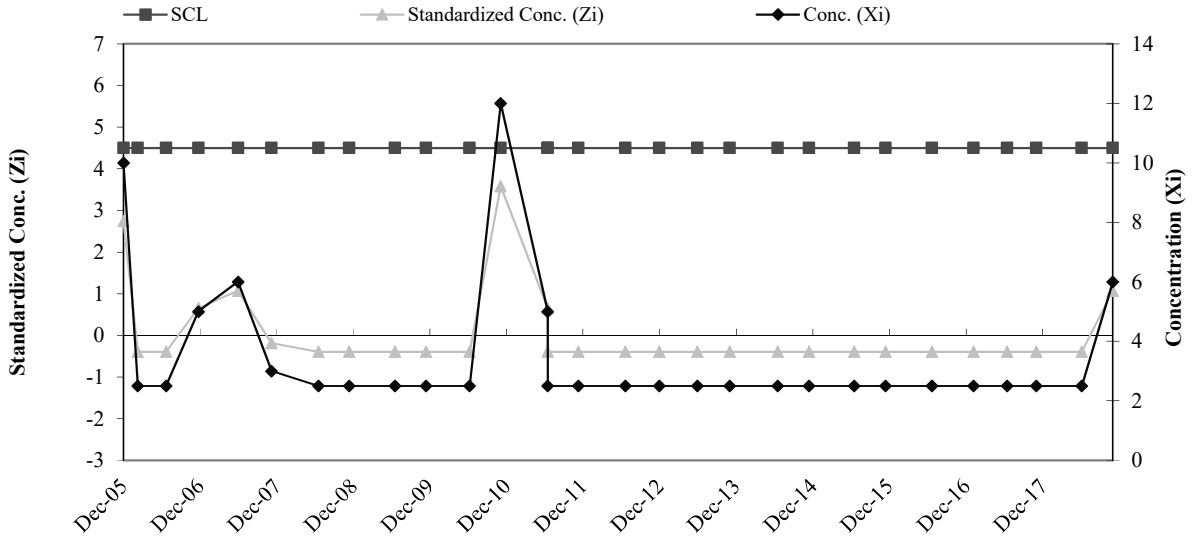


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-19a Cr**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | May-98 | 5 | | |
| 2 | May-01 | 5 | | |
| 3 | May-02 | 5 | | |
| 4 | Jun-03 | 2.5 | **3.44** | **2.39** |
| 5 | Nov-03 | 2.5 | | |
| 6 | Jun-04 | 2.5 | | |
| 7 | Dec-04 | 2.5 | | |
| 8 | Jun-05 | 2.5 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) | Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|---|---|---|---|---|
| 9 | Dec-05 | 4.5 | 10 | 2.74 | 37 | Nov-18 | 4.5 | 6 | 1.07 |
| 10 | Feb-06 | 4.5 | 2.5 | -0.39 | | | | | |
| 11 | Jun-06 | 4.5 | 2.5 | -0.39 | | | | | |
| 12 | Nov-06 | 4.5 | 5 | 0.65 | | | | | |
| 13 | Jun-07 | 4.5 | 6 | 1.07 | | | | | |
| 14 | Nov-07 | 4.5 | 3 | -0.18 | | | | | |
| 15 | Jun-08 | 4.5 | 2.5 | -0.39 | | | | | |
| 16 | Nov-08 | 4.5 | 2.5 | -0.39 | | | | | |
| 17 | Jun-09 | 4.5 | 2.5 | -0.39 | | | | | |
| 18 | Nov-09 | 4.5 | 2.5 | -0.39 | | | | | |
| 19 | Jun-10 | 4.5 | 2.5 | -0.39 | | | | | |
| 20 | Nov-10 | 4.5 | 12 | 3.58 | | | | | |
| 21 | Jun-11 | 4.5 | 5 | 0.65 | | | | | |
| 22 | Jun-11 | 4.5 | 2.5 | -0.39 | | | | | |
| 23 | Nov-11 | 4.5 | 2.5 | -0.39 | | | | | |
| 24 | Jun-12 | 4.5 | 2.5 | -0.39 | | | | | |
| 25 | Dec-12 | 4.5 | 2.5 | -0.39 | | | | | |
| 26 | Jun-13 | 4.5 | 2.5 | -0.39 | | | | | |
| 27 | Nov-13 | 4.5 | 2.5 | -0.39 | | | | | |
| 28 | Jun-14 | 4.5 | 2.5 | -0.39 | | | | | |
| 29 | Nov-14 | 4.5 | 2.5 | -0.39 | | | | | |
| 30 | Jun-15 | 4.5 | 2.5 | -0.39 | | | | | |
| 31 | Nov-15 | 4.5 | 2.5 | -0.39 | | | | | |
| 32 | Jun-16 | 4.5 | 2.5 | -0.39 | | | | | |
| 33 | Jan-17 | 4.5 | 2.5 | -0.39 | | | | | |
| 34 | Jun-17 | 4.5 | 2.5 | -0.39 | | | | | |
| 35 | Nov-17 | 4.5 | 2.5 | -0.39 | | | | | |
| 36 | Jun-18 | 4.5 | 2.5 | -0.39 | | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

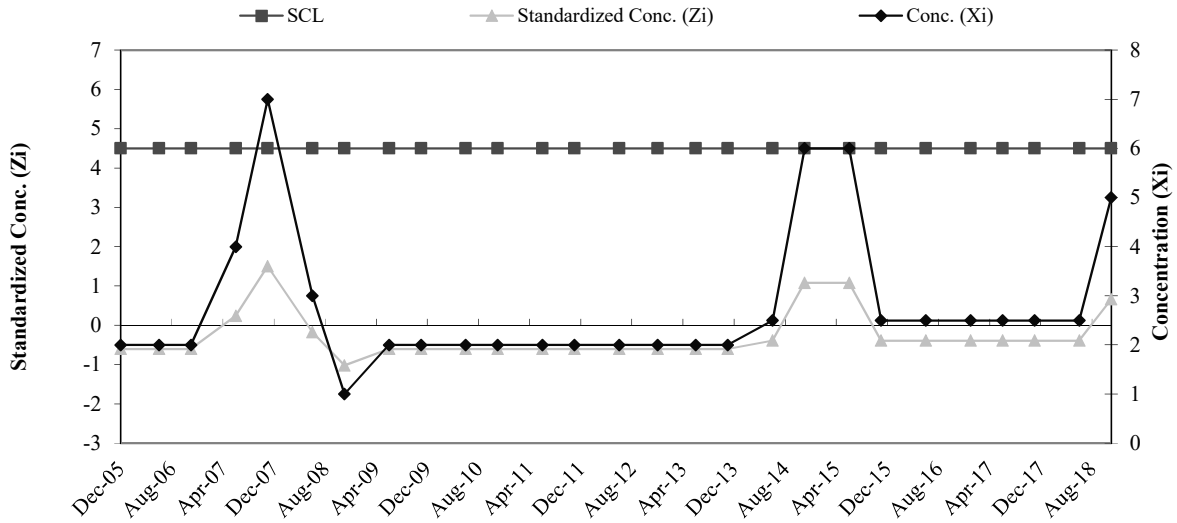


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-19a Cu**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | May-98 | 5 | | |
| 2 | May-01 | 5 | | |
| 3 | May-02 | 5 | | |
| 4 | Jun-03 | 2.5 | **3.43** | **2.38** |
| 5 | Nov-03 | 2.5 | | |
| 6 | Jun-04 | 2.5 | | |
| 7 | Dec-04 | 2.5 | | |
| 8 | Jun-05 | 2.5 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|
| 9 | Dec-05 | 4.5 | 2 | -0.60 |
| 10 | Jun-06 | 4.5 | 2 | -0.60 |
| 11 | Nov-06 | 4.5 | 2 | -0.60 |
| 12 | Jun-07 | 4.5 | 4 | 0.24 |
| 13 | Nov-07 | 4.5 | 7 | 1.50 |
| 14 | Jun-08 | 4.5 | 3 | -0.18 |
| 15 | Nov-08 | 4.5 | 1 | -1.02 |
| 16 | Jun-09 | 4.5 | 2 | -0.60 |
| 17 | Nov-09 | 4.5 | 2 | -0.60 |
| 18 | Jun-10 | 4.5 | 2 | -0.60 |
| 19 | Nov-10 | 4.5 | 2 | -0.60 |
| 20 | Jun-11 | 4.5 | 2 | -0.60 |
| 21 | Nov-11 | 4.5 | 2 | -0.60 |
| 22 | Jun-12 | 4.5 | 2 | -0.60 |
| 23 | Dec-12 | 4.5 | 2 | -0.60 |
| 24 | Jun-13 | 4.5 | 2 | -0.60 |
| 25 | Nov-13 | 4.5 | 2 | -0.60 |
| 26 | Jun-14 | 4.5 | 2.5 | -0.39 |
| 27 | Nov-14 | 4.5 | 6 | 1.08 |
| 28 | Jun-15 | 4.5 | 6 | 1.08 |
| 29 | Nov-15 | 4.5 | 2.5 | -0.39 |
| 30 | Jun-16 | 4.5 | 2.5 | -0.39 |
| 31 | Jan-17 | 4.5 | 2.5 | -0.39 |
| 32 | Jun-17 | 4.5 | 2.5 | -0.39 |
| 33 | Nov-17 | 4.5 | 2.5 | -0.39 |
| 34 | Jun-18 | 4.5 | 2.5 | -0.39 |
| 35 | Nov-18 | 4.5 | 5 | 0.66 |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

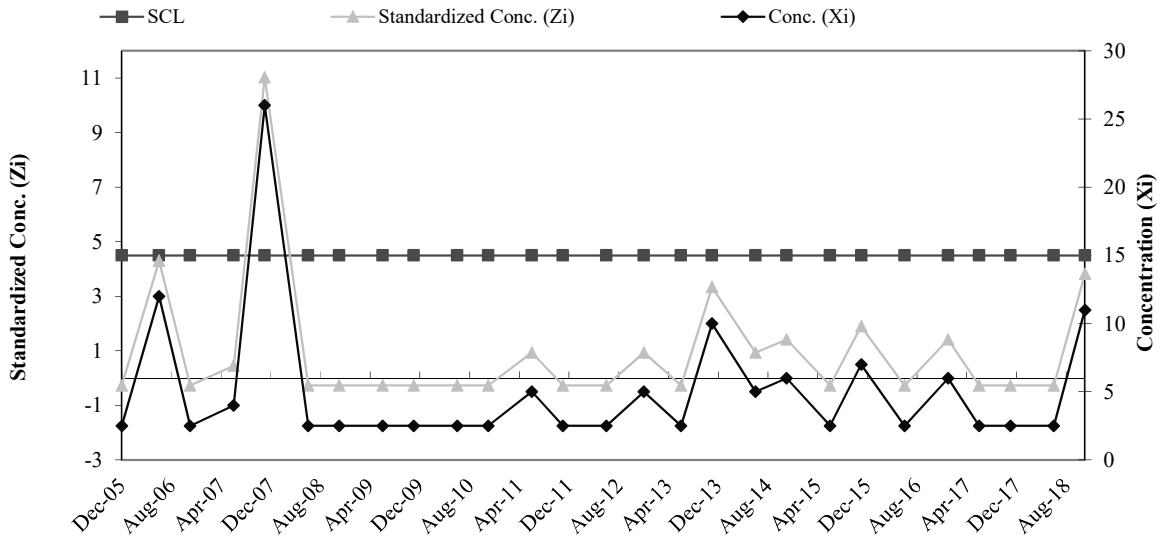


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-19a Ni**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | May-98 | 2.5 | | |
| 2 | May-01 | 2.5 | | |
| 3 | May-02 | 2.5 | | |
| 4 | Jun-03 | 2.5 | **3.06** | **2.08** |
| 5 | Nov-03 | 2.5 | | |
| 6 | Jun-04 | 2.5 | | |
| 7 | Dec-04 | 2.5 | | |
| 8 | Jun-05 | 7 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|
| 9 | Dec-05 | 4.5 | 2.5 | -0.27 |
| 10 | Jun-06 | 4.5 | 12 | 4.30 |
| 11 | Nov-06 | 4.5 | 2.5 | -0.27 |
| 12 | Jun-07 | 4.5 | 4 | 0.45 |
| 13 | Nov-07 | 4.5 | 26 | 11.03 |
| 14 | Jun-08 | 4.5 | 2.5 | -0.27 |
| 15 | Nov-08 | 4.5 | 2.5 | -0.27 |
| 16 | Jun-09 | 4.5 | 2.5 | -0.27 |
| 17 | Nov-09 | 4.5 | 2.5 | -0.27 |
| 19 | Jun-10 | 4.5 | 2.5 | -0.27 |
| 20 | Nov-10 | 4.5 | 2.5 | -0.27 |
| 21 | Jun-11 | 4.5 | 5 | 0.93 |
| 22 | Nov-11 | 4.5 | 2.5 | -0.27 |
| 23 | Jun-12 | 4.5 | 2.5 | -0.27 |
| 24 | Dec-12 | 4.5 | 5 | 0.93 |
| 25 | Jun-13 | 4.5 | 2.5 | -0.27 |
| 26 | Nov-13 | 4.5 | 10 | 3.34 |
| 27 | Jun-14 | 4.5 | 5 | 0.93 |
| 28 | Nov-14 | 4.5 | 6 | 1.41 |
| 29 | Jun-15 | 4.5 | 2.5 | -0.27 |
| 30 | Nov-15 | 4.5 | 7 | 1.89 |
| 31 | Jun-16 | 4.5 | 2.5 | -0.27 |
| 32 | Jan-17 | 4.5 | 6 | 1.41 |
| 33 | Jun-17 | 4.5 | 2.5 | -0.27 |
| 34 | Nov-17 | 4.5 | 2.5 | -0.27 |
| 35 | Jun-18 | 4.5 | 2.5 | -0.27 |
| 36 | Nov-18 | 4.5 | 11 | 3.82 |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

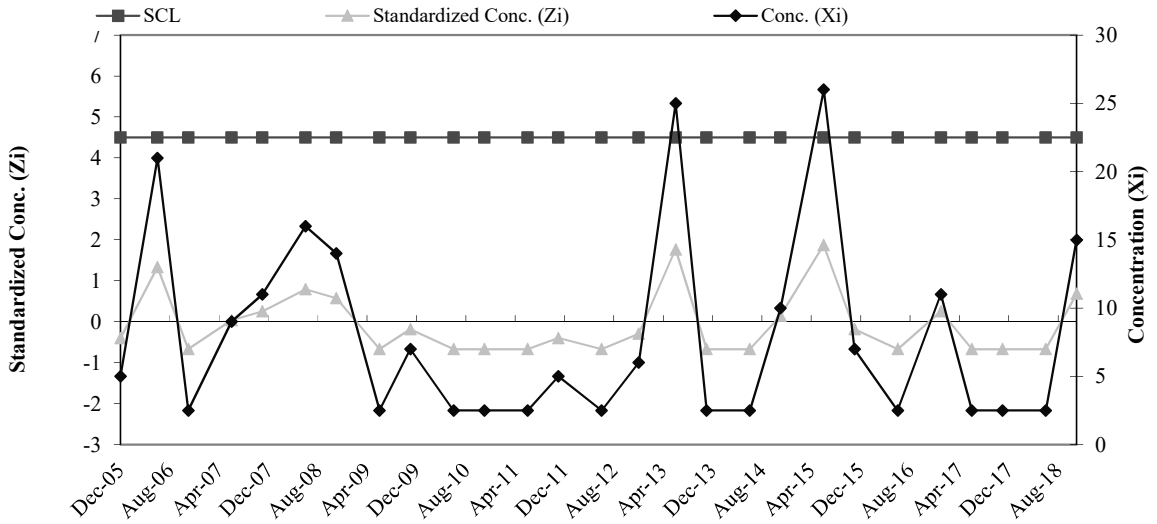


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-19a Zn**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | May-98 | 30 | | |
| 2 | May-01 | 5 | | |
| 3 | May-02 | 10 | | |
| 4 | Jun-03 | 2.5 | **8.69** | **9.24** |
| 5 | Nov-03 | 2.5 | | |
| 6 | Jun-04 | 8 | | |
| 7 | Dec-04 | 9 | | |
| 8 | Jun-05 | 2.5 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|
| 9 | Dec-05 | 4.5 | 5 | -0.40 |
| 10 | Jun-06 | 4.5 | 21 | 1.33 |
| 11 | Nov-06 | 4.5 | 2.5 | -0.67 |
| 12 | Jun-07 | 4.5 | 9 | 0.03 |
| 13 | Nov-07 | 4.5 | 11 | 0.25 |
| 14 | Jun-08 | 4.5 | 16 | 0.79 |
| 15 | Nov-08 | 4.5 | 14 | 0.57 |
| 16 | Jun-09 | 4.5 | 2.5 | -0.67 |
| 17 | Nov-09 | 4.5 | 7 | -0.18 |
| 18 | Jun-10 | 4.5 | 2.5 | -0.67 |
| 19 | Nov-10 | 4.5 | 2.5 | -0.67 |
| 20 | Jun-11 | 4.5 | 2.5 | -0.67 |
| 21 | Nov-11 | 4.5 | 5 | -0.40 |
| 22 | Jun-12 | 4.5 | 2.5 | -0.67 |
| 23 | Dec-12 | 4.5 | 6 | -0.29 |
| 24 | Jun-13 | 4.5 | 25 | 1.77 |
| 25 | Nov-13 | 4.5 | 2.5 | -0.67 |
| 26 | Jun-14 | 4.5 | 2.5 | -0.67 |
| 27 | Nov-14 | 4.5 | 10 | 0.14 |
| 28 | Jun-15 | 4.5 | 26 | 1.87 |
| 29 | Nov-15 | 4.5 | 7 | -0.18 |
| 30 | Jun-16 | 4.5 | 2.5 | -0.67 |
| 31 | Jan-17 | 4.5 | 11 | 0.25 |
| 32 | Jun-17 | 4.5 | 2.5 | -0.67 |
| 33 | Nov-17 | 4.5 | 2.5 | -0.67 |
| 34 | Jun-18 | 4.5 | 2.5 | -0.67 |
| 35 | Nov-18 | 4.5 | 15 | 0.68 |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

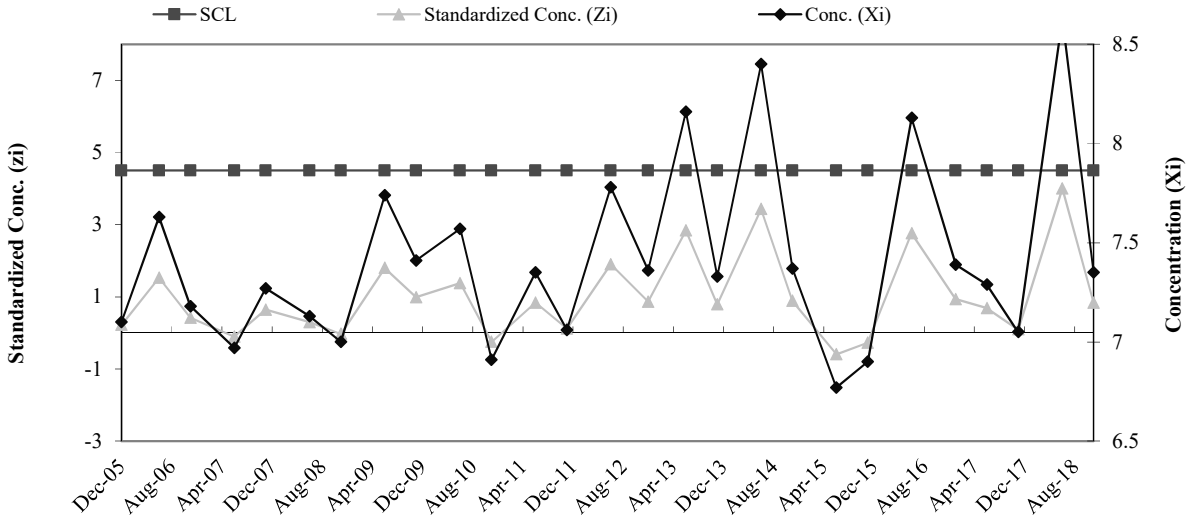


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-19a pH**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | May-98 | 6.8 | **7.01** | **0.40** |
| 2 | May-01 | 7.1 | | |
| 3 | May-02 | 7.2 | | |
| 4 | Jun-03 | 6.9 | | |
| 5 | Nov-03 | 7.6 | | |
| 6 | Jun-04 | 7.2 | | |
| 7 | Dec-04 | 6.2 | | |
| 8 | Jun-05 | 7.1 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|
| 9 | Dec-05 | 4.5 | 7.1 | 0.22 |
| 10 | Jun-06 | 4.5 | 7.6 | 1.53 |
| 11 | Nov-06 | 4.5 | 7.2 | 0.42 |
| 12 | Jun-07 | 4.5 | 7.0 | -0.10 |
| 13 | Nov-07 | 4.5 | 7.3 | 0.64 |
| 14 | Jun-08 | 4.5 | 7.1 | 0.29 |
| 15 | Nov-08 | 4.5 | 7.0 | -0.03 |
| 16 | Jun-09 | 4.5 | 7.7 | 1.80 |
| 17 | Nov-09 | 4.5 | 7.4 | 0.99 |
| 18 | Jun-10 | 4.5 | 7.6 | 1.38 |
| 19 | Nov-10 | 4.5 | 6.9 | -0.25 |
| 20 | Jun-11 | 4.5 | 7.4 | 0.84 |
| 21 | Nov-11 | 4.5 | 7.1 | 0.12 |
| 22 | Jun-12 | 4.5 | 7.8 | 1.90 |
| 23 | Dec-12 | 4.5 | 7.4 | 0.86 |
| 24 | Jun-13 | 4.5 | 8.2 | 2.84 |
| 25 | Nov-13 | 4.5 | 7.3 | 0.79 |
| 26 | Jun-14 | 4.5 | 8.4 | 3.43 |
| 27 | Nov-14 | 4.5 | 7.4 | 0.89 |
| 28 | Jun-15 | 4.5 | 6.8 | -0.60 |
| 29 | Nov-15 | 4.5 | 6.9 | -0.27 |
| 30 | Jun-16 | 4.5 | 8.1 | 2.76 |
| 31 | Jan-17 | 4.5 | 7.4 | 0.94 |
| 32 | Jun-17 | 4.5 | 7.3 | 0.69 |
| 33 | Nov-17 | 4.5 | 7.1 | 0.10 |
| 34 | Jun-18 | 4.5 | 8.6 | 4.00 |
| 35 | Nov-18 | 4.5 | 7.4 | 0.84 |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

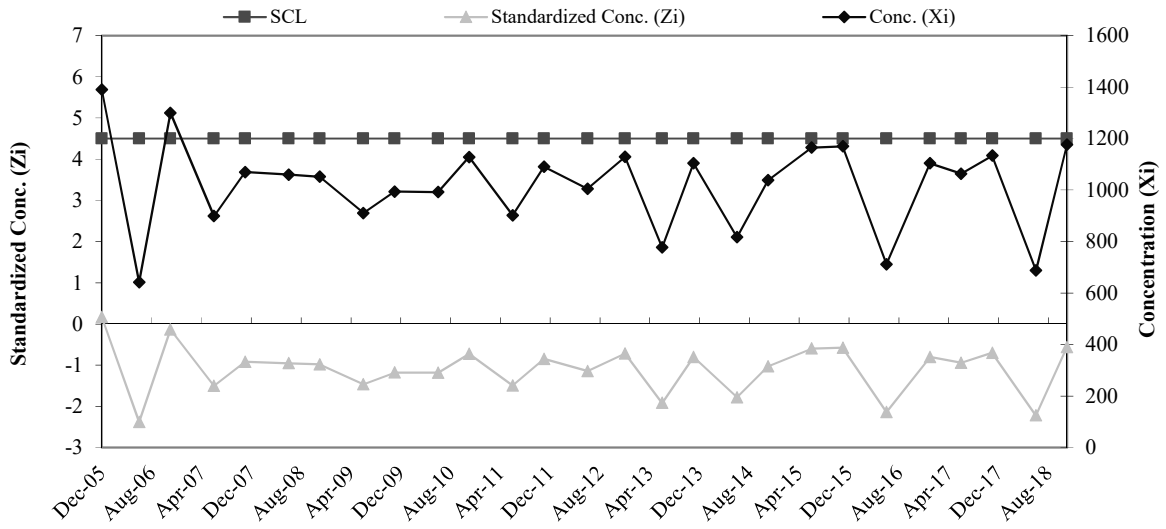


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-19a SpC**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | May-98 | 1480 | | |
| 2 | May-01 | 1050 | | |
| 3 | May-02 | 1740 | | |
| 4 | Jun-03 | 1350 | **1,340.63** | **293.72** |
| 5 | Nov-03 | 1620 | | |
| 6 | Jun-04 | 1316 | | |
| 7 | Dec-04 | 1340 | | |
| 8 | Jun-05 | 829 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|
| 9 | Dec-05 | 4.5 | 1390 | 0.17 |
| 10 | Jun-06 | 4.5 | 642 | -2.38 |
| 11 | Nov-06 | 4.5 | 1300 | -0.14 |
| 12 | Jun-07 | 4.5 | 899 | -1.50 |
| 13 | Nov-07 | 4.5 | 1070 | -0.92 |
| 14 | Jun-08 | 4.5 | 1060 | -0.96 |
| 15 | Nov-08 | 4.5 | 1052 | -0.98 |
| 16 | Jun-09 | 4.5 | 911 | -1.46 |
| 17 | Nov-09 | 4.5 | 994 | -1.18 |
| 18 | Jun-10 | 4.5 | 992 | -1.19 |
| 19 | Nov-10 | 4.5 | 1128 | -0.72 |
| 20 | Jun-11 | 4.5 | 902 | -1.49 |
| 21 | Nov-11 | 4.5 | 1091 | -0.85 |
| 22 | Jun-12 | 4.5 | 1005 | -1.14 |
| 23 | Dec-12 | 4.5 | 1129 | -0.72 |
| 24 | Jun-13 | 4.5 | 777 | -1.92 |
| 25 | Nov-13 | 4.5 | 1104 | -0.81 |
| 26 | Jun-14 | 4.5 | 817 | -1.78 |
| 27 | Nov-14 | 4.5 | 1038 | -1.03 |
| 28 | Jun-15 | 4.5 | 1165 | -0.60 |
| 29 | Nov-15 | 4.5 | 1170 | -0.58 |
| 30 | Jun-16 | 4.5 | 712 | -2.14 |
| 31 | Jan-17 | 4.5 | 1104 | -0.81 |
| 32 | Jun-17 | 4.5 | 1064 | -0.94 |
| 33 | Nov-17 | 4.5 | 1134 | -0.70 |
| 34 | Jun-18 | 4.5 | 688 | -2.22 |
| 35 | Nov-18 | 4.5 | 1176 | -0.56 |
| | | | | |
| | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

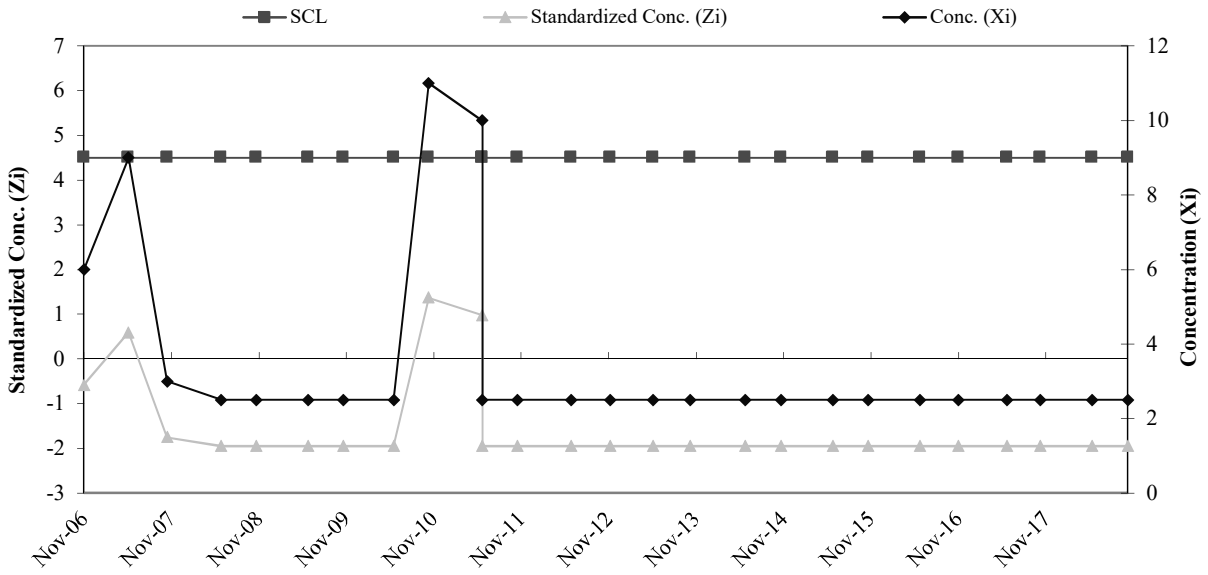


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-24 Cr**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Aug-96 | 10 | | |
| 2 | Nov-96 | 10 | | |
| 3 | May-97 | 5 | | |
| 4 | May-98 | 5 | **7.50** | **2.56** |
| 5 | Nov-03 | 5 | | |
| 6 | Jun-05 | 8 | | |
| 7 | Dec-05 | 11 | | |
| 8 | Jun-06 | 6 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|
| 9 | Nov-06 | 4.5 | 6 | -0.59 |
| 10 | Jun-07 | 4.5 | 9 | 0.59 |
| 11 | Nov-07 | 4.5 | 3 | -1.76 |
| 12 | Jun-08 | 4.5 | 2.5 | -1.95 |
| 13 | Nov-08 | 4.5 | 2.5 | -1.95 |
| 14 | Jun-09 | 4.5 | 2.5 | -1.95 |
| 15 | Nov-09 | 4.5 | 2.5 | -1.95 |
| 16 | Jun-10 | 4.5 | 2.5 | -1.95 |
| 17 | Nov-10 | 4.5 | 11 | 1.37 |
| 18 | Jun-11 | 4.5 | 10 | 0.98 |
| 19 | Jun-11 | 4.5 | 2.5 | -1.95 |
| 20 | Nov-11 | 4.5 | 2.5 | -1.95 |
| 21 | Jun-12 | 4.5 | 2.5 | -1.95 |
| 22 | Dec-12 | 4.5 | 2.5 | -1.95 |
| 23 | Jun-13 | 4.5 | 2.5 | -1.95 |
| 24 | Nov-13 | 4.5 | 2.5 | -1.95 |
| 25 | Jun-14 | 4.5 | 2.5 | -1.95 |
| 26 | Nov-14 | 4.5 | 2.5 | -1.95 |
| 27 | Jun-15 | 4.5 | 2.5 | -1.95 |
| 28 | Nov-15 | 4.5 | 2.5 | -1.95 |
| 29 | Jun-16 | 4.5 | 2.5 | -1.95 |
| 30 | Nov-16 | 4.5 | 2.5 | -1.95 |
| 31 | Jun-17 | 4.5 | 2.5 | -1.95 |
| 32 | Nov-17 | 4.5 | 2.5 | -1.95 |
| 33 | Jun-18 | 4.5 | 2.5 | -1.95 |
| 34 | Nov-18 | 4.5 | 2.5 | -1.95 |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

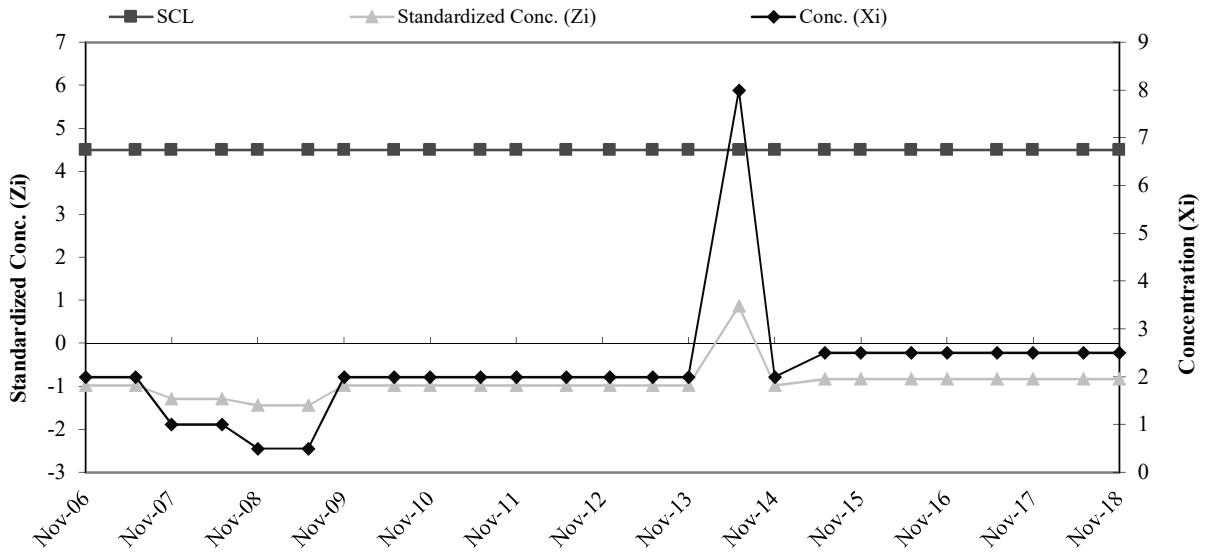


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-24 Cu**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Aug-96 | 10 | | |
| 2 | Nov-96 | 10 | | |
| 3 | May-97 | 5 | | |
| 4 | May-98 | 5 | **5.19** | **3.25** |
| 5 | Nov-03 | 5 | | |
| 6 | Jun-05 | 2.5 | | |
| 7 | Dec-05 | 2 | | |
| 8 | Jun-06 | 2 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|
| 9 | Nov-06 | 4.5 | 2 | -0.98 |
| 10 | Jun-07 | 4.5 | 2 | -0.98 |
| 11 | Nov-07 | 4.5 | 1 | -1.29 |
| 12 | Jun-08 | 4.5 | 1 | -1.29 |
| 13 | Nov-08 | 4.5 | 0.5 | -1.44 |
| 14 | Jun-09 | 4.5 | 0.5 | -1.44 |
| 15 | Nov-09 | 4.5 | 2 | -0.98 |
| 16 | Jun-10 | 4.5 | 2 | -0.98 |
| 17 | Nov-10 | 4.5 | 2 | -0.98 |
| 18 | Jun-11 | 4.5 | 2 | -0.98 |
| 19 | Nov-11 | 4.5 | 2 | -0.98 |
| 20 | Jun-12 | 4.5 | 2 | -0.98 |
| 21 | Dec-12 | 4.5 | 2 | -0.98 |
| 22 | Jun-13 | 4.5 | 2 | -0.98 |
| 23 | Nov-13 | 4.5 | 2 | -0.98 |
| 24 | Jun-14 | 4.5 | 8 | 0.87 |
| 25 | Nov-14 | 4.5 | 2 | -0.98 |
| 26 | Jun-15 | 4.5 | 2.5 | -0.83 |
| 27 | Nov-15 | 4.5 | 2.5 | -0.83 |
| 28 | Jun-16 | 4.5 | 2.5 | -0.83 |
| 29 | Nov-16 | 4.5 | 2.5 | -0.83 |
| 30 | Jun-17 | 4.5 | 2.5 | -0.83 |
| 31 | Nov-17 | 4.5 | 2.5 | -0.83 |
| 32 | Jun-18 | 4.5 | 2.5 | -0.83 |
| 33 | Nov-18 | 4.5 | 2.5 | -0.83 |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

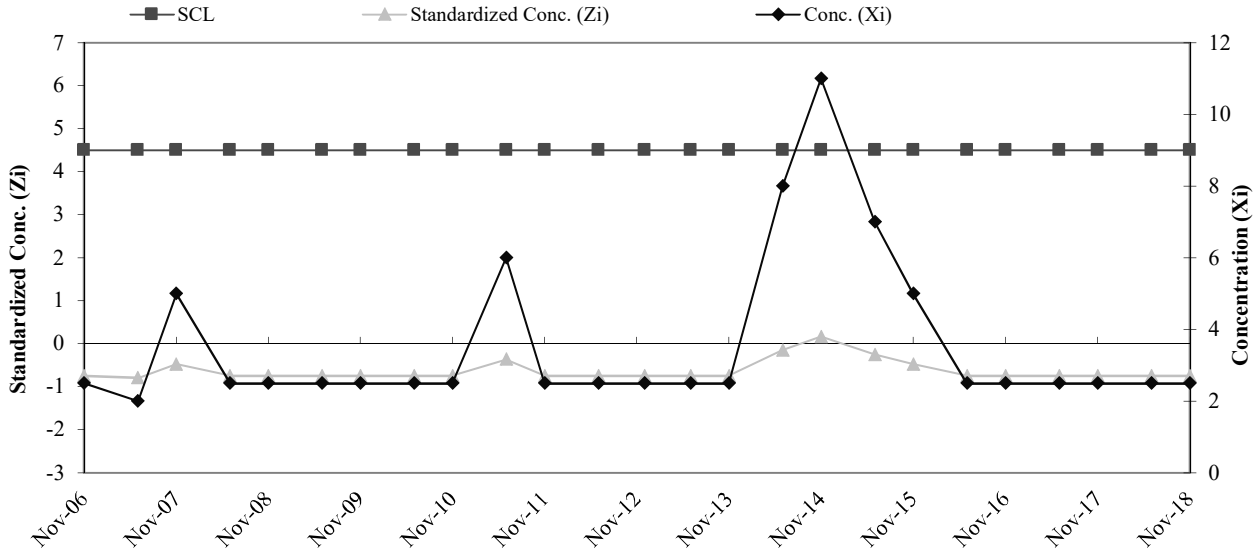


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-24 Ni**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Aug-96 | 10 | | |
| 2 | Nov-96 | 10 | | |
| 3 | May-97 | 31 | | |
| 4 | May-98 | 8 | **9.44** | **9.35** |
| 5 | Nov-03 | 9 | | |
| 6 | Jun-05 | 2.5 | | |
| 7 | Dec-05 | 2.5 | | |
| 8 | Jun-06 | 2.5 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|
| 9 | Nov-06 | 4.5 | 2.5 | -0.74 |
| 10 | Jun-07 | 4.5 | 2 | -0.80 |
| 11 | Nov-07 | 4.5 | 5 | -0.47 |
| 12 | Jun-08 | 4.5 | 2.5 | -0.74 |
| 13 | Nov-08 | 4.5 | 2.5 | -0.74 |
| 14 | Jun-09 | 4.5 | 2.5 | -0.74 |
| 15 | Nov-09 | 4.5 | 2.5 | -0.74 |
| 16 | Jun-10 | 4.5 | 2.5 | -0.74 |
| 17 | Nov-10 | 4.5 | 2.5 | -0.74 |
| 18 | Jun-11 | 4.5 | 6 | -0.37 |
| 19 | Nov-11 | 4.5 | 2.5 | -0.74 |
| 20 | Jun-12 | 4.5 | 2.5 | -0.74 |
| 21 | Dec-12 | 4.5 | 2.5 | -0.74 |
| 22 | Jun-13 | 4.5 | 2.5 | -0.74 |
| 23 | Nov-13 | 4.5 | 2.5 | -0.74 |
| 24 | Jun-14 | 4.5 | 8 | -0.15 |
| 25 | Nov-14 | 4.5 | 11 | 0.17 |
| 26 | Jun-15 | 4.5 | 7 | -0.26 |
| 27 | Nov-15 | 4.5 | 5 | -0.47 |
| 28 | Jun-16 | 4.5 | 2.5 | -0.74 |
| 29 | Nov-16 | 4.5 | 2.5 | -0.74 |
| 30 | Jun-17 | 4.5 | 2.5 | -0.74 |
| 31 | Nov-17 | 4.5 | 2.5 | -0.74 |
| 32 | Jun-18 | 4.5 | 2.5 | -0.74 |
| 33 | Nov-18 | 4.5 | 2.5 | -0.74 |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

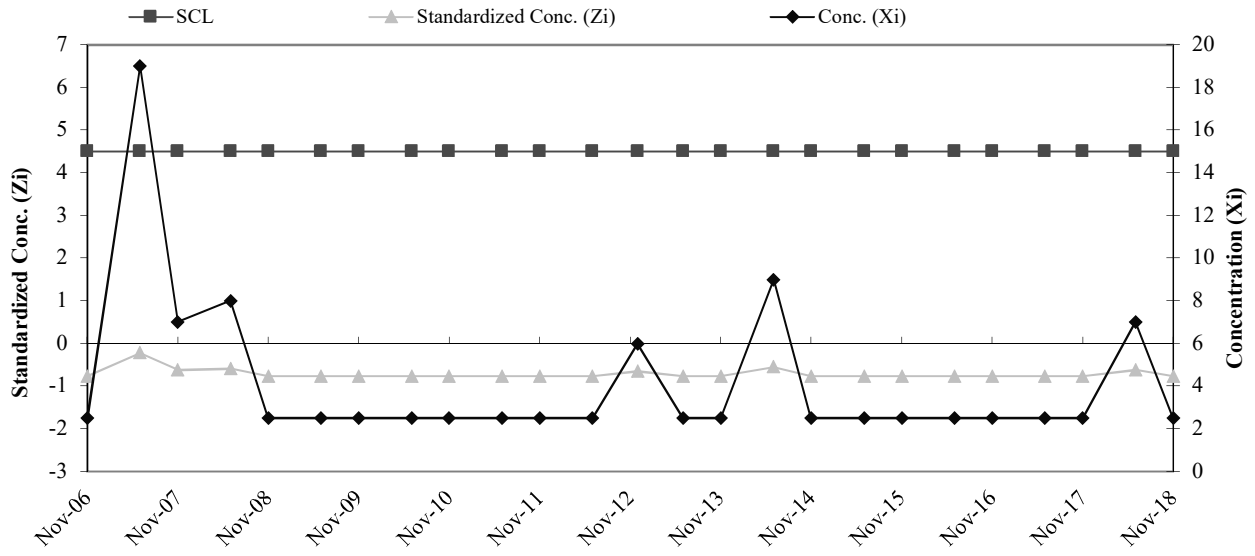


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-24 Zn**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Aug-96 | 90 | | |
| 2 | Nov-96 | 50 | | |
| 3 | May-97 | 10 | | |
| 4 | May-98 | 20 | **25.63** | **30.14** |
| 5 | Nov-03 | 20 | | |
| 6 | Jun-05 | 2.5 | | |
| 7 | Dec-05 | 10 | | |
| 8 | Jun-06 | 2.5 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|
| 9 | Nov-06 | 4.5 | 2.5 | -0.77 |
| 10 | Jun-07 | 4.5 | 19 | -0.22 |
| 11 | Nov-07 | 4.5 | 7 | -0.62 |
| 12 | Jun-08 | 4.5 | 8 | -0.58 |
| 13 | Nov-08 | 4.5 | 2.5 | -0.77 |
| 14 | Jun-09 | 4.5 | 2.5 | -0.77 |
| 15 | Nov-09 | 4.5 | 2.5 | -0.77 |
| 16 | Jun-10 | 4.5 | 2.5 | -0.77 |
| 17 | Nov-10 | 4.5 | 2.5 | -0.77 |
| 18 | Jun-11 | 4.5 | 2.5 | -0.77 |
| 19 | Nov-11 | 4.5 | 2.5 | -0.77 |
| 20 | Jun-12 | 4.5 | 2.5 | -0.77 |
| 21 | Dec-12 | 4.5 | 6 | -0.65 |
| 22 | Jun-13 | 4.5 | 2.5 | -0.77 |
| 23 | Nov-13 | 4.5 | 2.5 | -0.77 |
| 24 | Jun-14 | 4.5 | 9 | -0.55 |
| 25 | Nov-14 | 4.5 | 2.5 | -0.77 |
| 26 | Jun-15 | 4.5 | 2.5 | -0.77 |
| 27 | Nov-15 | 4.5 | 2.5 | -0.77 |
| 28 | Jun-16 | 4.5 | 2.5 | -0.77 |
| 29 | Nov-16 | 4.5 | 2.5 | -0.77 |
| 30 | Jun-17 | 4.5 | 2.5 | -0.77 |
| 31 | Nov-17 | 4.5 | 2.5 | -0.77 |
| 32 | Jun-18 | 4.5 | 7 | -0.62 |
| 33 | Nov-18 | 4.5 | 2.5 | -0.77 |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

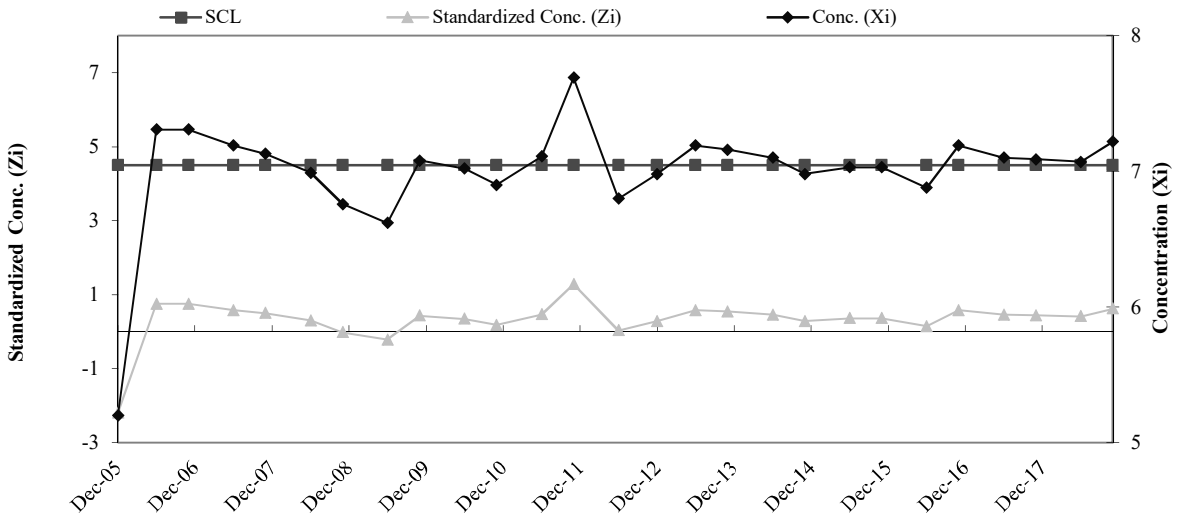


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-24 pH**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Aug-96 | 7.8 | | |
| 2 | Nov-96 | 7.1 | | |
| 3 | May-97 | 6.4 | | |
| 4 | May-98 | 7 | **6.78** | **0.72** |
| 5 | Nov-98 | 6 | | |
| 6 | Nov-99 | 7 | | |
| 7 | May-01 | 6.4 | | |
| 8 | Jun-05 | 7.3 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|
| 9 | Dec-05 | 4.5 | 5.2 | -2.20 |
| 10 | Jun-06 | 4.5 | 7.3 | 0.75 |
| 11 | Nov-06 | 4.5 | 7.3 | 0.75 |
| 12 | Jun-07 | 4.5 | 7.2 | 0.58 |
| 13 | Nov-07 | 4.5 | 7.1 | 0.50 |
| 14 | Jun-08 | 4.5 | 7.0 | 0.30 |
| 15 | Nov-08 | 4.5 | 6.8 | -0.02 |
| 14 | Jun-09 | 4.5 | 6.6 | -0.22 |
| 15 | Nov-09 | 4.5 | 7.1 | 0.43 |
| 16 | Jun-10 | 4.5 | 7.0 | 0.34 |
| 17 | Nov-10 | 4.5 | 6.9 | 0.17 |
| 18 | Jun-11 | 4.5 | 7.1 | 0.47 |
| 19 | Nov-11 | 4.5 | 7.7 | 1.28 |
| 20 | Jun-12 | 4.5 | 6.8 | 0.03 |
| 21 | Dec-12 | 4.5 | 7.0 | 0.29 |
| 22 | Jun-13 | 4.5 | 7.2 | 0.58 |
| 23 | Nov-13 | 4.5 | 7.2 | 0.54 |
| 24 | Jun-14 | 4.5 | 7.1 | 0.45 |
| 25 | Nov-14 | 4.5 | 7.0 | 0.29 |
| 26 | Jun-15 | 4.5 | 7.0 | 0.36 |
| 27 | Nov-15 | 4.5 | 7.0 | 0.36 |
| 28 | Jun-16 | 4.5 | 6.9 | 0.15 |
| 29 | Nov-16 | 4.5 | 7.2 | 0.58 |
| 30 | Jun-17 | 4.5 | 7.1 | 0.45 |
| 31 | Nov-17 | 4.5 | 7.1 | 0.44 |
| 32 | Jun-18 | 4.5 | 7.1 | 0.41 |
| 33 | Nov-18 | 4.5 | 7.2 | 0.62 |
| | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

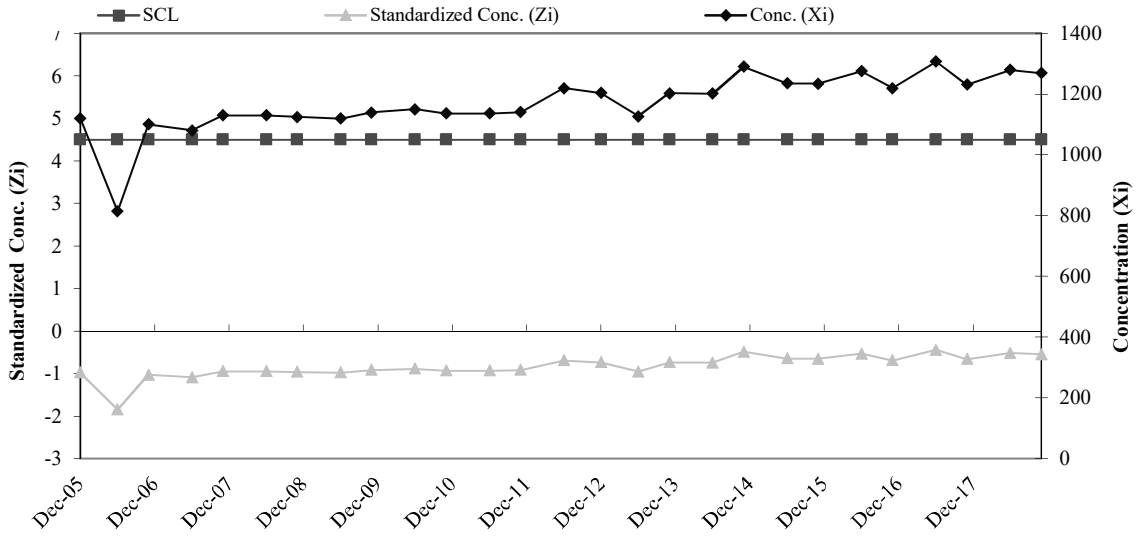


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-24 SpC**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Aug-96 | 1502 | | |
| 2 | Nov-96 | 2030 | | |
| 3 | May-97 | 1700 | | |
| 4 | May-98 | 1410 | **1,462.00** | **351.23** |
| 5 | Nov-98 | 1595 | | |
| 6 | Nov-99 | 1152 | | |
| 7 | May-01 | 1450 | | |
| 8 | Jun-05 | 857 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|
| 9 | Dec-05 | 4.5 | 1120 | -0.97 |
| 10 | Jun-06 | 4.5 | 814 | -1.84 |
| 11 | Nov-06 | 4.5 | 1100 | -1.03 |
| 12 | Jun-07 | 4.5 | 1080 | -1.09 |
| 13 | Nov-07 | 4.5 | 1130 | -0.95 |
| 14 | Jun-08 | 4.5 | 1130 | -0.95 |
| 15 | Nov-08 | 4.5 | 1125 | -0.96 |
| 16 | Jun-09 | 4.5 | 1120 | -0.97 |
| 17 | Nov-09 | 4.5 | 1140 | -0.92 |
| 18 | Jun-10 | 4.5 | 1150 | -0.89 |
| 19 | Nov-10 | 4.5 | 1136 | -0.93 |
| 20 | Jun-11 | 4.5 | 1136 | -0.93 |
| 21 | Nov-11 | 4.5 | 1141 | -0.91 |
| 22 | Jun-12 | 4.5 | 1219 | -0.69 |
| 23 | Dec-12 | 4.5 | 1204 | -0.73 |
| 24 | Jun-13 | 4.5 | 1127 | -0.95 |
| 25 | Nov-13 | 4.5 | 1203 | -0.74 |
| 26 | Jun-14 | 4.5 | 1202 | -0.74 |
| 27 | Nov-14 | 4.5 | 1290 | -0.49 |
| 28 | Jun-15 | 4.5 | 1235 | -0.65 |
| 29 | Nov-15 | 4.5 | 1234 | -0.65 |
| 30 | Jun-16 | 4.5 | 1275 | -0.53 |
| 31 | Nov-16 | 4.5 | 1220 | -0.69 |
| 32 | Jun-17 | 4.5 | 1307 | -0.44 |
| 33 | Nov-17 | 4.5 | 1231 | -0.66 |
| 34 | Jun-18 | 4.5 | 1280 | -0.52 |
| 35 | Nov-18 | 4.5 | 1269 | -0.55 |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

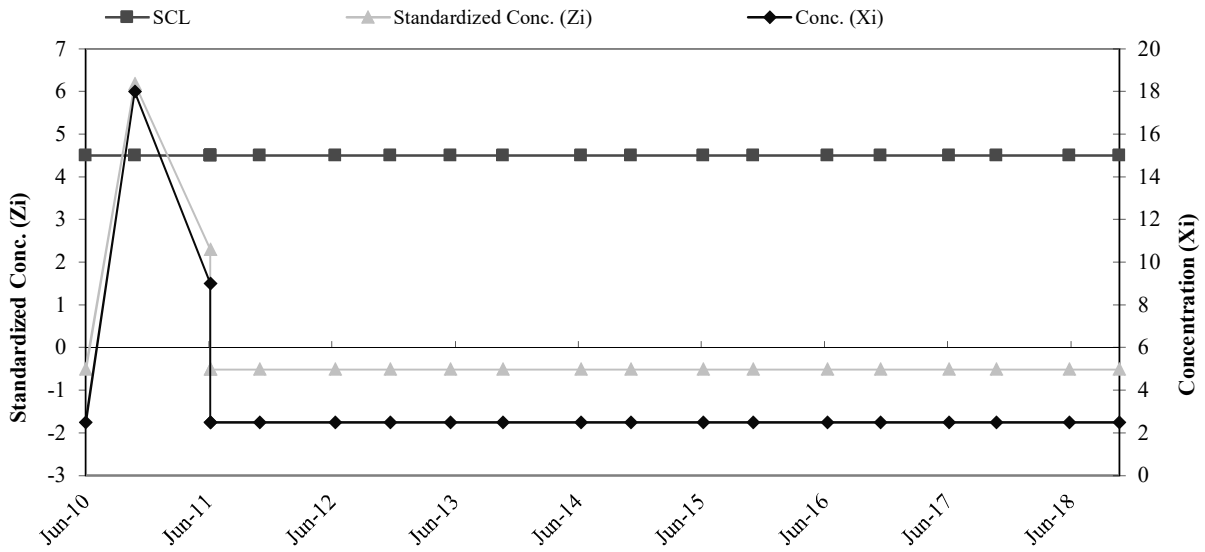


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-28 Cr**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-06 | 5 | | |
| 2 | Dec-06 | 2.5 | | |
| 3 | Jun-07 | 9 | | |
| 4 | Nov-07 | 3 | **3.69** | **2.31** |
| 5 | Jun-08 | 2.5 | | |
| 6 | Nov-08 | 2.5 | | |
| 7 | Jun-09 | 2.5 | | |
| 8 | Nov-09 | 2.5 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|
| 9 | Jun-10 | 4.5 | 2.5 | -0.51 |
| 10 | Nov-10 | 4.5 | 18 | 6.19 |
| 11 | Jun-11 | 4.5 | 9 | 2.30 |
| 12 | Jun-11 | 4.5 | 2.5 | -0.51 |
| 13 | Jun-11 | 4.5 | 2.5 | -0.51 |
| 14 | Nov-11 | 4.5 | 2.5 | -0.51 |
| 15 | Jun-12 | 4.5 | 2.5 | -0.51 |
| 16 | Dec-12 | 4.5 | 2.5 | -0.51 |
| 17 | Jun-13 | 4.5 | 2.5 | -0.51 |
| 18 | Nov-13 | 4.5 | 2.5 | -0.51 |
| 19 | Jun-14 | 4.5 | 2.5 | -0.51 |
| 20 | Nov-14 | 4.5 | 2.5 | -0.51 |
| 21 | Jun-15 | 4.5 | 2.5 | -0.51 |
| 22 | Nov-15 | 4.5 | 2.5 | -0.51 |
| 23 | Jun-16 | 4.5 | 2.5 | -0.51 |
| 24 | Nov-16 | 4.5 | 2.5 | -0.51 |
| 25 | Jun-17 | 4.5 | 2.5 | -0.51 |
| 26 | Nov-17 | 4.5 | 2.5 | -0.51 |
| 27 | Jun-18 | 4.5 | 2.5 | -0.51 |
| 28 | Nov-18 | 4.5 | 2.5 | -0.51 |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

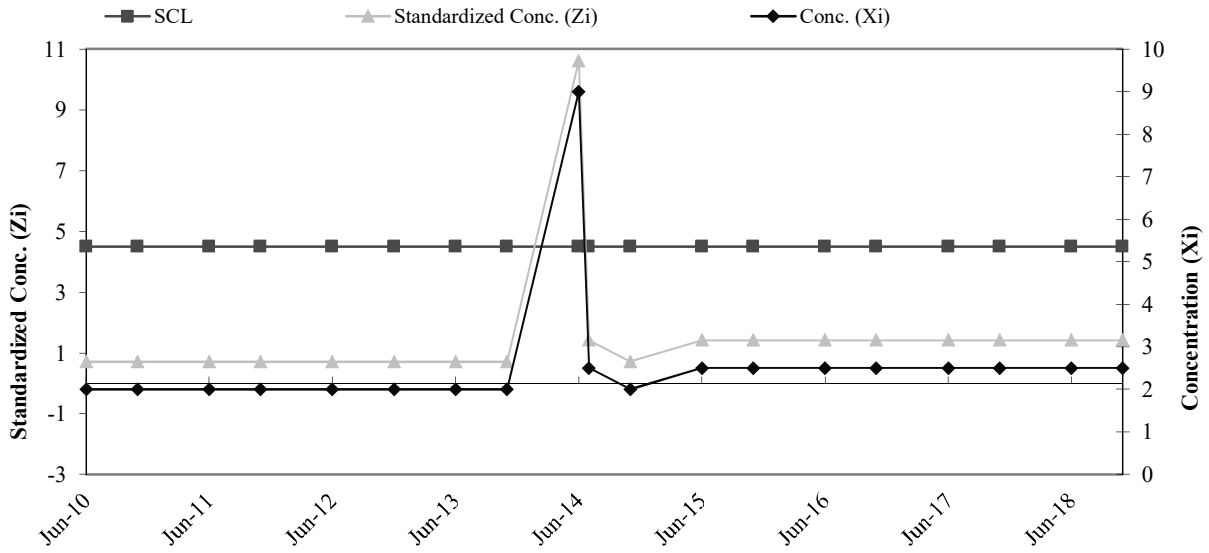


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-28 Cu**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-06 | 2 | | |
| 2 | Dec-06 | 2 | | |
| 3 | Jun-07 | 2 | | |
| 4 | Nov-07 | 2 | **1.50** | **0.71** |
| 5 | Jun-08 | 1 | | |
| 6 | Nov-08 | 0.5 | | |
| 7 | Jun-09 | 0.5 | | |
| 8 | Nov-09 | 2 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|
| 9 | Jun-10 | 4.5 | 2 | 0.71 |
| 10 | Nov-10 | 4.5 | 2 | 0.71 |
| 11 | Jun-11 | 4.5 | 2 | 0.71 |
| 12 | Nov-11 | 4.5 | 2 | 0.71 |
| 13 | Jun-12 | 4.5 | 2 | 0.71 |
| 14 | Dec-12 | 4.5 | 2 | 0.71 |
| 15 | Jun-13 | 4.5 | 2 | 0.71 |
| 16 | Nov-13 | 4.5 | 2 | 0.71 |
| 17 | Jun-14 | 4.5 | 9 | 10.61 |
| 18 | Jul-14 | 4.5 | 2.5 | 1.41 |
| 19 | Nov-14 | 4.5 | 2 | 0.71 |
| 20 | Jun-15 | 4.5 | 2.5 | 1.41 |
| 21 | Nov-15 | 4.5 | 2.5 | 1.41 |
| 22 | Jun-16 | 4.5 | 2.5 | 1.41 |
| 23 | Nov-16 | 4.5 | 2.5 | 1.41 |
| 24 | Jun-17 | 4.5 | 2.5 | 1.41 |
| 25 | Nov-17 | 4.5 | 2.5 | 1.41 |
| 26 | Jun-18 | 4.5 | 2.5 | 1.41 |
| 27 | Nov-18 | 4.5 | 2.5 | 1.41 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean



**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-28 Ni**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-06 | 2.5 | | |
| 2 | Dec-06 | 2.5 | | |
| 3 | Jun-07 | 3 | | |
| 4 | Nov-07 | 5 | **2.88** | **0.88** |
| 5 | Jun-08 | 2.5 | | |
| 6 | Nov-08 | 2.5 | | |
| 7 | Jun-09 | 2.5 | | |
| 8 | Nov-09 | 2.5 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|
| 9 | Jun-10 | 4.5 | 2.5 | -0.43 |
| 10 | Nov-10 | 4.5 | 2.5 | -0.43 |
| 9 | Jun-11 | 4.5 | 5 | 2.43 |
| 10 | Nov-11 | 4.5 | 2.5 | -0.43 |
| 11 | Jun-12 | 4.5 | 2.5 | -0.43 |
| 12 | Dec-12 | 4.5 | 2.5 | -0.43 |
| 13 | Jun-13 | 4.5 | 5 | 2.43 |
| 14 | Nov-13 | 4.5 | 2.5 | -0.43 |
| 15 | Jun-14 | 4.5 | 2.5 | -0.43 |
| 16 | Nov-14 | 4.5 | 2.5 | -0.43 |
| 17 | Jun-15 | 4.5 | 2.5 | -0.43 |
| 18 | Nov-15 | 4.5 | 2.5 | -0.43 |
| 19 | Jun-16 | 4.5 | 2.5 | -0.43 |
| 20 | Nov-16 | 4.5 | 2.5 | -0.43 |
| 21 | Jun-17 | 4.5 | 2.5 | -0.43 |
| 22 | Nov-17 | 4.5 | 2.5 | -0.43 |
| 23 | Jun-18 | 4.5 | 2.5 | -0.43 |
| 24 | Nov-18 | 4.5 | 2.5 | -0.43 |
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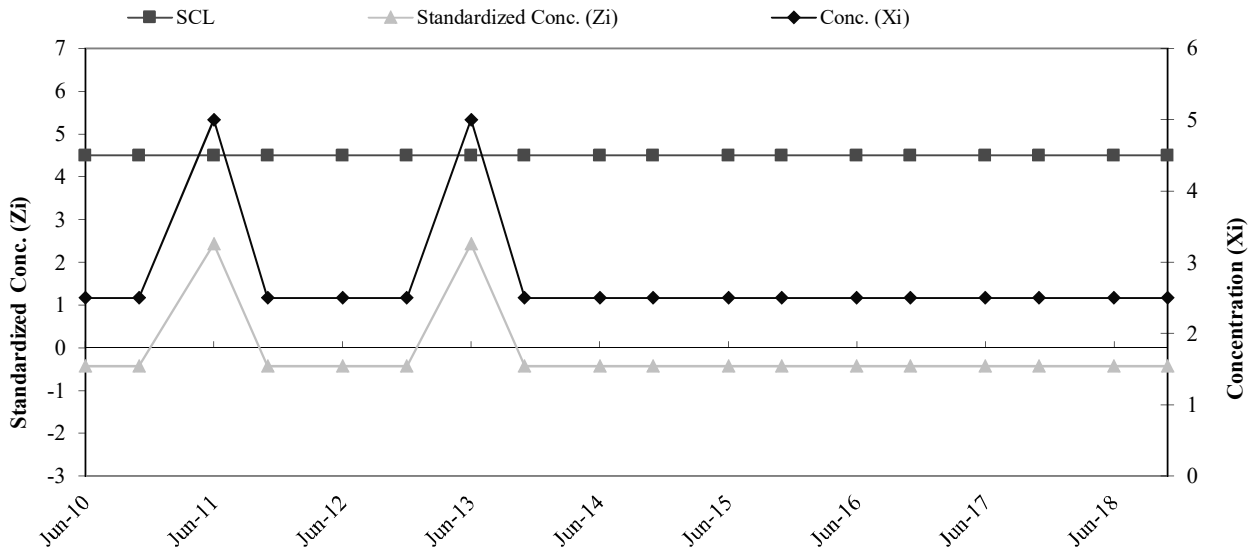
| | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean



**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-28 Zn**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Nov-05 | 7 | | |
| 2 | Jun-06 | 18 | | |
| 3 | Dec-06 | 5 | | |
| 4 | Jun-07 | 6 | **7.13** | **5.16** |
| 5 | Nov-07 | 11 | | |
| 6 | Jun-08 | 5 | | |
| 7 | Nov-08 | 2.5 | | |
| 8 | Jun-09 | 2.5 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|
| 9 | Nov-09 | 4.5 | 20 | 2.50 |
| 10 | Jun-10 | 4.5 | 2.5 | -0.90 |
| 11 | Nov-10 | 4.5 | 2.5 | -0.90 |
| 12 | Jun-11 | 4.5 | 2.5 | -0.90 |
| 13 | Nov-11 | 4.5 | 2.5 | -0.90 |
| 14 | Jun-12 | 4.5 | 2.5 | -0.90 |
| 15 | Dec-12 | 4.5 | 2.5 | -0.90 |
| 16 | Jun-13 | 4.5 | 2.5 | -0.90 |
| 17 | Nov-13 | 4.5 | 2.5 | -0.90 |
| 18 | Jun-14 | 4.5 | 2.5 | -0.90 |
| 19 | Nov-14 | 4.5 | 2.5 | -0.90 |
| 20 | Jun-15 | 4.5 | 2.5 | -0.90 |
| 21 | Nov-15 | 4.5 | 6 | -0.22 |
| 22 | Jun-16 | 4.5 | 2.5 | -0.90 |
| 23 | Nov-16 | 4.5 | 2.5 | -0.90 |
| 24 | Jun-17 | 4.5 | 2.5 | -0.90 |
| 25 | Nov-17 | 4.5 | 2.5 | -0.90 |
| 26 | Jun-18 | 4.5 | 2.5 | -0.90 |
| 27 | Nov-18 | 4.5 | 2.5 | -0.90 |
| | | | | |
| | | | | |
| | | | | |
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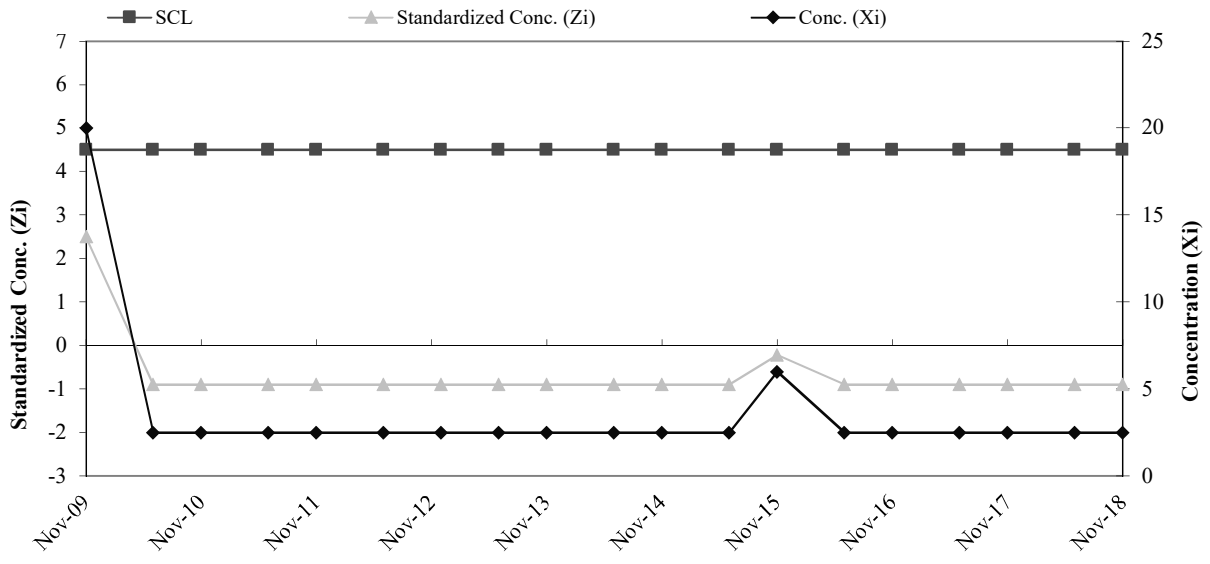
| | | | | |
| | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

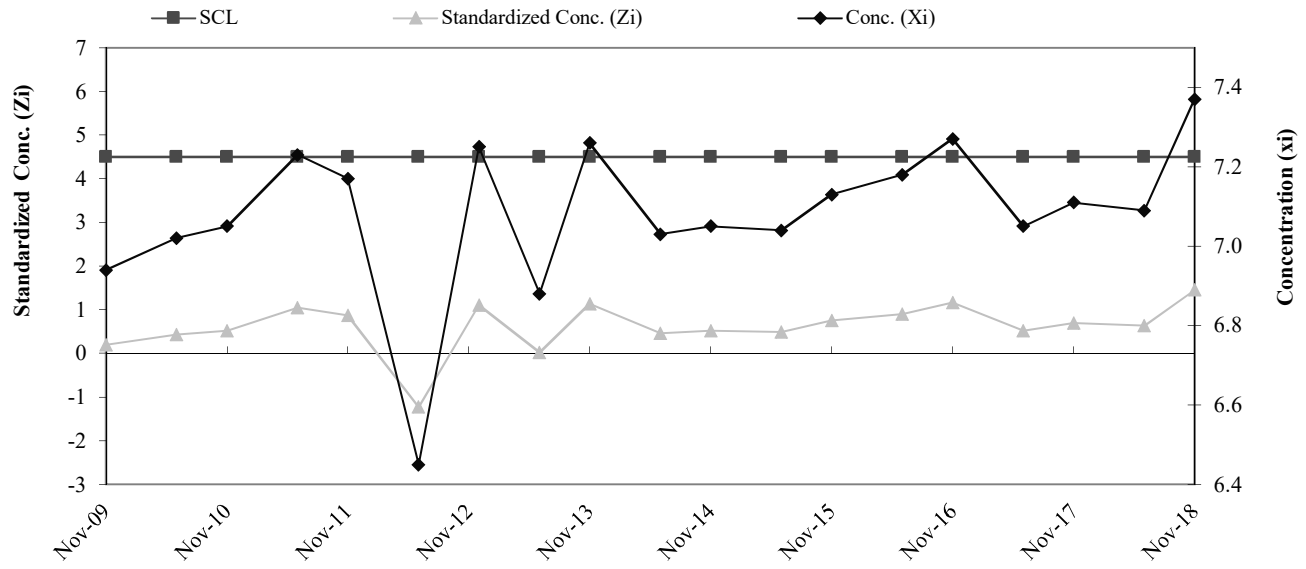


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-28 pH**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Nov-05 | 6.2 | | |
| 2 | Jun-06 | 7.1 | | |
| 3 | Dec-06 | 7.4 | | |
| 4 | Jun-07 | 6.8 | **6.87** | **0.34** |
| 5 | Nov-07 | 6.8 | | |
| 6 | Jun-08 | 6.9 | | |
| 7 | Nov-08 | 6.8 | | |
| 8 | Jun-09 | 7.0 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|
| 9 | Nov-09 | 4.5 | 6.9 | 0.19 |
| 10 | Jun-10 | 4.5 | 7.0 | 0.43 |
| 11 | Nov-10 | 4.5 | 7.1 | 0.51 |
| 12 | Jun-11 | 4.5 | 7.2 | 1.04 |
| 13 | Nov-11 | 4.5 | 7.2 | 0.87 |
| 14 | Jun-12 | 4.5 | 6.5 | -1.24 |
| 15 | Dec-12 | 4.5 | 7.3 | 1.10 |
| 16 | Jun-13 | 4.5 | 6.9 | 0.02 |
| 17 | Nov-13 | 4.5 | 7.3 | 1.13 |
| 18 | Jun-14 | 4.5 | 7.0 | 0.46 |
| 19 | Nov-14 | 4.5 | 7.1 | 0.51 |
| 20 | Jun-15 | 4.5 | 7.0 | 0.49 |
| 21 | Nov-15 | 4.5 | 7.1 | 0.75 |
| 22 | Jun-16 | 4.5 | 7.2 | 0.89 |
| 23 | Nov-16 | 4.5 | 7.3 | 1.16 |
| 24 | Jun-17 | 4.5 | 7.1 | 0.51 |
| 25 | Nov-17 | 4.5 | 7.1 | 0.69 |
| 26 | Jun-18 | 4.5 | 7.1 | 0.63 |
| 27 | Nov-18 | 4.5 | 7.4 | 1.45 |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

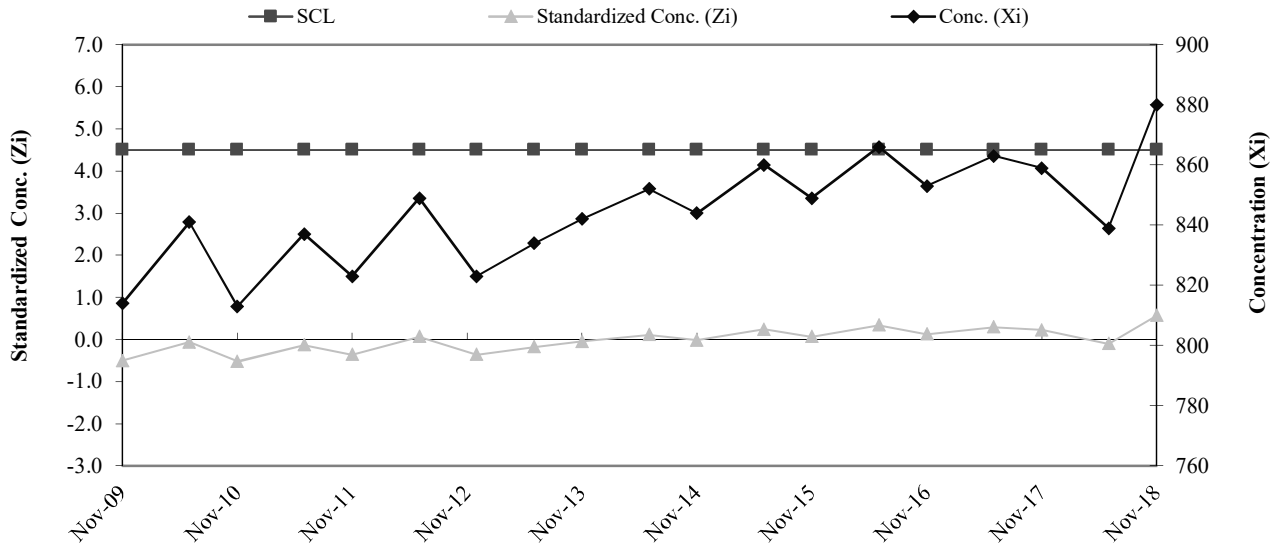


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-28 SpC**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Nov-05 | 994 | | |
| 2 | Jun-06 | 828 | | |
| 3 | Dec-06 | 812 | | |
| 4 | Jun-07 | 845 | **845.13** | **61.71** |
| 5 | Nov-07 | 816 | | |
| 6 | Jun-08 | 840 | | |
| 7 | Nov-08 | 804 | | |
| 8 | Jun-09 | 822 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|
| 9 | Nov-09 | 4.5 | 814 | -0.50 |
| 10 | Jun-10 | 4.5 | 841 | -0.07 |
| 11 | Nov-10 | 4.5 | 813 | -0.52 |
| 12 | Jun-11 | 4.5 | 837 | -0.13 |
| 13 | Nov-11 | 4.5 | 823 | -0.36 |
| 14 | Jun-12 | 4.5 | 849 | 0.06 |
| 15 | Dec-12 | 4.5 | 823 | -0.36 |
| 16 | Jun-13 | 4.5 | 834 | -0.18 |
| 17 | Nov-13 | 4.5 | 842 | -0.05 |
| 18 | Jun-14 | 4.5 | 852 | 0.11 |
| 19 | Nov-14 | 4.5 | 844 | -0.02 |
| 20 | Jun-15 | 4.5 | 860 | 0.24 |
| 21 | Nov-15 | 4.5 | 849 | 0.06 |
| 22 | Jun-16 | 4.5 | 866 | 0.34 |
| 23 | Nov-16 | 4.5 | 853 | 0.13 |
| 24 | Jun-17 | 4.5 | 863 | 0.29 |
| 25 | Nov-17 | 4.5 | 859 | 0.22 |
| 26 | Jun-18 | 4.5 | 839 | -0.10 |
| 27 | Nov-18 | 4.5 | 880 | 0.57 |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

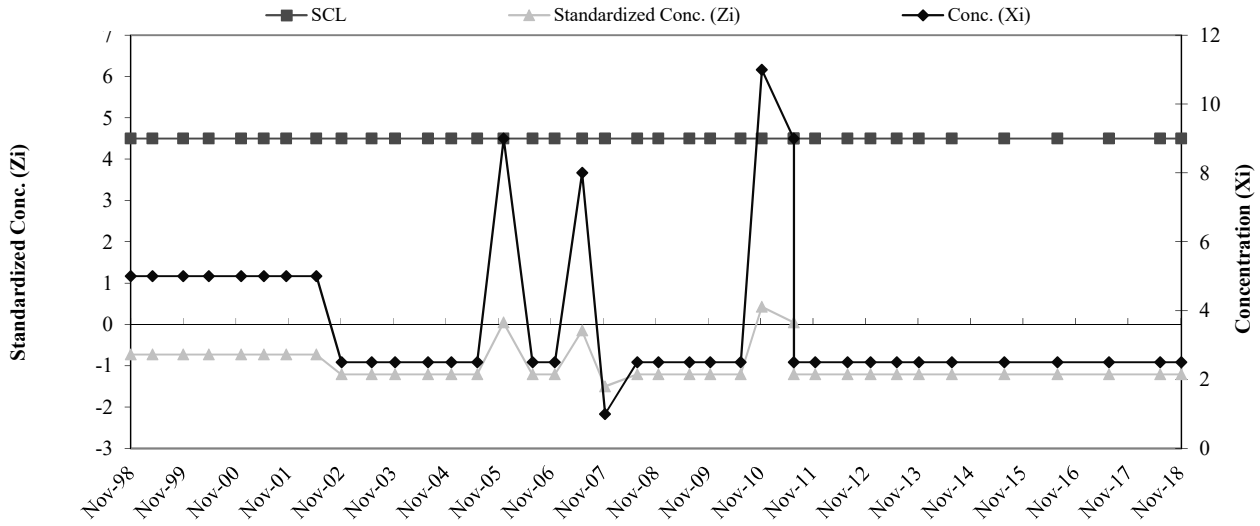


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-2D-OBGMW-16D Cr**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-95 | 10 | **8.78** | **5.19** |
| 2 | Aug-95 | 10 | | |
| 3 | Jun-96 | 10 | | |
| 4 | Aug-96 | 10 | | |
| 5 | Nov-96 | 10 | | |
| 6 | May-97 | 10 | | |
| 7 | Nov-97 | 5 | | |
| 8 | May-98 | 5 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) | Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|---|---|---|---|---|
| 9 | Nov-98 | 4.5 | 5 | -0.73 | 36 | Nov-11 | 4.50 | 2.5 | -1.21 |
| 10 | Apr-99 | 4.5 | 5 | -0.73 | 37 | Jun-12 | 4.50 | 2.5 | -1.21 |
| 11 | Nov-99 | 4.5 | 5 | -0.73 | 38 | Dec-12 | 4.50 | 2.5 | -1.21 |
| 12 | Apr-00 | 4.5 | 5 | -0.73 | 39 | Jun-13 | 4.50 | 2.5 | -1.21 |
| 13 | Dec-00 | 4.5 | 5 | -0.73 | 40 | Nov-13 | 4.50 | 2.5 | -1.21 |
| 14 | May-01 | 4.5 | 5 | -0.73 | 41 | Jun-14 | 4.50 | 2.5 | -1.21 |
| 15 | Oct-01 | 4.5 | 5 | -0.73 | 42 | Jun-15 | 4.50 | 2.5 | -1.21 |
| 16 | May-02 | 4.5 | 5 | -0.73 | 43 | Jun-16 | 4.50 | 2.5 | -1.21 |
| 17 | Nov-02 | 4.5 | 2.5 | -1.21 | 44 | Jun-17 | 4.50 | 2.5 | -1.21 |
| 18 | Jun-03 | 4.5 | 2.5 | -1.21 | 45 | Jun-18 | 4.50 | 2.5 | -1.21 |
| 19 | Nov-03 | 4.5 | 2.5 | -1.21 | 46 | Nov-18 | 4.50 | 2.5 | -1.21 |
| 20 | Jun-04 | 4.5 | 2.5 | -1.21 | | | | | |
| 21 | Dec-04 | 4.5 | 2.5 | -1.21 | | | | | |
| 22 | Jun-05 | 4.5 | 2.5 | -1.21 | | | | | |
| 23 | Dec-05 | 4.5 | 9 | 0.04 | | | | | |
| 24 | Jun-06 | 4.5 | 2.5 | -1.21 | | | | | |
| 25 | Nov-06 | 4.5 | 2.5 | -1.21 | | | | | |
| 26 | Jun-07 | 4.5 | 8 | -0.15 | | | | | |
| 27 | Nov-07 | 4.5 | 1 | -1.50 | | | | | |
| 28 | Jun-08 | 4.5 | 2.5 | -1.21 | | | | | |
| 29 | Nov-08 | 4.5 | 2.5 | -1.21 | | | | | |
| 30 | Jun-09 | 4.5 | 2.5 | -1.21 | | | | | |
| 31 | Nov-09 | 4.5 | 2.5 | -1.21 | | | | | |
| 32 | Jun-10 | 4.5 | 2.5 | -1.21 | | | | | |
| 33 | Nov-10 | 4.5 | 11 | 0.43 | | | | | |
| 34 | Jun-11 | 4.5 | 9 | 0.04 | | | | | |
| 35 | Jun-11 | 4.5 | 2.5 | -1.21 | | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

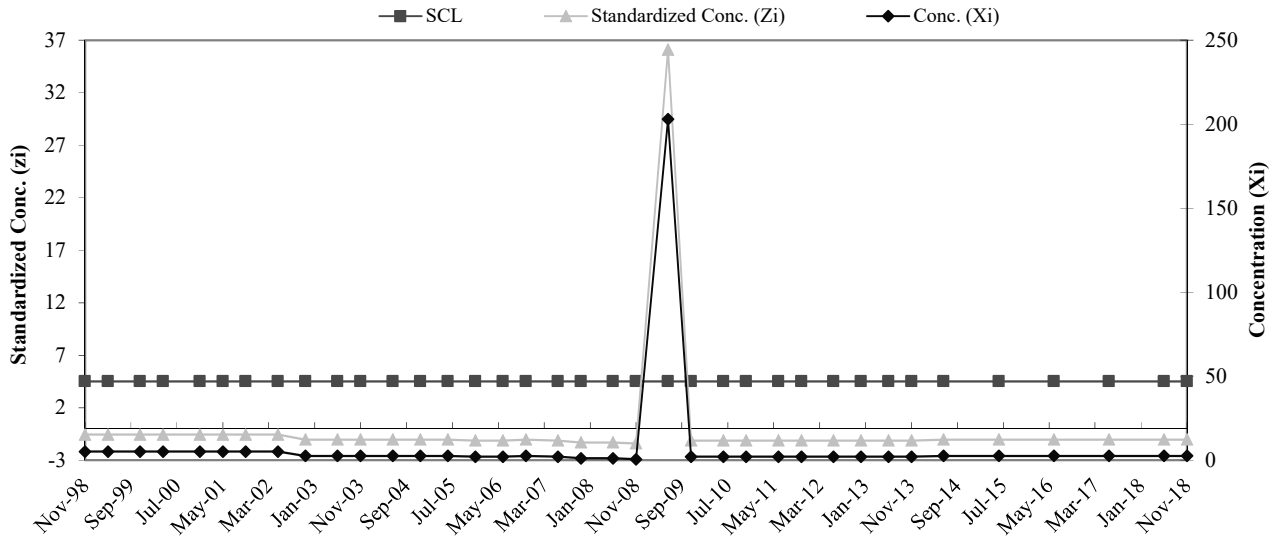


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-2D-OBGMW-16D Cu**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-95 | 10 | | |
| 2 | Aug-95 | 10 | | |
| 3 | Jun-96 | 10 | | |
| 4 | Aug-96 | 10 | **8.13** | **5.40** |
| 5 | Nov-96 | 10 | | |
| 6 | May-97 | 5 | | |
| 7 | Nov-97 | 5 | | |
| 8 | May-98 | 5 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) | Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|---|---|---|---|---|
| 9 | Nov-98 | 4.5 | 5 | -0.58 | 35 | Nov-11 | 4.5 | 2 | -1.14 |
| 10 | Apr-99 | 4.5 | 5 | -0.58 | 36 | Jun-12 | 4.5 | 2 | -1.14 |
| 11 | Nov-99 | 4.5 | 5 | -0.58 | 37 | Dec-12 | 4.5 | 2 | -1.14 |
| 12 | Apr-00 | 4.5 | 5 | -0.58 | 38 | Jun-13 | 4.5 | 2 | -1.14 |
| 13 | Dec-00 | 4.5 | 5 | -0.58 | 39 | Nov-13 | 4.5 | 2 | -1.14 |
| 14 | May-01 | 4.5 | 5 | -0.58 | 40 | Jun-14 | 4.5 | 2.5 | -1.04 |
| 15 | Oct-01 | 4.5 | 5 | -0.58 | 41 | Jun-15 | 4.5 | 2.5 | -1.04 |
| 16 | May-02 | 4.5 | 5 | -0.58 | 42 | Jun-16 | 4.5 | 2.5 | -1.04 |
| 17 | Nov-02 | 4.5 | 2.5 | -1.04 | 43 | Jun-17 | 4.5 | 2.5 | -1.04 |
| 18 | Jun-03 | 4.5 | 2.5 | -1.04 | 44 | Jun-18 | 4.5 | 2.5 | -1.04 |
| 19 | Nov-03 | 4.5 | 2.5 | -1.04 | 45 | Nov-18 | 4.5 | 2.5 | -1.04 |
| 20 | Jun-04 | 4.5 | 2.5 | -1.04 | | | | | |
| 21 | Dec-04 | 4.5 | 2.5 | -1.04 | | | | | |
| 22 | Jun-05 | 4.5 | 2.5 | -1.04 | | | | | |
| 23 | Dec-05 | 4.5 | 2 | -1.14 | | | | | |
| 24 | Jun-06 | 4.5 | 2 | -1.14 | | | | | |
| 25 | Nov-06 | 4.5 | 2.5 | -1.04 | | | | | |
| 26 | Jun-07 | 4.5 | 2 | -1.14 | | | | | |
| 27 | Nov-07 | 4.5 | 1 | -1.32 | | | | | |
| 28 | Jun-08 | 4.5 | 1 | -1.32 | | | | | |
| 29 | Nov-08 | 4.5 | 0.5 | -1.41 | | | | | |
| 30 | Jun-09 | 4.5 | 203 | 36.09 | | | | | |
| 31 | Nov-09 | 4.5 | 2 | -1.14 | | | | | |
| 32 | Jun-10 | 4.5 | 2 | -1.14 | | | | | |
| 33 | Nov-10 | 4.5 | 2 | -1.14 | | | | | |
| 34 | Jun-11 | 4.5 | 2 | -1.14 | | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

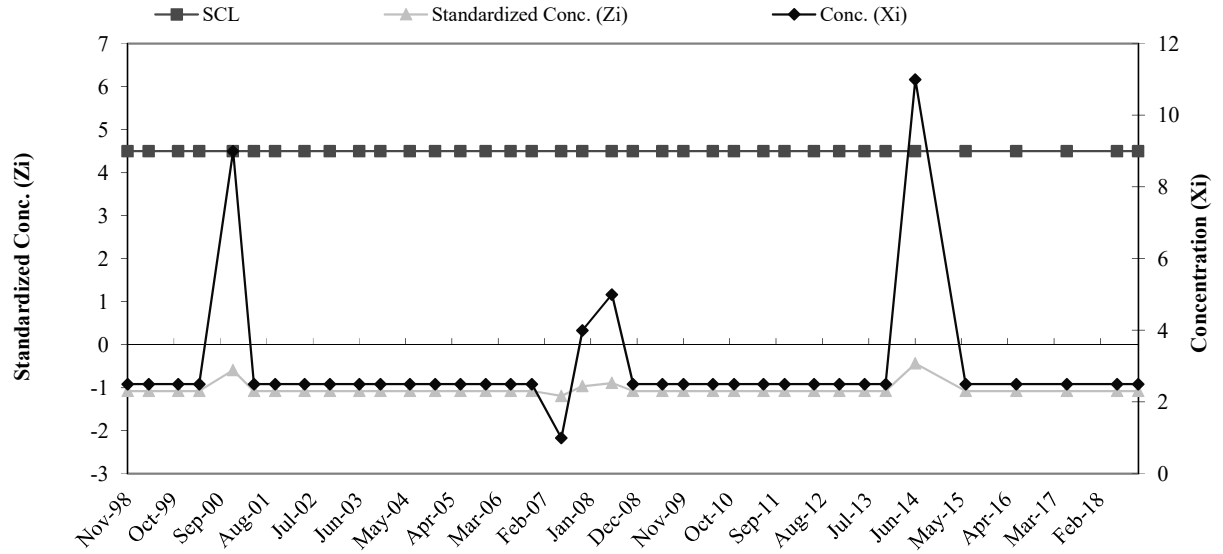


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-2D-OBGMW-16D Ni**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-95 | 15 | | |
| 2 | Aug-95 | 20 | | |
| 3 | Jun-96 | 10 | | |
| 4 | Aug-96 | 10 | **16.83** | **13.28** |
| 5 | Nov-96 | 10 | | |
| 6 | May-97 | 28 | | |
| 7 | Nov-97 | 39 | | |
| 8 | May-98 | 2.5 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) | Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|---|---|---|---|---|
| 9 | Nov-98 | 4.5 | 2.5 | -1.08 | 35 | Nov-11 | 4.5 | 2.5 | -1.08 |
| 10 | Apr-99 | 4.5 | 2.5 | -1.08 | 36 | Jun-12 | 4.5 | 2.5 | -1.08 |
| 11 | Nov-99 | 4.5 | 2.5 | -1.08 | 37 | Dec-12 | 4.5 | 2.5 | -1.08 |
| 12 | Apr-00 | 4.5 | 2.5 | -1.08 | 38 | Jun-13 | 4.5 | 2.5 | -1.08 |
| 13 | Dec-00 | 4.5 | 9 | -0.59 | 39 | Nov-13 | 4.5 | 2.5 | -1.08 |
| 14 | May-01 | 4.5 | 2.5 | -1.08 | 40 | Jun-14 | 4.5 | 11 | -0.44 |
| 15 | Oct-01 | 4.5 | 2.5 | -1.08 | 41 | Jun-15 | 4.5 | 2.5 | -1.08 |
| 16 | May-02 | 4.5 | 2.5 | -1.08 | 42 | Jun-16 | 4.5 | 2.5 | -1.08 |
| 17 | Nov-02 | 4.5 | 2.5 | -1.08 | 43 | Jun-17 | 4.5 | 2.5 | -1.08 |
| 18 | Jun-03 | 4.5 | 2.5 | -1.08 | 44 | Jun-18 | 4.5 | 2.5 | -1.08 |
| 19 | Nov-03 | 4.5 | 2.5 | -1.08 | 45 | Nov-18 | 4.5 | 2.5 | -1.08 |
| 20 | Jun-04 | 4.5 | 2.5 | -1.08 | | | | | |
| 21 | Dec-04 | 4.5 | 2.5 | -1.08 | | | | | |
| 22 | Jun-05 | 4.5 | 2.5 | -1.08 | | | | | |
| 23 | Dec-05 | 4.5 | 2.5 | -1.08 | | | | | |
| 24 | Jun-06 | 4.5 | 2.5 | -1.08 | | | | | |
| 25 | Nov-06 | 4.5 | 2.5 | -1.08 | | | | | |
| 26 | Jun-07 | 4.5 | 1 | -1.19 | | | | | |
| 27 | Nov-07 | 4.5 | 4 | -0.97 | | | | | |
| 28 | Jun-08 | 4.5 | 5 | -0.89 | | | | | |
| 29 | Nov-08 | 4.5 | 2.5 | -1.08 | | | | | |
| 30 | Jun-09 | 4.5 | 2.5 | -1.08 | | | | | |
| 31 | Nov-09 | 4.5 | 2.5 | -1.08 | | | | | |
| 32 | Jun-10 | 4.5 | 2.5 | -1.08 | | | | | |
| 33 | Nov-10 | 4.5 | 2.5 | -1.08 | | | | | |
| 34 | Jun-11 | 4.5 | 2.5 | -1.08 | | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

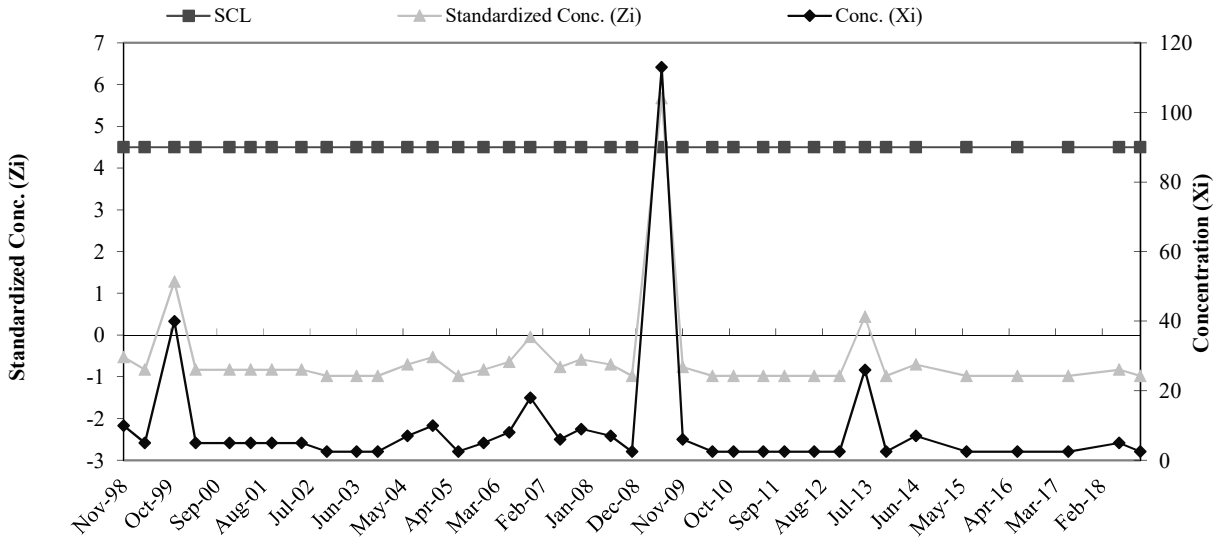


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-2D-OBGMW-16D Zn**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-95 | 10 | | |
| 2 | Aug-95 | 10 | | |
| 3 | Jun-96 | 10 | | |
| 4 | Aug-96 | 50 | **18.75** | **16.62** |
| 5 | Nov-96 | 30 | | |
| 6 | May-97 | 30 | | |
| 7 | Nov-97 | 5 | | |
| 8 | May-98 | 5 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) | Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|---|---|---|---|---|
| 9 | Nov-98 | 4.5 | 10 | -0.53 | 35 | Nov-11 | 4.5 | 2.5 | -0.98 |
| 10 | Apr-99 | 4.5 | 5 | -0.83 | 36 | Jun-12 | 4.5 | 2.5 | -0.98 |
| 11 | Nov-99 | 4.5 | 40 | 1.28 | 37 | Dec-12 | 4.5 | 2.5 | -0.98 |
| 12 | Apr-00 | 4.5 | 5 | -0.83 | 38 | Jun-13 | 4.5 | 26 | 0.44 |
| 13 | Dec-00 | 4.5 | 5 | -0.83 | 39 | Nov-13 | 4.5 | 2.5 | -0.98 |
| 14 | May-01 | 4.5 | 5 | -0.83 | 40 | Jun-14 | 4.5 | 7 | -0.71 |
| 15 | Oct-01 | 4.5 | 5 | -0.83 | 41 | Jun-15 | 4.5 | 2.5 | -0.98 |
| 16 | May-02 | 4.5 | 5 | -0.83 | 42 | Jun-16 | 4.5 | 2.5 | -0.98 |
| 17 | Nov-02 | 4.5 | 2.5 | -0.98 | 43 | Jun-17 | 4.5 | 2.5 | -0.98 |
| 18 | Jun-03 | 4.5 | 2.5 | -0.98 | 44 | Jun-18 | 4.5 | 5 | -0.83 |
| 19 | Nov-03 | 4.5 | 2.5 | -0.98 | 45 | Nov-18 | 4.5 | 2.5 | -0.98 |
| 20 | Jun-04 | 4.5 | 7 | -0.71 | | | | | |
| 21 | Dec-04 | 4.5 | 10 | -0.53 | | | | | |
| 22 | Jun-05 | 4.5 | 2.5 | -0.98 | | | | | |
| 23 | Dec-05 | 4.5 | 5 | -0.83 | | | | | |
| 24 | Jun-06 | 4.5 | 8 | -0.65 | | | | | |
| 25 | Nov-06 | 4.5 | 18 | -0.05 | | | | | |
| 26 | Jun-07 | 4.5 | 6 | -0.77 | | | | | |
| 27 | Nov-07 | 4.5 | 9 | -0.59 | | | | | |
| 28 | Jun-08 | 4.5 | 7 | -0.71 | | | | | |
| 29 | Nov-08 | 4.5 | 2.5 | -0.98 | | | | | |
| 30 | Jun-09 | 4.5 | 113 | 5.67 | | | | | |
| 31 | Nov-09 | 4.5 | 6 | -0.77 | | | | | |
| 32 | Jun-10 | 4.5 | 2.5 | -0.98 | | | | | |
| 33 | Nov-10 | 4.5 | 2.5 | -0.98 | | | | | |
| 34 | Jun-11 | 4.5 | 2.5 | -0.98 | | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

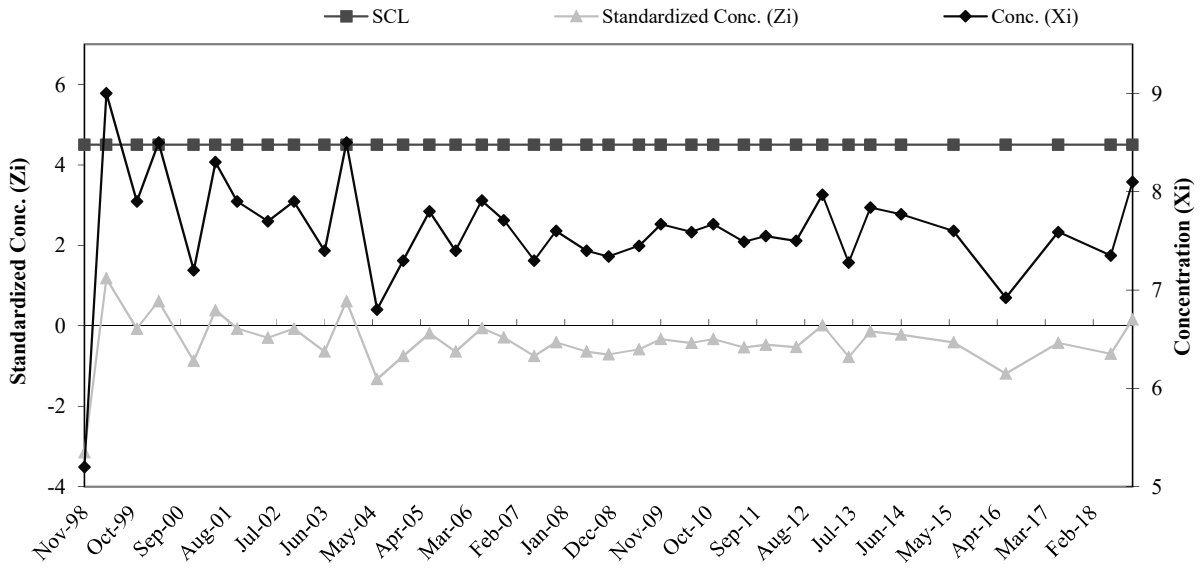


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-2D-OBGMW-16D pH**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-95 | 9.0 | | |
| 2 | Aug-95 | 8.3 | | |
| 3 | Jun-96 | 7.5 | | |
| 4 | Aug-96 | 7.7 | **7.46** | **0.88** |
| 5 | Nov-96 | 7.3 | | |
| 6 | May-97 | 6.3 | | |
| 7 | Nov-97 | 6.9 | | |
| 8 | May-98 | 6.7 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) | Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|---|---|---|---|---|
| 9 | Nov-98 | 4.5 | 4.7 | -3.15 | 35 | Nov-11 | 4.5 | 7.1 | -0.47 |
| 10 | Apr-99 | 4.5 | 8.5 | 1.18 | 36 | Jun-12 | 4.5 | 7.0 | -0.53 |
| 11 | Nov-99 | 4.5 | 7.4 | -0.07 | 37 | Dec-12 | 4.5 | 7.5 | 0.01 |
| 12 | Apr-00 | 4.5 | 8.0 | 0.61 | 38 | Jun-13 | 4.5 | 6.8 | -0.78 |
| 13 | Dec-00 | 4.5 | 6.7 | -0.87 | 39 | Nov-13 | 4.5 | 7.3 | -0.14 |
| 14 | May-01 | 4.5 | 7.8 | 0.38 | 40 | Jun-14 | 4.5 | 7.3 | -0.22 |
| 15 | Oct-01 | 4.5 | 7.4 | -0.07 | 41 | Jun-15 | 4.5 | 7.1 | -0.41 |
| 16 | May-02 | 4.5 | 7.2 | -0.30 | 42 | Jun-16 | 4.5 | 6.4 | -1.19 |
| 17 | Nov-02 | 4.5 | 7.4 | -0.07 | 43 | Jun-17 | 4.5 | 7.1 | -0.42 |
| 18 | Jun-03 | 4.5 | 6.9 | -0.64 | 44 | Jun-18 | 4.5 | 6.9 | -0.70 |
| 19 | Nov-03 | 4.5 | 8.0 | 0.61 | 45 | Nov-18 | 4.5 | 7.6 | 0.16 |
| 20 | Jun-04 | 4.5 | 6.3 | -1.32 | | | | | |
| 21 | Dec-04 | 4.5 | 6.8 | -0.75 | | | | | |
| 22 | Jun-05 | 4.5 | 7.3 | -0.19 | | | | | |
| 23 | Dec-05 | 4.5 | 6.9 | -0.64 | | | | | |
| 24 | Jun-06 | 4.5 | 7.4 | -0.06 | | | | | |
| 25 | Nov-06 | 4.5 | 7.2 | -0.29 | | | | | |
| 26 | Jun-07 | 4.5 | 6.8 | -0.75 | | | | | |
| 27 | Nov-07 | 4.5 | 7.1 | -0.41 | | | | | |
| 28 | Jun-08 | 4.5 | 6.9 | -0.64 | | | | | |
| 29 | Nov-08 | 4.5 | 6.8 | -0.71 | | | | | |
| 30 | Jun-09 | 4.5 | 7.0 | -0.58 | | | | | |
| 31 | Nov-09 | 4.5 | 7.2 | -0.33 | | | | | |
| 32 | Jun-10 | 4.5 | 7.1 | -0.42 | | | | | |
| 33 | Nov-10 | 4.5 | 7.2 | -0.33 | | | | | |
| 34 | Jun-11 | 4.5 | 7.0 | -0.54 | | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean

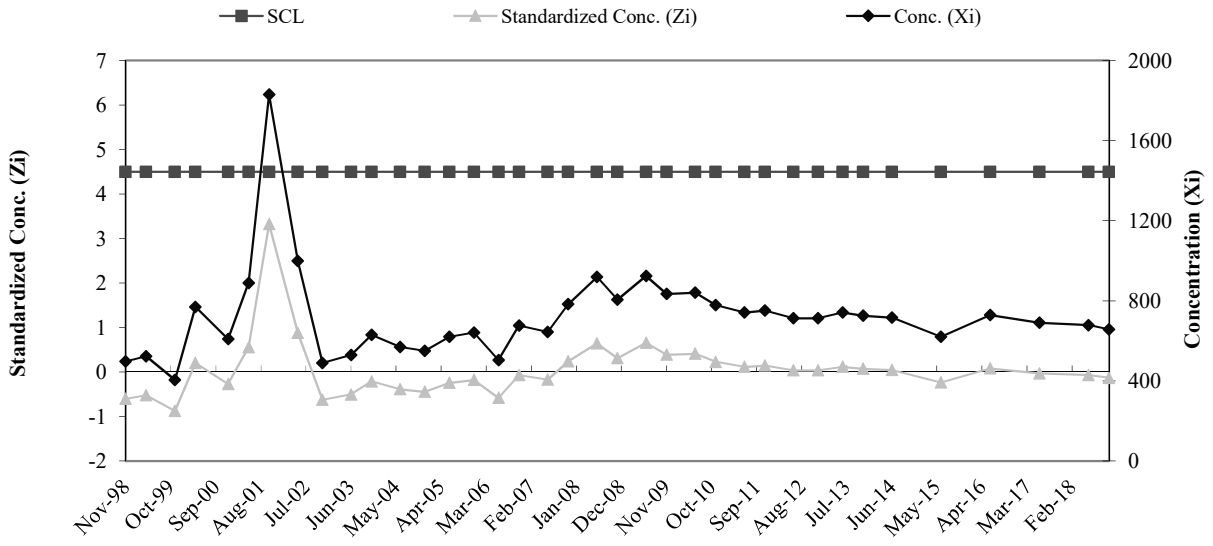


**COLDWATER ROAD LANDFILL FACILITY**
**RCRA GROUND WATER DETECTION MONITORING SYSTEM**
**SHEWART CONTROL CHART**
**B-2D-OBGMW-16D SpC**

| Baseline Data | | | | |
|---|---|---|---|---|
| Ti | Date | Conc. | Mean | Std. Dev |
| 1 | Jun-95 | 434.0 | 701.50 | 339.46 |
| 2 | Aug-95 | 479.0 | | |
| 3 | Jun-96 | 580.0 | | |
| 4 | Aug-96 | 641.0 | | |
| 5 | Nov-96 | 769.0 | | |
| 6 | May-97 | 1500.0 | | |
| 7 | Nov-97 | 660.0 | | |
| 8 | May-98 | 549.0 | | |

| Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) | Ti | Date | SCL | Conc. (Xi) | Standardized Conc. (Zi) |
|---|---|---|---|---|---|---|---|---|---|
| 9 | Nov-98 | 4.5 | 498.0 | -0.60 | 35 | Nov-11 | 4.5 | 751.0 | 0.15 |
| 10 | Apr-99 | 4.5 | 523.0 | -0.53 | 36 | Jun-12 | 4.5 | 714.0 | 0.04 |
| 11 | Nov-99 | 4.5 | 405.0 | -0.87 | 37 | Dec-12 | 4.5 | 714.0 | 0.04 |
| 12 | Apr-00 | 4.5 | 770.0 | 0.20 | 38 | Jun-13 | 4.5 | 742.0 | 0.12 |
| 13 | Dec-00 | 4.5 | 610.0 | -0.27 | 39 | Nov-13 | 4.5 | 726.0 | 0.07 |
| 14 | May-01 | 4.5 | 890.0 | 0.56 | 40 | Jun-14 | 4.5 | 717.0 | 0.05 |
| 15 | Oct-01 | 4.5 | 1830.0 | 3.32 | 41 | Jun-15 | 4.5 | 621.0 | -0.24 |
| 16 | May-02 | 4.5 | 1000.0 | 0.88 | 42 | Jun-16 | 4.5 | 730.0 | 0.08 |
| 17 | Nov-02 | 4.5 | 490.0 | -0.62 | 43 | Jun-17 | 4.5 | 691.0 | -0.03 |
| 18 | Jun-03 | 4.5 | 530.0 | -0.51 | 44 | Jun-18 | 4.5 | 679.0 | -0.07 |
| 19 | Nov-03 | 4.5 | 630.0 | -0.21 | 45 | Nov-18 | 4.5 | 657.0 | -0.13 |
| 20 | Jun-04 | 4.5 | 570.0 | -0.39 | | | | | |
| 21 | Dec-04 | 4.5 | 550.0 | -0.45 | | | | | |
| 22 | Jun-05 | 4.5 | 620.0 | -0.24 | | | | | |
| 23 | Dec-05 | 4.5 | 642.0 | -0.18 | | | | | |
| 24 | Jun-06 | 4.5 | 504.1 | -0.58 | | | | | |
| 25 | Nov-06 | 4.5 | 677.0 | -0.07 | | | | | |
| 26 | Jun-07 | 4.5 | 644.0 | -0.17 | | | | | |
| 27 | Nov-07 | 4.5 | 783.0 | 0.24 | | | | | |
| 28 | Jun-08 | 4.5 | 920.0 | 0.64 | | | | | |
| 29 | Nov-08 | 4.5 | 806.0 | 0.31 | | | | | |
| 30 | Jun-09 | 4.5 | 924.0 | 0.66 | | | | | |
| 31 | Nov-09 | 4.5 | 835.0 | 0.39 | | | | | |
| 32 | Jun-10 | 4.5 | 841.0 | 0.41 | | | | | |
| 33 | Nov-10 | 4.5 | 779.0 | 0.23 | | | | | |
| 34 | Jun-11 | 4.5 | 742.0 | 0.12 | | | | | |

h = Decision Value for CUSUM, SCL = Shewart Control Limit, k = Standard Error Shift Detection Parameter, Zi = Standardized Mean



# APPENDIX F

# Vault A and Sump A Analytical Tables

# TABLE 1
## RACER Trust - Coldwater Road Landfill Facility
## Landfill Leak Detection Vaults - Historical Analytical Results
## Inorganics and Metals

| | | Indicator Parameters | | | | | Dissolved Metals (µg/L) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Vault | Sample Date | TOC (mg/L) | TSS (mg/L) | pH | SpC | Temp | Cr | Cu | Ni | Zn |
| | | *MDEQ Residential Drinking Water Criteria & RBSLs* | | | | | *100 (A)* | *1,000 (E)* | *100 (A)* | *2,400* |
| | 23-Mar-95 | 4.6 | <1 | 7.50 | 690 | -- | <20 | <20 | <40 | 180 |
| | 20-Jun-95 | 8.9 | 2.0 | 6.80 | 1900 | -- | 24 | 21 | <30 | <20 |
| | 30-Aug-95 | 8.2 | 2.0 | 6.90 | 2000 | -- | <20 | <20 | <40 | <20 |
| | 28-Nov-95 | 9.1 | <1 | 7.00 | 1900 | -- | 23 | 31 | 43 | 24 |
| | 27-Mar-96 | 140.0 | <10 | 7.20 | 2000 | -- | <20 | <20 | 46 | <20 |
| **Vault A** | 18-Jun-96 | 12.0 | <10 | 6.90 | 2000 | -- | <20 | <20 | <20 | <20 |
| | 20-Aug-96 | 32.0 | <5 | 7.10 | 1900 | -- | <20 | <20 | <20 | 30 |
| | 11-Nov-96 | 18.0 | 5.0 | 7.10 | 2000 | -- | <20 | <20 | 30 | 60 |
| | 19-Feb-97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 9-May-97 | 13.0 | 17.0 | 6.67 | 1940 | 9.7 | <10 | <10 | 71 | 90 |
| | 12-Aug-97 | 6.0 | 4.0 | 5.98 | 1810 | 12.8 | <10 | <10 | 88 | 60 |
| | 15-Nov-97 | 8.0 | 12.0 | 6.50 | 2000 | 12.0 | <10 | 10 | 125 | 100 |
| | 9-Feb-98 | 6.0 | 8.0 | 6.40 | 1960 | 11.5 | <10 | <10 | 73 | 60 |
| | 14-May-98 | 12.0 | 15.0 | 6.90 | 1760 | 17.4 | <10 | 20 | 13 | 200 |
| | 14-Aug-98 | 5.0 | 6.0 | 6.70 | -- | -- | <10 | <10 | 15 | 160 |
| | 13-Nov-98 | 5.0 | 12.0 | 6.50 | 1990 | 16.5 | <10 | <10 | 20 | 220 |
| | 19-Mar-99 | 5.7 | 8.0 | 6.80 | 1334 | 13.6 | <10 | 10 | 14 | 60 |
| | 6-May-99 | 5.6 | 16.0 | 6.85 | 3250 | 26.2 | <10 | <10 | 15 | 20 |
| | 23-Jul-99 | 5.7 | 3.0 | 6.30 | 1470 | 18.9 | <5 | 9 | 13 | 19 |
| | 22-Oct-99 | 5.0 | 3.0 | 5.86 | 1750 | 12.1 | <10 | <10 | 16 | 30 |
| | 14-Mar-00 | 5.6 | <1 | 7.60 | 1410 | 10.7 | <10 | <10 | 15 | 20 |
| | 20-Jun-00 | 7.0 | 3.0 | 6.90 | 1410 | 18.3 | <10 | <10 | 12 | 20 |
| | 13-Sep-00 | 5.9 | 5.0 | 7.50 | 1650 | 15.1 | <5 | <10 | 14 | 20 |
| | 10-Nov-00 | 6.4 | 2.0 | 7.20 | 1470 | 11.8 | <10 | 100 | 10 | 150 |
| | 12-Mar-01 | 6.0 | 1.0 | 7.43 | 1530 | 12.8 | <10 | <10 | 7 | 10 |
| | 24-May-01 | 9.4 | 10.0 | 7.56 | 1380 | 11.9 | <10 | <10 | 10 | 20 |
| | 31-Aug-01 | 5.3 | 10.6 | 7.49 | 1450 | 12.5 | <5 | <10 | 14 | 9 |
| | 16-Nov-01 | 5.1 | 3.0 | 6.77 | 1300 | 12.4 | <10 | <10 | 15 | 50 |
| | 8-Mar-02 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 31-May-02 | 2.4 | 54.0 | 7.23 | 1470 | 13.8 | <10 | <10 | <5 | 40 |
| | 5-Sep-02 | 4.7 | 6.0 | 6.60 | -- | -- | <5 | <5 | 14 | 140 |
| | 12-Dec-02 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 18-Mar-03 | 6.7 | 8.0 | 6.81 | 1290 | 12 | <5 | <5 | 9 | 99 |
| | 4-Jun-03 | 2.0 | 11.0 | 6.78 | 1370 | 11.3 | <5 | <5 | 10 | <5 |
| | 5-Oct-03 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 8-Dec-03 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 27-Feb-04 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 30-Jun-04 | 4.5 | 55.0 | 6.99 | 1318 | 12.5 | <5 | <5 | 8 | <5 |
| | 19-Nov-04 | 3.4 | 2.0 | 6.85 | 1120 | 11.4 | 6 | <5 | 15 | 14 |
| Duplicate | 19-Nov-04 | 4.4 | 4.0 | -- | -- | -- | 6 | <5 | 18 | 16 |
| | 15-Jun-05 | 6.0 | 8.0 | 6.00 | 1640 | 13.4 | <5 | <5 | 13 | 21 |
| | 17-Jan-06 | 5.9 | 12785 | 10.01 | 1630 | 8.4 | <5 | <5 | 13 | 8 |
| Re-sample | 14-Feb-06 | -- | -- | 7.88 | 1800 | 8.5 | -- | -- | 14 | -- |
| | 29-Jun-06 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 28-Nov-06 | 4.7 | 438 | 7.73 | 1940 | 13.2 | <5 | <4 | 13 | 6 |
| | 6-Jun-07 | 4.9 | 11 | 6.76 | 1990 | 11.7 | 13 | 4 | 20 | 8 |
| | 12-Nov-07 | 5.9 | 70 | 6.76 | 2030 | 12.4 | 4 | 5 | 21 | 11 |
| | 24-Jun-08 | 5.0 | 371 | 6.89 | 2060 | 13.3 | <5 | <1 | 25 | 5 |
| | 17-Nov-08 | 5.8 | 23 | 6.06 | 2060 | 9.2 | <5 | <1 | 22 | <5 |
| | 23-Jun-09 | 5.5 | 88 | 7.01 | 2050 | 13.6 | <5 | 11 | 27 | 36 |
| **Vault A** | 17-Nov-09 | 6 | 8 | 7.07 | 2090 | 10.3 | <5 | <4 | 22 | 7 |
| | 14-Jun-10 | 6 | 10 | 7.05 | 2070 | 13.1 | 8 | <4 | 16 | 6 |
| | 20-Jun-11 | 6.7 | 9 | 7.33 | 2010 | 12.2 | 30 | <4 | 27 | 39 |
| Re-sample | 14-Jul-11 | -- | -- | -- | -- | -- | <5 | -- | -- | -- |
| | 14-Nov-11 | 7.0 | 316 | 6.93 | 2080 | 11.5 | <5 | <4 | 20 | <5 |
| | 25-Jun-12 | 6.0 | 6 | 5.75 | 1870 | 11.9 | <5 | 4 | 25 | <5 |
| Duplicate | 25-Jun-12 | 6.0 | 6 | 5.75 | 1872 | 11.9 | <5 | 6 | 25 | 10 |
| | 5-Dec-12 | 5.8 | 2 | 6.76 | 1820 | 10.6 | <5 | <4 | 24 | 10 |
| Duplicate | 5-Dec-12 | 5.8 | 3 | 6.76 | 1814 | 10.6 | <5 | <4 | 24 | 8 |
| | 6-Jun-13 | 6.1 | 4 | 6.71 | 1882 | 11.0 | <5 | <4 | 22 | <5 |
| | 4-Nov-13 | 5.0 | <1 | 6.71 | 1630 | 11.2 | <5 | <4 | 18 | <5 |
| | 23-Jun-14 | 5.0 | 3 | 6.82 | 1579 | 13.2 | <5 | <4 | 18 | <5 |
| | 18-Nov-14 | 4.1 | 2 | 6.27 | 1525 | 6.6 | <5 | <4 | 25 | 20 |
| | 25-Jun-15 | 4.5 | 2 | 6.64 | 1507 | 11.2 | <5 | 6 | 21 | 10 |
| | 17-Nov-15 | 3.6 | 1 | 6.64 | 1423 | 11.7 | <5 | <5 | 20 | 5 |
| | 21-Jun-16 | 3.8 | <3 | 6.93 | 1364 | 12.0 | <5 | <5 | 14 | <5 |
| Duplicate | 21-Jun-16 | 3.9 | <3 | 6.93 | 1362 | 12.0 | <5 | <5 | 13 | <5 |
| | 28-Nov-16 | 3.3 | <3 | 6.82 | 1378 | 11.4 | <5 | <5 | 15 | <5 |
| | 19-Jun-17 | 4.2 | <3 | 6.90 | 1450 | 11.4 | <5 | <5 | 15 | <5 |
| | 6-Nov-17 | 3.6 | <3 | 6.16 | 1363 | 11.8 | <5 | <5 | 17 | <5 |
| | 11-Jun-18 | 4.3 | <3 | 6.45 | 1447 | 11.0 | <5 | <5 | 15 | 10 |
| | **7-Nov-18** | **4.1** | **<3** | **6.50** | **1451** | **6.0** | **<5** | **<5** | **16** | **6** |

See notes on page 7.

# TABLE 2

## RACER Trust - Coldwater Road Landfill Facility
## Landfill Leak Detection Sumps - Historical Analytical Results
## Inorganics and Metals

| | | Indicator Parameters | | | | | Dissolved Metals (µg/L) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sump** | **Sample Date** | **TOC (mg/L)** | **TSS (mg/L)** | **pH** | **SpC** | **Temp** | **Cr** | **Cu** | **Ni** | **Zn** |
| | *MDEQ Residential Drinking Water Criteria & RBSLs* | | | | | | *100 (A)* | *1,000 (E)* | *100 (A)* | *2,400* |
| | 18-Jun-96 | 170.0 | 200 | 9.50 | 2800 | -- | 50 | 4300 | 640 | <20 |
| | 11-Nov-96 | 350.0 | 3000 | 10.00 | 4400 | -- | 150 | 8800 | 1300 | 30 |
| | 7-May-97 | 85.0 | 62 | 7.86 | 2200 | 8.9 | 20 | 2450 | 422 | 10 |
| | 5-Nov-97 | 110.0 | 14 | 8.50 | 2800 | 11.0 | <1 | 1050 | 376 | 20 |
| | 5-May-98 | 125.0 | 2 | 7.90 | 2280 | 9.1 | 40 | 1380 | 383 | 10 |
| **Sump A** | 6-Nov-98 | 136.0 | 984 | 7.54 | 2750 | 11.7 | 40 | 2950 | 519 | <10 |
| | 26-Apr-99 | 110.0 | 253 | 9.49 | 1334 | 12.6 | 40 | 2380 | 375 | <10 |
| | 22-Oct-99 | 44.7 | 8 | 6.60 | 1750 | 12.1 | 20 | 960 | 155 | 30 |
| | 20-Jun-00 | 53.4 | 16 | 8.20 | 1980 | 13.1 | 40 | 1160 | 187 | 20 |
| | 10-Nov-00 | 66.7 | 31 | 7.70 | 2130 | 11.1 | 30 | 1050 | 174 | 20 |
| | 24-May-01 | 70.0 | 16 | 8.59 | 2470 | 10.2 | 40 | 1030 | 163 | 20 |
| | 16-Nov-01 | 69.6 | 300 | 7.87 | 2130 | 12.3 | 40 | 990 | 160 | 20 |
| | 31-May-02 | 51.7 | 48 | 7.17 | 2340 | 15.3 | 80 | 880 | 127 | 20 |
| | 12-Dec-03 | 55.2 | 25 | 7.40 | 1840 | 11.2 | 37 | 770 | 121 | 7 |
| | 3-Jun-03 | 75.5 | 90 | -- | -- | -- | 41 | 1180 | 156 | 22 |
| | 8-Dec-03 | 67.0 | 115 | 8.75 | 2210 | 11.6 | 74 | 969 | 138 | 31 |
| | 30-Jun-04 | 62.0 | 6 | 8.37 | 2501 | 12.6 | 104 | 1450 | 161 | 7 |
| | 19-Nov-04 | 36.9 | 2.7 | 8.19 | 2070 | 11.4 | 31 | 492 | 70 | 20 |
| | 15-Jun-05 | 89.0 | 18.0 | 8.95 | 3320 | 14.7 | 215 | 1930 | 200 | <5 |
| | 17-Jan-06 | 83.7 | 980.0 | 8.40 | 3970 | 6.9 | 70 | 1350 | 155 | 14 |
| | 29-Jun-06 | 65.4 | 36.0 | 8.48 | 3640 | 11.7 | 192 | 1070 | 109 | 7 |
| | 28-Nov-06 | 78.2 | 258 | 8.15 | 3660 | 12.9 | 132 | 1240 | 126 | 6 |
| | 6-Jun-07 | 64.4 | 7 | 6.94 | 3350 | 10.0 | 95 | 1280 | 131 | 17 |
| | 12-Nov-07 | 71.7 | 3 | 7.19 | 3970 | 11.8 | 41 | 1460 | 150 | 22 |
| | 24-Jun-08 | 46.6 | 2 | 7.89 | 3210 | 12.4 | 123 | 1240 | 118 | 8 |
| | 17-Nov-08 | 48.5 | 4 | 7.26 | 3670 | 10.6 | 65 | 1190 | 114 | 12 |
| | 23-Jun-09 | 61.0 | 3 | 7.53 | 2900 | 12.8 | 222 | 1400 | 126 | <5 |
| | 17-Nov-09 | 69 | 40 | 8.42 | 3570 | 9.6 | 71 | 1040 | 100 | 14 |
| | 14-Jun-10 | 120 | 4 | 9.09 | 2880 | 11.9 | 305 | 1380 | 124 | <5 |
| | 8-Nov-10 | 71 | 10 | 8.34 | 3560 | 10.9 | 113 | 1110 | 1030 | 23 |
| **Sump A** | 20-Jun-11 | 52.4 | 3 | 9.18 | 2380 | 11.1 | 330 | 965 | 91 | <5 |
| | 14-Nov-11 | 62.0 | 1 | 8.09 | 3420 | 11.4 | 116 | 1000 | 94 | 6 |
| | 25-Jun-12 | 53.0 | 3 | 7.40 | 3070 | 12.0 | 180 | 863 | 83 | 32 |
| Duplicate | 25-Jun-12 | 52.0 | 3 | 7.40 | 3070 | 12.0 | 183 | 882 | 86 | 5 |
| | 5-Dec-12 | 63.5 | 4 | 7.86 | 3640 | 9.2 | 115 | 1050 | 97 | 10 |
| Duplicate | 5-Dec-12 | 63.5 | 4 | 7.86 | 3630 | 9.2 | 104 | 990 | 88 | 10 |
| | 6-Jun-13 | 50.2 | 5 | 9.11 | 2210 | 11.2 | 323 | 936 | 87 | <5 |
| | 4-Nov-13 | 58.9 | <1 | 7.96 | 3100 | 10.9 | 129 | 819 | 73 | 8 |
| | 23-Jun-14 | 49.2 | 58 | 8.84 | 2290 | 12.3 | 196 | 860 | 82 | <5 |
| | 25-Jun-15 | 36.6 | 3 | 7.60 | 1831 | 11.5 | 452 | 437 | 42 | 27 |
| | 21-Jun-16 | 39.8 | <3 | 8.46 | 1866 | 12.0 | 317 | 645 | 55 | <5 |
| Duplicate | 21-Jun-16 | 39.9 | <3 | 8.46 | 1867 | 12.0 | 315 | 659 | 54 | <5 |
| | 19-Jun-17 | 40.1 | <3 | 9.43 | 1716 | 12.9 | 317 | 554 | 52 | <5 |
| | **11-Jun-18** | **35.1** | **50** | **7.93** | **1894** | **11.0** | **288** | **435** | **43** | **<5** |

See notes on page 6.


OBG
Part of Ramboll