STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING

RICK SNYDER
GOVERNOR

C. HEIDI GRETHER
DIRECTOR

January 5, 2018

Mr. David Favero
RACER Trust
500 Woodward Avenue, Suite 2650
Detroit, Michigan 48226

RECEIVED JAN 16 2018

Dear Mr. Favero:

SUBJECT: Operation and Maintenance Inspection Report;
RACER Trust Coldwater Road Landfill; MID 005 356 860

The Department of Environmental Quality (DEQ), Waste Management and Radiological Protection Division (WMRPD), has completed an Operation and Maintenance (O&M) Inspection for the RACER Trust Coldwater Landfill located in Genesee County. The O&M inspection included a field audit of the Sampling and Analysis Plan (SAP) and split sampling of groundwater on November 7, 2017; records review; groundwater contour map confirmation; Stiff/Piper diagram evaluations; analysis; and completion of O&M checklists. Please refer to the enclosed O&M Inspection Report for the detailed review of each of these inspection items.

No violations were noted during this groundwater O&M inspection, and findings documented good compliance with the facility SAP, per the approved Postclosure Plan specifications.

The findings of this inspection do not preclude, nor limit, the DEQ's ability to initiate any other enforcement action, under state or federal law, as deemed appropriate.

Should you require further information, please contact me at 517-284-6564; mccabej@michigan.gov; or DEQ, WMRPD, P.O. Box 30241, Lansing, Michigan 48909-7741.

Sincerely,

John McCabe, Environmental Quality Analyst
Corrective Action Unit
Hazardous Waste Section
Waste Management and Radiological Protection

Enclosure
cc: Mr. Brian Grochowski, DEQ
Ms. Virginia Himich, DEQ
Mr. Richard Conforti, DEQ
Mr. Joseph Rogers, DEQ
cc/enc: HWS/C&E File

# Operation and Maintenance Inspection Report

## January 2018

## RACER Coldwater Road Landfill
## Flint, Michigan
## MID 005 356 860

State of Michigan

Department of Environmental Quality

**Conducted by the**
**Waste Management and Radiological Protection Division**

Table of Contents



**Inspection Conducted by:**
**Mr. Joe Rogers, Geologist**
**Mr. John McCabe, Environmental Quality Analyst**

# Field Inspection Guide

# APPENDIX B
# Part Two

# Field Inspection Guide

# PART TWO

The field inspector will complete four tasks during the field inspection. They are: 1) review the operating record to identify evidence of deficiencies in the owner/operator's sampling and/or operation and maintenance programs; 2) visually inspect each well and piezometer for evidence of damage or deterioration; 3) obtain measurements from the operations record of depths of water levels and well depths for each well and piezometer; and 4) visually observe the owner/operator's field crew as they collect ground-water samples.

Name of inspector(s) John McCabe Joe Rogers

Date(s) of inspection 11/07/2017

| **1. Review the operating record of the facility. Does the operating record:** | **Y/N** |
|---|---|
| Include annual reports of ground-water monitoring results including ground-water level data from each well and piezometer in the monitoring system? | Y |
| Include an inventory of all sampling devices and purging equipment in use at the facility and information on model number, serial number and manufacurers name? | Y |
| Include detailed operating, calibration and maintenance procedures for each sampling device? | Y |
| Describe decision criteria to be used to replace or repair sampling equipment and/or monitoring wells? | Y |
| Include schedules for performing operation and maintenance activities related to the ground-water monitoring system? | Y |
| Include records for ground-water monitoring which provide information on 1) the date, exact place and time of sampling or measurements; 2) the individual(s) who performed the sampling or measurements; 3) the date(s) analyses were performed; 4) the analytical techniques or methods used; and 5) the results of such analyses? | Y |
| Include records of all monitoring information including all calibration and maintenance records? | Y |
| Include records of monitoring information including determination of ground-water surface elevations? | Y |
| Include a determination of ground-water flow rate and direction(s) in the uppermost aquifer on an annual basis (e.g., prepare a potentiometric map annually using data collected during the year)? | Y |
| Provide for more frequent and intensive inspection of wells constructed of non-inert casing such as PVC? (Refer to Appendix A for permit example.) | Y |

## COMMENTS ON OPERATING RECORD

Complete and thorough. Information stored on site in Landfill Leachate Accumulation Building.

2. Visually inspect each well and piezometer and complete the table below (one line entry for each well or piezometer):

| Well/ Piezometer | Survey Mark Present? | Standing or Ponded Water? | Evidence of Collision Damage? | Evidence of Frost Heaving? | Evidence of Casing De-gradation? | Lock in Place? | Evidence of Well Sub-sidence? | Photograph Taken? |
|---|---|---|---|---|---|---|---|---|
| see attached monitoring well data sheets | | | | | | | | |
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3. Obtain data on depth to standing water and depth to the bottom of each monitoring well and piezometer in the owner/operator's monitoring system. Record depth measurements to the nearest 0.01 feet. Record the measurements

| Date | Well/ Piezometer I.D. No. | Depth to Water (0.01') | Depth of Well/ Piezometer (0.01') |
|---|---|---|---|
| See attached | | | |
| monitoring well data | | | |
| | sheets | | |
| | | | |
| | | | |
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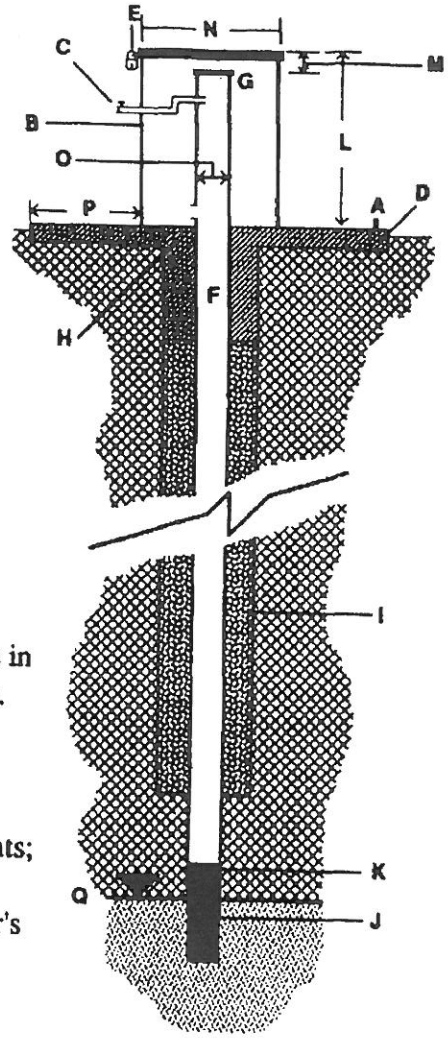
Key:

A - survey elevation mark
B - protective outer casing
C - gas vent
D - concrete apron
E - fitted lock
F - primary casing material
G - cap for primary casing
H - bore hole seal
I - annular space seal
J - well screen
K - filter pack
L - height of riser
M - elevation difference
N - diameter of outer casing
O - diameter of primary casing
P - radius of apron
Q - water level below surface




1. The field inspector has several options in collecting ground water elevation data. The inspector may:
   a. obtain past data from the operating record;and/or
   b. take his/her own depth measurements; and/or
   c. obtain data from the owner/operator's sampling crew.

4. Observe the owner/operator's staff as they collect ground-water samples at several wells. Complete the following table for each well (Note: revise or add to the table if permit conditions dictate a different requirement the owner/operator must follow):

| Position/Title | Name | Sampling Experience (years and type) |
|---|---|---|
| Geologist | Clifford Yantz | 20+ all media |
| Geologist | Kevin Schnieder | 10+ all media |
| | | |
| | | |
| | | |

| Well Identification Number All wells | Y/N | Photograph Taken Y/N |
|---|---|---|
| Did the sampling crew measure static water levels in the well and well depths prior to the sampling event? | Y | Y |
| Did the sampling crew use a steel tape or electronic device totake depth measurements? | Y | N |
| Did the sampling crew record depths to +/– 0.01 feet? | Y | N |
| Did the sampling crew follow these procedures:<br>1. remove locking and protective cap;<br>2. sample the air in the well head for organic vapors;<br>3. determine the static water level; and<br>4. lower an interface probe into the well to detect immiscible layers. | Y except 2- NA | N |
| If immiscible samples were collected, were they collected prior to well purging? | NA | N |
| Did the sampling crew evacuate low yielding wells to dryness prior to sampling? | Y | N |
| Did sampling crew evacuate high yielding wells so that at least three casing volumes were removed? All wells purged dry | NA | N |
| Did the sampling crew collect the purge water for storage and analysis or for shipment off-site to a RCRA treatment facility? | Y | N |
| Were sampling devices constructed of fluorocarbon resins or stainless steel? | Y | Y |

(Continued)

| Well Identification Number All wells | Y/N | Photograph Taken Y/N |
|---|---|---|
| If the sampling crew used dedicated samplers, did they disassemble and thoroughly clean the devices between samples? Disposable sampling equipment | NA | N |
| If samples are collected for organic analyses, did the cleaning procedure include the following steps:<br>1. non phosphate detergent wash<br>2. tap water rinse<br>3. distilled/deionized water rinse<br>4. acetone rinse<br>5. pesticide-grade hexane rinse? | NA | N |
| If samples are collected for inorganic analyses, does the cleaning procedure include the following steps:<br>1. dilute acid rinse ($HNO_3$ or HCL)<br>2. distilled/de-ionized water rinse? | NA | N |
| Did the sampling crew take trip blanks, field blanks and equipment blanks? | Y | N |
| If the sampling crew used bailers, were they bottom valve bailers? | NA | N |
| If the sampling crew used bailers, was "teflon" coated wire, single strand stainless steel wire or monofilament used to raise and lower the bailer? | NA | N |
| If the sampling crew used bailers, did they lower the bailer slowly to the well? | NA | N |
| If the sampling crew used bailers, were the bailer contents transferred to the sample container to minimize agitation and aeration? | NA | N |
| Did the sampling crew take care to avoid placing clean sampling equipment, hoses, and lines on the ground or other contaminated surfaces prior to insertion in the well? | Y | Y |
| If the sampling crew used dedicated bladder pumps:<br>Was the compressed gas from an oilless compressor certified quality commercial compressed gas cylinder? If not, was a suitable oil removal purification system installed and maintained? | NA | N |
| Was the bladder pump controller capable of throttling the bladder pump discharge flow to 100 ml/min or less for continuous periods of at least 20-30 seconds without restricting liquid discharge? | NA | N |

(Continued)

| Well Identification Number _____ | Y/N | Photograph Taken Y/N |
|---|---|---|
| Were samples taken from the bladder pump discharge tube, and not from any purge device discharge tube? | NA | N |
| Was the bladder pump discharge flow checked for the presence of gas bubbles before each sample collection, as a test for bladder integrity? | NA | N |
| Was bladder pump flow performance monitored regularly for dropoff in flow rate and discharge volume per cycle? | NA | N |
| Was the bladder pump incorporated in a combination sample-purge pump design which can expose the bladder pump interior and discharge tubing to the pump drive gs? If so, were operating procedures established and followed to prevent at all times the entry of drive gas into the sample flow or into the bladder pump interior? | NA | N |
| Did the sampling crew collect and containerize samples in the order of the volatilization sensitivity of the parameters? | Y | N |
| Did the sampling crew measure the following parameters in the field: pH, temperature; specific conductane? | Y | Y |
| Did the sampling crew sample background wells before sampling downgradient wells? No "background" wells - | NA | N |
| Did the sampling crew use fluorocarbon resin or polyethylene containers with polypropylene caps for samples requiring metals analysis? | Y | Y |
| Did the sampling crew use glass bottles with fluorocarbon resin-lined caps for samples requiring metals analysis? | N | N |
| If metals were the analytes of concern, did the sampling crew use containers cleaned with nonphosphate detergent and water, and rinsed with nitric acid, tap water, hydrochloric acid, tap water and finally Type II water? | Y | N |
| *If organics were the analytes of concern, did the sampling crew use* containers cleaned with nonphosphate detergent, rinsed with tap water, distilled water, acetone, and finally pesticide quaility hexane? | Y | Y |
| Did the sampling crew filter samples requiring analysis for organics? | N | N |

## COMMENTS ON SAMPLING PROGRAM

Samples collected according to MDEQ Approved sampling and analysis plan. MasterFlex Peristaltic pump used for sample collection, set to ≈ 200 ml/minute flow rate. Disposable tubing was the only component of the sampling train to touch the sample.

**After working through Part Two, the field inspector will have:**

- assessed whether the owner/operator's sampling crew departed from written sampling and analysis procedures as contained in the owner/operator's sampling and analysis plan (interim status) or in the owner/operator's RCRA permit (permit status);

- identified deficiencies in the way the owner/operator's sampling crew collected ground-water samples;

- identified deficiencies in the owner/operator's program to ensure on-going maintenance of sampling devices and monitoring wells/piezometers;

- identified deficiencies in the owner/operator's operating record (Does theoperating record have all the information in it that is required?); and

- collected field data that will allow the enforcement official to construct potentiometric maps and assess the viability of individual wells.

# Sampling and Analysis Inspection

## SAMPLING AND ANALYSIS INSPECTION

On November 7, 2017, a sampling and analysis inspection was conducted at the RACER Trust Coldwater Road Landfill as part of an Operation and Maintenance (O&M) inspection. Department of Environmental Quality (DEQ), Waste Management and Radiological Protection Division (WMRPD) staff involved in the sampling were Mr. John McCabe, Environmental Quality Analyst, and Mr. Joe Rogers, Geologist. Mr. Kevin Schneider and Mr. Clifford Yantz of O'Brien and Gere Engineers (OBG) participated in the sampling event on behalf of the facility.

Site monitoring wells were found to be in generally good condition, effectively secured and functioning properly. Static water levels in all site monitoring wells had been measured by OBG the previous day. Therefore, OBG and the WMRPD did not compare static water levels on the day of the sampling. All monitoring wells were found to contain water; this was not always the case in previous monitoring events.

The facility's approved Sampling and Analysis Plan (SAP) and associated monitoring documentation were stored on-site, in the Leachate Accumulation Building, immediately adjacent to the landfill. The current version of the SAP was revised October 18, 2006, and approved by the WMRPD on November 11, 2006.

Sampling was conducted using low-flow purging and sample collection methods. Samples collected for metals analysis were filtered in the field, in order to be comparable to historically collected samples. Purging rates were on the order of 100 milliliters per minute to prevent excess drawdown at what are historically low yielding wells. Drawdown conditions stabilized under low-flow pumping conditions. Purging continued until indicator parameters (i.e., temperature, dissolved oxygen, pH, and specific conductivity) stabilized, within ten percent, for three consecutive readings. Turbidity was typically the limiting factor in well stabilization during this sampling event. Turbidity values, both historically and during this sampling event, have been high relative to most naturally occurring groundwater systems. Based on a recommendation from the 2008 O&M inspection, the facility redeveloped a number of monitoring wells in an attempt to address the observed high turbidity. However, turbidity at the majority of monitoring wells at this site remains elevated and likely reflects actual perched groundwater conditions. Purge water was disposed of by pouring it on the ground away from the well, as these wells have no history of contamination.

Split sampling of the groundwater was performed at MW-B7, MW-B28, and MW-B24R. The WMRPD and OBG both measured pH and specific conductivity in the field, with all meters being calibrated before use that day. Readings of pH and specific conductivity showed relatively good agreement between the WMRPD and OBG for pH. However, with respect to specific conductivity, the DEQ meter consistently read at least 0.2 millisiemens per cubic centimeter lower than the meter used by OBG. The DEQ meter was calibrated before use and recalibrated in the field and the difference remained consistent. Specific conductivity and pH data are included on Table 3. Due to the variation in specific conductivity readings noted in the field, the WMRPD and OBG requested their respective laboratories to add specific conductivity to the parameters analyzed, in order to potentially determine the source of the discrepancy. Those results are discussed in the "Geochemical Evaluation" section of this Report.

Monitoring wells were sampled by OBG using an electric submersible pump, in accordance with the procedures discussed above. New pump tubing was used at each location. The flow through cell and associated tubing were decontaminated between each use, at each well. Gloves were worn by all personnel during sampling. Pursuant to the SAP, the facility sampled

for total cyanide, total organic halides, dissolved metals, and total organic carbon. Samples for volatile organics (DEQ Scan 8260+), dissolved metals, total cyanide, total organic carbon, total alkalinity, carbonate alkalinity, bicarbonate alkalinity, chloride, sulfate, and specific conductivity were taken by the WMRPD. Dissolved metals samples were filtered through a 0.45 micron filter in the field. MW-B7 ran dry during sample collection and the WMRPD was not able to collect a total cyanide sample at this location. Quality control samples collected by OBG were one duplicate, a field blank, and a rinse blank. The WMRPD collected a field blank for volatile organics and a duplicate sample (designated MW-B28 Dup) at MW-B28. None of the blanks displayed any evidence of contamination.

No violations were noted during this groundwater O&M inspection, and findings documented good compliance with the facility SAP, per the approved Postclosure Plan specifications.

# Monitor Well Data Sheets

# Michigan Department of Environmental Quality
## Office of Waste Management and Radiological Protection

### Monitor Well Data Sheet

Facility: Cold Water Rd
Location: Landfill
Facility Contact: Cliff Yantz
Facility Sampling Staff: Kevin Schneider
DEQ Staff Present: JR JM

EPA ID #: MI 005 356 860
Date: 11/7/17
Facility Phone # ( ) -

## WELL INFORMATION

Monitor Well ID: MW-7
Depth: 29.14
Diameter: 2"
Concrete Pad: ☑
Screen Material: PVC
Location of TOC Survey Mark:

Cap Locked: ☑ Y/N
Casing Material: PVC
Well Condition: good
Protective Barrier: ☑ NO
Other Well Info:

## SAMPLING INFORMATION

| | DEQ | FACILITY |
|---|---|---|
| Static Water Level: | | 19.81' |
| Method: | Solinst Electronic | Type |
| Measured By: | J.M | MS |
| Stabilized pH: | 6.96 | 6.94 |
| Stabilized Conductance: | 1.10 | 0.79 mS |
| Temperature: | | 10.8 |

DO 3.29
ORP 28.5

Purge Method: ~~Peristaltic~~ Master flex
Volume Purged: 3.5 gallons
Fate of Purge Water: ground
Recovery Rate: poor
Appearance: clear

Sampling Method: ~~Peristaltic~~ Master flex
Appearance: clear
Time Sample Was Collected: 930
Turbidity: ~~100~~ 86
DEQ Sampler: JR
Sample Bottles Collected: ☑VOCs ☐ON ☐BNA ☑MN ☑GA ☑GB ☐GG ☐GN
☐Dioxins ☐Rads ☑MADs Cd,Cr,Cu,Ni,Pb,Zn,Ca,Mg,Na,K,Hg,As,Se,Sb,Al,Mn,Fe,Ag,Ba,Be,Mo,Ti,V,Co,Li
☐ Other

Additional Notes ( External Sources of Contamination, Precautions Taken, Replicates and/or Blanks, Decon Procedures, Filtering Procedures)
Limited Volume GA, MAD, MN NO GB - dry
Touch Running While Sampling - New well
well goes dry

☑ Standing Water NO
☑ Collision Damage NO
☐ Casing Degradation NO
☑ Frost Heaving NO
☑ Well Subsidence NO
☑ Photograph Taken Y(1)

# Michigan Department of Environmental Quality
# Office of Waste Management and Radiological Protection

## Monitor Well Data Sheet

Facility: Coldwater Rd
Location: Land Fill
Facility Contact: Cliff Yantz
Facility Sampling Staff: Kevin Schneider
DEQ Staff Present: JR, JM

EPA ID #: MI 005 356 860
Date: 11/27/17
Facility Phone # ( ) -

## WELL INFORMATION

Monitor Well ID: B-28
Depth: 32.95
Diameter: 2"
Concrete Pad: ☒ NO
Screen Material: PVC
Location of TOC Survey Mark: N

Cap Locked: ☐
Casing Material: PVC
Well Condition: good
Protective Barrier: NO
Other Well Info:

## SAMPLING INFORMATION

| | DEQ | FACILITY |
|---|---|---|
| Static Water Level: | ~~5300~~ - | 7.18 |
| Method: | Solinst Electronic | Tape |
| Measured By: | JM | ORC |
| Stabilized pH: | 7.60 | 7.12 |
| Stabilized Conductance: | .97 | 0.76 ms |
| Temperature: | | 12.5 |

DO 1.78
ORP 74.8

Purge Method: Mastflex
Fate of Purge Water: Ground
Recovery Rate: 0.0
Volume Purged: 8 gal (Hydra)
Appearance: Clear

Sampling Method: Mastflex
Time Sample Was Collected: 10:30
DEQ Sampler: JR JM
Appearance: clear
Turbidity: 38

Sample Bottles Collected: ☒VOCs ☐ON ☐BNA ☒MN ☐GA ☒GB ☐GG ☐GN
☐Dioxins ☐Rads ☒MADs Cd,Cr,Cu,Ni,Pb,Zn,Ca,Mg,Na,K,Hg,As,Se,Sb,Al,Mn,Fe,Ag,Ba,Be,Mo,Ti,V,Co,Li
☐ Other

Additional Notes ( External Sources of Contamination, Precautions Taken, Replicates and/or Blanks, Decon Procedures, Filtering Procedures)

Duplicate Here (MW-28)

☐ Standing Water NO
☒ Collision Damage NO
☒ Casing Degradation NO

☐ Frost Heaving NO
☐ Well Subsidence NO
☐ Photograph Taken Yes

# Michigan Department of Environmental Quality
# Office of Waste Management and Radiological Protection

## Monitor Well Data Sheet

Facility: Coldwater Rd — EPA ID #: MID 005 356 860
Location: Landfill — Date: 11/7/17
Facility Contact: Cliff Yantz — Facility Phone # ( ) -
Facility Sampling Staff: ~~Kevin~~ Kevin Schneider
DEQ Staff Present: JL JM

## WELL INFORMATION

Monitor Well ID: B-24R — Cap Locked: ☑ Yes
Depth: 30.41' — Casing Material: PVC
Diameter: 2" — Well Condition: good
Concrete Pad: ☑ Yes — Protective Barrier:
Screen Material PVC — Other Well Info:
Location of TOC Survey Mark: North

## SAMPLING INFORMATION

| | DEQ | FACILITY |
|---|---|---|
| Static Water Level: | | 13.41 |
| Method: | Solinst Electronic | Typ |
| Measured By: | JM | CBG |
| Stabilized pH: | 7.7 | 7.09 |
| Stabilized Conductance: | 1.29 ms | 1.09 ms |
| Temperature: | 57.4 | |

DO 5.89
ORP 73.5

Purge Method: Masterflex — Volume Purged: 6.0 gal (4 tubing)
Fate of Purge Water: ground
Recovery Rate: OK — Appearance: clear

Sampling Method: Masterflex — Appearance: clear
Time Sample Was Collected: 11:30 — Turbidity: 50
DEQ Sampler: JL JM
Sample Bottles Collected: ☒VOCs ☐ON ☐BNA ☒MN ☒GA ☐GB ☐GG ☐GN
☐Dioxins ☐Rads ☒MADs Cd,Cr,Cu,Ni,Pb,Zn,Ca,Mg,Na,K,Hg,As,Se,Sb,Al,Mn,Fe,Ag,Ba,Be,Mo,Ti,V,Co,Li
☐ Other

Additional Notes ( External Sources of Contamination, Precautions Taken, Replicates and/or Blanks, Decon Procedures, Filtering Procedures)

☐ Standing Water No — ☐ Frost Heaving No
☐ Collision Damage No — ☐ Well Subsidence No
☐ Casing Degradation No — ☐ Photograph Taken Yes

# Groundwater Flow Evaluation

## GROUNDWATER FLOW EVALUATION

### Geology and Hydrogeology:

The facility is located on unconsolidated glacial sediments consisting of till (clay/sand/silt/gravel mixture) with occasional outwash layers. The outwash deposits are silt and sand layers of varying thickness, and lateral extent, within the till units. The site is located on an end moraine of the Saginaw Glacial Lobe and is, thus, a local topographic high.

The general stratigraphy at the site, starting at the surface, is an Upper Perched Zone consisting of clay and silt with lenticular sand layers. The next lower unit is continuous clay till layer or Aquiclude. The first usable aquifer at the site is found under the clay till, at an elevation of about 700 to 750 feet above Mean Sea Level (MSL), and is called the Drift Aquifer. Under the Drift Aquifer is another extensive clay layer that is underlain by bedrock. The unconsolidated glacial drift sediments range in thickness from approximately 100 to 200 feet in the area. The bedrock is the Pennsylvanian Age Saginaw Formation that consists of sandstone, shale, and limestone.

Groundwater can be found in two zones of the glacial drift sediments: the Upper Perched Zone and the Drift Aquifer. The Upper Perched Zone is relatively heterogeneous; therefore, groundwater flow direction has been difficult to evaluate and somewhat variable. The Upper Perched Zone is not used as a potable water source in the area. Groundwater in the Drift Aquifer has been documented to flow to the south-southwest in previous investigations. The Drift Aquifer is used as a potable water source for many residences located north (upgradient) of the facility.

### Groundwater Flow Evaluation:

Static water elevations were measured in both the shallow Upper Perched Zone, and the deeper Drift Aquifer, monitoring wells on November 6, 2017. Static water elevations data was collected by OBG using an electronic water level tape.

The attached Static Water Elevations Table (Table 1) provides the monitoring well designation, the unit monitored, the well depth in feet, the screened interval in feet below the top-of-casing, the top-of-casing elevation in feet relative to MSL, the depth to water in feet, and the static water elevation in feet relative to MSL. An evaluation of the results of the measurements for both the Upper Perched Zone and the Drift Aquifer is provided below.

### Upper Perched Zone:

Due to the heterogeneous, discontinuous, and intermittent nature of the Upper Perched Zone (silt/clay), a groundwater elevation contour map was not constructed for this unit. However, Figure 2 provides the groundwater static water elevations on a site map for visual comparison. The wide variability in static water elevations noted in Figure 2 and the Static Water Elevations Table (Table 1) are due to the fact that in many cases separate discreet perched sand zones are being monitored. The elevations, where available, are relatively consistent with historical data.

### Drift Aquifer:

A static water level elevation map for the Drift Aquifer is shown in Figure 3. This fine sand and silt aquifer is found at an elevation of between 700 to 750 feet MSL and is thicker to the north. The static water elevations of all five monitoring wells are relatively consistent with recent data and based on drift aquifer wells, the contours of groundwater flow are generally to the southwest, although the lack of any wells on the west side of the landfill may contribute to the

shape of the contours and the westerly component of flow. Based on the static water elevations in closely located MW B-27D and MW B-23DR, it also appears that there is a downward vertical gradient in the Drift Aquifer.

# Geochemical Evaluation

## GEOCHEMICAL EVALUATION

**Sampling Data:**
A table of final WMRPD analytical data (Table 2), along with a comparison chart of the WMRPD data and the facility data (Table 3), are enclosed. A full U.S. Environmental Protection Agency SW-846 Method 8260 B volatile organic compound scan was performed by the WMRPD, and all results were non-detect. Analytical results are included as part of this report.

There is very good agreement between the WMRPD data and the facility data for all parameters sampled. Apparent differences in results are actually an artifact of the DEQ Laboratory achieving lower detection limits than the analytical laboratory used by the facility. For many of the metals sampled, the detection limits required by the SAP, and used by the facility's laboratory, were 5 ug/L while the DEQ Laboratory routinely achieved lower detection limits and reported out values below 5 ug/L. Therefore, many of the metals values reported as non-detects by the facility were detected and reported by the DEQ Laboratory. All values reported by both laboratories were consistent with historical data. Specific conductivity measured by the DEQ Laboratory and the laboratory used by the facility agreed very well and did not display the differences in the WMPRD and OBG field measurements previously noted in the Sampling and Analysis Section of the report. These results suggest calibration or operational issues with the field meters used by both sampling teams.

**Stiff and Piper Diagrams:**
Stiff and Piper Diagrams were generated from the data collected by the WMRPD and are included as Figures 4 and 5. Monitoring wells included in the split sampling and used to generate the data were MW-B7, MW-B28 (and its duplicate sample),and MW-B24R. As in previous samplings, groundwater chemistry is dominated by bicarbonate alkalinity with similar levels in MW-B7 and MW-B28 and a slightly higher sulfate influence in MW-B24R. Differences between wells sampled, though noticeable on the Stiff Diagrams, are due to small variations in the relatively low levels of cations and are not significant. All data are comparable to historical data, and none of these data suggest an impact on groundwater quality from the regulated unit.

Ion charge balances, for the DEQ Laboratory data, were also calculated for each well and are included in Table 4. These data indicate that ion charges were imbalanced by 15.1 to 25.6%. These imbalances were uniformly the result of anion dominance. In general, the ion balances demonstrate that the analytical data were of good quality; however, the higher percentages indicate that some unmeasured constituents (organic anions, nutrients, and/or trace metals) are not represented in the analytical suite collected by the WMRPD. Future O&M sampling should include analyses for magnesium and potassium, to determine if these data resolve the ionic charge imbalance issue.

# Tables

# TABLE 1
## RACER Trust - Coldwater Road Landfill Facility
## Depth to Groundwater Levels in Monitoring Wells
### November 6, 2017

| Well | Top of Casing Elev. (ft)* | Depth to Water(ft) | Static Water Elev. (ft) |
|---|---|---|---|
| B-2D | 803.80 | 56.01 | 747.79 |
| B-7 | 813.63 | 19.81 | 793.82 |
| B-9 | 807.45 | 19.19 | 788.26 |
| B-18A | 810.85 | 25.81 | 785.04 |
| B-19A | 812.66 | 11.62 | 801.04 |
| B-19AR | 811.80 | 40.67 | 771.13 |
| B-20D | 815.14 | 71.44 | 743.70 |
| B-21D | 821.07 | 81.53 | 739.54 |
| B-22D | 822.15 | 85.56 | 736.59 |
| B-23DR | 812.12 | 82.05 | 730.07 |
| B-24R | 816.04 | 17.52 | 798.52 |
| B-27D | 812.70 | 76.84 | 735.86 |
| B-28 | 816.46 | 6.97 | 809.49 |

**Notes**

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

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
## DEQ Laboratory Results
## Operation and Maintenance Inspection Report
Sampled on November 7, 2017

| Inorganics (mg/L) | MW- B7 | MW-B28 | MW-B28 Dup | MW-B24R |
|---|---|---|---|---|
| Alkalinity | 350 | 360 | 360 | 400 |
| Carbonate Alkalinity | <10 | <10 | <10 | <10 |
| Bicarbonate Alkalinity | 350 | 360 | 360 | 400 |
| Total Cyanide | NS | <0.005 | <0.005 | <0.005 |
| Diss. Calcium | 100 | 110 | 100 | 150 |
| Diss. Chloride | 18 | 12 | 12 | 48 |
| Diss. Chromium | 0.0028 | <0.001 | <0.001 | <0.001 |
| Diss. Copper | 0.0058 | <0.001 | <0.001 | 0.0024 |
| Diss. Manganese | 0.0021 | 0.0037 | 0.0037 | 0.0055 |
| Diss. Nickel | 0.0096 | 0.0081 | 0.0079 | 0.0013 |
| Diss. Sodium | 28 | 19 | 18 | 49 |
| Diss. Sulfate | 110 | 110 | 110 | 210 |
| Diss. Zinc | <0.005 | <0.005 | <0.005 | <0.005 |

| Organic Compounds | MW-B7 | MW-B28 | MW-B28 Dup | M- B24R |
|---|---|---|---|---|
| Volatile Organics | ND | ND | ND | ND |
| Total Organic Carbon | 6.9 | 3.5 | 2.9 | 4.8 |

Chemical data in mg/L
NA = Not Analyzed
ND = Non Detect
NS = Not Sampled

## TABLE 3
### Data Comparison Table
### Operation and Maintenance Inspection Report
Sampled on November 7, 2017

| | MW-B7 | | MW-B28 | | | MW-B24R | |
|---|---|---|---|---|---|---|---|
| | OBG | DEQ | OBG | DEQ | DEQ Dup | OBG | DEQ |
| **INORGANICS** | | | | | | | |
| Total Cyanide | | NS | | <0.005 | <0.005 | | <0.005 |
| Diss. Chromium | <0.005 | 0.0028 | <0.005 | <0.001 | <0.001 | <0.005 | <0.001 |
| Diss. Copper | 0.005 | 0.0058 | <0.005 | <0.001 | <0.001 | <0.005 | 0.0024 |
| Diss. Nickel | 0.005 | 0.0096 | <0.005 | 0.0081 | 0.0079 | <0.005 | 0.0013 |
| Diss. Zinc | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| **Other Parameters** | | | | | | | |
| Total Organic Carbon | 6.5 | 6.9 | 1.6 | 3.5 | 2.9 | 3.4 | 4.8 |
| pH (field) | 6.94 | 6.96 | 7.12 | 7.6 | NA | 7.09 | 7.7 |
| Conductivity (field) | 1.10 | 0.79 | 0.76 | 0.97 | NA | 1.29 | 1.09 |
| Conductivity (lab) | 0.84 | 0.87 | 0.86 | 0.857 | NA | 1.231 | 1.21 |

Chemical data in mg/L
pH in standard pH units
Conductivity in microsiemens per square centimeter
NA = Not Analyzed
ND = Non Detect
NS = Not Sampled

Table 4: Ion Charge Balance

| Sample Location | Na | Ca | Cl | HCO3 | CO3 | SO4 | Charge Balance |
|---|---|---|---|---|---|---|---|
| MW-B7 | 28 | 100 | 18 | 350 | 5 | 110 | -16.3 |
| MW-B28 | 19 | 110 | 12 | 360 | 5 | 110 | -15.1 |
| MW-B28 Dup | 18 | 100 | 12 | 360 | 5 | 110 | -19.7 |
| MW-B24R | 49 | 150 | 48 | 400 | 5 | 400 | -25.6 |

# Figures

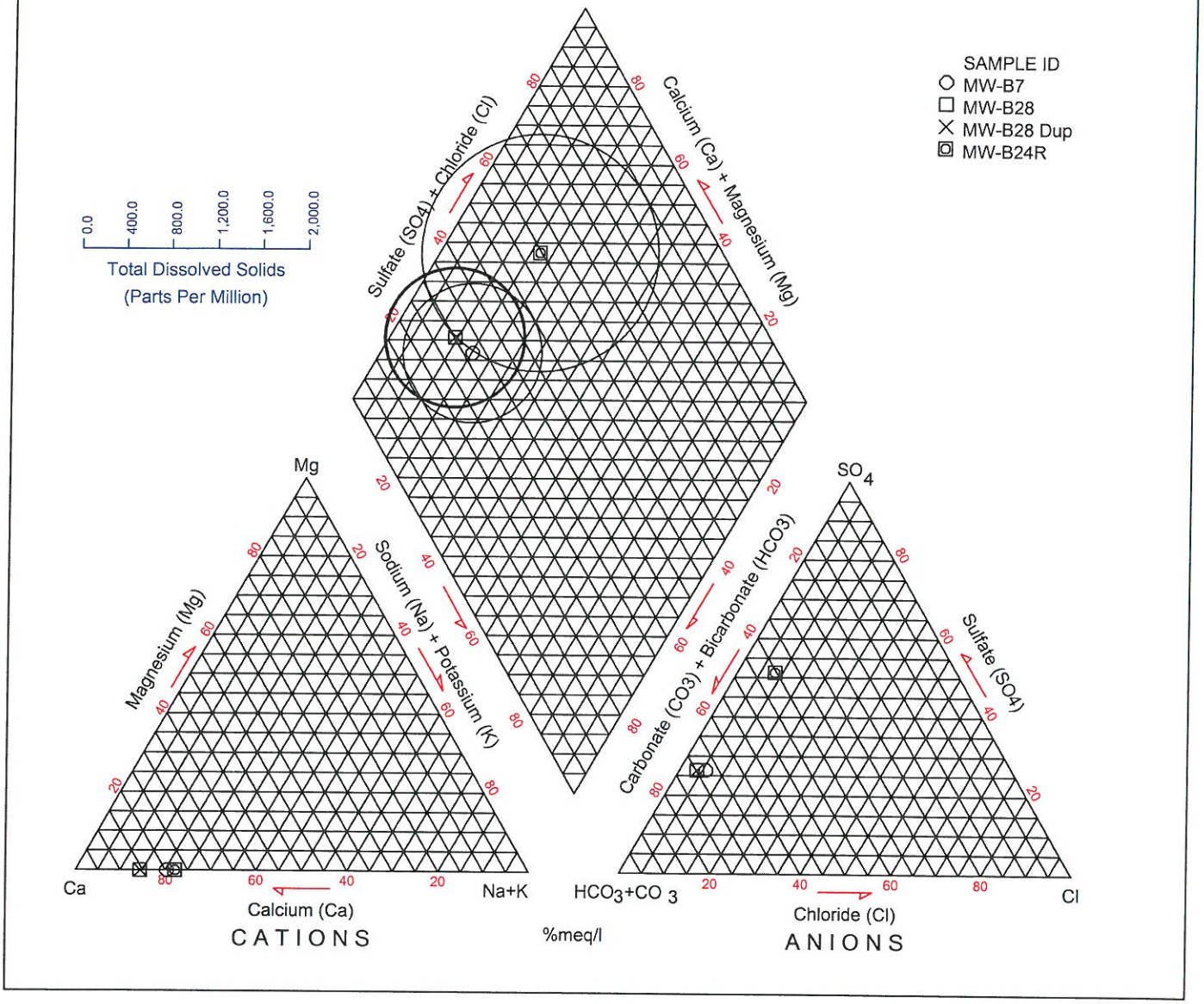
# Figure 1 - Facility Map
# GM Coldwater Road Facility

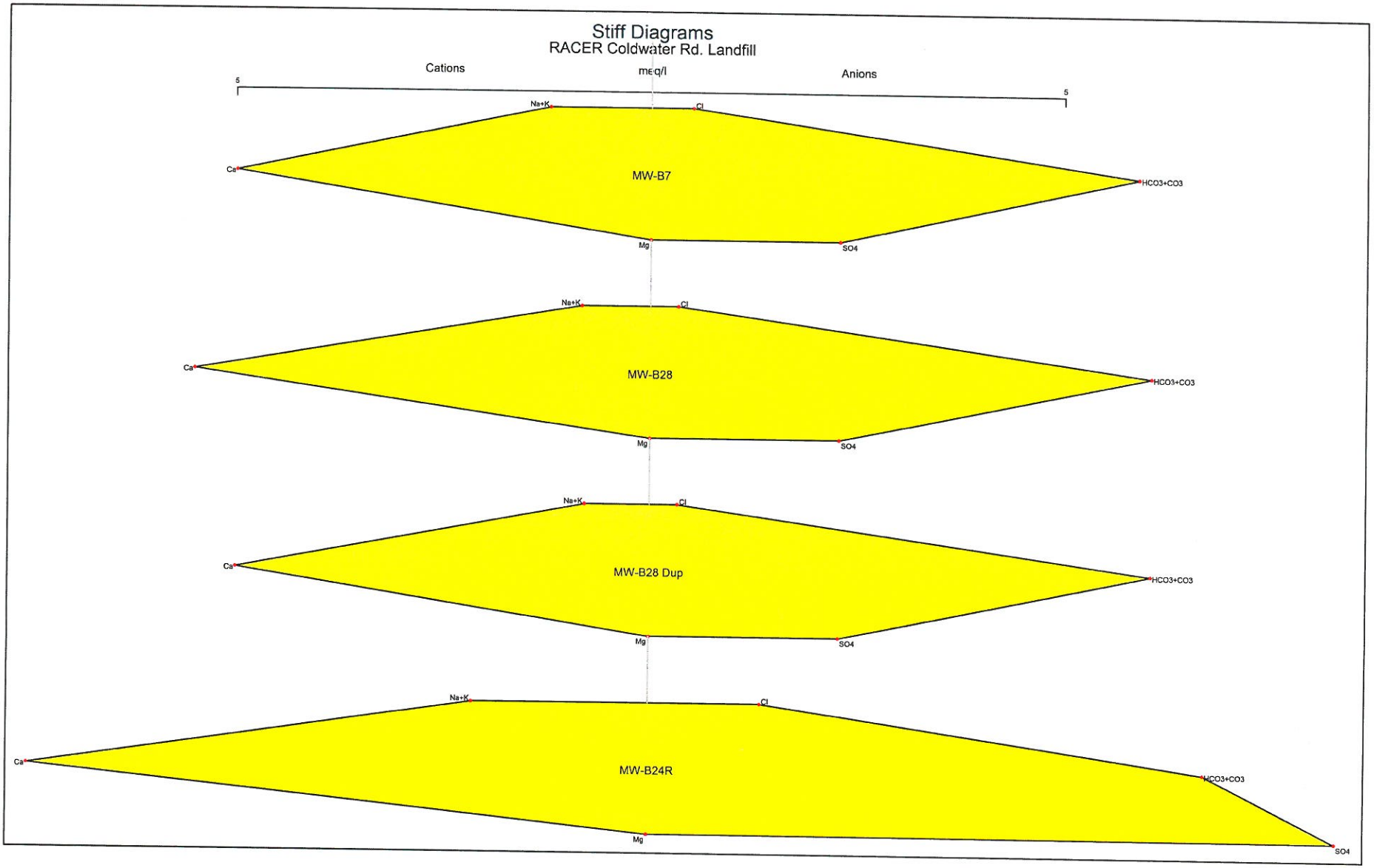
# Figure 2 - Perched Aquifer Static Water Elevations November 6, 2017

# Figure 3 - Drift Aquifer Static Water Elevations November 6, 2017

# Piper Diagram

RACER Coldwater Rd. Landfill




Stiff Diagrams
RACER Coldwater Rd. Landfill
Cations
meq/l
Anions
5
5
Na+K
Cl
Ca
HCO3+CO3
Mg
SO4
MW-B7
MW-B28
MW-B28 Dup
MW-B24R

# Appendix A
# Laboratory Data

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

15 December 2017

Work Order: 1711051

Price: $1,343.00

John McCabe
MDEQ-OWMRP-LANSING
525 W. Allegan, P.O. Box 30242
Lansing, MI 48909-7742

RE: RACER COLDWATER RD LANDFILL

I certify that the analyses performed by the MDEQ Environmental Laboratory were conducted by methods approved by the U.S. Environmental Protection Agency and other appropriate regulatory agencies.

Sincerely,

Kirby Shane
Laboratory Director

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

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MDEQ-OWMRP-LANSING
525 W. Allegan, P.O. Box 30242
Lansing MI, 48909-7742

Project: RACER COLDWATER RD LANDFILL
Site Code: 393431
Project Manager: John McCabe

**Reported:**
12/15/2017

## Analytical Report for Samples

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received | Qualifier |
|---|---|---|---|---|---|
| MW-B7 | 1711051-01 | Water | 11/07/2017 | 11/07/2017 | |
| MW-B28 | 1711051-02 | Water | 11/07/2017 | 11/07/2017 | |
| MW-B28 Dup | 1711051-03 | Water | 11/07/2017 | 11/07/2017 | |
| MW-B24R | 1711051-04 | Water | 11/07/2017 | 11/07/2017 | |
| FB | 1711051-05 | Water | 11/07/2017 | 11/07/2017 | |

## Notes and Definitions

| | |
|---|---|
| X3 | Spike recovery is not applicable due to large target analyte concentration in the source sample. |
| X | Methods 8260 & 624 are used to analyze volatile organics that have boiling points below 200 °C. 2-Methylnaphthalene & naphthalene have boiling points above 200 °C and are better suited to analysis by methods 8270 & 625 as semivolatile organics. |
| LRB | Laboratory reagent blank was greater than 2.2 times the MDL, or greater than 10% of the analyte level in the sample. |
| A11 | Result is estimated due to high initial verification standard criteria failure. |
| A09 | Result is estimated due to high recovery of batch quality control. |
| A06 | Result is estimated due to high continuing calibration standard criteria failure. |
| A04 | Result is estimated due to high matrix spike recovery. |
| A03 | Result(s) and reporting limit(s) are estimated due to low matrix spike recovery. |
| ND | Indicates compound analyzed for but not detected |
| RL | Reporting Limit |
| NA | Not Applicable |

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Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

**Client ID: MW-B7**

**Lab ID: 1711051-01**

| CAS # | Analyte | Result | RL | Units | Dilution | Analyzed Date | QC Batch | Method | Qualifier |
|---|---|---|---|---|---|---|---|---|---|
| **Organics-Volatiles** | | | | | | | | | |
| 630-20-6 | 1,1,1,2-Tetrachloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 71-55-6 | 1,1,1-Trichloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 79-00-5 | 1,1,2-Trichloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-34-3 | 1,1-Dichloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-35-4 | 1,1-Dichloroethylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 87-61-6 | 1,2,3-Trichlorobenzene | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 96-18-4 | 1,2,3-Trichloropropane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 526-73-8 | 1,2,3-Trimethylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 120-82-1 | 1,2,4-Trichlorobenzene | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 95-63-6 | 1,2,4-Trimethylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 106-93-4 | 1,2-Dibromoethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 95-50-1 | 1,2-Dichlorobenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 107-06-2 | 1,2-Dichloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 78-87-5 | 1,2-Dichloropropane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 108-67-8 | 1,3,5-Trimethylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 541-73-1 | 1,3-Dichlorobenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 106-46-7 | 1,4-Dichlorobenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 540-84-1 | 2,2,4-Trimethylpentane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 78-93-3 | 2-Butanone (MEK) | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 91-57-6 | 2-Methylnaphthalene | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | X |
| 67-64-1 | 2-Propanone (acetone) | ND | 20 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 108-10-1 | 4-Methyl-2-pentanone (MIBK) | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 107-13-1 | Acrylonitrile | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 71-43-2 | Benzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 74-97-5 | Bromochloromethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-27-4 | Bromodichloromethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-25-2 | Bromoform | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 74-83-9 | Bromomethane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-15-0 | Carbon disulfide | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 56-23-5 | Carbon tetrachloride | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 108-90-7 | Chlorobenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-00-3 | Chloroethane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 67-66-3 | Chloroform | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 74-87-3 | Chloromethane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 156-59-2 | cis-1,2-Dichloroethylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 10061-01-5 | cis-1,3-Dichloropropylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 110-82-7 | Cyclohexane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 124-48-1 | Dibromochloromethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 74-95-3 | Dibromomethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |

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Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

**Client ID: MW-B7**

**Lab ID: 1711051-01**

| CAS # | Analyte | Result | RL | Units | Dilution | Analyzed Date | QC Batch | Method | Qualifier |
|---|---|---|---|---|---|---|---|---|---|
| **Organics-Volatiles** | | | | | | | | | |
| 75-71-8 | Dichlorodifluoromethane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 60-29-7 | Diethyl ether | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 108-20-3 | Diisopropyl Ether | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 100-41-4 | Ethylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 637-92-3 | Ethyltertiarybutylether | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 67-72-1 | Hexachloroethane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 110-54-3 | Hexane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 98-82-8 | Isopropylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 1330-20-7 | m & p - Xylene | ND | 2.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-09-2 | Methylene chloride | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 1634-04-4 | Methyltertiarybutylether | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 91-20-3 | Naphthalene | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | X |
| 104-51-8 | n-Butylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 103-65-1 | n-Propylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 95-47-6 | o-Xylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 135-98-8 | sec-Butylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 100-42-5 | Styrene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 98-06-6 | tert-Butylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-65-0 | tertiary Butyl Alcohol | ND | 50 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 994-05-8 | tertiaryAmylmethylether | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 127-18-4 | Tetrachloroethylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 109-99-9 | Tetrahydrofuran | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 108-88-3 | Toluene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 156-60-5 | trans-1,2-Dichloroethylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 10061-02-6 | trans-1,3-Dichloropropylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 79-01-6 | Trichloroethylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-69-4 | Trichlorofluoromethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-01-4 | Vinyl chloride | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| *Surrogate: Bromofluorobenzene* | | | *105 %* | *85-115* | | *11/13/17* | B7K1310 | *8260* | |
| *Surrogate: Dibromofluoromethane* | | | *108 %* | *82.7-115* | | *11/13/17* | B7K1310 | *8260* | |
| *Surrogate: Toluene-d8* | | | *99.6 %* | *85-115* | | *11/13/17* | B7K1310 | *8260* | |

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

**Client ID: MW-B7**

**Lab ID: 1711051-01**

| CAS # | Analyte | Result | RL | Units | Dilution | Analyzed Date | QC Batch | Method | Qualifier |
|---|---|---|---|---|---|---|---|---|---|
| **Inorganics-General Chemistry** | | | | | | | | | |
| | **Alkalinity-Bicarbonate** | **350** | 10 | mg/L | 1 | 11/13/17 | [CALC] | 2320 B | |
| | Alkalinity-Carbonate | ND | 10 | mg/L | 1 | 11/13/17 | [CALC] | 2320 B | |
| | **Alkalinity-Total** | **350** | 20 | mg/L | 1 | 11/08/17 | B7K0815 | 310.2 | |
| 16887-00-6 | **Chloride** | **18** | 1.0 | mg/L | 1 | 11/09/17 | B7K0903 | 4500 Cl E | |
| | **Conductivity** | **870** | | umhos/cm | 1 | 11/09/17 | B7K0920 | 120.1 | |
| 18785-72-3 | **Sulfate** | **110** | 10 | mg/L | 5 | 11/21/17 | B7K2024 | 375.2 | |
| 7440-44-0 | **Total Organic Carbon** | **6.9** | 0.5 | mg/L | 1 | 11/14/17 | B7K1406 | 5310 C | |
| **Inorganics-Metals** | | | | | | | | | |
| 7440-70-2 | **Calcium, Dissolved** | **100** | 1.0 | mg/L | 1 | 11/13/17 | B7K0806 | 200.7 | |
| 7440-47-3 | **Chromium, Dissolved** | **2.8** | 1.0 | ug/L | 1 | 11/13/17 | B7K0806 | 200.8 | |
| 7440-50-8 | **Copper, Dissolved** | **5.8** | 1.0 | ug/L | 1 | 11/13/17 | B7K0806 | 200.8 | |
| 7439-89-6 | Iron, Dissolved | ND | 20 | ug/L | 1 | 11/13/17 | B7K0806 | 200.7 | |
| 7439-96-5 | **Manganese, Dissolved** | **21** | 5.0 | ug/L | 1 | 11/13/17 | B7K0806 | 200.8 | |
| 7440-02-0 | **Nickel, Dissolved** | **9.6** | 2.0 | ug/L | 1 | 11/13/17 | B7K0806 | 200.8 | |
| 7440-23-5 | **Sodium, Dissolved** | **28** | 1.0 | mg/L | 1 | 11/13/17 | B7K0806 | 200.7 | |
| 7440-66-6 | Zinc, Dissolved | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K0806 | 200.8 | |

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TEL: (517) 335-9800
FAX: (517) 335-9600

**Client ID: MW-B28**

**Lab ID: 1711051-02**

| CAS # | Analyte | Result | RL | Units | Dilution | Analyzed Date | QC Batch | Method | Qualifier |
|---|---|---|---|---|---|---|---|---|---|
| **Organics-Volatiles** | | | | | | | | | |
| 630-20-6 | 1,1,1,2-Tetrachloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 71-55-6 | 1,1,1-Trichloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 79-00-5 | 1,1,2-Trichloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-34-3 | 1,1-Dichloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-35-4 | 1,1-Dichloroethylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 87-61-6 | 1,2,3-Trichlorobenzene | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 96-18-4 | 1,2,3-Trichloropropane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 526-73-8 | 1,2,3-Trimethylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 120-82-1 | 1,2,4-Trichlorobenzene | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 95-63-6 | 1,2,4-Trimethylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 106-93-4 | 1,2-Dibromoethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 95-50-1 | 1,2-Dichlorobenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 107-06-2 | 1,2-Dichloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 78-87-5 | 1,2-Dichloropropane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 108-67-8 | 1,3,5-Trimethylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 541-73-1 | 1,3-Dichlorobenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 106-46-7 | 1,4-Dichlorobenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 540-84-1 | 2,2,4-Trimethylpentane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 78-93-3 | 2-Butanone (MEK) | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 91-57-6 | 2-Methylnaphthalene | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | X |
| 67-64-1 | 2-Propanone (acetone) | ND | 20 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 108-10-1 | 4-Methyl-2-pentanone (MIBK) | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 107-13-1 | Acrylonitrile | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 71-43-2 | Benzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 74-97-5 | Bromochloromethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-27-4 | Bromodichloromethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-25-2 | Bromoform | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 74-83-9 | Bromomethane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-15-0 | Carbon disulfide | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 56-23-5 | Carbon tetrachloride | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 108-90-7 | Chlorobenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-00-3 | Chloroethane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 67-66-3 | Chloroform | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 74-87-3 | Chloromethane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 156-59-2 | cis-1,2-Dichloroethylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 10061-01-5 | cis-1,3-Dichloropropylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 110-82-7 | Cyclohexane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 124-48-1 | Dibromochloromethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 74-95-3 | Dibromomethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |

STATE OF MICHIGAN
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MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

**Client ID: MW-B28**

**Lab ID: 1711051-02**

| CAS # | Analyte | Result | RL | Units | Dilution | Analyzed Date | QC Batch | Method | Qualifier |
|---|---|---|---|---|---|---|---|---|---|
| **Organics-Volatiles** | | | | | | | | | |
| 75-71-8 | Dichlorodifluoromethane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 60-29-7 | Diethyl ether | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 108-20-3 | Diisopropyl Ether | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 100-41-4 | Ethylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 637-92-3 | Ethyltertiarybutylether | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 67-72-1 | Hexachloroethane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 110-54-3 | Hexane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 98-82-8 | Isopropylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 1330-20-7 | m & p - Xylene | ND | 2.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-09-2 | Methylene chloride | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 1634-04-4 | Methyltertiarybutylether | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 91-20-3 | Naphthalene | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | X |
| 104-51-8 | n-Butylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 103-65-1 | n-Propylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 95-47-6 | o-Xylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 135-98-8 | sec-Butylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 100-42-5 | Styrene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 98-06-6 | tert-Butylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-65-0 | tertiary Butyl Alcohol | ND | 50 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 994-05-8 | tertiaryAmylmethylether | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 127-18-4 | Tetrachloroethylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 109-99-9 | Tetrahydrofuran | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 108-88-3 | Toluene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 156-60-5 | trans-1,2-Dichloroethylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 10061-02-6 | trans-1,3-Dichloropropylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 79-01-6 | Trichloroethylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-69-4 | Trichlorofluoromethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-01-4 | Vinyl chloride | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| *Surrogate: Bromofluorobenzene* | | | *107 %* | *85-115* | | *11/13/17* | B7K1310 | *8260* | |
| *Surrogate: Dibromofluoromethane* | | | *106 %* | *82.7-115* | | *11/13/17* | B7K1310 | *8260* | |
| *Surrogate: Toluene-d8* | | | *100 %* | *85-115* | | *11/13/17* | B7K1310 | *8260* | |

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TEL: (517) 335-9800
FAX: (517) 335-9600

**Client ID: MW-B28**

**Lab ID: 1711051-02**

| CAS # | Analyte | Result | RL | Units | Dilution | Analyzed Date | QC Batch | Method | Qualifier |
|---|---|---|---|---|---|---|---|---|---|
| **Inorganics-General Chemistry** | | | | | | | | | |
| | **Alkalinity-Bicarbonate** | **360** | 10 | mg/L | 1 | 11/13/17 | [CALC] | 2320 B | |
| | Alkalinity-Carbonate | ND | 10 | mg/L | 1 | 11/13/17 | [CALC] | 2320 B | |
| | **Alkalinity-Total** | **360** | 20 | mg/L | 1 | 11/08/17 | B7K0815 | 310.2 | |
| 16887-00-6 | **Chloride** | **12** | 1.0 | mg/L | 1 | 11/09/17 | B7K0903 | 4500 Cl E | |
| | **Conductivity** | **857** | | umhos/cm | 1 | 11/09/17 | B7K0920 | 120.1 | |
| 18785-72-3 | **Sulfate** | **110** | 10 | mg/L | 5 | 11/21/17 | B7K2024 | 375.2 | |
| 57-12-5 | Total Cyanide | ND | 0.005 | mg/L | 1 | 11/08/17 | B7K0820 | ASTM D7284 | |
| 7440-44-0 | **Total Organic Carbon** | **3.5** | 0.5 | mg/L | 1 | 11/14/17 | B7K1406 | 5310 C | |
| **Inorganics-Metals** | | | | | | | | | |
| 7440-70-2 | **Calcium, Dissolved** | **110** | 1.0 | mg/L | 1 | 11/13/17 | B7K0806 | 200.7 | |
| 7440-47-3 | Chromium, Dissolved | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K0806 | 200.8 | |
| 7440-50-8 | Copper, Dissolved | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K0806 | 200.8 | |
| 7439-89-6 | **Iron, Dissolved** | **380** | 20 | ug/L | 1 | 11/13/17 | B7K0806 | 200.7 | |
| 7439-96-5 | **Manganese, Dissolved** | **37** | 5.0 | ug/L | 1 | 11/13/17 | B7K0806 | 200.8 | |
| 7440-02-0 | **Nickel, Dissolved** | **8.1** | 2.0 | ug/L | 1 | 11/13/17 | B7K0806 | 200.8 | |
| 7440-23-5 | **Sodium, Dissolved** | **19** | 1.0 | mg/L | 1 | 11/13/17 | B7K0806 | 200.7 | |
| 7440-66-6 | Zinc, Dissolved | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K0806 | 200.8 | |

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**Client ID: MW-B28 Dup**

**Lab ID: 1711051-03**

| CAS # | Analyte | Result | RL | Units | Dilution | Analyzed Date | QC Batch | Method | Qualifier |
|---|---|---|---|---|---|---|---|---|---|
| **Organics-Volatiles** | | | | | | | | | |
| 630-20-6 | 1,1,1,2-Tetrachloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 71-55-6 | 1,1,1-Trichloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 79-00-5 | 1,1,2-Trichloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-34-3 | 1,1-Dichloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-35-4 | 1,1-Dichloroethylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 87-61-6 | 1,2,3-Trichlorobenzene | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 96-18-4 | 1,2,3-Trichloropropane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 526-73-8 | 1,2,3-Trimethylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 120-82-1 | 1,2,4-Trichlorobenzene | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 95-63-6 | 1,2,4-Trimethylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 106-93-4 | 1,2-Dibromoethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 95-50-1 | 1,2-Dichlorobenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 107-06-2 | 1,2-Dichloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 78-87-5 | 1,2-Dichloropropane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 108-67-8 | 1,3,5-Trimethylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 541-73-1 | 1,3-Dichlorobenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 106-46-7 | 1,4-Dichlorobenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 540-84-1 | 2,2,4-Trimethylpentane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 78-93-3 | 2-Butanone (MEK) | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 91-57-6 | 2-Methylnaphthalene | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | X |
| 67-64-1 | 2-Propanone (acetone) | ND | 20 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 108-10-1 | 4-Methyl-2-pentanone (MIBK) | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 107-13-1 | Acrylonitrile | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 71-43-2 | Benzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 74-97-5 | Bromochloromethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-27-4 | Bromodichloromethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-25-2 | Bromoform | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 74-83-9 | Bromomethane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-15-0 | Carbon disulfide | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 56-23-5 | Carbon tetrachloride | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 108-90-7 | Chlorobenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-00-3 | Chloroethane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 67-66-3 | Chloroform | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 74-87-3 | Chloromethane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 156-59-2 | cis-1,2-Dichloroethylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 10061-01-5 | cis-1,3-Dichloropropylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 110-82-7 | Cyclohexane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 124-48-1 | Dibromochloromethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 74-95-3 | Dibromomethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |

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**Client ID: MW-B28 Dup**

**Lab ID: 1711051-03**

| CAS # | Analyte | Result | RL | Units | Dilution | Analyzed Date | QC Batch | Method | Qualifier |
|---|---|---|---|---|---|---|---|---|---|
| **Organics-Volatiles** | | | | | | | | | |
| 75-71-8 | Dichlorodifluoromethane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 60-29-7 | Diethyl ether | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 108-20-3 | Diisopropyl Ether | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 100-41-4 | Ethylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 637-92-3 | Ethyltertiarybutylether | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 67-72-1 | Hexachloroethane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 110-54-3 | Hexane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 98-82-8 | Isopropylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 1330-20-7 | m & p - Xylene | ND | 2.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-09-2 | Methylene chloride | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 1634-04-4 | Methyltertiarybutylether | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 91-20-3 | Naphthalene | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | X |
| 104-51-8 | n-Butylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 103-65-1 | n-Propylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 95-47-6 | o-Xylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 135-98-8 | sec-Butylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 100-42-5 | Styrene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 98-06-6 | tert-Butylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-65-0 | tertiary Butyl Alcohol | ND | 50 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 994-05-8 | tertiaryAmylmethylether | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 127-18-4 | Tetrachloroethylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 109-99-9 | Tetrahydrofuran | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 108-88-3 | Toluene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 156-60-5 | trans-1,2-Dichloroethylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 10061-02-6 | trans-1,3-Dichloropropylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 79-01-6 | Trichloroethylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-69-4 | Trichlorofluoromethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-01-4 | Vinyl chloride | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| *Surrogate: Bromofluorobenzene* | | | *107 %* | *85-115* | | *11/13/17* | B7K1310 | *8260* | |
| *Surrogate: Dibromofluoromethane* | | | *105 %* | *82.7-115* | | *11/13/17* | B7K1310 | *8260* | |
| *Surrogate: Toluene-d8* | | | *99.6 %* | *85-115* | | *11/13/17* | B7K1310 | *8260* | |

STATE OF MICHIGAN
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**Client ID: MW-B28 Dup**

**Lab ID: 1711051-03**

| CAS # | Analyte | Result | RL | Units | Dilution | Analyzed Date | QC Batch | Method | Qualifier |
|---|---|---|---|---|---|---|---|---|---|
| **Inorganics-General Chemistry** | | | | | | | | | |
| | **Alkalinity-Bicarbonate** | **360** | 10 | mg/L | 1 | 11/13/17 | [CALC] | 2320 B | |
| | Alkalinity-Carbonate | ND | 10 | mg/L | 1 | 11/13/17 | [CALC] | 2320 B | |
| | **Alkalinity-Total** | **360** | 20 | mg/L | 1 | 11/08/17 | B7K0815 | 310.2 | |
| 16887-00-6 | **Chloride** | **12** | 1.0 | mg/L | 1 | 11/09/17 | B7K0903 | 4500 Cl E | |
| | **Conductivity** | **863** | | umhos/cm | 1 | 11/09/17 | B7K0920 | 120.1 | |
| 18785-72-3 | **Sulfate** | **110** | 10 | mg/L | 5 | 11/21/17 | B7K2024 | 375.2 | |
| 57-12-5 | Total Cyanide | ND | 0.005 | mg/L | 1 | 11/08/17 | B7K0820 | ASTM D7284 | |
| 7440-44-0 | **Total Organic Carbon** | **2.9** | 0.5 | mg/L | 1 | 11/14/17 | B7K1406 | 5310 C | |
| **Inorganics-Metals** | | | | | | | | | |
| 7440-70-2 | **Calcium, Dissolved** | **100** | 1.0 | mg/L | 1 | 11/13/17 | B7K0806 | 200.7 | |
| 7440-47-3 | Chromium, Dissolved | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K0806 | 200.8 | |
| 7440-50-8 | Copper, Dissolved | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K0806 | 200.8 | |
| 7439-89-6 | **Iron, Dissolved** | **360** | 20 | ug/L | 1 | 11/13/17 | B7K0806 | 200.7 | |
| 7439-96-5 | **Manganese, Dissolved** | **37** | 5.0 | ug/L | 1 | 11/13/17 | B7K0806 | 200.8 | |
| 7440-02-0 | **Nickel, Dissolved** | **7.9** | 2.0 | ug/L | 1 | 11/13/17 | B7K0806 | 200.8 | |
| 7440-23-5 | **Sodium, Dissolved** | **18** | 1.0 | mg/L | 1 | 11/13/17 | B7K0806 | 200.7 | |
| 7440-66-6 | Zinc, Dissolved | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K0806 | 200.8 | |

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**Client ID: MW-B24R**

**Lab ID: 1711051-04**

| CAS # | Analyte | Result | RL | Units | Dilution | Analyzed Date | QC Batch | Method | Qualifier |
|---|---|---|---|---|---|---|---|---|---|
| **Organics-Volatiles** | | | | | | | | | |
| 630-20-6 | 1,1,1,2-Tetrachloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 71-55-6 | 1,1,1-Trichloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 79-00-5 | 1,1,2-Trichloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-34-3 | 1,1-Dichloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-35-4 | 1,1-Dichloroethylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 87-61-6 | 1,2,3-Trichlorobenzene | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 96-18-4 | 1,2,3-Trichloropropane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 526-73-8 | 1,2,3-Trimethylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 120-82-1 | 1,2,4-Trichlorobenzene | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 95-63-6 | 1,2,4-Trimethylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 106-93-4 | 1,2-Dibromoethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 95-50-1 | 1,2-Dichlorobenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 107-06-2 | 1,2-Dichloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 78-87-5 | 1,2-Dichloropropane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 108-67-8 | 1,3,5-Trimethylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 541-73-1 | 1,3-Dichlorobenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 106-46-7 | 1,4-Dichlorobenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 540-84-1 | 2,2,4-Trimethylpentane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 78-93-3 | 2-Butanone (MEK) | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 91-57-6 | 2-Methylnaphthalene | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | X |
| 67-64-1 | 2-Propanone (acetone) | ND | 20 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 108-10-1 | 4-Methyl-2-pentanone (MIBK) | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 107-13-1 | Acrylonitrile | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 71-43-2 | Benzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 74-97-5 | Bromochloromethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-27-4 | Bromodichloromethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-25-2 | Bromoform | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 74-83-9 | Bromomethane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-15-0 | Carbon disulfide | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 56-23-5 | Carbon tetrachloride | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 108-90-7 | Chlorobenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-00-3 | Chloroethane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 67-66-3 | Chloroform | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 74-87-3 | Chloromethane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 156-59-2 | cis-1,2-Dichloroethylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 10061-01-5 | cis-1,3-Dichloropropylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 110-82-7 | Cyclohexane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 124-48-1 | Dibromochloromethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 74-95-3 | Dibromomethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

**Client ID: MW-B24R**

**Lab ID: 1711051-04**

| CAS # | Analyte | Result | RL | Units | Dilution | Analyzed Date | QC Batch | Method | Qualifier |
|---|---|---|---|---|---|---|---|---|---|
| **Organics-Volatiles** | | | | | | | | | |
| 75-71-8 | Dichlorodifluoromethane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 60-29-7 | Diethyl ether | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 108-20-3 | Diisopropyl Ether | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 100-41-4 | Ethylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 637-92-3 | Ethyltertiarybutylether | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 67-72-1 | Hexachloroethane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 110-54-3 | Hexane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 98-82-8 | Isopropylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 1330-20-7 | m & p - Xylene | ND | 2.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-09-2 | Methylene chloride | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 1634-04-4 | Methyltertiarybutylether | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 91-20-3 | Naphthalene | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | X |
| 104-51-8 | n-Butylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 103-65-1 | n-Propylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 95-47-6 | o-Xylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 135-98-8 | sec-Butylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 100-42-5 | Styrene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 98-06-6 | tert-Butylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-65-0 | tertiary Butyl Alcohol | ND | 50 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 994-05-8 | tertiaryAmylmethylether | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 127-18-4 | Tetrachloroethylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 109-99-9 | Tetrahydrofuran | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 108-88-3 | Toluene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 156-60-5 | trans-1,2-Dichloroethylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 10061-02-6 | trans-1,3-Dichloropropylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 79-01-6 | Trichloroethylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-69-4 | Trichlorofluoromethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-01-4 | Vinyl chloride | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| *Surrogate: Bromofluorobenzene* | | | *106 %* | *85-115* | | *11/13/17* | B7K1310 | *8260* | |
| *Surrogate: Dibromofluoromethane* | | | *107 %* | *82.7-115* | | *11/13/17* | B7K1310 | *8260* | |
| *Surrogate: Toluene-d8* | | | *100 %* | *85-115* | | *11/13/17* | B7K1310 | *8260* | |

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

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ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

**Client ID: MW-B24R**

**Lab ID: 1711051-04**

| CAS # | Analyte | Result | RL | Units | Dilution | Analyzed Date | QC Batch | Method | Qualifier |
|---|---|---|---|---|---|---|---|---|---|
| **Inorganics-General Chemistry** | | | | | | | | | |
| | **Alkalinity-Bicarbonate** | **400** | 10 | mg/L | 1 | 11/13/17 | [CALC] | 2320 B | |
| | Alkalinity-Carbonate | ND | 10 | mg/L | 1 | 11/13/17 | [CALC] | 2320 B | |
| | **Alkalinity-Total** | **400** | 20 | mg/L | 1 | 11/08/17 | B7K0815 | 310.2 | |
| 16887-00-6 | **Chloride** | **48** | 1.0 | mg/L | 1 | 11/09/17 | B7K0903 | 4500 Cl E | |
| | **Conductivity** | **1210** | | umhos/cm | 1 | 11/09/17 | B7K0920 | 120.1 | |
| 18785-72-3 | **Sulfate** | **210** | 10 | mg/L | 5 | 11/21/17 | B7K2024 | 375.2 | A03 |
| 57-12-5 | Total Cyanide | ND | 0.005 | mg/L | 1 | 11/08/17 | B7K0820 | ASTM D7284 | |
| 7440-44-0 | **Total Organic Carbon** | **4.8** | 0.5 | mg/L | 1 | 11/14/17 | B7K1406 | 5310 C | |
| **Inorganics-Metals** | | | | | | | | | |
| 7440-70-2 | **Calcium, Dissolved** | **150** | 1.0 | mg/L | 1 | 11/13/17 | B7K0806 | 200.7 | |
| 7440-47-3 | Chromium, Dissolved | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K0806 | 200.8 | |
| 7440-50-8 | **Copper, Dissolved** | **2.4** | 1.0 | ug/L | 1 | 11/13/17 | B7K0806 | 200.8 | |
| 7439-89-6 | Iron, Dissolved | ND | 20 | ug/L | 1 | 11/13/17 | B7K0806 | 200.7 | |
| 7439-96-5 | **Manganese, Dissolved** | **55** | 5.0 | ug/L | 1 | 11/13/17 | B7K0806 | 200.8 | |
| 7440-02-0 | **Nickel, Dissolved** | **13** | 2.0 | ug/L | 1 | 11/13/17 | B7K0806 | 200.8 | |
| 7440-23-5 | **Sodium, Dissolved** | **49** | 1.0 | mg/L | 1 | 11/13/17 | B7K0806 | 200.7 | |
| 7440-66-6 | Zinc, Dissolved | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K0806 | 200.8 | |

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Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

**Client ID: FB**

**Lab ID: 1711051-05**

| CAS # | Analyte | Result | RL | Units | Dilution | Analyzed Date | QC Batch | Method | Qualifier |
|---|---|---|---|---|---|---|---|---|---|
| **Organics-Volatiles** | | | | | | | | | |
| 630-20-6 | 1,1,1,2-Tetrachloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 71-55-6 | 1,1,1-Trichloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 79-00-5 | 1,1,2-Trichloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-34-3 | 1,1-Dichloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-35-4 | 1,1-Dichloroethylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 87-61-6 | 1,2,3-Trichlorobenzene | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 96-18-4 | 1,2,3-Trichloropropane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 526-73-8 | 1,2,3-Trimethylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 120-82-1 | 1,2,4-Trichlorobenzene | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 95-63-6 | 1,2,4-Trimethylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 106-93-4 | 1,2-Dibromoethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 95-50-1 | 1,2-Dichlorobenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 107-06-2 | 1,2-Dichloroethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 78-87-5 | 1,2-Dichloropropane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 108-67-8 | 1,3,5-Trimethylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 541-73-1 | 1,3-Dichlorobenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 106-46-7 | 1,4-Dichlorobenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 540-84-1 | 2,2,4-Trimethylpentane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 78-93-3 | 2-Butanone (MEK) | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 91-57-6 | 2-Methylnaphthalene | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | X |
| 67-64-1 | 2-Propanone (acetone) | ND | 20 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 108-10-1 | 4-Methyl-2-pentanone (MIBK) | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 107-13-1 | Acrylonitrile | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 71-43-2 | Benzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 74-97-5 | Bromochloromethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-27-4 | Bromodichloromethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-25-2 | Bromoform | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 74-83-9 | Bromomethane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-15-0 | Carbon disulfide | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 56-23-5 | Carbon tetrachloride | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 108-90-7 | Chlorobenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-00-3 | Chloroethane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 67-66-3 | Chloroform | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 74-87-3 | Chloromethane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 156-59-2 | cis-1,2-Dichloroethylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 10061-01-5 | cis-1,3-Dichloropropylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 110-82-7 | Cyclohexane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 124-48-1 | Dibromochloromethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 74-95-3 | Dibromomethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |

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P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

**Client ID: FB**

**Lab ID: 1711051-05**

| CAS # | Analyte | Result | RL | Units | Dilution | Analyzed Date | QC Batch | Method | Qualifier |
|---|---|---|---|---|---|---|---|---|---|
| **Organics-Volatiles** | | | | | | | | | |
| 75-71-8 | Dichlorodifluoromethane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 60-29-7 | Diethyl ether | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 108-20-3 | Diisopropyl Ether | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 100-41-4 | Ethylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 637-92-3 | Ethyltertiarybutylether | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 67-72-1 | Hexachloroethane | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 110-54-3 | Hexane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 98-82-8 | Isopropylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 1330-20-7 | m & p - Xylene | ND | 2.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-09-2 | Methylene chloride | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 1634-04-4 | Methyltertiarybutylether | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 91-20-3 | Naphthalene | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | X |
| 104-51-8 | n-Butylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 103-65-1 | n-Propylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 95-47-6 | o-Xylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 135-98-8 | sec-Butylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 100-42-5 | Styrene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 98-06-6 | tert-Butylbenzene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-65-0 | tertiary Butyl Alcohol | ND | 50 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 994-05-8 | tertiaryAmylmethylether | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 127-18-4 | Tetrachloroethylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 109-99-9 | Tetrahydrofuran | ND | 5.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 108-88-3 | Toluene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 156-60-5 | trans-1,2-Dichloroethylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 10061-02-6 | trans-1,3-Dichloropropylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 79-01-6 | Trichloroethylene | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-69-4 | Trichlorofluoromethane | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| 75-01-4 | Vinyl chloride | ND | 1.0 | ug/L | 1 | 11/13/17 | B7K1310 | 8260 | |
| *Surrogate: Bromofluorobenzene* | | | *105 %* | *85-115* | | *11/13/17* | B7K1310 | *8260* | |
| *Surrogate: Dibromofluoromethane* | | | *105 %* | *82.7-115* | | *11/13/17* | B7K1310 | *8260* | |
| *Surrogate: Toluene-d8* | | | *99.2 %* | *85-115* | | *11/13/17* | B7K1310 | *8260* | |

Michigan Department of Environmental Quality
Laboratory Services Section

# Analysis Request Sheet

| Lab Work Order Number | Project Name | Matrix |
|---|---|---|
| 1711051 | RACER Coldwater Rd. | WATER |

| Site Code/Project Number | AY | CC Email 1 | Project TAT Days | Sample Collector |
|---|---|---|---|---|
| 393431 | 18 | | Standard | John McCabe |
| **Dept-Division-District** | **Index** | **CC Email 2** | **Project Due Date** | **Sample Collector Phone** |
| WMRPD - Central | 33160 | | 12/15/17 | 517-284-6564 |
| **State Project Manager** | **PCA** | **CC Email 3** | | **Contract Firm** |
| John McCabe | 45215 | | | NA |
| **State Project Manager Email** | **Project** | **Overflow Lab Choice 1** | **Accept Analysis hold time codes** | **Contract Firm Primary Contact** |
| mccabej@michigan.gov | | | No | |
| **State Project Manager Phone** | **Phase** | **Overflow Lab Choice 2** | | **Primary Contact Phone** |
| 517-284-6564 | | | | |

| | Lab Use Only | Field Sample Identification | Collection Date | Collection Time | Container Count | Comments |
|---|---|---|---|---|---|---|
| 1 | 01 | MW-B7 | 11/7/17 | 9:40 | JN X6 | No GB |
| 2 | 02 | MW-B28 | 11/7/17 | 10:30 | 7 | |
| 3 | 03 | MW-B28 Dup | 11/7/17 | 10:30 | 7 | |
| 4 | 04 | MW-B24A | 11/7/17 | 11:25 | 7 | |
| 5 | 05 | FB | 11/7/17 | 9:20 | 2 | |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | | | | |

**ORGANIC CHEMISTRY**

VOA - Volatile Organic Acidic
- Volatiles - Full List: (1) 2 3 4 5 6 7 8 9 10
- BTEX/MTBE/TMB only: 1 2 3 4 5 6 7 8 9 10
- Chlorinated only: 1 2 3 4 5 6 7 8 9 10
- GRO: 1 2 3 4 5 6 7 8 9 10
- 1,4 Dioxane: 1 2 3 4 5 6 7 8 9 10

METH - Methane, Ethane, Ethene
- Methane, Ethane, Ethene: 1 2 3 4 5 6 7 8 9 10

ON - Pesticides, PCBs
- Pesticides & PCBs: 1 2 3 4 5 6 7 8 9 10
- Pesticides only: 1 2 3 4 5 6 7 8 9 10
- PCBs only: 1 2 3 4 5 6 7 8 9 10
- Toxaphene: 1 2 3 4 5 6 7 8 9 10
- Chlordane: 1 2 3 4 5 6 7 8 9 10

BNA - Base Neutral Acids
- BNAs: 1 2 3 4 5 6 7 8 9 10
- Benzidines: 1 2 3 4 5 6 7 8 9 10
- PNAs only: 1 2 3 4 5 6 7 8 9 10
- BNs only: 1 2 3 4 5 6 7 8 9 10
- Acids only: 1 2 3 4 5 6 7 8 9 10

Organic Specialty Requests
- Library search - Volatiles: 1 2 3 4 5 6 7 8 9 10
- Library search - SemiVols: 1 2 3 4 5 6 7 8 9 10
- Finger Print: 1 2 3 4 5 6 7 8 9 10
- DRO / ORO: 1 2 3 4 5 6 7 8 9 10

**METALS CHEMISTRY PACKAGES**
- OpMemo2 - Total: 1 2 3 4 5 6 7 8 9 10
- OpMemo2 - Dissolved: 1 2 3 4 5 6 7 8 9 10
  (Sb,As,Ba,Be,Cd,Cr,Cu,Co,Fe,Pb,Mn,Hg,Mo,Ni,Se,Ag,Tl,V,Zn)
- Michigan10 - Total: 1 2 3 4 5 6 7 8 9 10
- Michigan10 - Dissolved: 1 2 3 4 5 6 7 8 9 10
  (As,Ba,Cd,Cr,Cu,Pb,Hg,Se,Ag,Zn)

**MAD - DISSOLVED METALS**
- Diss - Silver - Ag: 1 2 3 4 5 6 7 8 9 10
- Diss - Aluminum - Al: 1 2 3 4 5 6 7 8 9 10
- Diss - Arsenic - As: 1 2 3 4 5 6 7 8 9 10
- Diss - Boron - B: 1 2 3 4 5 6 7 8 9 10
- Diss - Barium - Ba: 1 2 3 4 5 6 7 8 9 10
- Diss - Beryllium - Be: 1 2 3 4 5 6 7 8 9 10
- Diss - Cadmium - Cd: 1 2 3 4 5 6 7 8 9 10
- Diss - Cobalt - Co: 1 2 3 4 5 6 7 8 9 10
- Diss - Chromium - Cr: (1) (2) (3) (4) 5 6 7 8 9 10
- Diss - Copper - Cu: (1) (2) (3) (4) 5 6 7 8 9 10
- Diss - Iron - Fe: (1) (2) (3) (4) 5 6 7 8 9 10
- Diss - Mercury - Hg: 1 2 3 4 5 6 7 8 9 10
- Diss - Lithium - Li: 1 2 3 4 5 6 7 8 9 10
- Diss - Manganese - Mn: (1) (2) (3) (4) 5 6 7 8 9 10
- Diss - Molybdenum - Mo: 1 2 3 4 5 6 7 8 9 10
- Diss - Nickel - Ni: (1) (2) (3) (4) 5 6 7 8 9 10
- Diss - Lead - Pb: 1 2 3 4 5 6 7 8 9 10
- Diss - Antimony - Sb: 1 2 3 4 5 6 7 8 9 10
- Diss - Selenium - Se: 1 2 3 4 5 6 7 8 9 10
- Diss - Strontium - Sr: 1 2 3 4 5 6 7 8 9 10
- Diss - Titanium - Ti: 1 2 3 4 5 6 7 8 9 10
- Diss - Thallium - Tl: 1 2 3 4 5 6 7 8 9 10
- Diss - Uranium - U: 1 2 3 4 5 6 7 8 9 10
- Diss - Vanadium - V: 1 2 3 4 5 6 7 8 9 10
- Diss - Zinc - Zn: (1) (2) (3) (4) 5 6 7 8 9 10
- Diss - Calcium - Ca: (1) (2) (3) (4) 5 6 7 8 9 10
- Diss - Potassium - K: 1 2 3 4 5 6 7 8 9 10
- Diss - Magnesium - Mg: 1 2 3 4 5 6 7 8 9 10
- Diss - Sodium - Na: (1) (2) (3) (4) 5 6 7 8 9 10
- Diss - Hardness - Ca, Mg: 1 2 3 4 5 6 7 8 9 10

MD - Metals Dissolved
- Lab Filtration: 1 2 3 4 5 6 7 8 9 10

**MA - TOTAL METALS**
- Silver - Ag: 1 2 3 4 5 6 7 8 9 10
- Aluminum - Al: 1 2 3 4 5 6 7 8 9 10
- Arsenic - As: 1 2 3 4 5 6 7 8 9 10
- Boron - B: 1 2 3 4 5 6 7 8 9 10
- Barium - Ba: 1 2 3 4 5 6 7 8 9 10
- Beryllium - Be: 1 2 3 4 5 6 7 8 9 10
- Cadmium - Cd: 1 2 3 4 5 6 7 8 9 10
- Cobalt - Co: 1 2 3 4 5 6 7 8 9 10
- Chromium - Cr: 1 2 3 4 5 6 7 8 9 10
- Copper - Cu: 1 2 3 4 5 6 7 8 9 10
- Iron - Fe: 1 2 3 4 5 6 7 8 9 10
- Mercury - Hg: 1 2 3 4 5 6 7 8 9 10
- Lithium - Li: 1 2 3 4 5 6 7 8 9 10
- Manganese - Mn: 1 2 3 4 5 6 7 8 9 10
- Molybdenum - Mo: 1 2 3 4 5 6 7 8 9 10
- Nickel - Ni: 1 2 3 4 5 6 7 8 9 10
- Lead - Pb: 1 2 3 4 5 6 7 8 9 10
- Antimony - Sb: 1 2 3 4 5 6 7 8 9 10
- Selenium - Se: 1 2 3 4 5 6 7 8 9 10
- Strontium - Sr: 1 2 3 4 5 6 7 8 9 10
- Titanium - Ti: 1 2 3 4 5 6 7 8 9 10
- Thallium - Tl: 1 2 3 4 5 6 7 8 9 10
- Uranium - U: 1 2 3 4 5 6 7 8 9 10
- Vanadium - V: 1 2 3 4 5 6 7 8 9 10
- Zinc - Zn: 1 2 3 4 5 6 7 8 9 10
- Calcium - Ca: 1 2 3 4 5 6 7 8 9 10
- Potassium - K: 1 2 3 4 5 6 7 8 9 10
- Magnesium - Mg: 1 2 3 4 5 6 7 8 9 10
- Sodium - Na: 1 2 3 4 5 6 7 8 9 10
- Hardness - Ca, Mg: 1 2 3 4 5 6 7 8 9 10

LHG - Low Level Mercury
- Mercury Low Level - Hg: 1 2 3 4 5 6 7 8 9 10

**GENERAL CHEMISTRY**
- GB Total Cyanide - CN: (X) (2) (3) (4) 5 6 7 8 9 10
- GB Amenable Cyanide - CN: 1 2 3 4 5 6 7 8 9 10
- GCN Available Cyanide - CN: 1 2 3 4 5 6 7 8 9 10
- CA Chlorophyll: 1 2 3 4 5 6 7 8 9 10
- GN Ortho Phosphate - OP: 1 2 3 4 5 6 7 8 9 10
- GN Nitrite - $NO_2$: 1 2 3 4 5 6 7 8 9 10
- GN Nitrate - $NO_3$ (Calc.): 1 2 3 4 5 6 7 8 9 10
- GN Suspended Solids - SS: 1 2 3 4 5 6 7 8 9 10
- GN Dissolved Solids - TDS: 1 2 3 4 5 6 7 8 9 10
- MN Diss Solids - TDS (Calc.): 1 2 3 4 5 6 7 8 9 10
- GN Turbidity: 1 2 3 4 5 6 7 8 9 10
- MN Total Alkalinity: (1) (2) (3) (4) 5 6 7 8 9 10
- MN Bicarb/Carb Alkalinity (Includes Total Alkalinity): (1) (2) (3) (4) 5 6 7 8 9 10
- MN Chloride - Cl: (1) (2) (3) (4) 5 6 7 8 9 10
- MN Fluoride - F: 1 2 3 4 5 6 7 8 9 10
- MN Sulfate - SO4: (1) (2) (3) (4) 5 6 7 8 9 10
- MN Chromium 6 - Cr+6: 1 2 3 4 5 6 7 8 9 10
- MN Conductivity: (1) (2) (3) (4) 5 6 7 8 9 10
- MN pH: 1 2 3 4 5 6 7 8 9 10
- GA Chem Oxyg Dem - COD: 1 2 3 4 5 6 7 8 9 10
- GA Diss Org Carbon - DOC (FF) (Field - Filtered & Preserved): 1 2 3 4 5 6 7 8 9 10
- GN Diss Org Carbon - DOC (LF) (Lab - Filtered & Preserved): 1 2 3 4 5 6 7 8 9 10
- GA Total Org Carbon - TOC: (1) (2) (3) (4) 5 6 7 8 9 10
- GA Ammonia - NH3: 1 2 3 4 5 6 7 8 9 10
- GA Nitrate+Nitrite - NO3+NO2: 1 2 3 4 5 6 7 8 9 10
- GA Kjeldahl Nitrogen - KN: 1 2 3 4 5 6 7 8 9 10
- GA Total Phosphorus - TP: 1 2 3 4 5 6 7 8 9 10

**Chain of Custody**

| Relinquished by | Received By | Date / Time |
|---|---|---|
| Print Name & Org.: John McCabe WMRPD | Melissa Smith | |
| Signature: | | 11/2/17 1411 |
| Print Name & Org.: | | |
| Signature: | | |
| Print Name & Org.: | | |
| Signature: | | |

# Analytical Laboratory Report

Report ID: S85061.01(01)
Generated on 12/13/2017

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
37000 Grand River Ave.
Suite 260
Farmington, MI 48335

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): S85061.01-S85061.08
Project: RACER Coldwater Rd Landfill Annual Sampling
Collected Date: 11/07/2017
Submitted Date/Time: 11/08/2017 16:15
Sampled by: Kevin Schneider
P.O. #: 11700139

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.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
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 |

**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 20th Edition |
| 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 |
|---|---|---|---|
| S85061.01 | B-7 | Groundwater | 11/07/17 09:45 |
| S85061.02 | B-28 | Groundwater | 11/07/17 10:30 |
| S85061.03 | B-24r | Groundwater | 11/07/17 11:30 |
| S85061.04 | B-9 | Groundwater | 11/07/17 13:25 |
| S85061.05 | B-18A | Groundwater | 11/07/17 13:55 |
| S85061.06 | B-19Ar | Groundwater | 11/07/17 14:15 |
| S85061.07 | Dup-2 | Groundwater | 11/07/17 00:01 |
| S85061.08 | EB-1 | Liquid | 11/07/17 14:40 |

# Analytical Laboratory Report

**Lab Sample ID: S85061.01**
Sample Tag: B-7
Collected Date/Time: 11/07/2017 09:45
Matrix: Groundwater
COC Reference: 108778

Sample Containers

| # | Type | Preservative(s) | Refrigerated? | Arrival Temp. (C) | Thermometer # |
|---|---|---|---|---|---|
| 1 | 125ml Plastic | HNO3 | Yes | 5.1 | IR |
| 2 | 40ml Glass | H2SO4 | Yes | 5.1 | IR |
| 1 | 250ml Amber | H2SO4 | Yes | 5.1 | IR |
| 1 | 125ml Plastic | None | Yes | 5.1 | IR |

| Analysis | Results | Units | RL | Method | Run Date/Time | Tech | CAS # | Flags |
|---|---|---|---|---|---|---|---|---|
| ***Extraction / Prep.*** | | | | | | | | |
| Metal Digestion | Completed | | | SW3015A | 11/10/17 11:45 | CCM | | |
| ***Inorganics*** | | | | | | | | |
| Conductivity | 841 | umhos/cm | | E120.1 | 11/08/17 16:34 | JKB | | |
| TOC | 6.5 | mg/L | 1 | SM5310C | 11/09/17 17:39 | JKB | | |
| ***Metals*** | | | | | | | | |
| Chromium, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:27 | CCM | 7440-47-3 | |
| Copper, Dissolved | 0.005 | mg/L | 0.005 | E200.8 | 11/10/17 13:27 | CCM | 7440-50-8 | |
| Nickel, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:27 | CCM | 7440-02-0 | |
| Zinc, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:27 | CCM | 7440-66-6 | |
| ***Organics*** | | | | | | | | |
| TOX* | Completed | ug/L | 30.0 | SW9020B | 12/04/17 07:35 | TA | | O |

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

# Analytical Laboratory Report

**Lab Sample ID: S85061.02**
Sample Tag: B-28
Collected Date/Time: 11/07/2017 10:30
Matrix: Groundwater
COC Reference: 108778

Sample Containers

| # | Type | Preservative(s) | Refrigerated? | Arrival Temp. (C) | Thermometer # |
|---|---|---|---|---|---|
| 1 | 125ml Plastic | HNO3 | Yes | 5.1 | IR |
| 2 | 40ml Glass | H2SO4 | Yes | 5.1 | IR |
| 1 | 250ml Amber | H2SO4 | Yes | 5.1 | IR |
| 1 | 125ml Plastic | None | Yes | 5.1 | IR |

| Analysis | Results | Units | RL | Method | Run Date/Time | Tech | CAS # | Flags |
|---|---|---|---|---|---|---|---|---|
| ***Extraction / Prep.*** | | | | | | | | |
| Metal Digestion | Completed | | | SW3015A | 11/10/17 11:45 | CCM | | |
| ***Inorganics*** | | | | | | | | |
| Conductivity | 859 | umhos/cm | | E120.1 | 11/08/17 16:36 | JKB | | |
| TOC | 1.6 | mg/L | 1 | SM5310C | 11/09/17 18:03 | JKB | | |
| ***Metals*** | | | | | | | | |
| Chromium, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:28 | CCM | 7440-47-3 | |
| Copper, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:28 | CCM | 7440-50-8 | |
| Nickel, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:28 | CCM | 7440-02-0 | |
| Zinc, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:28 | CCM | 7440-66-6 | |
| ***Organics*** | | | | | | | | |
| TOX* | Completed | ug/L | 30.0 | SW9020B | 12/04/17 04:07 | TA | | O |

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

Merit Laboratories, Inc.

# Analytical Laboratory Report

**Lab Sample ID: S85061.03**
Sample Tag: B-24r
Collected Date/Time: 11/07/2017 11:30
Matrix: Groundwater
COC Reference: 108778

Sample Containers

| # | Type | Preservative(s) | Refrigerated? | Arrival Temp. (C) | Thermometer # |
|---|---|---|---|---|---|
| 1 | 125ml Plastic | HNO3 | Yes | 5.1 | IR |
| 2 | 40ml Glass | H2SO4 | Yes | 5.1 | IR |
| 1 | 250ml Amber | H2SO4 | Yes | 5.1 | IR |
| 1 | 125ml Plastic | None | Yes | 5.1 | IR |

| Analysis | Results | Units | RL | Method | Run Date/Time | Tech | CAS # | Flags |
|---|---|---|---|---|---|---|---|---|
| ***Extraction / Prep.*** | | | | | | | | |
| Metal Digestion | Completed | | | SW3015A | 11/10/17 11:45 | CCM | | |
| ***Inorganics*** | | | | | | | | |
| Conductivity | 1,231 | umhos/cm | | E120.1 | 11/08/17 16:38 | JKB | | |
| TOC | 3.4 | mg/L | 1 | SM5310C | 11/09/17 18:26 | JKB | | |
| ***Metals*** | | | | | | | | |
| Chromium, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:30 | CCM | 7440-47-3 | |
| Copper, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:30 | CCM | 7440-50-8 | |
| Nickel, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:30 | CCM | 7440-02-0 | |
| Zinc, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:30 | CCM | 7440-66-6 | |
| ***Organics*** | | | | | | | | |
| TOX* | Completed | ug/L | 30.0 | SW9020B | 12/04/17 07:35 | TA | | O |

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

Merit Laboratories, Inc.

# Analytical Laboratory Report

**Lab Sample ID: S85061.04**
Sample Tag: B-9
Collected Date/Time: 11/07/2017 13:25
Matrix: Groundwater
COC Reference: 108778

Sample Containers

| # | Type | Preservative(s) | Refrigerated? | Arrival Temp. (C) | Thermometer # |
|---|---|---|---|---|---|
| 1 | 125ml Plastic | HNO3 | Yes | 5.1 | IR |
| 2 | 40ml Glass | H2SO4 | Yes | 5.1 | IR |
| 1 | 250ml Amber | H2SO4 | Yes | 5.1 | IR |
| 1 | 125ml Plastic | None | Yes | 5.1 | IR |

| Analysis | Results | Units | RL | Method | Run Date/Time | Tech | CAS # | Flags |
|---|---|---|---|---|---|---|---|---|
| ***Extraction / Prep.*** | | | | | | | | |
| Metal Digestion | Completed | | | SW3015A | 11/10/17 11:45 | CCM | | |
| ***Inorganics*** | | | | | | | | |
| Conductivity | 2,540 | umhos/cm | | E120.1 | 11/08/17 16:40 | JKB | | |
| TOC | 2.1 | mg/L | 1 | SM5310C | 11/09/17 19:12 | JKB | | |
| ***Metals*** | | | | | | | | |
| Chromium, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:31 | CCM | 7440-47-3 | |
| Copper, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:31 | CCM | 7440-50-8 | |
| Nickel, Dissolved | 0.008 | mg/L | 0.005 | E200.8 | 11/10/17 13:31 | CCM | 7440-02-0 | |
| Zinc, Dissolved | 0.011 | mg/L | 0.005 | E200.8 | 11/10/17 13:31 | CCM | 7440-66-6 | |
| ***Organics*** | | | | | | | | |
| TOX* | Completed | ug/L | 30.0 | SW9020B | 12/04/17 07:35 | TA | | O |

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

# Analytical Laboratory Report

**Lab Sample ID: S85061.05**
Sample Tag: B-18A
Collected Date/Time: 11/07/2017 13:55
Matrix: Groundwater
COC Reference: 108778

Sample Containers

| # | Type | Preservative(s) | Refrigerated? | Arrival Temp. (C) | Thermometer # |
|---|---|---|---|---|---|
| 1 | 125ml Plastic | HNO3 | Yes | 5.1 | IR |
| 2 | 40ml Glass | H2SO4 | Yes | 5.1 | IR |
| 1 | 250ml Amber | H2SO4 | Yes | 5.1 | IR |
| 1 | 125ml Plastic | None | Yes | 5.1 | IR |

| Analysis | Results | Units | RL | Method | Run Date/Time | Tech | CAS # | Flags |
|---|---|---|---|---|---|---|---|---|
| ***Extraction / Prep.*** | | | | | | | | |
| Metal Digestion | Completed | | | SW3015A | 11/10/17 11:45 | CCM | | |
| ***Inorganics*** | | | | | | | | |
| Conductivity | 1,092 | umhos/cm | | E120.1 | 11/08/17 16:42 | JKB | | |
| TOC | 1.2 | mg/L | 1 | SM5310C | 11/09/17 19:36 | JKB | | |
| ***Metals*** | | | | | | | | |
| Chromium, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:32 | CCM | 7440-47-3 | |
| Copper, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:32 | CCM | 7440-50-8 | |
| Nickel, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:32 | CCM | 7440-02-0 | |
| Zinc, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:32 | CCM | 7440-66-6 | |
| ***Organics*** | | | | | | | | |
| TOX* | Completed | ug/L | 30.0 | SW9020B | 12/04/17 07:35 | TA | | O |

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

Merit Laboratories, Inc.

# Analytical Laboratory Report

**Lab Sample ID: S85061.06**
Sample Tag: B-19Ar
Collected Date/Time: 11/07/2017 14:15
Matrix: Groundwater
COC Reference: 108778

Sample Containers

| # | Type | Preservative(s) | Refrigerated? | Arrival Temp. (C) | Thermometer # |
|---|---|---|---|---|---|
| 1 | 125ml Plastic | HNO3 | Yes | 5.1 | IR |
| 2 | 40ml Glass | H2SO4 | Yes | 5.1 | IR |
| 1 | 250ml Amber | H2SO4 | Yes | 5.1 | IR |
| 1 | 125ml Plastic | None | Yes | 5.1 | IR |

| Analysis | Results | Units | RL | Method | Run Date/Time | Tech | CAS # | Flags |
|---|---|---|---|---|---|---|---|---|
| ***Extraction / Prep.*** | | | | | | | | |
| Metal Digestion | Completed | | | SW3015A | 11/10/17 11:45 | CCM | | |
| ***Inorganics*** | | | | | | | | |
| Conductivity | 1,134 | umhos/cm | | E120.1 | 11/08/17 16:44 | JKB | | |
| TOC | 2.6 | mg/L | 1 | SM5310C | 11/09/17 19:59 | JKB | | |
| ***Metals*** | | | | | | | | |
| Chromium, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:34 | CCM | 7440-47-3 | |
| Copper, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:34 | CCM | 7440-50-8 | |
| Nickel, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:34 | CCM | 7440-02-0 | |
| Zinc, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:34 | CCM | 7440-66-6 | |
| ***Organics*** | | | | | | | | |
| TOX* | Completed | ug/L | 30.0 | SW9020B | 12/04/17 07:35 | TA | | O |

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

Merit Laboratories, Inc.

# Analytical Laboratory Report

**Lab Sample ID: S85061.07**
Sample Tag: Dup-2
Collected Date/Time: 11/07/2017 00:01
Matrix: Groundwater
COC Reference: 108778

Sample Containers

| # | Type | Preservative(s) | Refrigerated? | Arrival Temp. (C) | Thermometer # |
|---|---|---|---|---|---|
| 1 | 125ml Plastic | HNO3 | Yes | 5.1 | IR |
| 2 | 40ml Glass | H2SO4 | Yes | 5.1 | IR |
| 1 | 250ml Amber | H2SO4 | Yes | 5.1 | IR |
| 1 | 125ml Plastic | None | Yes | 5.1 | IR |

| Analysis | Results | Units | RL | Method | Run Date/Time | Tech | CAS # | Flags |
|---|---|---|---|---|---|---|---|---|
| ***Extraction / Prep.*** | | | | | | | | |
| Metal Digestion | Completed | | | SW3015A | 11/10/17 11:45 | CCM | | |
| ***Inorganics*** | | | | | | | | |
| Conductivity | 867 | umhos/cm | | E120.1 | 11/08/17 16:46 | JKB | | |
| TOC | 1.5 | mg/L | 1 | SM5310C | 11/09/17 20:22 | JKB | | |
| ***Metals*** | | | | | | | | |
| Chromium, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:35 | CCM | 7440-47-3 | |
| Copper, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:35 | CCM | 7440-50-8 | |
| Nickel, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:35 | CCM | 7440-02-0 | |
| Zinc, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:35 | CCM | 7440-66-6 | |
| ***Organics*** | | | | | | | | |
| TOX* | Completed | ug/L | 30.0 | SW9020B | 12/04/17 07:35 | TA | | O |

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

Merit Laboratories, Inc.

# Analytical Laboratory Report

**Lab Sample ID: S85061.08**
Sample Tag: EB-1
Collected Date/Time: 11/07/2017 14:40
Matrix: Liquid
COC Reference: 108778

Sample Containers

| # | Type | Preservative(s) | Refrigerated? | Arrival Temp. (C) | Thermometer # |
|---|---|---|---|---|---|
| 1 | 125ml Plastic | HNO3 | Yes | 5.1 | IR |
| 2 | 40ml Glass | H2SO4 | Yes | 5.1 | IR |
| 1 | 250ml Amber | H2SO4 | Yes | 5.1 | IR |
| 1 | 125ml Plastic | None | Yes | 5.1 | IR |

| Analysis | Results | Units | RL | Method | Run Date/Time | Tech | CAS # | Flags |
|---|---|---|---|---|---|---|---|---|
| ***Extraction / Prep.*** | | | | | | | | |
| Metal Digestion | Completed | | | SW3015A | 11/10/17 11:45 | CCM | | |
| ***Inorganics*** | | | | | | | | |
| Conductivity | 7.07 | umhos/cm | | E120.1 | 11/08/17 16:48 | JKB | | |
| TOC | Not detected | mg/L | 1 | SM5310C | 11/09/17 20:45 | JKB | | |
| ***Metals*** | | | | | | | | |
| Chromium, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:48 | CCM | 7440-47-3 | |
| Copper, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:48 | CCM | 7440-50-8 | |
| Nickel, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:48 | CCM | 7440-02-0 | |
| Zinc, Dissolved | Not detected | mg/L | 0.005 | E200.8 | 11/10/17 13:48 | CCM | 7440-66-6 | |
| ***Organics*** | | | | | | | | |
| TOX* | Completed | ug/L | 30.0 | SW9020B | 12/05/17 08:10 | TA | | O |

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

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

108778

# CHAIN OF CUSTODY RECORD

## REPORT TO

CONTACT NAME: Clifford Yantz
COMPANY: O'Brien & Gere
ADDRESS: 37000 Grand River ste 260
CITY: Farmington Hills STATE: MI ZIP CODE: 48335
PHONE NO.: 248-477-5701 FAX NO.: 248-477-5962 P.O. NO.: 11700139
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 Landfill Annual sampling
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Kevin Schneider

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 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 550161.01 | 11/7/17 | 945 | B-7 | GW | 5 | 1 | | 1 | 3 | | | | X | X | X | X | Dissolved metals were field Filtered |
| .02 | | 1030 | B-28 | | | | | | | | | | X | X | X | X | |
| .03 | | 1130 | B-24r | | | | | | | | | | X | X | X | X | |
| .04 | | 1325 | B-9 | | | | | | | | | | X | X | X | X | Metals are; Cu, Cr, Ni, Zn |
| .05 | | 1355 | B-18A | | | | | | | | | | X | X | X | X | |
| .06 | | 1415 | B-19Ar | | | | | | | | | | X | X | X | X | |
| .07 | | — | DUP-2 | | | | | | | | | | X | X | X | X | |
| .08 | | 1440 | EB-1 | QC | | | | | | | | | X | X | X | X | Equipment Blank |

| | | | |
|---|---|---|---|
| RELINQUISHED BY: SIGNATURE/ORGANIZATION | OBG Sampler | DATE 11/8/17 | TIME 1330 |
| RECEIVED BY: SIGNATURE/ORGANIZATION | | DATE 11/8/17 | TIME 1336 |
| RELINQUISHED BY: SIGNATURE/ORGANIZATION | | DATE | TIME |
| RECEIVED BY: SIGNATURE/ORGANIZATION | | DATE | TIME |

| | | | |
|---|---|---|---|
| RELINQUISHED BY: SIGNATURE/ORGANIZATION | | 11/8/17 DATE | TIME |
| RECEIVED BY: SIGNATURE/ORGANIZATION | | DATE 11/8/17 | TIME 1615 |
| SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS | |
| SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS | |

NOTES: TEMP ON ARRIVAL 5.1

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: 190-14874-1
Client Project/Site: S85061

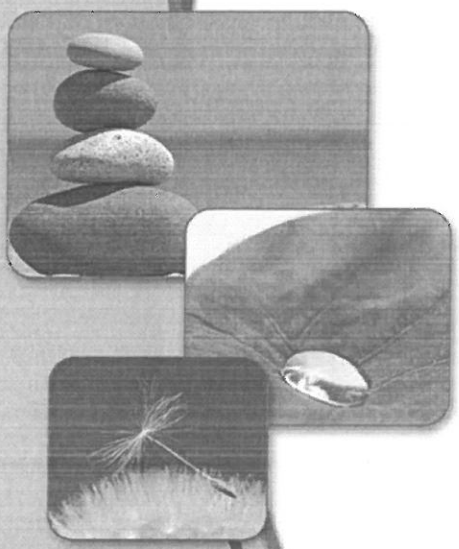
For:
Merit Laboratories
2680 E Lansing Drive
East Lansing, Michigan 48823

Attn: John Laverty

Sue Schafer

*Authorized for release by:*
*12/13/2017 10:03:40 AM*

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



LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.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: S85061

TestAmerica Job ID: 190-14874-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 190-14874-1 | 85061.01 | Water | 11/07/17 09:45 | 11/10/17 14:06 |
| 190-14874-2 | 85061.02 | Water | 11/07/17 10:30 | 11/10/17 14:06 |
| 190-14874-3 | 85061.03 | Water | 11/07/17 11:30 | 11/10/17 14:06 |
| 190-14874-4 | 85061.04 | Water | 11/07/17 13:25 | 11/10/17 14:06 |
| 190-14874-5 | 85061.05 | Water | 11/07/17 13:55 | 11/10/17 14:06 |
| 190-14874-6 | 85061.06 | Water | 11/07/17 14:15 | 11/10/17 14:06 |
| 190-14874-7 | 85061.07 | Water | 11/07/17 00:01 | 11/10/17 14:06 |
| 190-14874-8 | 85061.08 | Water | 11/07/17 14:40 | 11/10/17 14:06 |

# Case Narrative

Client: Merit Laboratories
Project/Site: S85061

TestAmerica Job ID: 190-14874-1

## Job ID: 190-14874-1

**Laboratory: TestAmerica Michigan**

**Narrative**

**Job Narrative**
**190-14874-1**

**Comments**
No additional comments.

**Receipt**
The samples were received on 11/10/2017 2:06 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.0° C.

**General Chemistry**
Method(s) 9020B: Breakthrough exceeded 10% for the following sample:85061.01 (190-14874-1) and 85061.06 (190-14874-6). Sample duplicate results are outside 20% RPD requirement. Insufficient sample volume remaining to perform additional replicates. The data has been reported.

Method(s) 9020B: Insufficient sample volume was available to perform a matrix spike (MS) associated with analytical batch 490-481762, 490-482659, 482666, 490-482700

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

**Client Sample ID: 85061.01**
**Date Collected: 11/07/17 09:45**
**Date Received: 11/10/17 14:06**

**Lab Sample ID: 190-14874-1**
**Matrix: Water**

General Chemistry

| Analyte | Result | Qualifier | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Halogens, Total Organic | 0.039 | | 0.030 | mg/L | | | 12/04/17 07:35 | 1 |
| TOX Result 1 | <0.030 | | 0.030 | mg/L | | | 12/04/17 07:35 | 1 |
| TOX Result 2 | 0.039 | | 0.030 | mg/L | | | 12/04/17 07:35 | 1 |

**Client Sample ID: 85061.02**
**Date Collected: 11/07/17 10:30**
**Date Received: 11/10/17 14:06**

**Lab Sample ID: 190-14874-2**
**Matrix: Water**

General Chemistry

| Analyte | Result | Qualifier | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Halogens, Total Organic | <0.030 | | 0.030 | mg/L | | | 12/04/17 04:07 | 1 |
| TOX Result 1 | <0.030 | | 0.030 | mg/L | | | 12/04/17 04:07 | 1 |
| TOX Result 2 | <0.030 | | 0.030 | mg/L | | | 12/04/17 04:07 | 1 |

**Client Sample ID: 85061.03**
**Date Collected: 11/07/17 11:30**
**Date Received: 11/10/17 14:06**

**Lab Sample ID: 190-14874-3**
**Matrix: Water**

General Chemistry

| Analyte | Result | Qualifier | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Halogens, Total Organic | <0.030 | | 0.030 | mg/L | | | 12/04/17 07:35 | 1 |
| TOX Result 1 | <0.030 | | 0.030 | mg/L | | | 12/04/17 07:35 | 1 |
| TOX Result 2 | <0.030 | | 0.030 | mg/L | | | 12/04/17 07:35 | 1 |

**Client Sample ID: 85061.04**
**Date Collected: 11/07/17 13:25**
**Date Received: 11/10/17 14:06**

**Lab Sample ID: 190-14874-4**
**Matrix: Water**

General Chemistry

| Analyte | Result | Qualifier | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Halogens, Total Organic | <0.030 | | 0.030 | mg/L | | | 12/04/17 07:35 | 1 |
| TOX Result 1 | <0.030 | | 0.030 | mg/L | | | 12/04/17 07:35 | 1 |
| TOX Result 2 | <0.030 | | 0.030 | mg/L | | | 12/04/17 07:35 | 1 |

**Client Sample ID: 85061.05**
**Date Collected: 11/07/17 13:55**
**Date Received: 11/10/17 14:06**

**Lab Sample ID: 190-14874-5**
**Matrix: Water**

General Chemistry

| Analyte | Result | Qualifier | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Halogens, Total Organic | <0.030 | | 0.030 | mg/L | | | 12/04/17 07:35 | 1 |
| TOX Result 1 | <0.030 | | 0.030 | mg/L | | | 12/04/17 07:35 | 1 |
| TOX Result 2 | <0.030 | | 0.030 | mg/L | | | 12/04/17 07:35 | 1 |

## Client Sample ID: 85061.06

Date Collected: 11/07/17 14:15
Date Received: 11/10/17 14:06

Lab Sample ID: 190-14874-6
Matrix: Water

### General Chemistry

| Analyte | Result | Qualifier | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Halogens, Total Organic | 0.12 | | 0.030 | mg/L | | | 12/04/17 07:35 | 1 |
| TOX Result 1 | <0.030 | | 0.030 | mg/L | | | 12/04/17 07:35 | 1 |
| TOX Result 2 | 0.12 | | 0.030 | mg/L | | | 12/04/17 07:35 | 1 |

## Client Sample ID: 85061.07

Date Collected: 11/07/17 00:01
Date Received: 11/10/17 14:06

Lab Sample ID: 190-14874-7
Matrix: Water

### General Chemistry

| Analyte | Result | Qualifier | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Halogens, Total Organic | <0.030 | | 0.030 | mg/L | | | 12/04/17 07:35 | 1 |
| TOX Result 1 | <0.030 | | 0.030 | mg/L | | | 12/04/17 07:35 | 1 |
| TOX Result 2 | <0.030 | | 0.030 | mg/L | | | 12/04/17 07:35 | 1 |

## Client Sample ID: 85061.08

Date Collected: 11/07/17 14:40
Date Received: 11/10/17 14:06

Lab Sample ID: 190-14874-8
Matrix: Water

### General Chemistry

| Analyte | Result | Qualifier | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Halogens, Total Organic | <0.030 | | 0.030 | mg/L | | | 12/05/17 08:10 | 1 |
| TOX Result 1 | <0.030 | | 0.030 | mg/L | | | 12/05/17 08:10 | 1 |
| TOX Result 2 | <0.030 | | 0.030 | mg/L | | | 12/05/17 08:10 | 1 |

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

**Lab Sample ID: MB 490-481762/3**
**Matrix: Water**
**Analysis Batch: 481762**

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

| Analyte | MB Result | MB Qualifier | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Halogens, Total Organic | <0.030 | | 0.030 | mg/L | | | 12/04/17 10:20 | 1 |
| TOX Result 1 | <0.030 | | 0.030 | mg/L | | | 12/04/17 10:20 | 1 |
| TOX Result 2 | <0.030 | | 0.030 | mg/L | | | 12/04/17 10:20 | 1 |

**Lab Sample ID: LCS 490-481762/4**
**Matrix: Water**
**Analysis Batch: 481762**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Halogens, Total Organic | 0.250 | 0.229 | | mg/L | | 92 | 90 - 110 |
| TOX Result 1 | 0.250 | 0.231 | | mg/L | | 93 | 90 - 110 |
| TOX Result 2 | 0.250 | 0.227 | | mg/L | | 91 | 90 - 110 |

**Lab Sample ID: LCSD 490-481762/16**
**Matrix: Water**
**Analysis Batch: 481762**

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

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Halogens, Total Organic | 0.250 | 0.259 | | mg/L | | 103 | 90 - 110 | 12 | 20 |
| TOX Result 1 | 0.250 | 0.243 | | mg/L | | 97 | 90 - 110 | 5 | 20 |
| TOX Result 2 | 0.250 | 0.274 | | mg/L | | 110 | 90 - 110 | 19 | 20 |

**Lab Sample ID: MB 490-482659/3**
**Matrix: Water**
**Analysis Batch: 482659**

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

| Analyte | MB Result | MB Qualifier | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Halogens, Total Organic | <0.030 | | 0.030 | mg/L | | | 12/08/17 12:36 | 1 |
| TOX Result 1 | <0.030 | | 0.030 | mg/L | | | 12/08/17 12:36 | 1 |
| TOX Result 2 | <0.030 | | 0.030 | mg/L | | | 12/08/17 12:36 | 1 |

**Lab Sample ID: LCS 490-482659/4**
**Matrix: Water**
**Analysis Batch: 482659**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Halogens, Total Organic | 0.250 | 0.228 | | mg/L | | 91 | 90 - 110 |
| TOX Result 1 | 0.250 | 0.227 | | mg/L | | 91 | 90 - 110 |
| TOX Result 2 | 0.250 | 0.228 | | mg/L | | 91 | 90 - 110 |

**Lab Sample ID: LCSD 490-482659/8**
**Matrix: Water**
**Analysis Batch: 482659**

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

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Halogens, Total Organic | 0.250 | 0.231 | | mg/L | | 92 | 90 - 110 | 1 | 20 |
| TOX Result 1 | 0.250 | 0.233 | | mg/L | | 93 | 90 - 110 | 2 | 20 |
| TOX Result 2 | 0.250 | 0.228 | | mg/L | | 91 | 90 - 110 | 0 | 20 |

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

**Lab Sample ID: MB 490-482666/3**
**Matrix: Water**
**Analysis Batch: 482666**

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

| Analyte | MB Result | MB Qualifier | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Halogens, Total Organic | <0.030 | | 0.030 | mg/L | | | 12/08/17 14:10 | 1 |
| TOX Result 1 | <0.030 | | 0.030 | mg/L | | | 12/08/17 14:10 | 1 |
| TOX Result 2 | <0.030 | | 0.030 | mg/L | | | 12/08/17 14:10 | 1 |

**Lab Sample ID: LCS 490-482666/4**
**Matrix: Water**
**Analysis Batch: 482666**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Halogens, Total Organic | 0.250 | 0.236 | | mg/L | | 94 | 90 - 110 |
| TOX Result 1 | 0.250 | 0.242 | | mg/L | | 97 | 90 - 110 |
| TOX Result 2 | 0.250 | 0.229 | | mg/L | | 92 | 90 - 110 |

**Lab Sample ID: MB 490-482700/3**
**Matrix: Water**
**Analysis Batch: 482700**

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

| Analyte | MB Result | MB Qualifier | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Halogens, Total Organic | <0.030 | | 0.030 | mg/L | | | 12/08/17 14:20 | 1 |
| TOX Result 1 | <0.030 | | 0.030 | mg/L | | | 12/08/17 14:20 | 1 |
| TOX Result 2 | <0.030 | | 0.030 | mg/L | | | 12/08/17 14:20 | 1 |

**Lab Sample ID: LCS 490-482700/4**
**Matrix: Water**
**Analysis Batch: 482700**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Halogens, Total Organic | 0.250 | 0.241 | | mg/L | | 96 | 90 - 110 |
| TOX Result 1 | 0.250 | 0.233 | | mg/L | | 93 | 90 - 110 |
| TOX Result 2 | 0.250 | 0.249 | | mg/L | | 99 | 90 - 110 |

**Lab Sample ID: LCSD 490-482700/8**
**Matrix: Water**
**Analysis Batch: 482700**

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

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Halogens, Total Organic | 0.250 | 0.231 | | mg/L | | 92 | 90 - 110 | 4 | 20 |
| TOX Result 1 | 0.250 | 0.226 | | mg/L | | 90 | 90 - 110 | 3 | 20 |
| TOX Result 2 | 0.250 | 0.235 | | mg/L | | 94 | 90 - 110 | 6 | 20 |

## 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: S85061

TestAmerica Job ID: 190-14874-1

## General Chemistry

### Analysis Batch: 481762

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 190-14874-1 | 85061.01 | Total/NA | Water | 9020B | |
| 190-14874-2 | 85061.02 | Total/NA | Water | 9020B | |
| 190-14874-3 | 85061.03 | Total/NA | Water | 9020B | |
| 190-14874-4 | 85061.04 | Total/NA | Water | 9020B | |
| MB 490-481762/3 | Method Blank | Total/NA | Water | 9020B | |
| LCS 490-481762/4 | Lab Control Sample | Total/NA | Water | 9020B | |
| LCSD 490-481762/16 | Lab Control Sample Dup | Total/NA | Water | 9020B | |

### Analysis Batch: 482659

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 190-14874-7 | 85061.07 | Total/NA | Water | 9020B | |
| MB 490-482659/3 | Method Blank | Total/NA | Water | 9020B | |
| LCS 490-482659/4 | Lab Control Sample | Total/NA | Water | 9020B | |
| LCSD 490-482659/8 | Lab Control Sample Dup | Total/NA | Water | 9020B | |

### Analysis Batch: 482666

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 190-14874-5 | 85061.05 | Total/NA | Water | 9020B | |
| MB 490-482666/3 | Method Blank | Total/NA | Water | 9020B | |
| LCS 490-482666/4 | Lab Control Sample | Total/NA | Water | 9020B | |

### Analysis Batch: 482700

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 190-14874-6 | 85061.06 | Total/NA | Water | 9020B | |
| 190-14874-8 | 85061.08 | Total/NA | Water | 9020B | |
| MB 490-482700/3 | Method Blank | Total/NA | Water | 9020B | |
| LCS 490-482700/4 | Lab Control Sample | Total/NA | Water | 9020B | |
| LCSD 490-482700/8 | Lab Control Sample Dup | Total/NA | Water | 9020B | |

# Lab Chronicle

Client: Merit Laboratories
Project/Site: S85061

TestAmerica Job ID: 190-14874-1

## Client Sample ID: 85061.01
Date Collected: 11/07/17 09:45
Date Received: 11/10/17 14:06

Lab Sample ID: 190-14874-1
Matrix: Water

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9020B | | 1 | 481762 | 12/04/17 07:35 | RN | TAL NSH |

## Client Sample ID: 85061.02
Date Collected: 11/07/17 10:30
Date Received: 11/10/17 14:06

Lab Sample ID: 190-14874-2
Matrix: Water

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9020B | | 1 | 481762 | 12/04/17 04:07 | RN | TAL NSH |

## Client Sample ID: 85061.03
Date Collected: 11/07/17 11:30
Date Received: 11/10/17 14:06

Lab Sample ID: 190-14874-3
Matrix: Water

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9020B | | 1 | 481762 | 12/04/17 07:35 | RN | TAL NSH |

## Client Sample ID: 85061.04
Date Collected: 11/07/17 13:25
Date Received: 11/10/17 14:06

Lab Sample ID: 190-14874-4
Matrix: Water

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9020B | | 1 | 481762 | 12/04/17 07:35 | RN | TAL NSH |

## Client Sample ID: 85061.05
Date Collected: 11/07/17 13:55
Date Received: 11/10/17 14:06

Lab Sample ID: 190-14874-5
Matrix: Water

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9020B | | 1 | 482666 | 12/04/17 07:35 | RN | TAL NSH |

## Client Sample ID: 85061.06
Date Collected: 11/07/17 14:15
Date Received: 11/10/17 14:06

Lab Sample ID: 190-14874-6
Matrix: Water

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9020B | | 1 | 482700 | 12/04/17 07:35 | RN | TAL NSH |

# Lab Chronicle

Client: Merit Laboratories
Project/Site: S85061

TestAmerica Job ID: 190-14874-1

**Client Sample ID: 85061.07**
**Date Collected: 11/07/17 00:01**
**Date Received: 11/10/17 14:06**

**Lab Sample ID: 190-14874-7**
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9020B | | 1 | 482659 | 12/04/17 07:35 | RN | TAL NSH |

**Client Sample ID: 85061.08**
**Date Collected: 11/07/17 14:40**
**Date Received: 11/10/17 14:06**

**Lab Sample ID: 190-14874-8**
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9020B | | 1 | 482700 | 12/05/17 08:10 | RN | TAL NSH |

**Laboratory References:**

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

**Analyst References:**

Lab: TAL NSH

Batch Type: Analysis

RN = Ryan Nowak

# Accreditation/Certification Summary

Client: Merit Laboratories
Project/Site: S85061

TestAmerica Job ID: 190-14874-1

## 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 Nashville

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 | A2LA | | NA: NELAP & A2LA | 12-31-17 * |
| A2LA | ISO/IEC 17025 | | 0453.07 | 12-31-17 * |
| Alaska (UST) | State Program | 10 | UST-087 | 01-01-18 * |
| Arizona | State Program | 9 | AZ0473 | 05-05-18 |
| Arkansas DEQ | State Program | 6 | 88-0737 | 04-25-18 |
| California | State Program | 9 | 2938 | 10-31-18 |
| Connecticut | State Program | 1 | PH-0220 | 12-31-17 * |
| Florida | NELAP | 4 | E87358 | 06-30-18 |
| Georgia | State Program | 4 | E87358(FL)/453.07(A2LA) | 06-30-18 |
| Illinois | NELAP | 5 | 200010 | 12-09-18 |
| Iowa | State Program | 7 | 131 | 04-01-18 |
| Kansas | NELAP | 7 | E-10229 | 12-31-17 * |
| Kentucky (UST) | State Program | 4 | 19 | 06-30-18 |
| Kentucky (WW) | State Program | 4 | 90038 | 12-31-17 * |
| Louisiana | NELAP | 6 | 30613 | 06-30-18 |
| Maine | State Program | 1 | TN00032 | 11-03-19 |
| Maryland | State Program | 3 | 316 | 03-31-18 |
| Massachusetts | State Program | 1 | M-TN032 | 06-30-18 |
| Minnesota | NELAP | 5 | 047-999-345 | 12-31-17 * |
| Mississippi | State Program | 4 | N/A | 06-30-18 |
| Montana (UST) | State Program | 8 | NA | 02-24-20 |
| Nevada | State Program | 9 | TN00032 | 07-31-18 |
| New Hampshire | NELAP | 1 | 2963 | 10-09-18 |
| New Jersey | NELAP | 2 | TN965 | 06-30-18 |
| New York | NELAP | 2 | 11342 | 03-31-18 |
| North Carolina (WW/SW) | State Program | 4 | 387 | 12-31-17 * |
| North Dakota | State Program | 8 | R-146 | 06-30-18 |
| Ohio VAP | State Program | 5 | CL0033 | 07-06-19 |
| Oklahoma | State Program | 6 | 9412 | 08-31-18 |
| Oregon | NELAP | 10 | TN200001 | 04-27-18 |
| Pennsylvania | NELAP | 3 | 68-00585 | 06-30-18 |
| Rhode Island | State Program | 1 | LAO00268 | 12-30-17 * |
| South Carolina | State Program | 4 | 84009 (001) | 02-28-18 |
| South Carolina (Do Not Use - DW) | State Program | 4 | 84009 (002) | 12-16-17 |
| Tennessee | State Program | 4 | 2008 | 02-23-20 |
| Texas | NELAP | 6 | T104704077 | 08-31-18 |
| USDA | Federal | | P330-13-00306 | 12-01-19 |
| Utah | NELAP | 8 | TN00032 | 07-31-18 |
| Virginia | NELAP | 3 | 460152 | 06-14-18 |
| Washington | State Program | 10 | C789 | 07-19-18 |
| West Virginia DEP | State Program | 3 | 219 | 02-28-18 |
| Wisconsin | State Program | 5 | 998020430 | 08-31-18 |
| Wyoming (UST) | A2LA | 8 | 453.07 | 12-31-19 |

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

# Method Summary

Client: Merit Laboratories
Project/Site: S85061

TestAmerica Job ID: 190-14874-1

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

**Protocol References:**

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

**Laboratory References:**

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

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: S85061 | 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 | HNO3 | H2SO4 | NaOH | MeOH | OTHER | TOX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 11/7/17 | 0945 | 85061.01 | GW | 1 | | | | X | | | | ✓ |
| | 11/7/17 | 1030 | 85061.02 | GW | 1 | | | | X | | | | ✓ |
| | 11/7/17 | 1130 | 85061.03 | GW | 1 | | | | X | | | | ✓ |
| | 11/7/17 | 1325 | 85061.04 | GW | 1 | | | | X | | | | ✓ |
| | 11/7/17 | 1355 | 85061.05 | GW | 1 | | | | X | | | | ✓ |
| | 11/7/17 | 1415 | 85061.06 | GW | 1 | | | | X | | | | ✓ |
| | 11/7/17 | 0001 | 85061.07 | GW | 1 | | | | X | | | | ✓ |
| | 11/7/17 | 1440 | 85061.08 | GW | 1 | | | | X | | | | ✓ |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

190-14874 Chain of Custody

Subcontracted to Test America

RELINQUISHED BY: SIGNATURE/ORGANIZATION: [signature] ☐ Sampler | DATE: 11/9/17 | TIME: 1640
RECEIVED BY: SIGNATURE/ORGANIZATION: UPS | DATE | TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION: UPS | DATE | TIME
RECEIVED BY: SIGNATURE/ORGANIZATION: [signature] MTL MI | DATE: 11/10/17 | TIME: 14:20

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. 5.16.12



12/13/2017

TestAmerica

# Cooler/Sample Receipt

(AFTER HOURS receipt, complete gray areas. Place cooler in walk-in cooler in Receiving in box. Date/Time received _____ Initials _____)

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

Client ID Mont Laboratories
Work Order # 190-14894
Receipt evaluation performed by - Initials AmH Date 11/10/17 Time 14:06

**Method of Shipment:**
☐ Walk-In Client ☐ TestAmerica Field/Courier
☐ Other Client/3rd Party Courier _____
☐ Fed Ex Tracking # _____
☒ UPS Tracking # 1Z 466 497 03 6055 0422
☐ Other Ground

**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

**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 | 1.0 | 1.0 | ☐ | ☒ | ☐Yes ☐No | ☒Yes ☐No | | |
| | | | ☐ | ☐ | ☐Yes ☐No | ☐Yes ☐No | | |

C.F. 0.0

* 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 N/A) |
| 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 _____ Date 11/10/17

WI Page 1 of 1

WI No DT-SCA-001 TO effective 06/11/12

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

# COOLER RECEIPT FORM

190-14874 Chain of Custody

Cooler Received/Opened On 11/11/2017 @ 1005

Time Samples Removed From Cooler_____ Time Samples Placed In Storage_____ (2 Hour Window)

1. Tracking # 1988 (last 4 digits, FedEx) Courier: FedEx

IR Gun ID 17960353 pH Strip Lot_____ Chlorine Strip Lot_____

2. Temperature of rep. sample or temp blank when opened: 2.2 Degrees Celsius

3. If item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? (YES) NO...NA

If yes, how many and where: Front

5. Were the seals intact, signed, and dated correctly? (YES)..NO...NA

6. Were custody papers inside cooler? (YES)..NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) es

7. Were custody seals on containers: YES (NO) and Intact YES...NO...(NA)

Were these signed and dated correctly? YES...NO...(NA)

8. Packing mat'l used? (Bubblewrap) (Plastic bag) Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: (Ice) Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? (YES)..NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? (YES)...NO...NA

12. Did all container labels and tags agree with custody papers? (YES)...NO...NA

13a. Were VOA vials received? YES..(NO)..NA

b. Was there any observable headspace present in any VOA vial? YES...NO..(NA)

Larger than this.

14. Was there a Trip Blank in this cooler? YES...(NO)..NA If multiple coolers, sequence #_____

I certify that I unloaded the cooler and answered questions 7-14 (intial) es

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...(NA)

b. Did the bottle labels indicate that the correct preservatives were used (YES)..NO...NA

16. Was residual chlorine present? YES...NO...(NA)

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) es

17. Were custody papers properly filled out (ink, signed, etc)? (YES)..NO...NA

18. Did you sign the custody papers in the appropriate place? (YES)..NO...NA

19. Were correct containers used for the analysis requested? (YES)..NO...NA

20. Was sufficient amount of sample sent in each container? (YES)..NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) es

I certify that I attached a label with the unique LIMS number to each container (intial) es

21. Were there Non-Conformance issues at login? YES..(NO) Was a NCM generated? YES..(NO)..# es

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 8/23/17

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

# Chain of Custody Record

# 190-14874

America
IN ENVIRONMENTAL TESTING

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Schafer, Sue | | :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 #: 190-14874-1 |
| Address: 2960 Foster Creighton Drive, | Due Date Requested: 11/22/2017 | | | |
| City: Nashville | TAT Requested (days): | | | |
| State, Zip: TN, 37204 | | | | |
| Phone: 615-726-0177(Tel) 615-726-3404(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Merit Laboratories | Project #: 19001249 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

| | |
|---|---|
| A - HCL | M - Hexane |
| B - NaOH | N - None |
| C - Zn Acetate | O - AsNaO2 |
| D - Nitric Acid | P - Na2O4S |
| E - NaHSO4 | Q - Na2SO3 |
| F - MeOH | R - Na2S2O3 |
| G - Amchlor | S - H2SO4 |
| H - Ascorbic Acid | T - TSP Dodecahydrate |
| I - Ice | U - Acetone |
| J - DI Water | V - MCAA |
| K - EDTA | W - pH 4-5 |
| L - EDA | 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/ Total Organic Halides (TOX) | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| 85061.01 (190-14874-1) | 11/7/17 | 09:45 Eastern | | Water | | | X | 1 | |
| 85061.02 (190-14874-2) | 11/7/17 | 10:30 Eastern | | Water | | | X | 1 | |
| 85061.03 (190-14874-3) | 11/7/17 | 11:30 Eastern | | Water | | | X | 1 | |
| 85061.04 (190-14874-4) | 11/7/17 | 13:25 Eastern | | Water | | | X | 1 | |
| 85061.05 (190-14874-5) | 11/7/17 | 13:55 Eastern | | Water | | | X | 1 | |
| 85061.06 (190-14874-6) | 11/7/17 | 14:15 Eastern | | Water | | | X | 1 | |
| 85061.07 (190-14874-7) | 11/7/17 | 00:01 Eastern | | Water | | | X | 1 | |
| 85061.08 (190-14874-8) | 11/7/17 | 14:40 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 compliance 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: 11/10/17 1505 | Company TAL | Received by: | Date/Time: 11-11-17 1005 | | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | | Company |
| 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: 2.2 |

Ver: 09/20/2016

# Appendix B
# Inspection Photos

View (to South) of Sampling at Monitoring Well B-7

View (to North) of Sampling at Monitoring Well B-28

View (to West) of Sampling at Monitoring Well B-28

View (to North) of Sampling at Monitoring Well B-28

View (to West) of Recently Repaired Washed-Out Area on Eastern Slope of Landfill Near Monitoring Well B-24r