



**2018 ANNUAL SITE MONITORING AND
OPERATIONS REPORT WEST ELGIN LANDFILL SITE**

**MUNICIPALITY OF WEST ELGIN
RODNEY, ONTARIO**

Submitted to:

The Corporation of the Municipality of West Elgin
22413 Hoskins Line, Box 490
Rodney, ON N0L 2C0

Prepared by:

BluMetric Environmental Inc.
171 Victoria Street North
Kitchener, ON N2H 5C5

Project Number: 180351
April 26, 2019

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1. INTRODUCTION

BluMetric Environmental Inc. (BluMetric™) was retained by The Corporation of the Municipality of West Elgin (Municipality of West Elgin) to complete the 2018 annual site monitoring and operations report for the West Elgin Landfill site (the site) located near Rodney, Ontario (Figure 1). The monitoring program consisted of semi-annual (spring and fall) monitoring of the site groundwater quality. It should be noted that “the site” is defined as the study area as a whole (as noted in Figure 2) and incorporates both on-site (property currently owned by the Municipality of West Elgin) and off-site components.

This report has been prepared to comply with the Ministry of the Environment, Conservation, and Parks (MECP’s) 2010 Technical Guidance Document entitled “Monitoring and Reporting for Waste Disposal Sites, Groundwater and Surface Water” (MOE, 2010). As such a Competent Environmental Practitioner (CEP) completed the document’s checklist which is included as Appendix A of this report.

1.1 LOCATION

The site is located near Rodney, Ontario off of Downie Line as shown in Figure 1.

Coordinates are approximately (using Google Earth© as a reference):

UTM 17T, 439670.29 m E, 4710278.09 m N

Figure 2 provides a site plan with all groundwater monitoring stations and the property boundary as shown on an aerial photo (from 2016).

Figure 3 provides the site plan without the aerial photo, with the general infrastructure of the site shown (i.e. the waste transfer station bins).

1.2 OWNERSHIP AND KEY PERSONNEL

The Municipality of West Elgin currently operates the West Elgin Landfill site under the MECP Amended Provisional Environmental Compliance Approval (ECA) for Waste Disposal Site No. A051101 dated December 21st, 2005 (MOE, 2005), and amended on April 11, 2012, September 11, 2015 and April 4, 2017, provided in Appendix B of this report.



The contact information is as follows:

Contact: Mr. Lee Gosnell, Public Works Superintendent
Municipality of West Elgin
22413 Hoskins Line
Rodney, ON N0L 2C0
Phone: 519-878-3961

1.3 DESCRIPTION AND DEVELOPMENT OF THE WASTE DISPOSAL SITE

BluMetric (operating as WESA until 2015) was retained by the Municipality of West Elgin in 2006 to prepare a Hydrogeological Investigation and Design and Operations Report (WESA, 2006). In response to recommendations made in that report and to comments from the MECP (MOE, 2007a and b), BluMetric was retained by the Municipality of West Elgin to complete a subsurface investigation and leachate delineation study for the site (WESA, 2007b). The subsurface investigation and leachate delineation study allowed for delineation of leachate impacts down-gradient of the landfill (off-site). The study concluded that impacts to groundwater were identified beyond the property boundaries (off-site) and therefore the site was out of compliance with the Reasonable Use Guideline (RUL) (B-7) (MOEE, 1994).

The need for the establishment of a Contaminant Attenuation Zone (CAZ) was identified and in 2012, the Municipality of West Elgin purchased the recommended CAZ to the south (50 m) of the site. As a result, monitoring wells MW6, MW8, MW9, and MW12 are considered on-site. In 2015, the Municipality purchased additional CAZ to the east of the site. As a result of this purchase, monitoring wells MW11 and MW15 are also considered on-site. In July 2015, a new piezometer (MW19) was installed within the CAZ to the east. Figures 2 and 3 present a site plan and detail the locations of all the monitoring wells.

Historically, background water quality on-site had been evaluated on the conditions at MW1; however due to the potential for a small component of groundwater flow to be directed towards this monitoring well, it was determined that it may not be fully representative of background conditions (WESA, 2009). A new background well (MW14) was installed at the site in May 2010 (Figure 2). RULs have been calculated for the landfill site using historical analytical data collected from MW14 (including data collected since installation in 2010 through to current data).



The landfill site was surveyed in the spring of 2010 and again in the fall of 2016 (to confirm waste input). It should be noted that all reference elevations for the site, including borehole elevations, monitoring well elevations and cross sections have been updated based on the spring 2010 survey. A revised final Trigger Mechanism and Contingency Plan (BluMetric, 2017) was approved by the MECP in 2017. No communications from the MECP were received in 2018.

Appendix B includes:

- Certificate of Approval Number A051101, Issue Date: December 21, 2005;
- Amendment to Environmental Compliance Approval A051101, Issue Date April 11, 2012;
- Amendment to Environmental Compliance Approval A051101, Issue Date September 11, 2015;
- Amendment to Environmental Compliance Approval A051101, Issue Date April 4, 2017.

1.4 MONITORING AND REPORTING PROGRAM OBJECTIVES AND REQUIREMENTS

The monitoring program meets the requirements of the ECA as provided in Appendix B. This was amended in April 2017 to revise the Final Trigger Mechanism and Contingency Plan (BluMetric, 2015) as the assessment criteria. The trigger level is established based on Reasonable Use Policy B7 (MOEE, 1994) which was established to address the quality of groundwater on properties adjacent to potential sources of contaminants such as landfills. Therefore, the groundwater quality at the site is compared to the calculated Reasonable Use Limit (RUL) based on the background conditions on-site and the Ontario Drinking Water Quality Standards (ODWQS) for the following leachate indicator parameters (LIPs):

- Alkalinity, arsenic, chloride, dissolved organic carbon (DOC), iron, and sodium

Monitoring Well MW14, shown on Figures 2 and 3, is representative of background groundwater conditions and therefore RULs for the site are calculated using the historical background concentrations up to and including the most recent sampling events at this well. Therefore the calculated RUL changes each year.



The following demonstrates how the RUL is calculated:

$$C_m = C_b + x * (C_r - C_b)$$

Where,

- C_m Reasonable Use Limit
- C_b Background concentration of groundwater before it has been affected by human activity (average concentrations since May 2010 at MW 14)
- C_r Maximum concentration of contaminant that should be present in groundwater (ODWQS)
- x Constant that reduces the contaminant (equal to 0.25 for health-related parameters and equal to 0.5 for non-health related parameters)

The amended ECA determines site compliance using the Trigger Mechanism and Contingency Plan that compares the groundwater concentrations to a trigger limit of 75% of the RUL at specific trigger or boundary wells. A tier 1 alert is initiated once a trigger limit is exceeded over three consecutive sampling events at a trigger well/monitor. Site compliance is ultimately determined using 100% of the RUL.

The RUL calculations for Spring and Fall 2018 were completed using the current ODWQS concentrations.

1.5 ASSUMPTIONS AND LIMITATIONS

The conclusions presented in this report represent our professional opinion and are based upon the work described in this report and any limiting conditions in the terms of reference, scope of work, or conditions noted herein.

The findings presented in this report are based on conditions observed at the specified dates and locations, and on the analysis of samples for the specified parameters. Unless otherwise stated, the findings cannot be extended to previous or future site conditions, portions of the site that were not investigated directly, or types of analysis not performed.

BluMetric makes no warranty as to the accuracy or completeness of the information provided by others, or of conclusions and recommendations predicated on the accuracy of that information.

Nothing in this report is intended to constitute or provide a legal opinion. BluMetric makes no representation as to compliance with environmental laws, rules, regulations or policies established by regulatory agencies.



This report has been prepared for the Municipality of West Elgin and the Ontario Ministry of the Environment, Conservation and Parks (MECP). Any use a third party makes of this report, any reliance on the report, or decisions based upon the report, are the responsibility of those third parties unless authorization is received from BluMetric in writing. BluMetric accepts no responsibility for any loss or damages suffered by any unauthorized third party as a result of decisions made or actions taken based on this report.

2. PHYSICAL SETTING

2.1 GEOLOGY AND HYDROGEOLOGY

2.1.1 Site Geology

The surficial geology in the area of the site is classified into three units. The upper unit is a lacustrine deep water deposit consisting of sand, silt and clay till. These are underlain by lacustrine shallow water deposits consisting of gravel and sand.

The gravel and sand unit in the area overlies a well laminated to massive clayey silt till. Drift thickness of the gravel and sand units are upwards of 10 m in the area (P. Map, 1973).

Observations during drilling programs (excluding the boreholes completed in the landfill material) (WESA, 2006) identified an overlying till unit present across the area. A gravel/sand, gravel or sand unit that was up to 2.5 m thick was beneath the till and overlying a clay unit. In places throughout the landfill, some or all the units overlying the clay had been removed and replaced with landfill material.

Boreholes were not advanced more than 2 m into the clay and therefore the full depth of the clay is not known. Based on MECP wells records for the area the clay extends to the top of bedrock that is approximately 55 to 70 m below ground surface (bgs).

The distribution of units can be seen in two cross sections that were constructed north–south and east–west across the site. The location of the cross sections is outlined in Figure 4, and the cross sections are included as Figures 5 and 6. The additional off-site investigation confirms the geology in the area (WESA, 2007b).

The bedrock geology in the subject area is described as an inter-bedded limestone and shale with fossiliferous zones. Bedrock in the area is part of the Dundee formation and is Middle Devonian in age (P.2544).



2.1.2 Hydrogeology

Historical hydrogeological information for the area suggests that the direction of regional groundwater flow is generally from the northwest to the southeast towards Lake Erie (Chapman and Putnam, 1984).

Shallow groundwater flow has been characterized by wells completed within the landfill material or the native sand and gravel units (with the exception of MW2D). Monitoring well MW2D is completed within the clay layer that underlies the landfill and is therefore not part of the shallow groundwater flow system.

Based on the historical site operations as a former sand and gravel pit, it was determined during the initial hydrogeological investigation on-site where areas of native sand and gravel remained. These areas were identified along the property boundaries as preferential pathways for leachate migration (WESA, 2006). The areas were confirmed in 2007 to continue off-site (WESA, 2007a and b).

The results of the initial hydrogeological investigation (WESA, 2006) concluded that the hydraulic conductivity of the sand and gravel unit (1.0×10^{-3} m/s) is two orders of magnitude higher than that of the landfill material (1.5×10^{-5} m/s) tested and therefore could act as a preferential pathway for leachate impacted groundwater to migrate off-site. The clay that is present around the area has a measured hydraulic conductivity (1.0×10^{-8} m/s) that is two to three orders of magnitude less than the overlaying units and therefore will help to restrict water and leachate movement.

2.2 SURFACE WATER FEATURES

The landfill is positioned adjacent to a series of wetlands (northwest property boundary) and provincially significant wetlands (south and east property boundary). At the request of the MECP, surface water samples were collected from the wetlands to the north, south and southeast of the landfill in 2013. Based on the results of the 2013 surface water analytical results, future sampling was not recommended at these locations (WESA, 2014).

2.3 MONITORING LOCATIONS

Locations of the monitoring wells are detailed in Figures 2 and 3. All borehole logs / monitoring well construction logs are provided in Appendix C. Note there are no logs for MW15 through MW18 as these were installed by hand as temporary drivepoint piezometers. BluMetric conducted a GPS survey in 2010. The elevations and UTM coordinates for all monitoring wells



are included in Appendix D (note there are no UTM coordinates for temporary piezometers MW16 through MW18).

Prior to the Spring sampling event, MW5-R, which had been noted as damaged in Fall 2017, was repaired on April 19, 2018. This well is still referred to as MW5-R as it was not redrilled. Monitoring wells MW2-R and MW2D had partial extensions installed on April 19, 2018 to preserve them as the landfill continues to grow in height. The protective casings were removed from these wells and builder's tubes were placed around them for protection. A 5' well extension was added to each of MW2-R and MW2D and the builder's tubes were backfilled with bentonite chips to stabilize the wells. Additional extensions will likely be required as the landfill continues to grow. The repair of MW5 and extensions of MW2-R and MW2D were completed by Direct Environmental Drilling of London, Ontario under the supervision of BluMetric personnel.

MW14 was noted to be damaged in January 2018. An attempt at repairing it was made on April 19, 2018, however it was determined that it would need to be abandoned and re-drilled. This was completed on June 5, 2018 by Direct Environmental Drilling under the supervision of BluMetric personnel. The old well was abandoned as per Ontario Regulation 903 and the new well was installed adjacent to it. This well is now called MW14-R and is installed to a depth of 7.27 m bgs. MW14-R was developed and sampled after installation on June 5, 2018.

2.4 MONITORING FREQUENCY

As per the ECA, samples are collected twice a year to represent the spring and the fall monitoring events.

The groundwater monitoring programs were conducted on May 29th and June 8th 2018 (spring) and September 20th, 2018 (fall).

2.5 FIELD AND LABORATORY PARAMETERS AND ANALYSIS

Chain of Custody forms accompanied the samples from the field to the laboratory and until chemical results were presented to BluMetric. All groundwater samples were submitted to ALS Laboratories (ALS) of Waterloo, Ontario.

Groundwater samples from each of the monitoring locations were analyzed for the list of chemical parameters as defined in Schedule B of the ECA.

Field temperature, conductivity and pH were also collected at each monitoring location.



2.6 ENVIRONMENTAL COMPLIANCE APPROVAL REQUIREMENTS

The monitoring program consisted of semi-annual monitoring of site groundwater. The site is operated under, and is in compliance with, ECA No. A051101 (Appendix B). The CAZ to the southeast was purchased in 2015. A final Trigger Mechanism and Contingency Plan was submitted to the MECP and approved by the MECP in 2017. Groundwater trigger mechanisms were established for five trigger wells. Trigger limits were set at 75% of the calculated RUL, but site compliance will be determined using 100% of the RUL.

2.7 MONITORING PROCEDURES AND METHODS

All monitoring wells were developed prior to sampling by purging a minimum of three well volumes or until the well was run dry three times. The monitoring wells were then sampled using dedicated Waterra™ inertial lift foot valves and polyethylene tubing.

Clean, disposable nitrile gloves were worn when sampling. Inorganic parameter and metal samples were collected in sealed, laboratory provided bottles. Depending on the parameters analyzed, the appropriate preserved bottles were prepared by the laboratory. Care was taken in the field to limit cross contamination of preservative and loss of preservative during sampling. In addition, dissolved metal samples were field-filtered using dedicated 0.45 µm in-line Waterra™ filters. Volatile organic compound (VOC) samples were collected in three, 40 mL clear glass vials with Teflon septa. All samples were stored at approximately 4°C during shipment to the laboratory.

All samples were collected with respect to the Standard Operating Procedures described in Section 2.8.

2.8 STANDARD OPERATING PROCEDURES

Groundwater

Prior to sampling, static water levels are measured using a water level tape at each monitoring well location and each monitor is purged of a minimum of three well bore volumes or to dryness three times. Monitoring well purging and sampling is conducted using dedicated Waterra™ tubing with foot valves.

All groundwater samples are collected in new sample containers provided by a CALA-accredited laboratory. Samples are stored at approximately 4°C during shipment to the laboratory for chemical analyses. Holding times for samples conform to CCME Standards where applicable



(CCME, 1993). Chain of custody forms accompany the samples from submittal to the laboratory until the chemical results are presented to the client.

Methane

Methane concentrations are measured using a portable GEM™2000 landfill gas monitor at all groundwater monitoring locations at the same time as the groundwater elevation measurements. Methane readings are measured within the riser pipe at each location and reported in % volume of methane.

2.9 RECORD KEEPING AND FIELD NOTES

BluMetric retains all field notes supporting sample collection and analysis and provides the Municipality of West Elgin with electronic copies when requested.

2.10 QUALITY ASSURANCE FOR SAMPLING AND ANALYSIS

As per the ECA, one blind duplicate was collected during each of the sample events conducted at the Site in 2018. Sampling precision was determined by calculating the relative percentage difference (RPD) for the duplicate samples as follows:

$$\text{RPD (\%)} = [(\text{Dup1} - \text{Dup2}) / (\text{average of Dup1+Dup2})] \times 100$$

An RPD is calculated for duplicate samples returning contaminant concentrations greater than 5 times the reportable detection limit (RDL). Concentrations less than 5 times the RDL become increasingly imprecise and, in these cases, the results are not considered sufficiently reliable and an RPD is not calculated. When the analytical result for one or both of a duplicate pair are less than the RDL (i.e. non-detect), an RPD cannot be calculated. BluMetric evaluated the results of the QA/QC analyses using RPD values of 30% for groundwater. An RPD below 30% was considered acceptable and confirmed that the sampling methodology is capable of producing repeatable results.

2.11 OPERATIONAL MONITORING

During May and September 2018 landfill site inspections were completed by BluMetric staff as part of the annual environmental monitoring program. Results are discussed below.



3. 2018 OVERVIEW – SITE MONITORING RESULTS

The results of the 2018 environmental monitoring program are presented below.

3.1 HISTORICAL DATA

BluMetric was originally retained in 2006 by the Municipality and has collected all the data for the environmental monitoring events from that time through to 2018.

Figure 2 provides all sample locations and Tables 1 through 4 provide all historic and current data.

3.2 DATA QUALITY EVALUATION

Appendix E provides all Laboratory Certificates of Analysis for the 2018 monitoring period.

As discussed in Section 2.10, blind field duplicates were collected and the RPD calculated to assess the quality of the data collected. During the spring and fall events, blind field duplicates were collected from MW5-R. The RPD for colour was 31% in the fall event and the RPD for calculated Organic N was 34% in fall 2018. Colour is highly variable and organic N is a calculated parameter. Despite these instances the RPDs indicate that the overall data quality is acceptable.

3.3 GROUNDWATER LEVEL MONITORING

The groundwater monitoring programs were conducted on May 29th and June 8th 2018 (spring) and September 20th, 2018 (fall). Water levels were obtained from each monitoring well to calculate groundwater elevations and determine flow directions.

Spring 2018

Static groundwater elevation data collected on May 29th, 2018 and June 8th 2018 (MW14-R) for the monitoring well network is summarized in Table 1.

The groundwater within the shallow flow ranged between 218.81 (MW1) to 217.04 (MW19-R) metres above sea level (masl) in the spring of 2018. Groundwater flow on-site is generally towards the east. Groundwater flow patterns are similar to historic results. Figure 7 shows the direction of groundwater flow.



In the spring of 2018, a horizontal gradient of 0.004 was present across the landfill towards the southeast using monitors MW1 and MW3. Vertical flow between the landfill material, measured in MW2-R and the underlying clay unit, measured in MW2D, was downward at a gradient of 0.16.

Fall 2018

Static groundwater elevation data collected on September 20th, 2018 is summarized in Table 1.

The groundwater within the shallow flow regime ranged between 218.03 (MW10) to 216.58 (MW19-R) masl in the fall of 2018. Groundwater was slightly lower overall in the fall of 2018 than in historical monitoring events but was similar to recent findings. Groundwater flow on-site is generally towards the east. Groundwater flow patterns are similar to historic results. Figure 8 shows the direction of groundwater flow.

In the fall of 2018, a horizontal gradient of 0.003 was present across the landfill towards the southeast using monitors MW1 and MW3. Vertical flow between the landfill material, measured in MW2-R and the underlying clay unit, measured in MW2D, was downward at a gradient of 0.023.

3.4 METHANE MONITORING

Methane vapour survey results from each monitoring location are presented in Table 2, along with an indication of whether the well screen was saturated or not during the time of survey.

During the spring 2018 sampling event, elevated levels of methane were detected in MW2-R (42.6% by volume). The methane vapour readings in the remaining wells were below detection limits.

During the fall 2018 sampling event, elevated methane concentrations were measured in MW2-R (30.4% by volume), MW2D (3.2% by volume), and MW5-R (15.7% by volume). The concentrations in the remainder of the wells during the fall sampling event were 0.1% by volume except for MW1, MW12, and MW15 which were all below detection limits.

Historically, the highest methane readings were noted in wells located within or below landfill material (MW2-R and MW2D) or in close proximity to historical and / or current land filling operations (MW4 and MW5-R). The readings during the fall monitoring event are similar to historical results.



Readings were historically measured at the on-site attendant trailer that is above grade. The results were non-detect at the method detection limit and continued measurement was not required by the ECA. Presently, there is no concern of gas buildup in confined spaces. There are no permanent structures on or below grade within site limits. A small, elevated trailer is located adjacent to a monitoring well that measured below detection.

3.5 GROUNDWATER QUALITY MONITORING

Groundwater quality results are discussed based on background groundwater chemistry and leachate characterization. The groundwater quality within the shallow flow system and the clay unit are summarized in Table 3 with the RUL, 75% of the RUL and the background groundwater quality established for the site. In Table 3, parameter concentrations that exceed 75% of the RUL are bolded with light shading and concentrations that exceed 100% of the RUL are bolded and italicized with dark shading. Table 4 presents the VOC data.

Groundwater chemistry results showing leachate indicator parameters that exceeded 75% of the RUL over three consecutive sampling events can be seen in Figures 9 and 10 for the May and September 2018 monitoring events, respectively. As well, Appendix F provides time-series plots of leachate indicator parameters for all monitoring wells (please note that the plots are not on the same scale).

Figures 11 and 12 present the spring and fall 2018 data (respectively) on a tri-linear, or piper plot. These diagrams identify groundwater monitoring wells with chemical similarities by plotting the relative contribution of major cations and anions on a charge equivalent basis, to the total ion content of the water. Therefore this figure identifies those wells that have similar chemistry to the leachate well MW2-R.

In general the monitoring wells plot away for MW2-R with the exception of the results shown on the anion plot. In the spring anion diagram the monitoring well that is in closest proximity to the leachate well is MW4. In the fall anion diagram, the monitoring wells that are in closest proximity to the leachate well include MW3, MW4, MW8 and MW15.

Complete analytical results are presented in the original laboratory certificates of analyses provided in Appendix E.

3.5.1 Background Groundwater Chemistry and Reasonable Use Calculations

The groundwater quality at the site was compared to 75% of the RUL (or the trigger limit) values based on the background conditions on-site, as measured in MW14 and the ODWQS.



Calculated trigger limits, RUL values and ODWQS are listed in Table 3. The current RULs have been calculated using historical data from MW14. Monitoring well MW14 exhibits concentrations of alkalinity and iron above 75% and 100% of the RUL, respectively. As discussed in Section 1.4, a tier 1 alert (or early warning alert) is initiated when the trigger limit is exceeded over three consecutive sampling events. This initiates a Tier 2 assessment.

3.5.2 Leachate Indicator Parameters

Historically, leachate has been characterized by high concentrations of:

- Ammonia, alkalinity, arsenic, chloride, DOC, iron and sodium (WESA, 2006).

In 2007, the additional investigations and the historical analytical results were reviewed and the list of leachate indicator parameters was re-assessed. The off-site groundwater quality, the natural features located off-site (wetlands) and the surrounding properties' current and historical operations were used in this review. Based on this information, DOC and iron are not believed to be solely representative of leachate impacts originating from the landfill and therefore were removed from the definitive leachate indicator parameters and were not used to delineate leachate impacts off-site. However, as requested by the MECP in their letter dated December 3rd, 2008 (MOE, 2008), DOC has been included on the leachate impact parameter list.

The landfill is positioned adjacent to a series of wetlands (northwest property boundary) and provincially significant wetlands (east property boundary). As a result of the wetlands in close proximity to the landfill and the groundwater monitoring wells, the DOC reported in the wells could be attributed to secondary sources and not just from leachate.

In addition, deforestation activities have occurred on the property adjacent to the southwestern property boundary (MW9). Deforestation could also attribute to elevated DOC within the groundwater (MW9).

Iron concentrations are variable across the site, but have been noted in background well MW14. Given this, iron concentrations cannot be fully attributed to landfill activities but may be signs of localized impacts due to metal storage on-site. On its own iron is not representative of leachate impacts but in conjunction with other parameters, such as chloride, it can be an indicator for leachate impacts.

Organic N concentrations are often used to assess the impacts of leachate and are sometimes preferred over just using ammonia concentrations for groundwater. The concentration of organic N is based on a calculation using the concentrations of ammonia and TKN reported in a sample.



Prior to 2014, Organic N was used in conjunction with ammonia to assess leachate impacts. Natural biological processes in wetland environments can contribute organic N to surface water, through the degradation of decaying plant matter. On its own organic N is not representative of leachate impacts but in conjunction with other parameters, such as chloride, it can be an indicator for leachate impacts.

However, in the 2013 Annual Monitoring Report (WESA, 2013c), BluMetric recommended the removal of Organic N from the list of indicator parameters as it has been observed to be naturally occurring in the surface waters within the on and off-site wetlands. Both ammonia and Organic N are still monitored at the site; however they are discussed separately from the discussion below regarding indicator parameters and RUL exceedances.

Based on the information presented above, a revised list of leachate indicator parameters has been prepared and approved in the ECA amendment in September 2015 (Appendix B). The revised parameter list is believed to be representative of leachate impacts associated with the site.

- alkalinity, arsenic, chloride, DOC, iron, and sodium

The leachate indicator parameters (LIPs) are used to assess the quality of groundwater and will be used to monitor changes in groundwater chemistry at each sampling location. However, as previously noted that although certain parameters (i.e. iron) are LIPs for the site, they often occur naturally (i.e. at non-impacted wells) at concentrations above RUL and / or ODWQS. Therefore, concentrations of leachate indicator parameters are compared to background concentrations to assess leachate impact.

Upon comparison of the groundwater chemistry at one or more monitoring locations to calculated RULs, ODWQS and background conditions, several parameters exceed the set value. Although exceedances were noted, the parameters are not considered LIPs for this site. These parameters include ammonia, Organic N, colour, hardness, TDS, turbidity, fluoride, nitrate, aluminium, barium, boron, chromium, manganese and uranium.

As discussed in previous reports (WESA 2006, 2007a and b), the natural occurrence of these parameters provide evidence that they are not necessarily indicative of leachate impact. A discussion with respect to ammonia, Organic N, TDS, manganese, sulphate and boron parameters within the groundwater is provided below for completeness, as per MECP request (MOE, 2009).



It is recognized that chloride represents the most mobile of the LIPs and would be expected to be the first to reach a monitoring location if leachate migration was occurring. Concentrations of chloride will be monitored closely to evaluate the migration of leachate impacts off site.

3.5.3 Site Groundwater Quality

The analytical results observed during the monitoring events are, in general, consistent with those historically observed and reported for the site.

The following table summarizes all leachate indicator parameters measured in excess of 75% of the RUL for three (3) consecutive sampling events (including during the Spring or Fall 2018 event depending on the assessment date). The table also identifies if the well is considered a trigger well as per the Final Groundwater Trigger Mechanism and Contingency Plan and the location of each monitoring well. Only those wells that are considered trigger wells (or boundary wells) would trigger a Tier 1 – Alert.



Results Summary Relative to Tier 1 Trigger Alerts:

Monitoring Well	Well Location	Trigger Well?	Groundwater Flow	Spring 2018 Leachate Indicator Parameters which exceed 75% of the RUL for three consecutive events	Fall 2018 Leachate Indicator Parameters which exceed 75% of the RUL for three consecutive events
MW1	Northwest	YES – North	Shallow	Alkalinity	Alkalinity
MW2-R	Leachate (Landfill Footprint)	No	Shallow	Alkalinity, Arsenic, Chloride, DOC, Iron, and Sodium	Alkalinity, Arsenic, Chloride, DOC, Iron, and Sodium
MW3	East	No	Shallow	Alkalinity, Arsenic, Chloride, DOC, and Iron	Alkalinity, Arsenic, Chloride, DOC, and Iron
MW4	Southeast	No	Shallow	Alkalinity and DOC	Alkalinity, DOC, and Iron
MW5-R	Southwest	No	Shallow	Alkalinity, Arsenic, DOC, and Iron	Alkalinity, Arsenic, DOC, and Iron
MW6	South – CAZ	No	Shallow	Alkalinity, Arsenic, Chloride, DOC and Iron	Alkalinity, Arsenic, Chloride, DOC, and Iron
MW7	East	No	Shallow	Alkalinity, Chloride, DOC, and Sodium	Alkalinity, Chloride, DOC, and Sodium
MW8	South – CAZ	No	Shallow	Alkalinity, Chloride, and DOC	Alkalinity, Chloride, and DOC
MW9	South – CAZ	YES – South	Shallow	None	None
MW10	Off Site	YES – West	Shallow	None	None
MW11	East – CAZ	No	Shallow	Alkalinity, Chloride, and DOC	Alkalinity, Chloride, DOC, and Sodium
MW12	South – CAZ	YES - South	Shallow	None	DOC
MW15	East – CAZ	No	Surface/ Shallow	Alkalinity, Chloride, and DOC	Alkalinity, Chloride, and DOC
MW2D	Clay	No	Deep	None	DOC
MW19-R	East - CAZ	YES - East	Surface/ Shallow	None	None

Based on the 2018 sampling events, only trigger wells MW1 and MW12 exceeded 75% of the RUL for trigger parameters (alkalinity and DOC, respectively) for three consecutive sampling events. This early warning Tier 1 Alert initiates the Tier 2 – Assessment discussion under the separate heading below.



No other trigger wells had concentrations of LIPs which exceeded 75% of RUL for three consecutive sampling events including 2018, and therefore no other Tier 1 Alerts occurred. It is worth noting, prior to the addition of the Eastern CAZ in 2015, MW11 and MW15 were considered trigger wells, and based on 2018 LIP values would have prompted a Tier 1 Alert. The analytical results of MW11 and MW15 are consistent with historical data and are not of concern and do not trigger any alerts. In conjunction with addition of the Eastern CAZ, a new monitoring well, MW19, was installed on the eastern boundary in July 2015 that would act as a trigger well. In Spring 2016, DOC exceeded 75% of the RUL in MW19, and in Fall 2016 the well was observed to be damaged and therefore could not be sampled again. The well was repaired in May 2017 and is now sampled as MW19-R. In May and September 2018 DOC again exceeded 75% of the RUL in MW19-R but it did not exceed in October 2017 so this does not trigger a Tier 1 Alert.

Tier 2 Assessment Discussion – MW1

The results for alkalinity in trigger well MW1 have exceeded 75% of the RUL for over three (3) consecutive monitoring events, resulting in an early warning Tier 1 alert. This initiates the following Tier 2 Assessment.

The alkalinity results at MW1 are still within the range of 100% RUL. Alkalinity is the measure of the water's ability to neutralize acid. It is calculated using carbonate/ bicarbonate. pH, on the other hand, is a numeric scale which measures the hydrogen ion concentration of the water. The pH determines how acidic or basic the water is.

Appendix F includes the time-concentration graphs for MW1 depicting the results of primary LIP monitoring over time. A stable trend is noted in conservative LIPs chloride and DOC. Chloride and DOC showed a slight increase in 2018 but remains within the historical range. As well, alkalinity is depicted in the second graph in Appendix F for MW1. The results were showing a slight increasing trend since May 2016; however concentrations decreased in 2018 and remain below historical results. Therefore it is concluded that Tier 3 monitoring is not required at this time. Trends in LIPs in this trigger well should be reviewed closely in the spring of 2019.

Tier 2 Assessment Discussion – MW12

The results for DOC in trigger well MW12 have exceeded 75% of the RUL for over three (3) consecutive monitoring events, resulting in an early warning Tier 1 alert. This initiates the following Tier 2 Assessment.



A review of the historical DOC results at MW12 indicates occasional exceedances of both 75% of the RUL and the RUL. Other than the fall 2009 concentration, the DOC concentrations are fairly consistent and have not varied more than 4 mg/L; however the fall 2018 sampling even had a concentration of 8.28 mg/L which coincides with elevated DOC concentrations noted across the Site. The DOC concentrations at MW12 are lower than in up-gradient monitors that are closer to the operating area (MW2-R with a concentration of 389 mg/L). The MW12 concentrations are also lower than at MW15 which is situated within the wetland area (with a DOC of 23.5 mg/L). The wetland itself is a potential source of DOC and therefore the concentrations observed at MW15 may be attributed to secondary sources and not just from leachate.

Appendix F includes the time-concentration graphs for MW12 depicting the results of primary LIP monitoring over time. A slightly increasing trend is noted in conservative LIPs chloride and DOC; however the most recent results continue to be much lower than historical sampling has indicated. As well, alkalinity is depicted in the second graph in Appendix E. The 2018 results depict a decreasing trend. Overall the DOC concentrations are not indicative of an increase in leachate impacts on a concentration or area basis. It is therefore recommended that Tier 3 monitoring is not required at this time. Trends in LIPs in this trigger well will continue to be reviewed in future monitoring events.

Other Leachate Indicator Parameters and Organic N, TDS, Manganese, Sulphate, and Boron Trends

The following general trends with respect to the leachate indicator parameters and additional parameters Organic N, TDS, manganese, sulphate and boron were noted:

- Leachate indicator parameters have exhibited concentrations above the RUL (and therefore also the Trigger Limit) in 2018 in monitors MW1 through MW8, MW11, and MW15 with some parameters, in particular chloride at MW3, MW7, MW9, MW11, and MW15 showing an increase in 2018;
- In 2018, Organic N exceeded the RUL in MW1 (spring only), MW2-R, MW2D, MW3, MW4, MW5-R, MW6, MW7, MW8, MW11, and MW15;
- Sulphate concentrations exceeded 100% and 75% of the RUL in Spring 2018 in MW1 and MW11, respectively;
- Concentrations of TDS were above 75% or 100% of the RUL in 2018 for all monitoring locations;
- In 2018, boron concentrations were above 75% or 100% of the RUL for monitoring locations MW2-R (spring only), MW7, and MW11; and



- Manganese concentrations exceeded 75% or 100% of the RUL in 2018 in MW1 (fall only), MW2-R, MW2D (fall only), MW3, MW4, MW5-R, MW6, MW7, MW8 (fall only), MW9 (fall only), MW10 (fall only), MW11, background well MW14-R, MW15, and MW19-R.

MW2D – Deep (Clay)

Monitoring well MW2D, located within the landfill material was completed within the clay to see the effects of the landfill activities on the clay layer. DOC exceeded 75% of the RUL in Fall 2018. No other LIPs exceeded the respective RULs in 2018. It should be noted however that due to the thickness of the clay unit beneath the landfill (55 to 70 m based on MECP well records) and the tested hydraulic conductivity (see Section 2.1.2), the leachate impact, if identified at this location, would be restricted to the upper clay and it is unlikely that leachate impact would extend to deeper aquifers.

VOCs

The results of the VOC analyses are summarized in Table 4. The results of the VOC analyses indicated that concentrations of all parameters measured were below the ODWQS in the spring and fall of 2018, except ethylbenzene and xylene (fall only) in leachate well MW2-R. Ethylbenzene was observed at 3.72 µg/L and 4.73 µg/L in May and October 2018, respectively. Xylene was observed at 22.5 µg/L in September 2018. MW2-R was installed to replace the damaged leachate well MW2. Historically, VOCs have been below detection limits in MW2 and will be monitored closely in MW2-R in future events. Chlorobenzene was noted in MW5-R in the spring and fall of 2018 (1.67 and 2.13 µg/L, respectively), which was installed to replace the damaged well MW5, however concentrations were below the ODWQS (30.0 µg/L). This parameter has been noted in MW5 since May 2006.

4. ASSESSMENT, INTERPRETATION AND DISCUSSION

Historic water levels in MW15 through MW18 within the wetland in the eastern portion of the property were within range of those seen in the groundwater monitoring wells currently on-site and therefore considered representative of groundwater discharging conditions within the wetland at the time monitoring was completed. Similarly, MW19-R, re-installed in May 2017 to replace MW19, is representative of groundwater discharging from the landfill.

As discussed in previous annual reports, within the wetland, high levels of DOC and organic N can be attributed to rotting plant matter and may not be a direct result of leachate. High ammonia concentrations are indicative of anaerobic activity within the wetland that is further supported by low sulphate, low nitrate and high iron concentrations. The water chemistry



in the wetland (MW15) is indicative of an anaerobic reducing system with enhanced de-nitrification potential/conditions and therefore acts to provide natural treatment of leachate.

Based on the concentration trends of the leachate indicator parameters (as seen in the concentration versus time graphs provided in Appendix F) trends can be noted and conclusions made with respect to the leachate characterization for the site. The data for background monitoring well MW14-R indicates that indicator parameter concentrations are relatively stable and low in comparison to the other monitors.

To the south and west, it is noted that concentration levels in MW9 (down-gradient to the south) and MW10 (down-gradient to the west) have similar trends to that seen in the background well with concentrations of chloride well below the RUL.

The wells located down-gradient and to the east (MW7, MW8, MW11, and MW12) all show similar concentration trends over time to each other. It was noted previously that MW8 was exhibiting an increasing trend in the concentration of chloride and this was seen again in 2018. Chloride was also noted to have increased in MW3, MW7, MW9, MW11 and MW15 in 2018.

Trends cannot be noted in MW16 through MW18 (to the east and off-site) as they were only sampled twice and have since been decommissioned. Similarly MW19-R was installed in May 2017 to replace the damaged MW19 and has only been sampled four times.

Concentration trends in the remaining wells, MW3 and MW6 do not follow the groups of trends at other locations, but show leachate impacts.

The site is considered to be in compliance at this time.

5. ANNUAL OPERATIONS REPORT

5.1 HISTORICAL SITE OPERATIONS

The West Elgin Landfill site has been in operation since 1971. An ECA (A051101) was first issued in 1971 and reissued in 1972, 1973, 1974, and 1976. On July 16th, 1980 the MECP reissued an ECA to the Village of Rodney.

The MECP issued an amendment to the ECA on December 21, 2005 and amended it on April 11, 2012, September 11, 2015, and April 4, 2017 (Appendix B).



5.2 EXISTING CONDITIONS

The West Elgin Landfill site is owned by the Municipality of West Elgin. The site is located on Lot B, Concession 7 former Township of Aldborough, West Elgin Municipality, County of Elgin (Figure 1). For this reporting period, the Municipality is the operator of the site.

The landfill services the entire Municipality of West Elgin. The population served is approximately 5,500 which is estimated to increase to approximately 6,000 during the summer months.

Adjacent land uses to the site include a low lying wood lot, wetlands and agricultural fields to the northwest, an aggregate (sand and gravel pit) to the northeast, a wood lot and low lying wetlands to the southeast, and land consisting of grasses, shrubs and trees to the southwest. General topography, surface water drainage, and the hydrogeological assessment of the site are included in Section 2 of this report.

There is one access road entering the site from the northwest at Downie Line. The gate across the access road is locked whenever the landfill is closed or the attendant is not present.

The site is bounded at each property boundary by natural forest and marshlands that deter illegal access to the site. A temporary access road is maintained to access the active landfill area. This road will be modified accordingly as waste disposal proceeds.

There are no permanent structures on or below grade within site limits. A small, elevated trailer that is raised above the ground and a sea container is present and acts as the on-site worker's office. There are no utilities (electricity, gas, water, sanitary sewers, or phone) to the site. The site operator has a cell phone in case of emergencies.

Existing signs include an entrance sign and signs denoting bins for recyclable material. As per the ECA, the entrance sign states the owner's name and hours of operation, the operator's name, the ECA No., the type of waste accepted, and a contact telephone number to call with complaints or in the event of an emergency.

Landfill operating hours are from 9am to 4pm on Wednesday, Friday, and Saturday.

Waste disposal records are kept at the local municipal offices. The Municipality of West Elgin maintains a record of daily site operations, a record of complaints, a record of site inspections, and a record of unacceptable waste as per the ECA.



During the environmental monitoring events, BluMetric completes a landfill inspection and maintenance record to determine if any adjustments are required for the operation of the site. The completed inspection records for spring and fall 2018 are included in Appendix G.

The inspections noted the following:

- Spring: MW14 needed replacement (see Section 2.3 for details); and
- Fall: confirm use of burn pit follows ECA, staking of MW1 and MW19, clear concrete to improve access to MW1.

5.3 WASTE DISPOSAL

The West Elgin Landfill site is currently licensed for the disposal of domestic and commercial waste.

Surveys conducted in 2007 and 2008 identified the source of the waste and recyclable materials, and the number of bags disposed each day. In May 2007, BluMetric conducted a one-day waste audit to provide an approximate average weight per bag of waste, as well as per car, truck, and van load accepted at the site. In addition, the number of bags of waste collected from residential versus commercial sources was counted during the survey.

Based on the May 2007 waste survey, the assumed average weight per bag was 5 kg and the assumed number of bags per car, truck, and van was 3.4, 3.2, and 3.4, respectively. The results of the 2008 waste survey were similar to those from the 2007 waste survey. The measured weight for pick-up runs from the residential areas was also used to calculate the total amount of waste coming into the landfill.

A waste audit was conducted in 2012 as part of the Municipality's 2011 Waste Recycling Plan (WESA, 2011). The work plan was developed based on recommendations provided in the 2011 Waste Recycling Plan and the purpose of the waste audit was to confirm the recyclable diversion rate for the Landfill and identify the amount of recyclable material not being diverted.

The 2012 waste audit further confirmed the type of waste accepted and the average weight per bag of 5 kg (5.7 kg per bag during the summer event and 4.8 kg per bag during the winter event) (WESA, 2013). The waste audit concluded that there was a potential to divert a further 23-24% of recyclable material from the landfill.



As part of the daily records, the Municipality tracks the number of cars, trucks, and vans entering the facility to drop off waste. In addition, they also track the pick-ups from local residential communities and trailer parks. In the latter half of 2015, the Municipality switched to accepting all waste from West Lorne and Rodney (previously some waste was diverted to other approved landfills). Due to this and improved data collection techniques in 2017 and 2018, the total recorded amount of waste brought to the landfill has increased. The following breakdown of accepted waste at the landfill is provided:

Village of Rodney (based on scale tickets):	246.47 metric tonnes
Village of West Lorne (based on scale tickets):	425.27 metric tonnes
Waste Transfer Site (tracked acceptance with assumed weights):	512.06 metric tonnes
Large Item Collection (Rodney and West Lorne) (assumed weights):	20.25 metric tonnes

The total waste accepted at the West Elgin Landfill in 2018 is therefore estimated to be 1,204 metric tonnes.

Domestic waste represents greater than an estimated 85% of the waste entering the landfill. The domestic waste was delivered by commercial hauler or individual drop-off and is comprised of mixed household garbage. Large items such as discarded appliances, furniture, and mattresses, are collected by the haulers or delivered to the waste disposal site for recycling, re-use or deposition at the landfill. Clean wood and brush are collected in a pile to the west of the approved waste limits and burned.

Commercial waste represents approximately 15% of the total waste accepted at the West Elgin Landfill. Commercial waste is delivered by commercial hauler and typically consists of construction material.

The change in operations at the landfill no longer allows for large quantities of recyclable material to accumulate as the bins are transferred to the London Material Recovery Facility (MRF) on a regular basis. The following represents the total diversion to the London MRF or other approved recycling contractors in 2018:

Village of Rodney (based on scale tickets):	48.78 metric tonnes
Village of West Lorne (based on scale tickets):	69.35 metric tonnes
Waste Transfer Station (Paper/Cardboard) (based on scale tickets):	45.35 metric tonnes
Waste Transfer Station (Containers – Glass/ Cans/ Plastics) (based on scale tickets):	31.09 metric tonnes
Waste Transfer Station (Steel/ Electronics):	347.83 metric tonnes



In total, the Municipality diverted 542.40 metric tonnes of recyclable materials to the London MRF or other approved recycling contractors.

Additionally, the Municipality diverts organics from the landfill (including spring and fall leaf and yard pick-ups). The total amount diverted in 2018 was 24.51 metric tonnes.

5.4 FINAL CONTOURS AND SITE CAPACITY

On September 13, 2016, an Unmanned Aerial Vehicle (UAV) survey was completed on site by BluMetric personnel. The results of the 2010 and 2016 survey are presented in Figures 13 to 16.

Figure 13 presents the site layout and contours resulting from the 2016 UAV survey with the updated aerial photo. The proposed final design contours are presented in Figure 14. The final contours are based on the local topography of the site and the estimated footprint area of 1.59 hectares. All side slopes will be constructed to a maximum 25% grade. The crown of the landfill will be constructed to a minimum 5% grade to promote surface water runoff. Figure 15 provides a direct elevation comparison of the current 2016 survey and the proposed final design. The purple, blue, and green colours in Figure 15 represent areas where material can still be placed or filled (i.e. areas with capacity) and the red, orange, and yellow colours identify areas where material must be removed or cut to comply with the final contour plan (i.e. areas where the proposed final contour is exceeded).

In 1984, MECP staff estimated the site capacity to be 100,600 m³ (MOE 2003). Prior to this time, the site did not have an approved capacity. The GPS survey data from 2010 estimated a new total site capacity of 106,109.5 m³ as the landfill footprint had increased. Based on the final contours plan and the updated 2016 UAV survey data, the remaining site capacity is calculated to be 31,190 m³ at the end of September 2016.

Note that the areas depicted in red and yellow in Figure 15 are slightly above the final design capacity (approximately 3,450 m³), however this location at the site is used for concrete debris and metal, and therefore is not attributed to landfill waste. The areas in blue and purple still have capacity remaining for waste disposal. Figure 16 shows cross sections C-C' and D-D', which are shown in plan-view on Figure 15. The cross sections shown in red are from the 2010 survey, blue are from the 2016 survey and green are the proposed final design.

Based on the 2018 annual waste input rate of 1,204 metric tonnes (obtained from the Municipality), a compaction density of 0.5 tonne/m³ and a waste to cover ratio of 4:1, the annual air space utilization rate for the site is calculated to be 3,010 m³/annum. Using the estimated quantity of in-place waste, calculated utilization rates, and a projected annual



population (i.e. waste) growth rate of 0.5% over the next 25 years, the estimated life of the landfill is 9 years (that is, until December 2026). The remaining site capacity as of December 2018 is estimated to be 25,231 m³.

Note that the estimated life is calculated based on the remaining site capacity as determined by the UAV survey at the end of September 2016 and then calculated until the end of 2018 based on measured scale ticket weights from collection, as well, as the tracked material accepted through the waste transfer station (based on assumed weights as discussed above). It is noted that any estimate of remaining site life is highly sensitive to variations in waste characteristics, waste generation rates, cover material utilization, waste compaction and recycling efforts. Surveys should be completed every 5 years to reassess and update the remaining site capacity.

5.5 2018 SITE OPERATIONS

The Hydrogeological Investigation and Design and Operations Report prepared by WESA (WESA, 2006) provides a detailed phased development plan for landfill operations over the site life.

In 2010, clay was placed on the edge of the laneway as final cover, however no other final cover has been placed on the landfill foot print. Interim cover is placed over the active face on a weekly basis. All locations that are not part of the active face should be covered with 300 mm of intermediate cover material as discussed in the WESA 2006 report. The Municipality has surveyed and staked the landfill extents.

As per Condition 18 of the Amended ECA, cover or suitable alternative must be placed over the entire active face at the end of every operating week. In 2018, soil cover was placed on the active face at the end of each operating day.

The Hydrogeological Investigation and Design and Operations Report prepared by WESA (WESA, 2006) outlines the requirement for active face operations at the landfill. The active face should be kept to a maximum width of 10 m wide. The height of the active face should be the shorter of 1.5 m or the distance to the final waste contour. Site inspections in 2018 indicate that the active face is within the 10 m width requirement and the height is less than the 1.5 m recommendation. Site inspection forms are provided in Appendix G.

The natural surface water drainage at the site is controlled by the low topographic relief. There are no on-site drains and little evidence of surface water ponding or channels identified during BluMetric's site visits. The Municipality of West Elgin purchased CAZ both south and east of the landfill in which portions of the property comprise a Provincially Significant Wetland



(PSW). The landfill is situated on a local topographic high and therefore surface water run-off has not been a problem.

The site currently maintains a record of complaints received about the site or any environmental emergency situations that occur at the site at the local municipal offices. There were no complaints in the log for 2018.

5.6 CHANGES TO OPERATIONAL PROCEDURES AND INFRASTRUCTURE

The Municipality took over operations of the West Elgin Landfill in 2015.

The site layout was also modified in 2015 in such a manner that the requirements of the recyclable receiver are met (see Figures 2 and 3). All recyclables and waste brought to site are placed in the appropriate bins located on the transfer station.

The recyclable handling areas were moved in an effort to:

- Allow better promotion of separating Recyclable and Waste (including better signage and bin storage); and
- Provide better access control to the landfill at the entrance and limit the access to the face of the landfill.

The Municipality is currently a member in the London MRF, and only requires two separated recyclables streams: fibres and mixed recyclables, including glass, plastic and metals. The Municipality maintains the right to decide where recyclables are taken following collection. Should the London MRF cease to offer a viable solution, temporary storage will be maintained onsite until an alternate is established.

The location for collection of waste tires and electronic waste is adjacent to MW6.

6. RECOMMENDATIONS

The recommendations derived from 2018 annual site monitoring and operations for the West Elgin Landfill site are outlined below. In general, the recommendations for the Annual Site Monitoring and Reporting and Site Operations are consistent with those from the previous annual reports.



6.1 ANNUAL SITE MONITORING AND REPORTING

1. Background water quality analyses should continue to be conducted at MW14-R for the purpose of updating the RULs for the site.
2. The site groundwater monitoring network should be sampled in the spring and fall each year for a full set of parameters, as listed in Tables 3 and 4 of this report, to establish site conditions.
3. As required by the ECA, by no later than April 30th of every year a site operation and environmental monitoring report will be prepared and submitted to the Ministry of the Environment. This recommendation is outlined in the provisional Certificate of Approval for this site.
4. A UAV survey should be completed at a minimum of every 5 years (next survey in 2021) in order to reassess the estimated landfill capacity.

6.2 ANNUAL OPERATIONS REPORT

The design and operations recommendations made by BluMetric as part of the Hydrogeological Investigation and Design and Operations Report (WESA, 2006) should be implemented to minimize any leachate impacts. Recommendations are as follows:

1. The landfill site should continue to maintain a record of daily site operations, monthly site inspections conducted by a trained person, all occurrences of receipt of unacceptable waste, and complaints received about the site or any environmental emergency situations that occur at the local municipal offices. In order for the landfill site to be in compliance with the Amended ECA, these records containing the information specified in in the ECA must be maintained.
2. The site operator should continue to use the delineated landfill footprint to ensure operations adhere to the detailed phased development plan and active face operations as provided in the Hydrogeological Investigation and Design and Operations Report (WESA, 2006).
3. Bins used to collect recyclables must be kept in good condition without leaks.



4. As per Condition 18 of the Amended ECA, daily cover must be placed over the entire active face with a minimum thickness of 150 mm of soil cover at the end of every operating day. As stated, a tarp can be used as an alternative and the Municipality should continue its efforts in utilizing this tarp. Final cover should be placed over the areas where the waste footprint is within the 30 m buffer area.

Respectfully submitted,
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TABLES



Table 1
Groundwater Elevation Data
West Elgin Landfill Site, Rodney, Ontario

Monitoring Location	Well Depth (m)	Elevation (masl)	Measuring Point	1-May-06		11-Jul-06		15-Nov-06		31-May-07		16-Oct-07		8-Nov-07	
				Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)
MW1	5.35	220.855	top	2.22	218.64	2.65	218.21	2.55	218.31	2.26	218.60	3.46	217.40	3.49	217.37
MW2	9.96	224.713	top	6.13	218.58	6.53	218.18	6.37	218.34	6.17	218.54	7.21	217.50	7.30	217.41
MW2	9.79	226.183	top	DNE		DNE		DNE		DNE		DNE		DNE	
MW2	11.5	226.296	top	11.09	213.83	6.72	218.20	6.97	217.95	6.60	218.32	7.45	217.47	8.48	216.44
MW3	6.17	222.891	top	5.20	217.69	5.49	217.40	5.35	217.54	5.23	217.66	6.00	216.89	6.03	216.86
MW4	5.18	221.994	top	3.36	218.63	3.80	218.19	3.52	218.47	3.42	218.57	4.48	217.51	4.55	217.44
MW5	4.38	221.321	top	2.64	218.68	3.80	217.52	2.79	218.53	2.78	218.54	3.81	217.51	3.89	217.43
MW5	4.745	222.173	top	DNE		DNE		DNE		DNE		DNE		DNE	
MW6	6.94	223.392	top	DNE		DNE		DNE		DNE		6.09	217.30	6.16	217.23
MW7	7.77	223.571	top	DNE		DNE		DNE		DNE		6.58	216.99	6.64	216.93
MW8	6.68	222.251	top	DNE		DNE		DNE		DNE		5.43	216.83	5.44	216.81
MW5	6.18	221.423	top	DNE		DNE		DNE		DNE		4.09	214.21	4.15	217.27
MW1	5.86	222.145	top	DNE		DNE		DNE		DNE		DNE		4.61	217.54
MW1	7.96	223.450	top	DNE		DNE		DNE		DNE		DNE		7.02	216.43
MW1	3.44	218.884	top	DNE		DNE		DNE		DNE		DNE		2.21	216.67
MW1	7.51	222.741	top	DNE		DNE		DNE		DNE		DNE		DNE	
MW1	7.9	222.741	top	DNE		DNE		DNE		DNE		DNE		DNE	
MW1	1.44	218.298	top	DNE		DNE		DNE		DNE		DNE		DNE	
MW1	1.9	218.235	top	DNE		DNE		DNE		DNE		DNE		DNE	
MW1	1.9	218.201	top	DNE		DNE		DNE		DNE		DNE		DNE	
MW1	1.9	217.068	top	DNE		DNE		DNE		DNE		DNE		DNE	
MW1	2.31	218.618	top	DNE		DNE		DNE		DNE		DNE		DNE	
MW1	2.285	218.302	top	DNE		DNE		DNE		DNE		DNE		DNE	

Notes:
 Water levels measured in meters below measuring point (top of pipe or top of casing)
 Full site survey was completed by WESA in May 2010
 There is no MW13 on-site
 MW15, MW19 and MW19-R are drive point piezometers

Table 1
Groundwater Elevation Data
West Elgin Landfill Site, Rodney, Ontario

Monitoring Location	Well Depth (m)	Elevation (masl)	Measuring Point	12-May-08		16-Sep-08		12-May-09		16-Sep-09		20-May-10		9-Nov-10	
				Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)
MW1	5.35	220.855	top	2.15	218.71	2.84	218.02	1.98	218.88	3.05	217.81	2.36	218.50	3.29	217.57
MW2	9.96	224.713	top	6.08	218.63	6.76	217.95	5.94	218.77	6.68	218.03	6.14	218.57	7.17	217.54
MW2	9.79	226.183	top	DNE		DNE		DNE		DNE		DNE		DNE	
MW2	11.5	226.296	top	6.35	218.57	7.30	217.62	6.27	218.65	7.30	217.62	6.68	218.24	7.60	217.32
MW3	6.17	222.891	top	5.16	217.73	5.57	217.32	5.10	217.79	5.76	217.13	5.16	217.73	5.92	216.97
MW4	5.18	221.994	top	3.33	218.66	3.99	218.00	3.27	218.72	4.21	217.78	3.34	218.65	4.42	217.57
MW5	4.38	221.321	top	2.71	218.61	3.36	217.96	2.52	218.80	3.46	217.86	2.65	218.67	3.72	217.60
MW5	4.745	222.173	top	DNE		DNE		DNE		DNE		DNE		DNE	
MW6	6.94	223.392	top	5.10	218.29	5.76	217.63	5.00	218.39	5.86	217.53	5.11	218.28	6.07	217.32
MW7	7.77	223.571	top	5.51	218.06	6.27	217.30	5.30	218.27	6.29	217.28	5.58	217.99	6.55	217.02
MW8	6.68	222.251	top	4.58	217.67	4.99	217.26	4.53	217.72	5.20	217.05	4.57	217.68	5.32	216.93
MW5	6.18	221.423	top	2.96	218.46	3.66	217.76	2.90	218.52	3.86	217.56	2.95	218.47	4.03	217.39
MW1	5.86	222.145	top	3.40	218.75	3.93	218.22	3.34	218.81	4.15	218.00	3.43	218.72	4.33	217.82
MW1	7.96	223.450	top	5.42	218.03	6.10	217.35	5.24	218.21	6.15	217.30	5.48	217.97	6.41	217.04
MW1	3.44	218.884	top	1.45	217.43	1.74	217.14	1.38	217.50	1.98	216.90	1.40	217.48	2.05	216.83
MW1	7.51	222.741	top	DNE		DNE		DNE		DNE		4.91	217.83	5.81	216.93
MW1	7.9	222.741	top	DNE		DNE		DNE		DNE		DNE		DNE	
MW1	1.44	218.298	top	DNE		DNE		DNE		DNE		0.83	217.47	1.41	216.89
MW1	1.9	218.235	top	DNE		DNE		DNE		DNE		DNE		DNE	
MW1	1.9	218.201	top	DNE		DNE		DNE		DNE		DNE		DNE	
MW1	1.9	217.068	top	DNE		DNE		DNE		DNE		DNE		DNE	
MW1	2.31	218.618	top	DNE		DNE		DNE		DNE		DNE		DNE	
MW1	2.285	218.302	top	DNE		DNE		DNE		DNE		DNE		DNE	

Notes:
Water levels measured in meters below measuring point (top of pipe or top of casing)
Full site survey was completed by WESA in May 2010
There is no MW13 on-site
MW15, MW19 and MW19-R are drive point piezometers

Table 1
Groundwater Elevation Data
West Elgin Landfill Site, Rodney, Ontario

Monitoring Location	Well Depth (m)	Elevation (masl)	Measuring Point	16-May-11		2-Nov-11		23-May-12		10-Sep-12		7-Nov-12		8-May-13	
				Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)
MW1	5.35	220.855	top	1.92	218.94	2.55	218.31	2.43	218.43	-	-	3.18	217.68	2.15	218.71
MW2	9.96	224.713	top	5.77	218.94	6.37	218.34	6.27	218.44	-	-	7.50	217.21	6.00	218.71
MW2	9.79	226.183	top	DNE		DNE		DNE		DNE		DNE		DNE	
MW2	11.5	226.296	top	6.08	218.84	6.99	217.93	6.76	218.16	-	-	7.63	217.29	6.61	218.21
MW3	6.17	222.891	top	5.05	217.84	5.37	217.52	5.29	217.60	-	-	5.78	217.11	5.12	217.77
MW4	5.18	221.994	top	3.17	218.82	3.57	218.42	3.54	218.45	-	-	4.29	217.70	3.30	218.69
MW5	4.38	221.321	top	2.53	218.79	2.29	219.03	2.86	218.46	-	-	3.60	217.72	2.67	218.65
MW5	4.745	222.173	top	DNE		DNE		DNE		DNE		DNE		DNE	
MW6	6.94	223.392	top	4.93	218.46	5.41	217.98	5.30	218.09	-	-	5.99	217.40	5.01	218.38
MW7	7.77	223.571	top	5.14	218.43	5.93	217.64	5.79	217.78	-	-	6.47	217.10	5.43	218.14
MW8	6.68	222.251	top	4.48	217.77	4.75	217.50	4.70	217.55	-	-	5.18	217.07	4.54	217.71
MW5	6.18	221.423	top	2.80	218.62	3.29	218.13	3.23	218.19	-	-	3.90	217.52	2.93	218.49
MW1	5.86	222.145	top	3.30	218.85	3.54	218.61	3.56	218.59	-	-	4.20	217.95	3.37	218.78
MW1	7.96	223.450	top	5.03	218.42	5.81	217.64	5.69	217.76	-	-	6.32	217.13	5.35	218.10
MW1	3.44	218.884	top	1.33	217.55	1.54	217.34	1.51	217.37	-	-	1.89	216.99	1.39	217.49
MW1	7.51	222.741	top	4.50	218.24	5.24	217.50	5.13	217.61	-	-	5.72	217.02	4.81	217.93
MW1	7.9	222.741	top	DNE		DNE		DNE		DNE		DNE		DNE	
MW1	1.44	218.298	top	0.86	217.44	0.93	217.37	0.92	217.38	1.40	216.90	1.27	217.03	0.82	217.48
MW1	1.9	218.235	top	DNE		DNE		DNE		1.71	216.53	1.50	216.74	Decommissioned	
MW1	1.9	218.201	top	DNE		DNE		DNE		1.61	216.59	1.42	216.78	Decommissioned	
MW1	1.9	217.068	top	DNE		DNE		DNE		1.76	216.54	1.52	216.78	Decommissioned	
MW1	2.31	218.618	top	DNE		DNE		DNE		DNE		DNE		DNE	
MW1	2.285	218.302	top	DNE		DNE		DNE		DNE		DNE		DNE	

Notes:
Water levels measured in meters below measuring point (top of pipe or top of casing)
Full site survey was completed by WESA in May 2010
There is no MW13 on-site
MW15, MW19 and MW19-R are drive point piezometers

Table 1
Groundwater Elevation Data
West Elgin Landfill Site, Rodney, Ontario

Monitoring Location	Well Depth (m)	Elevation (masl)	Measuring Point	7-Nov-13		28-Apr-14		8-Oct-14		29-Apr-15		16-Oct-15		27-May-16		5-Oct-16		10-May-17		12-Oct-17		29-May-18		20-Sep-18			
				Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)	Depth to Water (m)	Elevation (masl)
MW1	5.35	220.855	top	2.89	217.97	2.23	218.63	2.64	218.22	2.25	218.61	3.17	217.69	2.26	218.60	3.30	217.55	2.14	218.72	3.30	217.56	2.05	218.81	3.04	217.82		
MW2	9.96	224.713	top	6.83	217.88	6.03	218.68	6.55	218.16	6.01	218.70	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned		
MW2	9.79	226.183	top	DNE		DNE		DNE		DNE		DNE		6.11	218.575	7.07	217.61	5.96	218.73	7.10	217.58	7.40	218.78	8.29	217.89		
MW2	11.5	226.296	top	7.31	217.51	6.57	218.25	6.95	217.87	6.57	218.25	7.30	217.52	6.31	218.61	7.41	217.51	6.61	218.31	7.43	217.49	7.77	218.53	8.44	217.86		
MW3	6.17	222.891	top	5.61	217.28	5.11	217.78	5.45	217.44	5.08	217.81	5.80	217.09	5.16	217.73	5.77	217.13	5.02	217.87	5.79	217.10	5.11	217.79	5.74	217.16		
MW4	5.18	221.994	top	4.09	217.90	3.30	218.69	3.80	218.19	3.28	218.71	4.28	217.71	3.38	218.62	4.35	217.64	3.24	218.75	4.40	217.59	3.30	218.70	4.19	217.81		
MW5	4.38	221.321	top	3.38	217.94	2.67	218.65	3.02	218.30	2.65	218.67	3.54	217.78	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned		
MW5	4.745	222.173	top	DNE		DNE		DNE		DNE		DNE		DNE		4.48	217.67	3.39	218.76	4.57	217.57	3.38	218.80	4.16	218.02		
MW6	6.94	223.392	top	5.82	217.57	5.02	218.37	5.58	217.81	5.00	218.39	5.93	217.46	5.12	218.27	5.98	217.41	4.90	218.50	6.02	217.37	5.01	218.39	5.84	217.55		
MW7	7.77	223.571	top	6.31	217.26	5.48	218.09	6.10	217.47	5.44	218.13	6.40	217.17	5.58	218.00	6.43	217.15	5.23	218.34	6.46	217.11	5.40	218.17	6.26	217.31		
MW8	6.68	222.251	top	5.00	217.25	4.52	217.73	4.84	217.41	4.50	217.75	5.24	217.01	4.57	217.68	5.19	217.06	4.43	217.82	5.21	217.05	4.52	217.73	5.19	217.07		
MW5	6.18	221.423	top	3.72	217.70	2.91	218.51	3.47	217.95	2.90	218.52	3.91	217.51	3.01	218.41	3.98	217.45	2.82	218.60	4.03	217.39	2.92	218.50	3.84	217.59		
MW1	5.86	222.145	top	4.00	218.15	3.38	218.77	3.72	218.43	3.36	218.79	4.22	217.93	3.43	218.72	4.33	217.82	3.31	218.84	4.38	217.76	3.36	218.79	4.12	218.03		
MW1	7.96	223.450	top	6.17	217.28	5.40	218.05	5.98	217.47	5.37	218.08	6.26	217.19	5.49	217.96	6.28	217.17	5.14	218.32	6.33	217.13	5.35	218.11	6.16	217.30		
MW1	3.44	218.884	top	1.71	217.17	1.37	217.51	1.60	217.28	1.36	217.52	1.99	216.89	1.40	217.49	1.94	216.95	1.31	217.57	1.92	216.97	1.36	217.52	1.95	216.93		
MW1	7.51	222.741	top	5.54	217.20	4.89	217.85	5.40	217.34	4.86	217.88	5.70	217.04	4.90	217.84	5.78	216.96	4.55	218.19	5.78	216.96	Decommissioned	Decommissioned	Decommissioned	Decommissioned		
MW1	7.9	222.741	top	DNE		DNE		DNE		DNE		DNE		DNE		DNE		DNE		DNE		DNE		5.22	217.52	5.76	216.99
MW1	1.44	218.298	top	1.09	217.21	0.82	217.48	1.03	217.27	0.84	217.46	1.37	216.93	0.87	217.43	1.30	216.99	0.80	217.50	1.28	217.02	0.83	217.47	1.10	217.20		
MW1	1.9	218.235	top	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	
MW1	1.9	218.201	top	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	
MW1	1.9	217.068	top	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	
MW1	2.31	218.618	top	DNE		DNE		DNE		DNE		0.98	217.64	1.54	217.08	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	
MW1	2.285	218.302	top	DNE		DNE		DNE		DNE		DNE		DNE		DNE		DNE		DNE		DNE		1.29	217.02	1.68	216.62

Notes:
 Water levels measured in meters below measuring point (top of pipe or top of casing)
 Full site survey was completed by WESA in May 2010
 There is no MW13 on-site
 MW15, MW19 and MW19-R are drive point piezometers

Table 2
Methane Vapour Data
West Elgin Landfill Site, Rodney, Ontario

Monitoring Location	Well Depth (m)	Elevation	Measuring Point	Saturated Well Screen? (Yes/ No)	8-Nov-07	12-May-08	16-Sep-08	12-May-09	16-Sep-09	20-May-10		9-Nov-10	16-May-11	2-Nov-11
					Methane (%Vol)	Methane (%Vol)	Methane (%Vol)	Methane (%Vol)	Methane (%Vol)	Methane (ppm)	Methane (%Vol)	Methane (%Vol)	Methane (%Vol)	Methane (%Vol)
MW1	5.35	98.649	top	yes	-	-	-	-	-	7.5	-	-	-	-
MW2	9.96	102.560	top	no	11	-	-	-	-	<7.5	-	0.5	-	-
MW2-R	9.79				DNE	DNE	DNE	DNE	DNE	DNE		DNE	DNE	DNE
MW2D	11.5	102.603	top	yes	-	-	-	-	-	7.5	-	-	-	-
MW3	6.17	100.625	top	no	-	-	-	-	-	30	-	-	-	-
MW4	5.18	99.765	top	no	-	-	-	-	-	<7.5	-	-	-	-
MW5	4.38	99.211	toc	no	18	6.5	4	21.5	6	330	-	17	9	0.5
MW5-R	4.745				DNE	DNE	DNE	DNE	DNE	DNE		DNE	DNE	DNE
MW6	6.94	101.147	top	no	-	-	-	-	-	<7.5	-	-	-	-
MW7	7.77	101.317	top	no	-	-	-	-	-	37.5	-	-	-	-
MW8	6.68	100.002	top	no	-	-	-	-	-	<7.5	-	-	-	-
MW9	6.18	99.193	top	no	-	-	-	-	-	15	-	-	-	-
MW10	5.86	99.792	top	no	-	-	-	-	-	<7.5	-	-	-	-
MW11	7.96	101.147	top	no	-	-	-	-	-	37.5	-	-	-	-
MW12	3.44	96.710	top	no	-	-	-	-	-	<7.5	-	-	-	-
MW14	7.51			yes	-	-	-	-	-	-	-	-	-	-
MW14-R	7.9			yes	DNE	DNE	DNE	DNE	DNE	DNE		DNE	DNE	DNE
MW15	1.44			yes	-	-	-	-	-	-	-	-	-	-
MW16	1.9			yes	-	-	-	-	-	-	-	-	-	-
MW17	1.9			yes	-	-	-	-	-	-	-	-	-	-
MW18	1.9			yes	-	-	-	-	-	-	-	-	-	-
MW19	2.31			yes	-	-	-	-	-	-	-	-	-	-
MW19-R	2.285			yes	DNE	DNE	DNE	DNE	DNE	DNE		DNE	DNE	DNE

Notes:
Methane readings taken with RKI Eagle up to and including October 2016 and with a GEM2000 beginning in May 2017.
* - May 2010 Methane concentrations are calculated from Hexane based on conversion factor of 1.5ppm.
There is no MW13 on-site
MW15 is a drive point piezometer
MW19-R is a drive point piezometer

Table 2
Methane Vapour Data
West Elgin Landfill Site, Rodney, Ontario

Monitoring Location	Well Depth (m)	Elevation	Measuring Point	Saturated Well Screen? (Yes/ No)	23-May-12	7-Nov-12	8-May-13	7-Nov-13	28-Apr-14	8-Oct-14	29-Apr-15	16-Oct-15
					Methane (%Vol)	Methane (%Vol)	Methane (%Vol)	Methane (%Vol)	Methane (%Vol)	Methane (%Vol)	Methane (%Vol)	Methane (%Vol)
MW1	5.35	98.649	top	yes	-	-	-	-	-	-	-	-
MW2	9.96	102.560	top	no	-	9.5	-	-	-	-	-	Decommissioned
MW2-R	9.79				DNE	DNE	DNE	DNE	DNE	DNE	DNE	DNE
MW2D	11.5	102.603	top	yes	-	-	-	-	-	-	-	2.5
MW3	6.17	100.625	top	no	-	-	-	-	-	-	-	-
MW4	5.18	99.765	top	no	-	-	-	-	-	-	-	-
MW5	4.38	99.211	toc	no	1	5	9.5	10	40	0.5	-	13.0
MW5-R	4.745				DNE	DNE	DNE	DNE	DNE	DNE	DNE	DNE
MW6	6.94	101.147	top	no	-	-	-	-	-	-	-	-
MW7	7.77	101.317	top	no	-	-	-	-	-	-	-	-
MW8	6.68	100.002	top	no	-	-	-	-	-	-	-	-
MW9	6.18	99.193	top	no	-	-	-	-	-	-	-	-
MW10	5.86	99.792	top	no	-	-	-	-	-	-	-	-
MW11	7.96	101.147	top	no	-	-	-	-	-	-	-	-
MW12	3.44	96.710	top	no	-	-	-	-	-	-	-	-
MW14	7.51			yes	-	-	-	-	-	-	-	-
MW14-R	7.9			yes	DNE	DNE	DNE	DNE	DNE	DNE	DNE	DNE
MW15	1.44			yes	-	-	-	-	-	-	-	-
MW16	1.9			yes	-	-	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned
MW17	1.9			yes	-	-	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned
MW18	1.9			yes	-	-	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned
MW19	2.31			yes	-	-	-	-	-	-	-	-
MW19-R	2.285			yes	DNE	DNE	DNE	DNE	DNE	DNE	DNE	DNE

Notes:
Methane readings taken with RKI Eagle up to and including October 2016 and with a GEM2000 beginning in May 2017.
* - May 2010 Methane concentrations are calculated from Hexane based on conversion factor of 1.5ppm.
There is no MW13 on-site
MW15 is a drive point piezometer
MW19-R is a drive point piezometer

Table 2
Methane Vapour Data
West Elgin Landfill Site, Rodney, Ontario

Monitoring Location	Well Depth (m)	Elevation	Measuring Point	Saturated Well Screen? (Yes/ No)	27-May-16	5-Oct-16	10-May-17	12-Oct-17	29-May-18	20-Sep-18
					Methane (%Vol)	Methane (%Vol)	Methane (%Vol)	Methane (%Vol)	Methane (%Vol)	Methane (%Vol)
MW1	5.35	98.649	top	yes	0.0	1.0	0.0	0.0	0.0	0.0
MW2	9.96	102.560	top	no	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned
MW2-R	9.79				24	34.0	29.5	47.4	42.6	30.4
MW2D	11.5	102.603	top	yes	0.5	54.0	0.0	0.2	0.0	3.2
MW3	6.17	100.625	top	no	0.0	0.0	0.0	0.0	0.0	0.1
MW4	5.18	99.765	top	no	0.0	0.0	0.0	0.0	0.0	0.1
MW5	4.38	99.211	toc	no	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned
MW5-R	4.745				DNE	21.0	0.0	0.1	0.0	15.7
MW6	6.94	101.147	top	no	0.0	1.0	0.0	0.1	0.0	0.1
MW7	7.77	101.317	top	no	0.0	0.0	0.0	0.0	0.0	0.1
MW8	6.68	100.002	top	no	0.0	0.0	0.0	0.0	0.0	0.1
MW9	6.18	99.193	top	no	0.0	0.0	0.0	0.0	0.0	0.1
MW10	5.86	99.792	top	no	0.0	0.0	0.0	0.0	0.0	0.1
MW11	7.96	101.147	top	no	0.0	0.0	0.0	0.0	0.0	0.1
MW12	3.44	96.710	top	no	0.0	0.0	0.0	0.0	0.0	0.0
MW14	7.51			yes	0.0	0.0	0.0	0.0	Decommissioned	Decommissioned
MW14-R	7.9			yes	DNE	DNE	DNE	DNE	DNE	0.1
MW15	1.44			yes	0.0	-	0.0	0.0	0.0	0.0
MW16	1.9			yes	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned
MW17	1.9			yes	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned
MW18	1.9			yes	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned	Decommissioned
MW19	2.31			yes	0.0		Decommissioned	Decommissioned	Decommissioned	Decommissioned
MW19-R	2.285			yes	DNE	DNE	0.0	0.0	0.0	0.1

Notes:
Methane readings taken with RKI Eagle up to and including October 2016 and with a GEM2000 beginning in May 2017.
* - May 2010 Methane concentrations are calculated from Hexane based on conversion factor of 1.5ppm.
There is no MW13 on-site
MW15 is a drive point piezometer
MW19-R is a drive point piezometer

Table 3
Groundwater Geochemistry Data
General and Elemental Metals Scan
West Elgin Landfill, Rodney, Ontario

Parameter	Sample Location		MW5																					
			Southwest																					
			Field Dup.																					
			QA/QC	Background	75% of RUL	RUL	2-May-06	15-Nov-06	30-May-07	16-Oct-07	12-May-08	16-Sep-08	16-Sep-08	12-May-09	12-May-09	20-May-10	20-May-10	9-Nov-10	9-Nov-10	16-May-11	16-May-11			
ODWQ2 Value	ODWQ2 Type																							
Field Temperature (C)					na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na			
Field Conductivity (µmhos/cm)					na	na	na	na	na	na	na	na	1757	1757	1757	1094	1094	1295	1295	933	933			
Field pH					na	na	na	na	na	na	na	na	7.86	7.86	7.9	8.62	8.62	6.48	6.48	6.81	6.81			
Ammonia (NH3-N)					0.106333				9.7	4.1	4.8	21	9	4.5	4.8	18.9	18.9	29.6	10	10.1	1.81	1.73	1.38	1.27
Chloride (Cl)	250	AO	0.5	95	127	41	41	58	69	28	37	37	97.6	96.9	107	15.1	15	15.1	14.8	14.8	19.2	20.6		
Bromide (Br-)					0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoride (F)	1.5	MAC	0.053625	0.311	0.415	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite (NO2-N)	1.0	MAC	0.5	0.469	0.625	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrate (NO3-N)	10	MAC	0.1241286	1.94	2.59	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phosphate (PO4-3)					0.00412	<0.3	<0.3	0.023	0.004	0.004	<0.003	<0.003	0.0035	0.0039	0.0039	<0.0030	<0.0030	0.0044	0.0039	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Sulfate (SO4=)	500	AO	37.73899	202	269	90	81	58	43	81	73	74	127	131	186	35.2	35.7	35.2	35.3	40.6	41.5			
Silica					13.0111	21.5	21	28.9	18.4	na	33	30	20.5	23.1	31.1	18.5	18.1	<0.1	<0.1	<0.1	<0.1	13.8	19.6	
Colour (TCU)	5	AO	73.43333	29.4	39.2	100	89	66	110	240	59	40	124	130	124	39.7	69.9	58.1	119	92.5	80			
Conductivity (µmhos/cm)					722.4444	1310	1250	1335	1550	1160	1220	1230	1660	1650	1800	951	948	1180	1180	923	950			
Total Dissolved Solids (TDS)	500	AO	645.5556	355	473	785	760	690	820	660	700	720	1010	1040	1090	690	690	719	704	570	616			
pH (pH unit)	6.5 - 8.3	OG	7.733333	5.34 - 6.09	7.12 - 8.12	6.72	6.57	6.55	6.76	7.17	7.39	7.52	7.31	7.24	7.24	7.4	7.39	7.19	7.31	7.31	6.61	6.64	6.72	
Alkalinity	30 - 500	OG	381.22222	154 - 330	206 - 441	560	500	610	730	510	521	522	610	606	657	404	503	614	611	664	472			
Turbidity (NTU)	5.0	AO	355.945000	133.9	178.5	>200	>200	20	28	31	12.1	11.7	43	51	34	8.1	10.5	13.8	14	21	17.6			
Dissolved Organic Carbon (DOC)	5.0	AO	2.29615385	2.74	3.65	9	10	9	10	9	7	7	12.4	11.8	117	4	4.1	4.1	5.2	5.9	4			
Hardness	80 - 100	OG	395.2778	178 - 186	238 - 248	720	650	640	690	600	686	661	680	674	757	455	447	641	641	479	476			
Organic N (calculated, see notes)	0.15	OG	0.7384	0.333	0.444	-	8.9	7.8	<0.15	9	4.2	3.6	2.7	4.3	2.6	1.9	0.1	2.99	2.6	2.24	2.08			
Total Kjeldahl Nitrogen (TKN)					0.85727				13	12.6	13	12	8.7	8.4	21.6	22.5	32.2	11.3	30.2	4.8	4.3	3.62	3.35	
Aluminium (Al)	0.1	OG	0.012	0.0420	0.0560	<0.01	<0.1	0.05	<0.01	<0.1	<0.1	<0.1	<0.1	<0.10	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Antimony (Sb)	0.006	IMAC	0.0002	0.00124	0.00165	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Arsenic (As)	0.01	IMAC	0.00276	0.00310	0.00413	0.01	0.01	0.014	0.014	<0.01	0.01	0.01	0.01	0.014	0.014	0.0192	0.0192	<0.010	<0.010	0.0092	0.0112			
Barium (Ba)	1.0	MAC	0.196444	0.298	0.397	0.27	0.3	0.23	0.29	0.2	0.2	0.2	0.27	0.262	0.27	0.114	0.114	0.16	0.17	0.111	0.117			
Beryllium (Be)					0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010
Bismuth (Bi)					0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	5.0	IMAC	0.02828571	0.95	1.27	0.32	<0.5	0.16	0.22	<0.5	<0.5	<0.5	<0.50	0.275	<0.50	0.178	0.176	<0.50	<0.50	0.153	0.172			
Cadmium (Cd)	0.005	MAC	0.000016	0.00095	0.00126	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Calcium (Ca)					123.1111	250	222	<0.00010	239	205	240	230	236	230	248	155	152	238	239	165	171			
Chromium (Cr)	0.05	MAC	0.00145	0.0102	0.0136	0.006	0.01	0.014	0.001	<0.01	<0.01	<0.01	<0.010	0.0038	<0.010	0.0035	0.0034	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cobalt (Co)					0.0000725	0.0014	<0.005	0.001	0.0006	<0.005	<0.005	<0.005	<0.0050	0.00072	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Copper (Cu)	1.0	AO	0.0006873	0.375	0.500	0.061	<0.01	0.001	0.001	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Iron (Fe)	0.3	AO	0.811235	0.417	0.556	21	18.7	23	18.5	17.5	16.9	16.2	23.4	19.1	9.08	9.97	15	15.5	10.3	8.62				
Lead (Pb)	0.01	MAC	0.0000825	0.00192	0.00256	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium (Mg)					21.67222	23.3	24	20.1	23.7	20	21	21	21	22	24.3	33.5	16.4	16.3	22.7	24	16.6	17.9		
Manganese (Mn)	0.05	AO	0.238	0.108	0.144	1.48	1.72	2.04	2.03	1.48	2.18	2.17	2.07	2.08	2.08	1.49	1.45	2.33	2.38	1.45	1.89			
Molybdenum (Mo)					0.002413	0.003	<0.01	0.002	0.003	<0.01	<0.01	<0.01	<0.010	0.0029	<0.010	0.0025	0.0025	<0.010	<0.010	0.0028	0.0029			
Nickel (Ni)					0.00215714	0.003	<0.02	0.007	0.006	<0.02	<0.02	<0.02	<0.020	0.0084	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Phosphorus (P)					0.5	<0.05	<0.5	<0.05	<0.05	<0.5	<0.5	<0.5	<0.50	<0.050	<0.50	<0.050	<0.050	<0.50	<0.50	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)					1.374111	23	20	16	27	20	20	20	20	25	39	12.7	13	<0.1	<0.1	6.5	6.8			
Selenium (Se)	0.05	MAC	0.005	0.01219	0.01625	<0.005	<0.05	<0.005	<0.005	<0.05	<0.05	<0.05	<0.050	<0.0050	<0.050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Silicon (Si)					6.075000	10.1	10	12.5	8.6	9	15	14												

Table 3
Groundwater Geochemistry Data
General and Elemental Metals Scan
West Elgin Landfill, Rodney, Ontario

Parameter	Sample Location		MW6																												
			South																												
			QVQC																												
DDWQS Value	DDWQS Type	Background	75% of RUL	RUL	16-Oct-07	12-May-08	16-Sep-08	12-May-09	16-Sep-09	20-May-10	9-Nov-10	9-May-11	26-Nov-11	23-May-12	7-Nov-12	8-May-13	7-Oct-13	28-Apr-14	8-Oct-14	29-Apr-15	16-Oct-15	27-May-16	5-Oct-16	11-May-17	12-Oct-17	29-May-18	20-Sep-18				
Field Temperature (C)			na	na	na	na	na	na	na	19.6	17.1	16.9	16.8	16.2	12.4	10.1	10.1	14.4	15	13.17	18.1	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4
Field Conductivity (µmhos/cm)			na	na	na	na	na	na	na	1433	1639	402	1551	1751	1173	1497	1397	1570	1343	1489	1768	684	1393	1143	1321	1301	1359	1180	1573	1180	
Field pH			na	na	na	na	na	na	na	8.3	8.24	8.36	6.97	7.09	7.32	9.39	7.01	7.16	7.6	7.32	7.22	7.37	7	7.02	7.32	7.32	6.92	7.32	6.92	7.32	
Ammonia (NH3-N)			0.106333							31	38	26	16.9	30.6	19.5	21.4	18.2	21.6	18.9	24.9	16.1	20.9	16.2	11.9	13.4	22.1	11	17.4	19.7	13.8	14
Chloride (Cl)	250	AO	0.5	95	127	145	214	194	122	157	149	121	184	111	201	161	174	157	205	229	91.9	101	118	117	117	159	144	109	126	106	
Bromide (Br)			0.5			<0.5	1.3	1.1	0.55	0.64	0.91	<0.10	0.98	<0.50	1.71	1.13	1.29	0.86	1.47	1.72	0.53	1.35	0.57	0.68	0.72	0.83	0.72	0.73	0.73	0.73	
Fluoride (F)	1.5	MAC	0.053625	0.311	0.415	<0.5	<0.1	<0.5	<0.10	<0.5	0.24	<0.50	<0.50	<0.50	<0.50	0.35	<0.10	0.16	<0.50	<0.50	0.094	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Nitrite (NO2-N)	1.0	MAC	0.469	0.625		<0.1	<0.1	<0.5	<0.10	<0.5	<0.10	<0.10	<0.50	<0.50	<0.50	<0.10	<0.10	<0.50	<0.50	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	
Nitrate (NO3-N)	10	MAC	0.1241286	1.94	2.59	0.1	3.6	<0.5	0.7	<0.5	0.53	0.62	1.76	<0.50	<0.50	<0.10	<0.10	<0.10	<0.50	<0.50	0.177	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Phosphate (PO4-3)			0.00412			0.003	0.004	<0.003	0.0031	0.0041	0.0035	0.0051	0.0032	<0.0030	0.0041	<0.0030	<0.0030	0.0032	0.0031	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	
Sulfate (SO4=)	500	AO	37.73689	202	269	158	304	84	51.6	16.6	55.9	45.4	143	34.4	84.1	21.1	72.1	58.2	72	142	62.9	86.6	80.5	109	61.5	92.8	102	113	102	113	
Silica			13.0111			16.3	21.1	24.6	18.2	22	17.5	19.8	18.6	24.9	26.9	22.8	17.5	21.3	18.8	18.5	18.8	21.1	16.9	19.3	19.2	21.2	21.2	21.2	21.2	21.2	
Colour (TCU)	5	AO	73.43333	29.4	39.2	42	42	19	62	57.2	46.9	12.2	69.4	43.7	24	76.4	21.4	28.6	76.7	43.1	83.2	159	53.1	53.6	79.2	61.9	147	147	147	147	
Conductivity (µmhos/cm)			722.4444			1610	2080	1510	1400	1460	1480	1450	1760	1460	1710	1340	1390	1340	1540	1620	1710	1230	1500	1300	1460	1410	1480	1320	1390	1390	
Total Dissolved Solids (TDS)	500	AO	645.5556	355	473	810	1190	760	746	740	802	749	1020	790	1020	790	828	789	892	997	697	697	997	697	792	792	792	792	792	792	
pH (pH unit)	6.5 - 8.3	OG	7.733333	5.34 - 6.09	7.12 - 8.12	7.3	7.46	7.7	7.14	7.59	7.65	7.59	7.59	7.43	7.51	7.19	7.35	7.4	7.34	7.42	7.85	7.65	7.91	7.45	7.45	7.59	7.62	7.66	7.66	7.5	
Alkalinity	30 - 500	OG	381.22222	154 - 330	206 - 441	490	530	489	499	489	536	519	466	541	448	572	487	495	469	467	469	467	469	467	469	467	469	467	469	467	469
Hardness (NTU)	3.0	AO	395.945000	133.9	178.5	7.5	7.5	7.2	20	23	11	10.6	33	16.6	>300	9.7	31.5	14.7	26	77	35	121	119	73.3	93.1	71.5	169	138	138		
Dissolved Organic Carbon (DOC)	5.0	AO	2.29615385	2.74	3.65	19	6	8	60	6.5	7.6	6.7	7.3	5.2	8.7	4.3	7	8.8	5.1	2.7	4.69	4.8	5.8	3.8	3.8	5.6	5.2	10.7	10.7		
Hardness	80 - 100	OG	395.2778	178 - 186	238 - 248	510	810	445	423	426	414	411	480	409	532	526	506	478	492	539	377	480	384	468	468	457	490	496	532	532	
Organic N (calculated, see notes)	0.15	OG	0.7384	0.333	0.444	<0.15	6	7	2.4	2.7	0.7	0.9	0.9	1.9	1	0.3	0.1	<0.15	<0.15	6.1	<0.15	<0.00	0.1	0.3	0.27	3.8	2.2	3.4	3.4		
Total Kjeldahl Nitrogen (TKN)			0.852727			0.852727																									
Aluminium (Al)	0.1	OG	0.012	0.0420	0.0560	0.01	<0.1	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
Antimony (Sb)	0.006	IMAC	0.0002	0.00124	0.00165	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
Arsenic (As)	0.01	IMAC	0.002176	0.00310	0.00413	0.005	<0.01	0.011	0.014	0.016	0.0085	0.018	0.008	0.016	0.0096	0.0246	0.0121	0.0226	0.0095	0.0154	0.0082	0.0101	0.00985	0.0191	0.00985	0.0191	0.0097	0.0191	0.0191	0.0191	
Barium (Ba)	1.0	MAC	0.196444	0.298	0.397	0.7	0.3	0.18	0.186	0.32	0.293	0.37	0.373	0.38	0.992	0.377	0.423	0.316	0.376	0.369	0.253	0.337	0.297	0.227	0.253	0.232	0.229	0.2	0.2		
Beryllium (Be)			0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Bismuth (Bi)			0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Boron (B)	5.0	IMAC	0.02828571	0.95	1.27	0.65	0.7	1.19	0.684	0.683	0.646	0.75	0.681	0.669	0.701	0.641	0.671	0.748	0.811	0.829	0.767	0.84	0.732	0.778	0.555	0.66	0.68	0.78	0.78	0.78	
Cadmium (Cd)	0.005	MAC	0.000016	0.000095	0.000126	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Calcium (Ca)			123.11111			137	211	112	121	114	117	120	138	115	152	150	140	135	135	149	106	119	107	129	130	118	143	138	138		
Chromium (Cr)	0.05	MAC	0.00145	0.0102	0.0136	0.001	<0.01	0.005	0.0032	0.0067	0.0044	<0.010	<0.010	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
Cobalt (Co)			0.0009125			0.02	<0.005	0.0018	0.00261	0.00407	0.00176	<0.0050	0.0026	0.0034	0.00267	0.00431	0.0022	0.00312	0.00273	0.00302	0.00192	0.0017	0.00252	0.00263	0.00151	0.0017	0.0026	0.0033	0.0026	0.0033	
Copper (Cu)	1.0	AO	0.0006873	0.375	0.500	0.005	<0.01	0.003	0.0034	0.0025	<0.010	<0.010	0.0014	0.0010	0.001	<0.0010	0.0016														

Table 3
Groundwater Geochemistry Data
General and Elemental Metals Scan
West Elgin Landfill, Rodney, Ontario

Parameter	Sample Location		MW10																													
			West (Off-Shore)																													
			Q/A/Q/C	Field Dup.																												
ODWQ2 Value	ODWQ2 Type	Background	75% of RUL	RUL	8-Nov-07	12-May-08	16-Sep-08	12-May-09	16-Sep-09	20-May-10	16-Sep-10	9-Nov-10	16-May-11	22-Nov-11	23-May-12	7-Nov-12	8-May-13	7-Nov-13	28-Apr-14	8-Oct-14	29-Apr-15	16-Oct-15	27-May-16	5-Oct-16	10-May-17	12-Oct-17	29-May-18	20-Sep-18				
Field Temperature (C)			na	na	na	15.1	17.6	16.3	15.6	16.3	15.6	15.7	15.2	15.7	15.6	15.2	15.7	15.6	15.2	15.7	15.6	15.2	15.7	15.6	15.2	15.7	15.6	15.2	15.7	15.6		
Field Conductivity (µmhos/cm)			na	na	na	560	682	609	900	494	466	1062	518	554	456	584	455	397	463	586	486	601	601	515	706	669	604	8.04	6.97	7.31		
Field pH			na	na	na	9.28	8.77	7.96	7.3	7.98	7.44	7.27	7.82	7.14	7.91	8.32	7.65	7.78	7.33	7.51	7.77	6.69	8.04	8.04	6.97	7.31	6.69	8.04	8.04	6.97	7.31	
Ammonia (NH3-N)			0.106333			0.14	0.13	0.15	0.075	0.10	0.083	0.129	<0.050	0.063	0.064	<0.050	<0.050	0.076	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	
Chloride (Cl)	250	AO	0.5	95	127	19	11	12	9.9	14.6	4.9	11.5	9.3	5	16.3	10.8	10.4	11.3	9	5.9	5.9	8.8	14.2	10.1	7.88	9.43	9.65	12.6	15.1			
Bromide (Br)			0.5			<0.1	<0.1	<0.5	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Fluoride (F)	1.5	MAC	0.053625	0.311	0.415	<0.1	0.1	<0.5	<0.10	<0.50	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Nitrite (NO2-N)	1.0	MAC	0.469	0.625		<0.1	<0.1	<0.5	<0.10	<0.50	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Nitrate (NO3-N)	10	MAC	0.1241286	1.94	2.59	<0.1	0.1	<0.5	<0.10	<0.50	0.11	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Phosphate (PO4-P)			0.00412			<0.003	0.003	<0.003	<0.003	0.0031	<0.0030	0.0038	0.0031	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	
Sulfate (SO4=S)	500	AO	37.73689	202	269	150	57	105	15.9	51.2	37.5	269	27.6	34.3	15.8	469	53	56.6	17.1	10.5	11	15.8	57.9	21.9	67.7	7.3	110	52.8				
Silica			13.0111			12.8	na	15.9	8.07	14.4	8.8	12.8	8.4	9.3	8.3																	
Colour (TCU)	5	AO	73.43333	29.4	39.2	21	130	55	72.2	96.2	156	7.7	109	36.4	67.1	68.1	12.4	11.5	82.6	80.6	160	222	144	46.9	63.7	38.4	114	190	14.9			
Conductivity (µmhos/cm)	30-500	OC	722.4444	355	473	669	544	692	772	589	467	962	462	593	1050	521	609	483	584	443	512	505	622	490	641	642	600	445				
Total Dissolved Solids (TDS)	500	AO	645.5556	355	473	670	530	640	292	296	317	726	354	366	326	994	332	366	276	319	278	266	316	388	263	396	447	387	425			
pH (pH units)	6.5-8.3	OC	7.733333	5.34-6.09	7.12-8.12	6.86	7.85	7.92	7.96	7.88	7.97	7.56	7.98	7.66	7.8	7.42	7.78	7.75	7.7	7.73	7.83	7.89	8.12	7.89	7.91	7.75	7.81	7.76	7.64			
Alkalinity	30-500	OC	381.22222	154-330	206-441	210	220	255	226	239	235	263	214	247	266	307	239	262	218	300	255	268	232	266	226	267	278	240	274			
Ammonia (NH3-N)	5.0	AO	355.945000	133.9	178.5	4.6	7.5	6.6	19	36	24	9.3	31	12.9	>200	4.1	12.5	5.52	42	35	49	366	289	87.4	69.4	381	409	146	229			
Dissolved Organic Carbon (DOC)	5.0	AO	2.9915385	2.74	3.65	4	2	2.5	21		<1.0	1.6	2.8	1.5	1.3	1.2	<1.0	1.5	<1.0	<1.0	<1.0	0.95	1.7	1.2	<1.0	1.2	<1.0	2.1	8.69			
Hardness	80-100	OC	395.2778	178-186	238-248	550	310	427	221	323	238	506	234	305	399	711	278	323	249	326	225	267	263	323	259	322	341	276	356			
Organic N (calculated, see notes)	0.15	OC	0.7384	0.333	0.444	0.26	0.2	0.21	0.225	0.297	<0.15	0.181	<0.15	<0.15	0.256	0.29	0.21	0.124	<0.15	0.16	<0.15	0.22	0.16	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15		
Total Kjeldahl Nitrogen (TKN)			0.85727			0.4	0.3	0.36	0.3	0.36	<0.15	0.31	<0.15	<0.15	0.31	0.29	0.21	0.2	<0.15	0.16	<0.15	0.22	0.16	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15		
Aluminium (Al)	0.1	OC	0.012	0.0420	0.0560	0.02	<0.01	0.02	<0.010	<0.010	<0.010	0.019	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Antimony (Sb)	0.006	IMAC	0.0002	0.00124	0.00165	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Arsenic (As)	0.01	IMAC	0.002796	0.00310	0.00413	0.005	0.001	0.003	<0.0010	0.0016	<0.0010	0.0042	<0.0010	0.0029	<0.0010	<0.0010	<0.0010	0.0016	<0.0010	<0.0010	<0.0010	0.0005	0.0034	0.0005	0.0032	0.00178	0.00169	0.0015	0.001	0.001		
Barium (Ba)	1.0	MAC	0.196444	0.298	0.397	0.11	0.04	0.06	0.041	0.088	0.046	0.151	0.045	0.097	0.07	0.164	0.046	0.063	0.052	0.086	0.047	0.062	0.069	0.101	0.0495	0.0811	0.0803	0.0512	0.0751			
Beryllium (Be)			0.001			<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Bismuth (Bi)			0.001			<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	5.0	IMAC	0.0282871	0.95	1.27	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.018	0.012	0.023	0.016	0.028	0.028	0.013	0.021			
Cadmium (Cd)	0.005	MAC	0.000016	0.00095	0.00126	0.0009	<0.0005	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Calcium (Ca)			123.1111			130	97.6	131	71.5	100	76	158	75.4	96.9	93.1	236	85.9	104	79.5	104	72	90.6	83.3	103	80.8	101	104	87.6	114			
Chromium (Cr)	0.05	MAC	0.000145	0.0102	0.0136	0.002	0.002	0.001	<0.0010	0.0014	0.0013	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)			0.0000725			0.00068	0.0012	0.0011	<0.0010	0.0016	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0026	<0.0010	0.00085	<0.0010	0.00091	<0.0010	0.00031	0.00031	0.00031	0.00031	0.00047	0.00048	0.00049	0.00063	0.00069	
Copper (Cu)	1.0	AO	0.0006873	0.375	0.500	<0.001	0.001	0.002	0.0091	0.011	0.0015	<0.0010	0.0012	0.0016	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.00034	0.00039	0.00032	0.00064	<0.00020	0.00021				

Table 3
Groundwater Geochemistry Data
General and Elemental Metals Scan
West Elgin Landfill, Rodney, Ontario

Parameter	ODWQ2 Value	ODWQ3 Type	Sample Location		MW15 East																			MW16 East		MW17 East		MW18 East		MW19 East		
			Background	75% of RUL	East																			(Decommissioned)		(Decommissioned)		(Decommissioned)		(Damaged)		
			RUL	RUL	20-May-10	9-Nov-10	16-May-11	2-Nov-11	23-May-12	7-Jun-12	8-May-13	7-Nov-13	28-Apr-14	8-Oct-14	29-Apr-15	16-Oct-15	24-Feb-16	18-Feb-16	10-May-17	12-Oct-17	29-May-18	20-Sep-18	10-Sep-12	7-Nov-12	10-Sep-12	7-Nov-12	16-Oct-15	27-May-16	5-Oct-16			
Field Temperature (C)					18.7	IS	15.4	21.9	12.1	15.1	9.8	14.5	15.1	13.54	24.6	18.2	13.5	16.2	22	19.5	18.8	11.5	21.4	14.1	22.4	12.8	IS	26	na			
Field Conductivity (µmhos/cm)					1664	IS	1585	1173	1810	1478	1573	946	1580	1532	1469	1445	1647	1669	1411	1880	1458	2331	1594	1395	715	602	746	568	IS	476	na	
Field pH					8.17	IS	7.44	7.13	9.92	7.71	6.97	8.22	7.92	7.29	7.09	6.95	6.96	7.2	7.11	7.99	6.98	7.41	7.35	7.8	7.79	8.29	7.52	8.21	IS	7.36	na	
Ammonia (NH3-N)			0.106333		39.5	IS	17.4	16.6	44	24.4	11.8	10.7	15.4	18.3	16.1	45.7	27.2	30.6	9.08	19.6	18.3	35.4	11.1	6.03	0.057	0.053	0.102	0.102	IS	0.224	na	
Chloride (Cl)	250	AO	3.8	95	127	IS	105	186	170	101	166	64.3	288	107	666	188	161	190	218	246	162	379	125	131	14.9	19.2	17.2	19.3	IS	6.1	na	
Bromide (Br-)			0.37	IS	0.55	IS	0.59	<0.50	0.3	1.66	<0.10	2.29	0.59	1.49	1.13	1.33	1.18	1.36	1.66	1.38	1.83	0.74	0.58	<0.10	<0.10	<0.10	<0.10	<0.10	IS	<0.10	na	
Fluoride (F)	1.5	MAC	0.053625	0.311	0.415	IS	<0.50	<0.50	<0.50	<0.50	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	IS	0.076	na	
Sulfate (SO4=)	1.0	MAC	0.469	0.625	<0.10	IS	<0.50	<0.50	<0.50	0.19	0.1	<0.10	<0.10	<0.10	<0.10	0.403	0.089	0.07	<0.050	0.71	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	IS	<0.020	na
Nitrate (NO3-N)	10	MAC	0.1241286	1.94	2.59	IS	2.09	<0.50	<0.50	34.5	12.2	5.0	3.46	0.37	7.29	3.75	0.74	28.2	4.1	38.2	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	IS	<0.020	na
Phosphate (PO4-3)			0.0035	IS	0.0032	<0.0030	0.0051	<0.0030	<0.0030	0.0038	<0.0030	0.0189	0.0058	<0.0030	<0.0030	<0.0030	0.0031	<0.0030	<0.0030	0.0043	<0.0030	0.0034	0.0031	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	IS	<0.0030	na	
Sulphate (SO4=)	500	AO	37.1389	202	269	IS	50.6	20.2	410	22.3	17.3	16.5	6	5.9	5.47	5.6	6.7	8.1	25.9	8.7	20.1	5.6	44.9	38.5	12.2	41.2	23.7	50.1	IS	2.73	na	
Silica			13.0111			IS	19.5	16.9	271	17.3	22.3	14.8	14.9	21.7	15.7	23.7	23.5	25	16.9	20.1	23.9	28.9	21.2	16.4	13.4	11.5	16.1	9.9	IS	14.2	na	
Colour (TCU)	5	AO	73.4333	29.4	39.2	IS	184	65.6	41.6	88.7	53.1	35.8	79.6	39.9	71.9	56.6	29	69	87.9	59.6	87.2	30.2	31.9	88.9	72.7	20.6	96.1	IS	177	na		
Conductivity (µmhos/cm)			722.4444			IS	154	160	2130	1370	1370	1050	1790	1610	1490	1880	1820	1930	1530	2070	1640	2100	1550	1470	685	639	714	469	IS	510	na	
Dissolved Solids (TDS)	500	AO	645.5556	355	473	IS	940	876	1090	926	869	878	977	862	896	946	939	1160	896	1160	939	1240	856	1160	412	418	456	402	IS	306	na	
pH (pH unit)	6.5 - 8.3	OG	7.333333	5.34 - 6.09	7.12 - 8.12	IS	7.75	7.87	7.39	7.57	7.63	7.7	7.59	7.65	7.31	7.92	7.79	8.01	7.41	7.69	7.75	7.74	7.92	7.59	8.07	7.74	8	7.71	IS	8.18	na	
Alkalinity	30 - 500	OG	381.22222	154 - 330	206 - 441	IS	395	635	866	443	487	453	646	768	598	794	794	676	643	440	549	618	681	611	494	378	322	371	273	IS	262	na
Hardness (NTU)	3.0	AO	355.945000	133.8	178.5	IS	29	7.9	>300	10.3	15.1	9.88	19.1	9.57	11.7	14.7	19.4	26.6	22.0	39.4	1470	216	39	6.4	7.1	6.7	5.4	10.7	5.5	IS	>4000	na
Dissolved Organic Carbon (DOC)	5.0	AO	2.9615385	2.74	3.68	IS	17.7	12.3	20.5	15.3	11.7	10.9	11.6	15	11.8	13.6	14.6	15.7	10.8	15.1	22.1	23.5	7.3	10.4	3.4	3.2	3.1	3.3	IS	8.3	na	
Hardness	80 - 100	OG	395.2778	178 - 186	238 - 248	IS	472	547	631	413	469	291	548	619	478	605	600	684	502	718	585	729	581	509	366	386	364	307	IS	266	na	
Organic N (calculated, see notes)	0.15	OG	0.7384	0.333	0.444	IS	0.9	0.9	3.8	3.1	2	3.1	<0.15	<0.15	3.8	5.8	<0.15	3.2	4.1	7.2	19.6	0	0.19	0.153	0.227	0.148	0.228	IS	18.078	na		
Total Kjeldahl Nitrogen (TKN)			0.852727			IS	19.3	22.4	31.1	26.5	14.6	9.92	14.7	21.8	15.2	42.9	33	26.9	11.8	21.2	26.8	55	11.1	6.92	0.21	0.28	0.25	0.33	IS	13.1	na	
Aluminium (Al)	0.1	OG	0.012	0.0420	0.0560	IS	0.025	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	IS	0.0059	na	
Antimony (Sb)	0.006	IMAC	0.0002	0.00124	0.00165	IS	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0023	0.00012	0.00014	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	IS	0.0018	na	
Arsenic (As)	0.01	IMAC	0.002176	0.00310	0.00413	IS	<0.010	<0.010	0.015	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.0027	0.0063	0.00124	0.00018	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	IS	0.0019	na	
Barium (Ba)	1.0	MAC	0.196444	0.298	0.397	IS	0.599	0.549	0.845	0.618	0.584	0.302	0.612	0.811	0.593	1.03	0.876	0.59	0.891	0.664	1.13	0.245	0.245	0.121	0.139	0.138	0.102	IS	0.0648	na		
Beryllium (Be)			0.001			IS	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	IS	<0.0010	na		
Bismuth (Bi)			0.001			IS	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	IS	<0.00050	na		
Boron (B)	5.0	IMAC	0.0288571	0.95	1.27	IS	0.838	0.789	0.467	0.783	0.528	0.825	0.478	0.668	0.811	0.582	0.9	0.942	0.792	0.632	0.7	0.87	0.91	0.951	0.657	<0.050	0.146	0.07	IS	0.036	na	
Calcium (Ca)	0.005	MAC	0.000916	0.00095	0.00126	IS	<0.00010	<0.00010	0.00028	0.00047	<0.000025	<0.000090	<0.000090	<0.000090	<0.000090	<0.000090	<0.000090	0.00028	0.000053	0.000102	<0.000010	<0.000010	<0.000066	<0.000090	<0.000090	<0.000090	<0.000090	IS	0.000011	na		
Calcium (Ca)			123.1111			IS	130	156	185	123	139	87.4	161	181	140	170	173	201	147	213	172	214	157	126	129	119	99.9	IS	85.4	na		
Chromium (Cr)	0.05	MAC	0.00145	0.0102	0.0136	IS	<0.0010	<0.0010	0.00089	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00054	0.00057	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	IS	<0.00050	na		
Cobalt (Co)			0.000196			IS	0.00168	0.0022	0.00542	0.00202	0.00093	0.00086	0.00078	0.0033	0.00165	0.0046	0.00143	0.00488	0.00118	0.003	0.0014	0.0042	0.00346	0.00213	0.0012	0.00114	0.00101	<0.00050	IS	0.0006	na	
Copper (Cu)	1.0	AO	0.0006873	0.375	0.500	IS	0.0122	0.011	0.0237	0.055	0.0158	0.0175	0.0106	0.0144	0.01	0.0089	0.015	0.0048	0.0111	0.0095	0.0157	0.0164	0.0079	0.0053	0.0011	<0.0010	0.0027	0.0023	IS	0.00148	na	
Iron (Fe)	0.3	AO	0.811235	0.417	0.556	IS	<0.050	0.175	0.084	<0.050	<0.050	<0.050	<0.050	<0.050	0.071	2.6	0.035	1.54	<0.010	0.23	<0.10	0.25	0.066	<0.050	<0.							

Table 3
Groundwater Geochemistry Data
General and Elemental Metals Scan
West Elgin Landfill, Rodney, Ontario

Parameter	ODWQS Value	ODWQS Type	Background	75% of RUL	RUL	MW19-R			
						East			
						10-May-17	12-Oct-17	29-May-18	20-Sep-18
Field Temperature (C)						11.6	16.2	19	19.4
Field Conductivity (µmhos/cm)						600	692	544	934
Field pH						7.44	7.85	6.98	7.52
Ammonia (NH3-N)			0.106333			0.064	0.172	0.314	0.34
Chloride (Cl)	250	AO	3.98	95	127	26.1	43.4	34.2	73.4
Bromide (Br-)			0.5			<0.10	0.17	<0.10	0.43
Fluoride (F-)	1.5	IMAC	0.053625	0.311	0.415	0.074	0.046	0.078	0.069
Nitrite (NO2-N)	1.0	MAC	0.5	0.469	0.625	<0.020	<0.020	<0.020	<0.020
Nitrate (NO3-N)	10	MAC	0.1241286	1.94	2.59	<0.020	<0.020	<0.020	<0.020
Phosphate (PO4-3)			0.00412			<0.0030	<0.0030	<0.0030	<0.0030
Sulphate (SO4=)	500	AO	37.7389	202	269	26.3	36.3	12.7	42.2
Silica			13.0111			9.62	10.6	10.9	11.3
Colour (TCU)	5	AO	73.43333	29.4	39.2	98.3	68.3	222	25.6
Conductivity (µmhos/cm)			722.4444			669	752	586	818
Total Dissolved Solids (TDS)	500	AO	645.5556	355	473	403	445	354	569
pH (pH unit)	6.5 - 8.3	OG	7.733333	5.34 - 6.09	7.12 - 8.12	7.83	7.8	7.81	7.69
Alkalinity	30 - 500	OG	381.22222	154 - 330	206 - 441	313	306	281	293
Turbidity (NTU)	5.0	AO	355.945000	133.9	178.5	4000	3310	1420	2310
Dissolved Organic Carbon (DOC)	5.0	AO	2.29615385	2.74	3.65	3.3	2.6	4.5	5.56
Hardness	80 - 100	OG	395.2778	178 - 186	238 - 248	329	337	302	411
Organic N (calculated, see notes)	0.15	OG	0.7384	0.333	0.444	1.936	1.828	0.106	<1.5
Total Kjeldahl Nitrogen (TKN)			0.85727			2	2.1	0.42	<1.5
Aluminium (Al)	0.1	OG	0.012	0.0420	0.0560	<0.0050	<0.0050	<0.0050	<0.0050
Antimony (Sb)	0.006	IMAC	0.0002	0.00124	0.00165	<0.00010	0.0003	<0.00010	0.00026
Arsenic (As)	0.01	IMAC	0.002796	0.00310	0.00413	0.00021	0.00499	0.00032	0.00129
Barium (Ba)	1.0	MAC	0.196444	0.298	0.397	0.111	0.149	0.096	0.166
Beryllium (Be)			0.001			<0.00010	<0.00010	<0.00010	<0.00010
Bismuth (Bi)			0.001			<0.000050	<0.000050	<0.000050	<0.000050
Boron (B)	5.0	IMAC	0.02828571	0.95	1.27	0.04	0.074	0.036	0.126
Cadmium (Cd)	0.005	MAC	0.000016	0.00095	0.00126	0.000011	<0.000010	<0.000010	<0.000010
Calcium (Ca)			123.1111			106	110	98	136
Chromium (Cr)	0.05	MAC	0.00145	0.0102	0.0136	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt (Co)			0.0000725			0.00009	0.00044	0.00045	0.00107
Copper (Cu)	1.0	AO	0.0006873	0.375	0.500	0.00084	0.00031	0.00067	0.0007
Iron (Fe)	0.3	AO	0.811235	0.417	0.556	0.019	0.299	0.472	0.451
Lead (Pb)	0.01	MAC	0.00008525	0.00192	0.00256	<0.000050	<0.000050	<0.000050	<0.000050
Magnesium (Mg)			21.672222			15.7	15.2	13.9	17.2
Manganese (Mn)	0.05	AO	0.238	0.108	0.144	0.115	0.097	0.197	0.126
Molybdenum (Mo)			0.002413			0.00134	0.00256	0.0024	0.00189
Nickel (Ni)			0.00215714			0.00373	0.0406	0.00202	0.0141
Phosphorus (P)			0.5			<0.050	<0.050	<0.050	<0.050
Potassium (K)			1.376111			5.24	5.67	4.61	5.81
Selenium (Se)	0.05	MAC	0.005	0.01219	0.01625	<0.000050	<0.000050	<0.000050	<0.000050
Silicon (Si)			6.075000			4.49	4.96	3.07	5.27
Silver (Ag)			0.0001			<0.000050	<0.000050	<0.000050	<0.000050
Sodium (Na)	200	AO	4.553333	77	102	4.89	8.89	4.07	11.1
Strontium (Sr)			0.520556			0.241	0.265	0.24	0.316
Thallium (Tl)			0.000037			<0.000010	<0.000010	<0.000010	0.000025
Tin (Sn)			0.00021			<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)			0.002			<0.00010	<0.00010	<0.00010	<0.00010
Uranium (U)	0.02	MAC	0.00187971	0.00481	0.00641	0.000734	0.00648	0.00107	0.0038
Vanadium (V)			0.0037			<0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)	5.0	AO	0.007300	1.88	2.50	0.0412	0.0025	0.0017	0.0017
Zincium (Zr)			0.004			<0.00010	<0.00010	<0.00010	<0.00010

Notes:
All units are in mg/L unless otherwise noted
na indicates Not Analyzed
Parameters in Bold are Lead/Lake Indicator Parameters
ODWQS - Ontario Drinking Water Quality Standards (2000)
ODWQS Type:
AO - Aesthetic Objective (Table 4)
OC - Operational Guideline (Table 4)
MAC - Maximum Acceptable Concentration (Table 1)
IMAC - Interim Maximum Acceptable Concentration (Table 1)
¹ - Turbidity AO = 5 NTU unless the sample is filtered, in which case the water quality should be compared to a Turbidity of less than 1 NTU.
Background - calculated by taking the average of the concentrations since (and including) May 2010 at MW14. In the case where all values are non-detected values, the highest detection limit was selected as the background level; in the case where there are non-detected values and detected values, the average of the detected values was selected as the background level.
RUL - Reasonable Use Limit
294 - Exceeds RUL or outside of RUL range
234 - Exceeds 75% of RUL or outside of 75% RUL range
QA/QC - Quality Assurance/Quality Control
IS - indicates insufficient water in well to sample
MDL - Method Detection Limit
Organic N - calculated as follows:
When both TRN and Ammonia are not <MDL
= TRN - Ammonia (NH3-N)
= MDL (higher of TRN and Ammonia) if TRN < Ammonia (NH3-N)
When only TRN is <MDL
= TRN as <MDL
When only Ammonia is <MDL
= TRN value
When both TRN and Ammonia are <MDL
= MDL (higher of TRN and Ammonia)

Table 4
Groundwater Geochemical Results
Volatile Organic Compound Data
West Elgin Landfill Site, Rodney, Ontario

Parameter	Sample Location		MWS																			
	QA/QC		Field Dup.		Field Dup.		Field Dup.		Field Dup.		Field Dup.		Field Dup.		Field Dup.		Field Dup.					
	ODWQS Type	ODWQS Value	2-May-06	15-Nov-06	15-Nov-06	30-May-07	30-May-07	16-Oct-07	16-Oct-07	12-May-08	12-May-08	16-Sep-08	16-Sep-08	12-May-09	12-May-09	16-Sep-09	16-Sep-09	20-May-10	20-May-10	9-Nov-10	9-Nov-10	
1,1,1,2-Tetrachloroethane			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane (TCA)			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane (DCA)	MAC	70	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene (DCE)	MAC	14	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	AO ¹	3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethene			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	AO ¹	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-Hexanone			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Heptane			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Benzene	MAC	1	1.9	0.8	0.8	1.3	0.8	1	1	<0.5	1.6	1.5	1.56	1.24	1.10	0.94	1	0.83	0.81			
Bromodichloromethane			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	MAC	5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromomethane			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon Disulfide			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	MAC	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	AO ¹	30	2.8	2.9	2.8	3.9	<0.5	4.4	4	<0.5	<0.5	5.2	5	4.38	3.15	4.18	2.88	4.18	3.97	4.19	3.85	
Chloroethane			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloromethane			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromodichloromethane			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloromethane	MAC	50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	AO ¹	1.6	4.9	<0.5	<0.5	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Methyl Ethyl Ketone			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Methyl Isobutyl Ketone			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
MTBE	AO	15	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
m-Xylene & p-Xylene			33	3	3	<1	2	<1	1	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
p-Xylene			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Styrene	MAC	100	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	MAC	10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	AO ¹	24	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene (TCE)	MAC	50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	MAC	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylenes	AO ¹	20	39	3	3	<1.5	<1.5	<1.5	<1.5	<1.5	<2	<2	<2	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
2-Chloroethanol/vinyl Ether			<20	<20	<20	<20	<20	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na

Notes:
All units are in µg/L
ODWQS - Ontario Drinking Water Quality Standards (2000)
ODWQS Type: AO - Aesthetic Objective (Table 4)
MAC - Maximum Acceptable Concentration (†)
IMAC - Interim Maximum Acceptable Concentration
† - where both a MAC/IMAC and AO/OC exist for one parameter as per the "PIBS 4449e01: Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines" (MOE, June 2006), the more stringent of the two concentrations is selected for comparison purposes.
234 - Exceeds ODWQS
QA/QC - Quality Assurance/Quality Control
B - Indicates insufficient water to sample
na - not analysed

Table 4
Groundwater Geochemical Results
Volatile Organic Compound Data
West Elgin Landfill Site, Rodney, Ontario

Parameter	Sample Location		MW8																						
	ODWQS Type	ODWQS Value	16-Oct-07	12-May-08	16-Sep-08	12-May-09	16-Sep-09	20-May-10	9-Nov-10	16-May-11	2-Nov-11	23-May-12	7-Nov-12	8-May-13	7-Nov-13	28-Apr-14	8-Oct-14	29-Apr-15	16-Oct-15	27-May-16	5-Oct-16	10-May-17	12-Oct-17	29-May-18	28-Sep-18
			QA/QC	QA/QC																					
1,1,1,2-Tetrachloroethane			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane (TCA)			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane (DCA)	MAC	70	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene (DCE)	MAC	14	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	AO ¹	3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethene	IMAC	5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	AO ¹	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-Hexanone			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Heptanone			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	MAC	5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromomethane			<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon Disulfide			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	MAC	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	AO ¹	30	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane			<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloromethane			<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
di-1,2-Dichloroethene			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
di-1,3-Dichloropropene			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	MAC	50	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloromethane	MAC	50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	AO ¹	1.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Methyl Ethyl Ketone			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Methyl Isobutyl Ketone			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
MtBE	AO	15	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
m-Xylene & p-Xylene			<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
p-Xylene			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Styrene	MAC	100	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	MAC	10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	AO ¹	24	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethane (TCE)	MAC	50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane			<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	MAC	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylenes	AO ¹	20	<1.5	<1.5	<2	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
2-Chloroethylvinyl Ether			na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na

Notes:
All units are in µg/L
ODWQS - Ontario Drinking Water Quality Standards (2000)
ODWQS Type:
AO - Aesthetic Objective (Table 4)
MAC - Maximum Acceptable Concentration
IMAC - Interim Maximum Acceptable Concentration
¹ - where both a MAC/IMAC and AO/OC exist for one parameter as per the "PBIS 4449e01: Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines" (MOE, June 2006), the more stringent of the two concentrations is selected for comparison purposes.
234 - Exceeds ODWQS
QA/QC - Quality Assurance/Quality Control
B - Indicates insufficient water to sample
na - not analysed

Table 4
Groundwater Geochemical Results
Volatile Organic Compound Data
West Elgin Landfill Site, Rodney, Ontario

Parameter	Sample Location		MW9																							
	ODWQS Type	ODWQS Value																								
			16-Oct-07	12-May-08	16-Sep-08	12-May-09	16-Sep-09	20-May-10	9-Nov-10	16-May-11	2-Nov-11	23-May-12	7-Nov-12	8-May-13	7-Nov-13	28-Apr-14	8-Oct-14	29-Apr-15	16-Oct-15	27-May-16	5-Oct-16	10-May-17	12-Oct-17	29-May-18	28-Sep-18	
1,1,1,2-Tetrachloroethane			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane (TCA)			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane (DCA)	MAC	70	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane (DCE)	MAC	14	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	AO ¹	3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	IMAC	5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	AO ¹	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-Hexanone			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Heptane			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	MAC	5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromomethane			<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon Disulfide			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	MAC	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	AO ¹	30	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane			<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloromethane			<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane			<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloromethane	MAC	50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	AO ¹	1.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Methyl Ethyl Ketone			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Methyl Isobutyl Ketone			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
MtBE	AO	15	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
m-Xylene & p-Xylene			<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
p-Xylene			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Styrene	MAC	100	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	MAC	10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	AO ¹	24	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethane (TCE)	MAC	50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane			<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	MAC	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylenes	AO ¹	20	<1.5	<1.5	<2	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
2-Chloroethylvinyl Ether			na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na

Notes:
All units are in µg/L
ODWQS - Ontario Drinking Water Quality Standards (2000)
ODWQS Type: AO - Aesthetic Objective (Table 4)
MAC - Maximum Acceptable Concentration
IMAC - Interim Maximum Acceptable Concentration
¹ - where both a MAC/IMAC and AO/OC exist for one parameter as per the "PIBS 4449e01: Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines" (MOE, June 2006), the more stringent of the two concentrations is selected for comparison purposes.
234 - Exceeds ODWQS
QA/QC - Quality Assurance/Quality Control
B - Indicates insufficient water to sample
na - not analysed

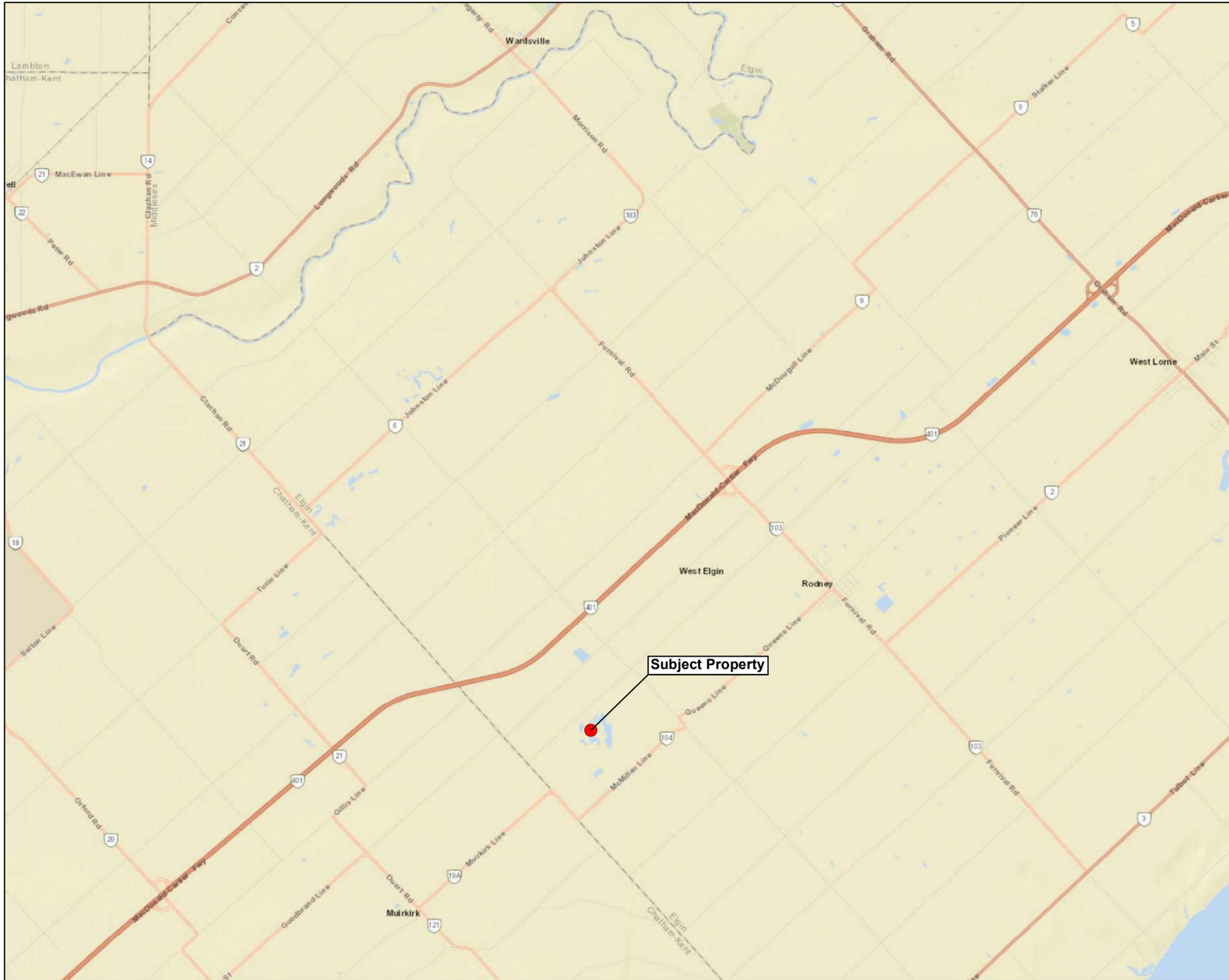
Table 4
Groundwater Geochemical Results
Volatile Organic Compound Data
West Elgin Landfill Site, Rodney, Ontario

Parameter	Sample Location		MW14 (Decommissioned)																MW14R		
	Q/VQC	ODWQS Type	20-May-10	9-Nov-10	16-May-11	2-Nov-11	23-May-12	7-Nov-12	8-May-13	7-Nov-13	28-Apr-14	8-Oct-14	29-Apr-15	16-Oct-15	27-May-16	5-Oct-16	11-May-17	12-Oct-17	5-Jun-18	20-Sep-18	
	Value																				
1,1,1,2-Tetrachloroethane			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1-Trichloroethane (TCA)			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2-Trichloroethane			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethane (DCA)	MAC	70	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethene (DCE)	MAC	14	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichlorobenzene	AO ¹	3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloroethane	IMAC	5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloropropane			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichlorobenzene			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	AO ¹	1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2-Hexanone			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Heptane			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Benzene	MAC	1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.0	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	MAC	5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Carbon Disulfide			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon Tetrachloride	MAC	2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chlorobenzene	AO ¹	30	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloroethane			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloromethane			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
di-1,2-Dichloroethene			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
di-1,3-Dichloropropane			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dibromochloromethane			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.0	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloromethane	MAC	50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Ethylbenzene	AO ¹	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl Ethyl Ketone			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Methyl Isobutyl Ketone			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
MTBE	AO	15	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
m-Xylene & p-Xylene			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
p-Xylene			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	na	na	na	na	na	na	na	na	na
Styrene	MAC	100	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Tetrachloroethene	MAC	10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	AO ¹	24	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,2-Dichloroethene			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,3-Dichloropropene			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethene (TCE)	MAC	50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.64	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichlorofluoromethane			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	MAC	1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nylenes	AO ¹	20	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
2-Chloroethylvinyl Ether			na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na

Notes:
All units are in µg/L
ODWQS - Ontario Drinking Water Quality Standards (2000)
ODWQS Type:
AO - Aesthetic Objective (Table 4)
MAC - Maximum Acceptable Concentration
IMAC - Interim Maximum Acceptable Concentration
¹ - where both a MAC/IMAC and AO/QOC exist for one parameter as per the "PIBS 4449e01: Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines" (MOE, June 2006), the more stringent of the two concentrations is selected for comparison purposes.
234 - Exceeds ODWQS
Q/VQC - Quality Assurance/Quality Control
B - Indicates insufficient water to sample
na - not analysed

FIGURES





LEGEND

1				
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REV.	DESCRIPTION	YY/MM/DD	BY	CHK
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REFERENCES
 PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.



CLIENT
 MUNICIPALITY OF WEST ELGIN
 RODNEY, ONTARIO

PROJECT
 2018 SITE OPERATIONS

TITLE
 SITE LOCATION MAP

171, Victoria St. N.,
 Kitchener, Ontario N2H 5C5
 TEL: (519) 742-6685
 FAX: (519) 742-9810
 Email: info@blumetric.ca
 Web: http://www.blumetric.ca

PROJECT # 180351	DATE March 28, 2019
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DRAWN IB	CHECKED SS	FIG NO. 01	REV 0
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LEGEND

- MW1 ☉ MONITORING WELL LOCATION
- MW16 ☐ FORMER MONITORING WELL LOCATION
- ACCESS ROADS
- APPROXIMATE PROPERTY BOUNDARY
- APPROXIMATE LIMIT OF WETLAND BOUNDARY
- APPROXIMATE LIMIT OF PROVINCIALLY SIGNIFICANT WETLAND
- 2016 WASTE BOUNDARY

1				
REV.	DESCRIPTION	YY/MM/DD	BY	CHK

REFERENCES
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THIS SCALE TO BE USED TO OBTAIN APPROXIMATE DIMENSIONS FOR INFORMATION



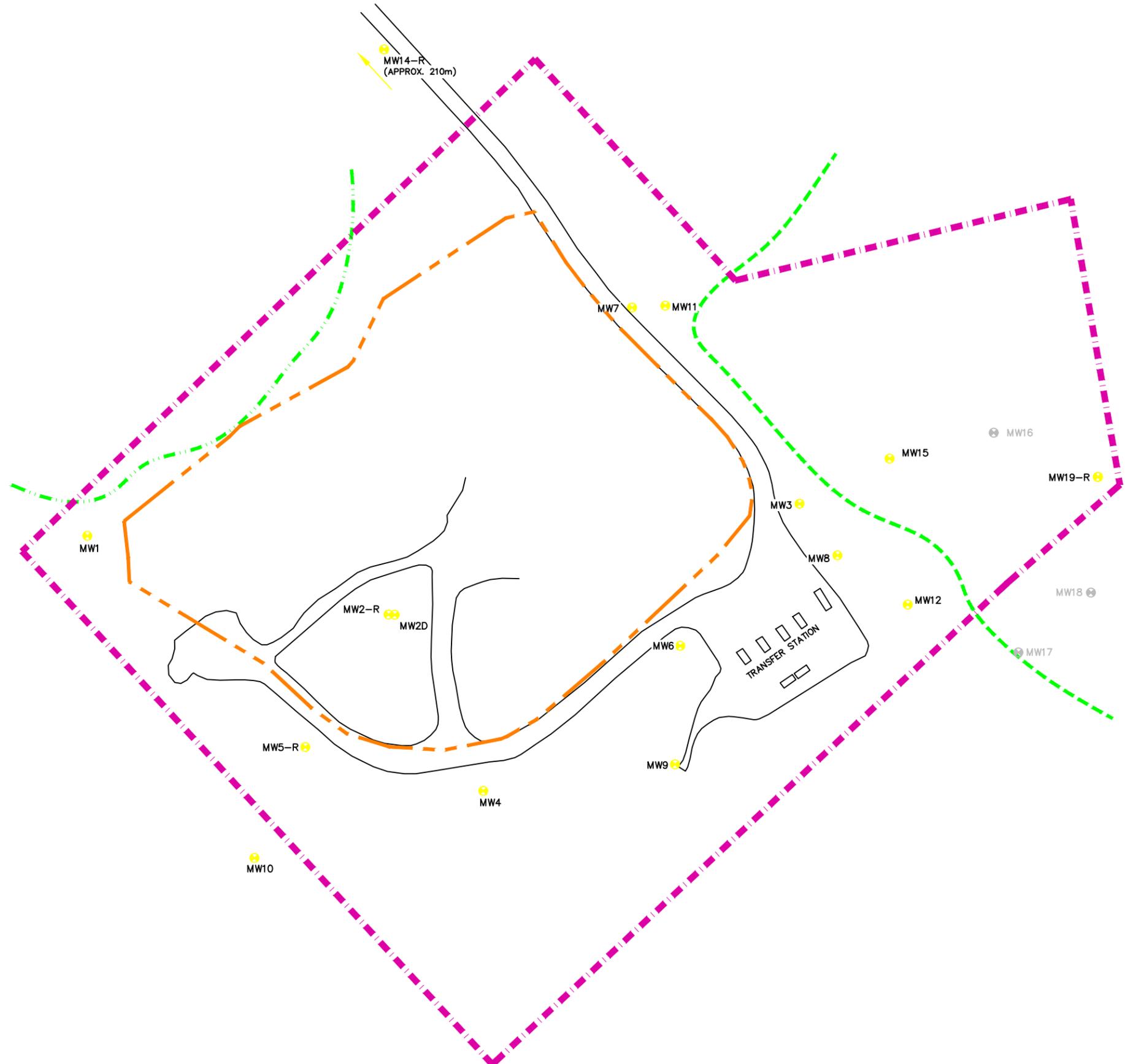
CLIENT
**MUNICIPALITY OF WEST ELGIN
 RODNEY, ON**

PROJECT
2018 SITE OPERATIONS

TITLE
SITE PLAN WITH AIR PHOTO

BluMetric Environmental
 171 Victoria Street North
 Kitchener, Ontario N2H 5C5
 TEL: (519) 742-6685 FAX: (519) 742-9810
 Email: info@blumetric.ca Web: http://www.blumetric.ca

PROJECT #	180351	DATE	2019-03-28
DRAWN	IB	CHECKED	SS
DWG NO.	2	REV	0



LEGEND

- MW1 ☉ MONITORING WELL LOCATION
- MW16 ☉ FORMER MONITORING WELL LOCATION
- ACCESS ROADS
- APPROXIMATE PROPERTY BOUNDARY
- APPROXIMATE LIMIT OF WETLAND BOUNDARY
- APPROXIMATE LIMIT OF PROVINCIALLY SIGNIFICANT WETLAND
- 2016 WASTE BOUNDARY

1				
REV.	DESCRIPTION	YY/MM/DD	BY	CHK

REFERENCES
 PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.



THIS SCALE TO BE USED TO OBTAIN APPROXIMATE DIMENSIONS FOR INFORMATION

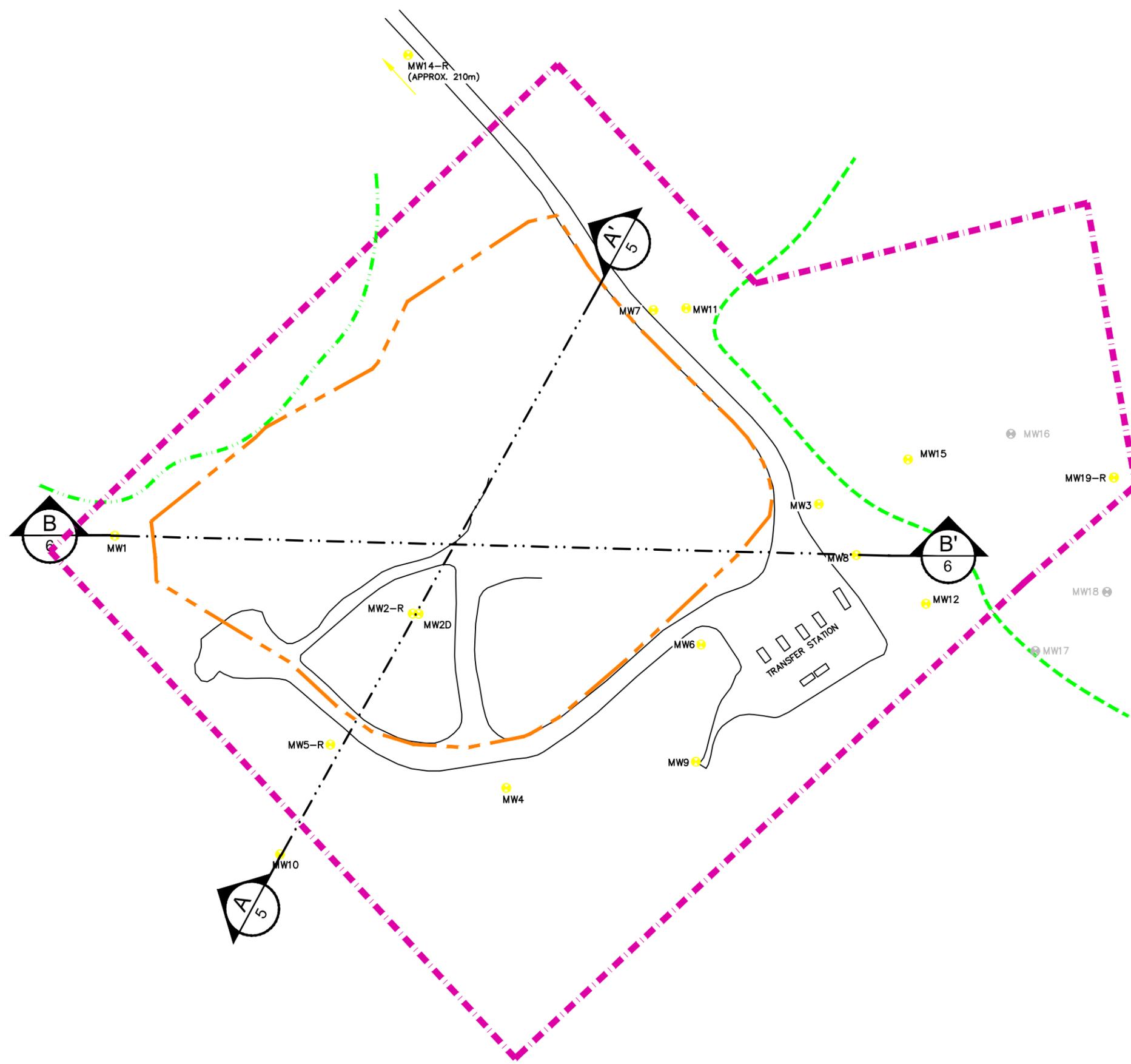
CLIENT
**MUNICIPALITY OF WEST ELGIN
 RODNEY, ON**

PROJECT
2018 SITE OPERATIONS

TITLE
SITE PLAN

BluMetric Environmental
 171 Victoria Street North
 Kitchener, Ontario N2H 5C5
 TEL: (519) 742-6685 FAX: (519) 742-9810
 Email: info@blumetric.ca Web: http://www.blumetric.ca

PROJECT #	DATE		
180351	2019-03-28		
DRAWN	CHECKED	DWG NO.	REV
WC	SS	3	0



LEGEND

- MW1 MONITORING WELL LOCATION
- MW16 FORMER MONITORING WELL LOCATION
- ACCESS ROADS
- APPROXIMATE PROPERTY BOUNDARY
- APPROXIMATE LIMIT OF WETLAND BOUNDARY
- APPROXIMATE LIMIT OF PROVINCIALLY SIGNIFICANT WETLAND
- CROSS SECTION
- 2016 WASTE BOUNDARY

1				
REV.	DESCRIPTION	YY/MM/DD	BY	CHK

REFERENCES
 PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.



THIS SCALE TO BE USED TO OBTAIN APPROXIMATE DIMENSIONS FOR INFORMATION

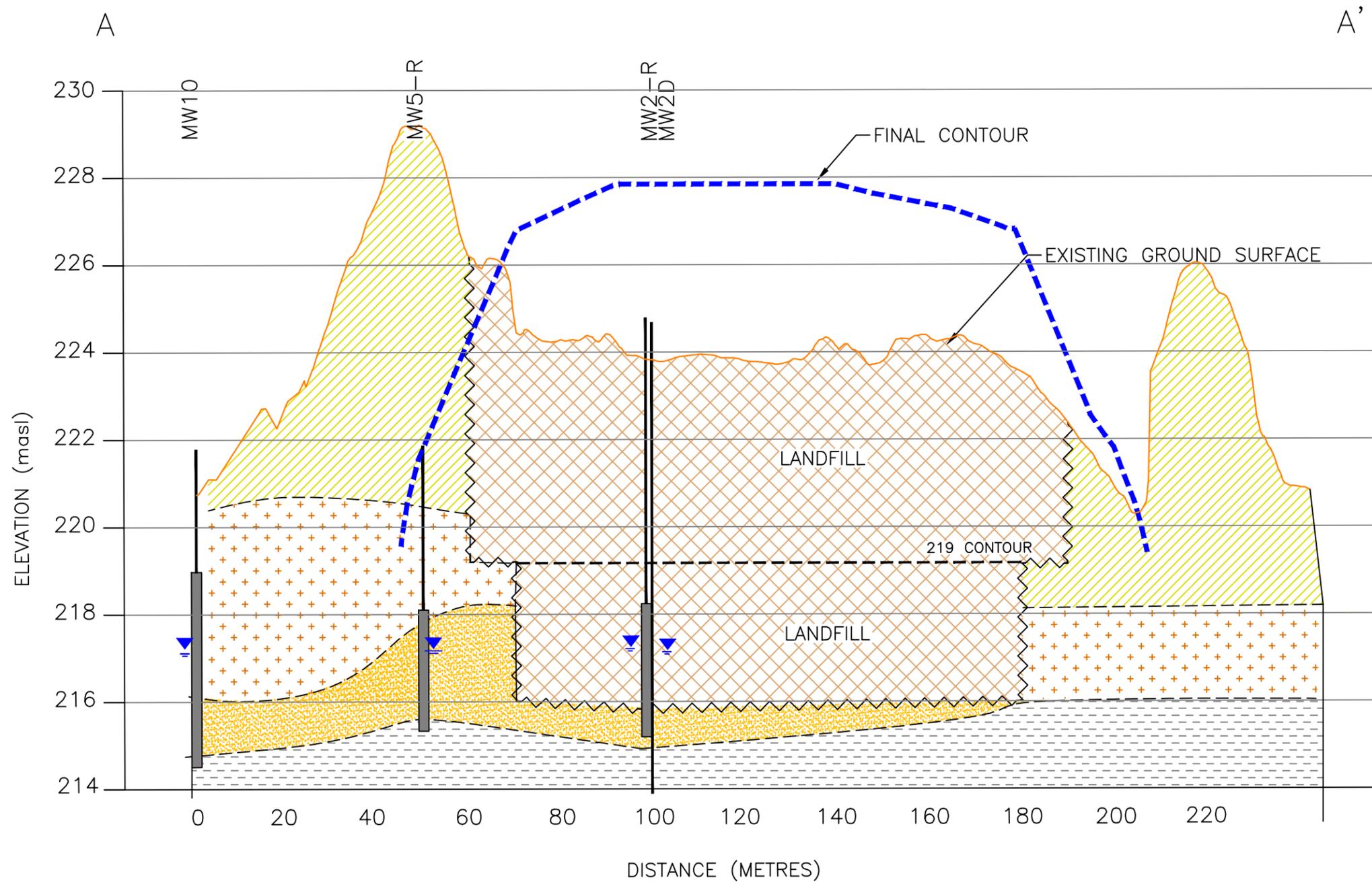
CLIENT
 MUNICIPALITY OF WEST ELGIN
 RODNEY, ON

PROJECT
 2018 SITE OPERATIONS

TITLE
 CROSS SECTION LOCATIONS

171 Victoria Street North
 Kitchener, Ontario N2H 5C5
 TEL: (519) 742-6685 FAX: (519) 742-9810
 Email: info@blumetric.ca
 Web: http://www.blumetric.ca

PROJECT # 180351	DATE 2019-03-28		
DRAWN WC	CHECKED SS	DWG NO. 4	REV 0



LEGEND

- SAND
- GRAVEL
- TILL
- CLAY
- LANDFILL MATERIAL
- FINAL CONTOUR
- EXISTING GROUND SURFACE BASED ON 2016 SURVEY
- SCREENED INTERVAL
- WATER LEVEL (OCTOBER 2017)

1				
REV.	DESCRIPTION	YY/MM/DD	BY	CHK

REFERENCES
 PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

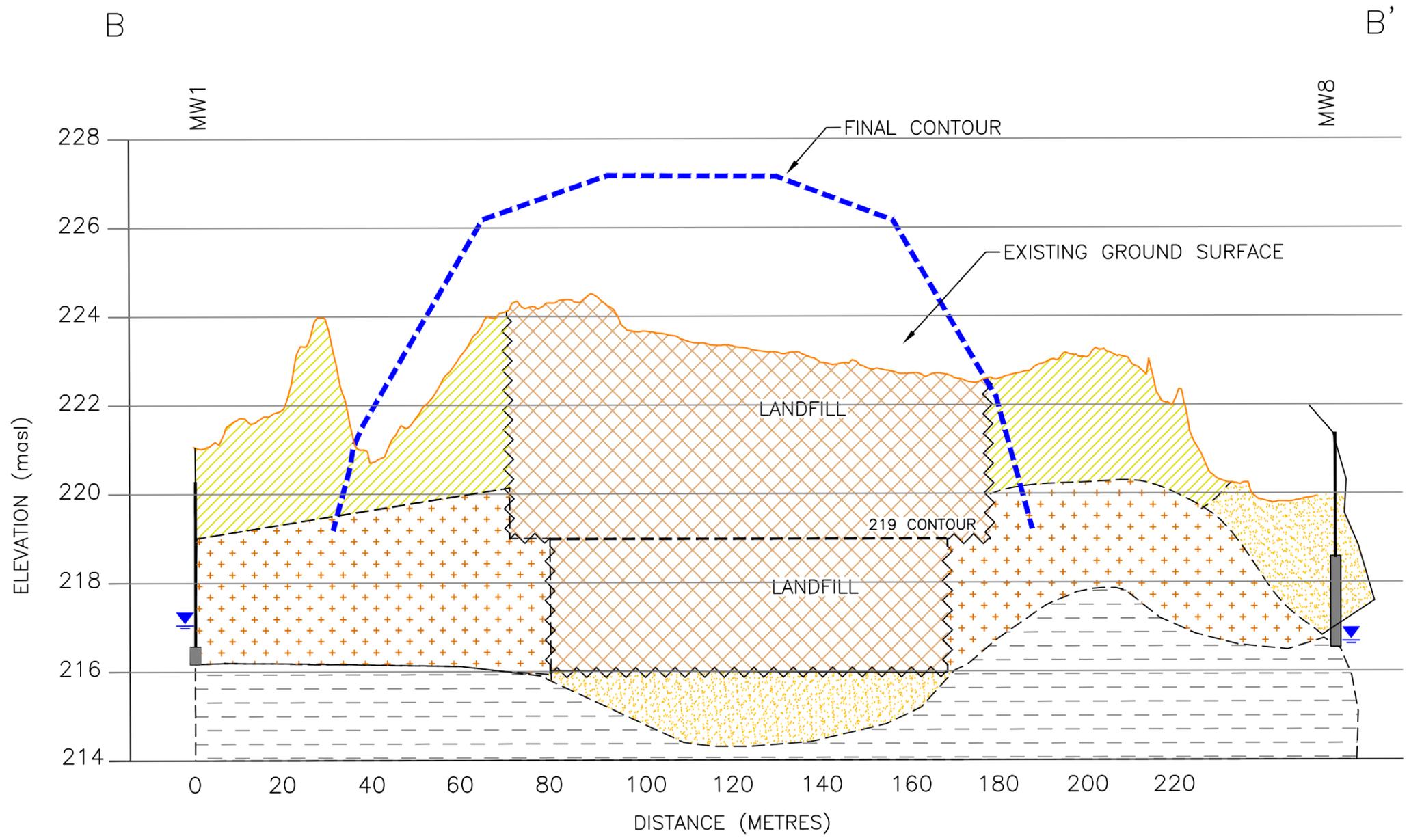
CLIENT
**MUNICIPALITY OF WEST ELGIN
 RODNEY, ON**

PROJECT
 2018 SITE OPERATIONS

TITLE
 CROSS SECTION A-A'

171 Victoria Street North
 Kitchener, Ontario N2H 5C5
 TEL: (519) 742-6685 FAX: (519) 742-9810
 Email: info@blumetric.ca Web: http://www.blumetric.ca

PROJECT # 180351		DATE 2019-03-28	
DRAWN WC	CHECKED SS	DWG NO. 5	REV 0



LEGEND

- SAND
- GRAVEL
- TILL
- CLAY
- LANDFILL MATERIAL
- FINAL CONTOUR
- EXISTING GROUND SURFACE BASED ON 2016 SURVEY
- SCREENED INTERVAL
- WATER LEVEL (OCTOBER 2017)

1				
REV.	DESCRIPTION	YY/MM/DD	BY	CHK

REFERENCES
 PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

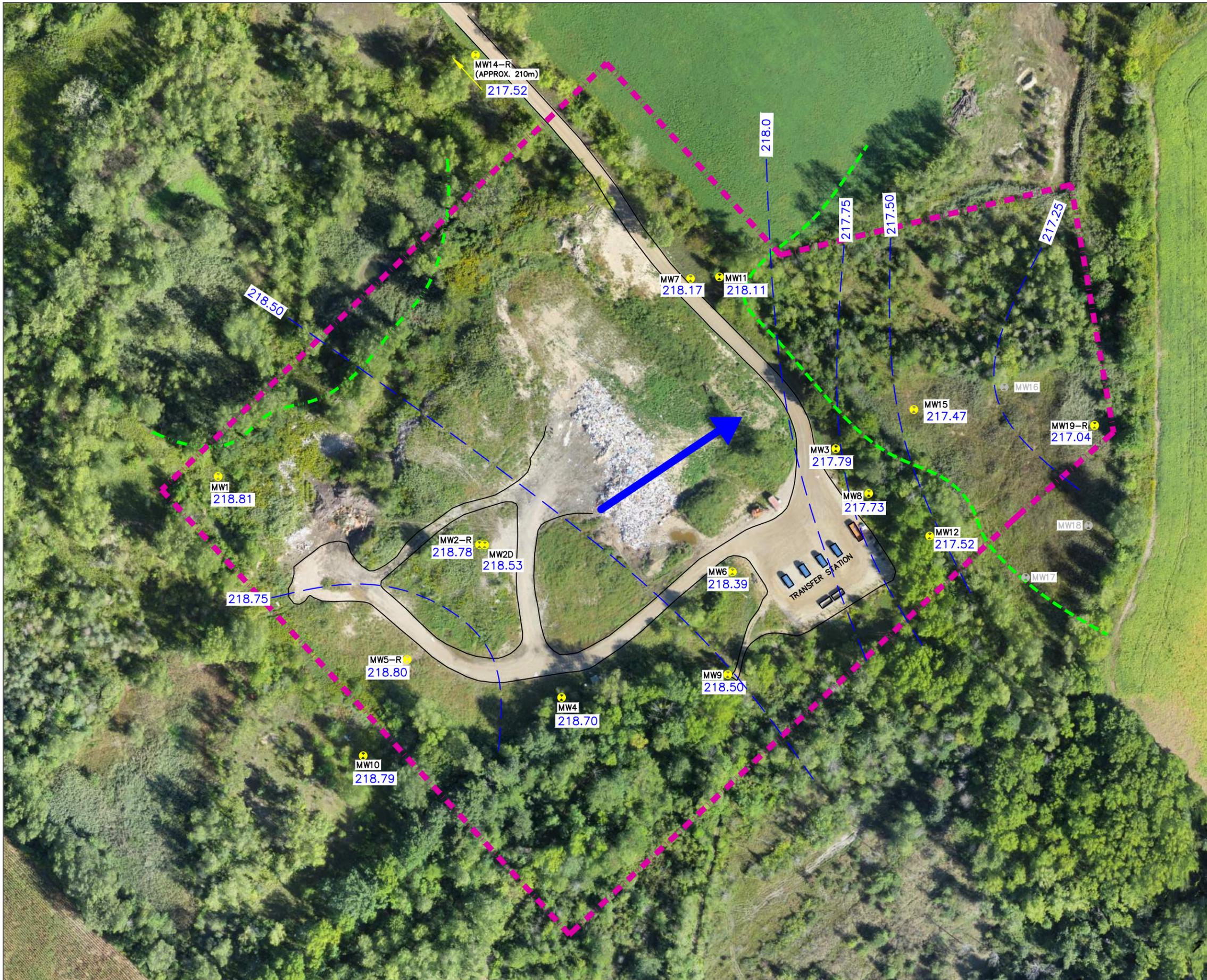
CLIENT
 MUNICIPALITY OF WEST ELGIN
 RODNEY, ON

PROJECT
 2018 SITE OPERATIONS

TITLE
 CROSS SECTION B-B'

171 Victoria Street North
 Kitchener, Ontario N2H 5C5
 TEL: (519) 742-6685 FAX: (519) 742-9810
 Email: info@blumetric.ca Web: http://www.blumetric.ca

PROJECT # 180351		DATE 2019-03-28		
DRAWN WC	CHECKED SS	DWG NO. 6	REV 0	

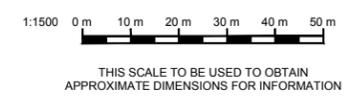


LEGEND

- MW1 MONITORING WELL LOCATION
- MW16 FORMER MONITORING WELL LOCATION
- ACCESS ROADS
- APPROXIMATE PROPERTY BOUNDARY
- APPROXIMATE LIMIT OF WETLAND BOUNDARY
- APPROXIMATE LIMIT OF PROVINCIALLY SIGNIFICANT WETLAND
- GROUNDWATER ELEVATION CONTOURS (masl)
- 217.17 GROUNDWATER ELEVATION (masl)
- GROUNDWATER FLOW DIRECTION

1				
REV.	DESCRIPTION	YY/MM/DD	BY	CHK

REFERENCES
 PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.
 IMAGERY: FIRST BASE, 2013



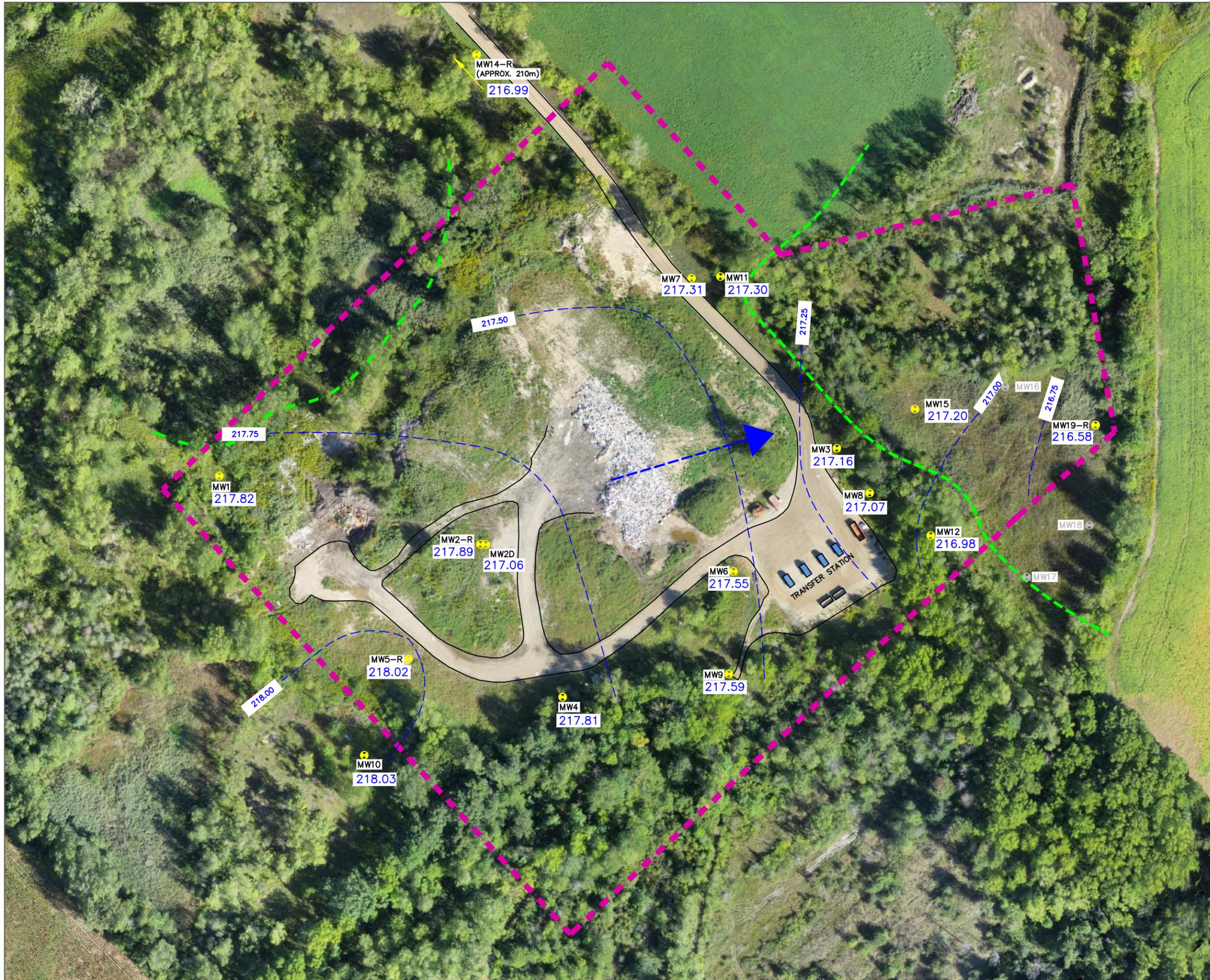
CLIENT
**MUNICIPALITY OF WEST ELGIN
 RODNEY, ON**

PROJECT
 2018 SITE OPERATIONS

TITLE
 GROUNDWATER ELEVATIONS AND
 FLOW DIRECTION
 SPRING 2018

171 Victoria Street North
 Kitchener, Ontario N2H 5C5
 TEL: (519) 742-6685 FAX: (519) 742-9810
 Email: info@blumetric.ca
 Web: http://www.blumetric.ca

PROJECT #	DATE		
180351	2018-06-26		
DRAWN	CHECKED	DWG NO.	REV
IB	SS	7	0

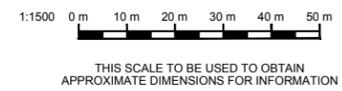


LEGEND

- MW1 ☉ MONITORING WELL LOCATION
- MW16 ☐ FORMER MONITORING WELL LOCATION
- ACCESS ROADS
- - - APPROXIMATE PROPERTY BOUNDARY
- - - APPROXIMATE LIMIT OF WETLAND BOUNDARY
- - - APPROXIMATE LIMIT OF PROVINCIALLY SIGNIFICANT WETLAND
- - - GROUNDWATER ELEVATION CONTOURS (masl)
- 217.17 GROUNDWATER ELEVATION (masl)
- GROUNDWATER FLOW DIRECTION

1				
REV.	DESCRIPTION	YY/MM/DD	BY	CHK

REFERENCES
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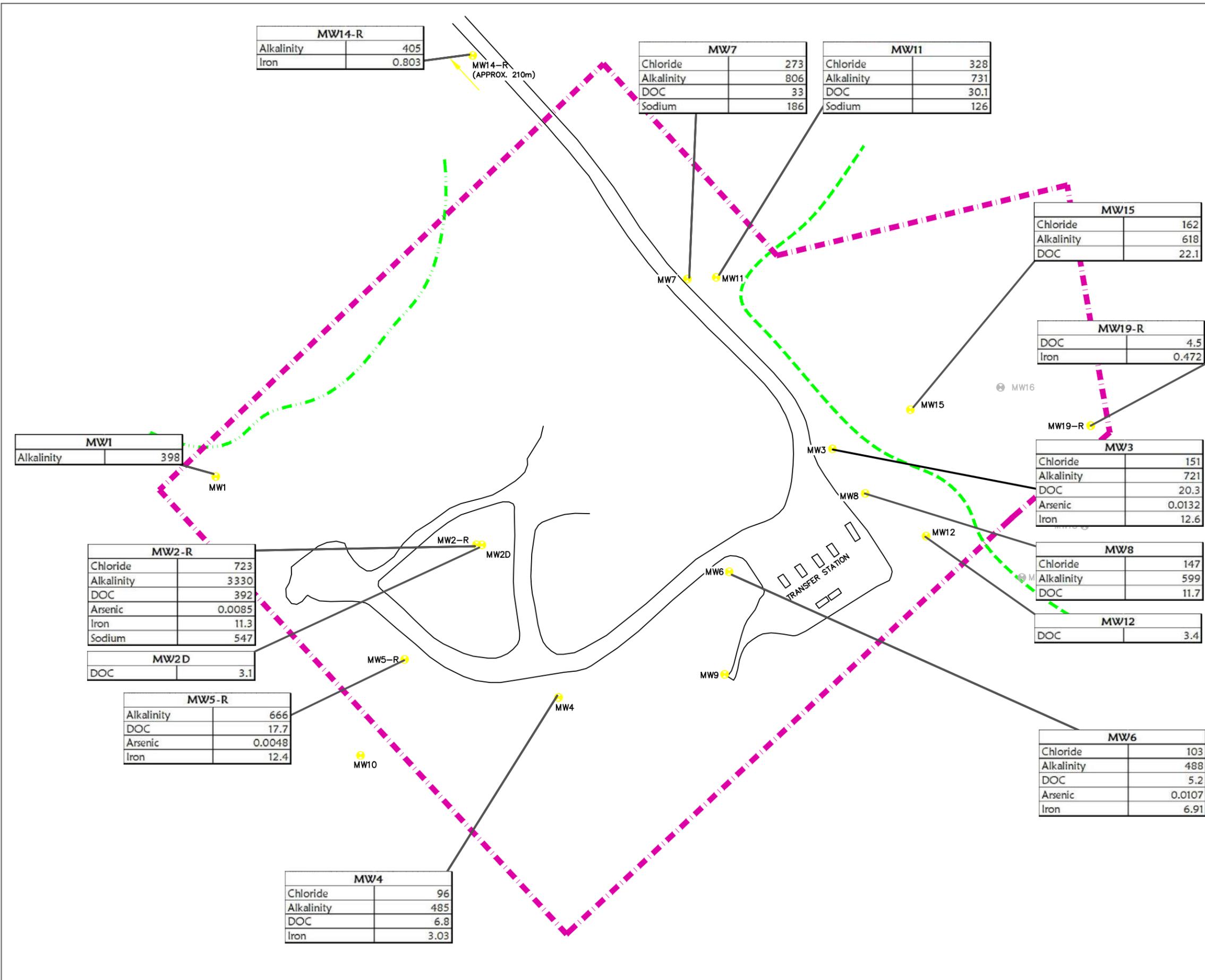
CLIENT
**MUNICIPALITY OF WEST ELGIN
 RODNEY, ON**

PROJECT
2018 SITE OPERATIONS

TITLE
**GROUNDWATER ELEVATIONS
 AND FLOW DIRECTION
 FALL 2018**

BluMetric Environmental
 171 Victoria Street North
 Kitchener, Ontario N2H 5C5
 TEL: (519) 742-6685 FAX: (519) 742-9810
 Email: info@blumetric.ca
 Web: http://www.blumetric.ca

PROJECT #	DATE		
180351	2019-03-28		
DRAWN	CHECKED	DWG NO.	REV
GM	SS	08	0



- LEGEND
- MW1 ● MONITORING WELL LOCATION
 - MW16 ● FORMER MONITORING WELL LOCATION
 - ACCESS ROADS
 - APPROXIMATE PROPERTY BOUNDARY
 - APPROXIMATE LIMIT OF WETLAND BOUNDARY
 - APPROXIMATE LIMIT OF PROVINCIALLY SIGNIFICANT WETLAND

Parameter	75% of RUL
Chloride (Cl ⁻)	95
Alkalinity	154-330
Dissolved Organic Carbon (DOC)	2.74
Arsenic (As)	0.0031
Iron (Fe)	0.417
Sodium (Na)	77

Note: Tables denote locations where leachate indicator parameter concentrations exceed the Trigger Limit (75% RUL) for three consecutive monitoring events. The table identifies the concentration analyzed during the Spring 2018 event.

Note: All units are in mg/L.

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES
 PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.
 IMAGERY: FIRST BASE, 2013



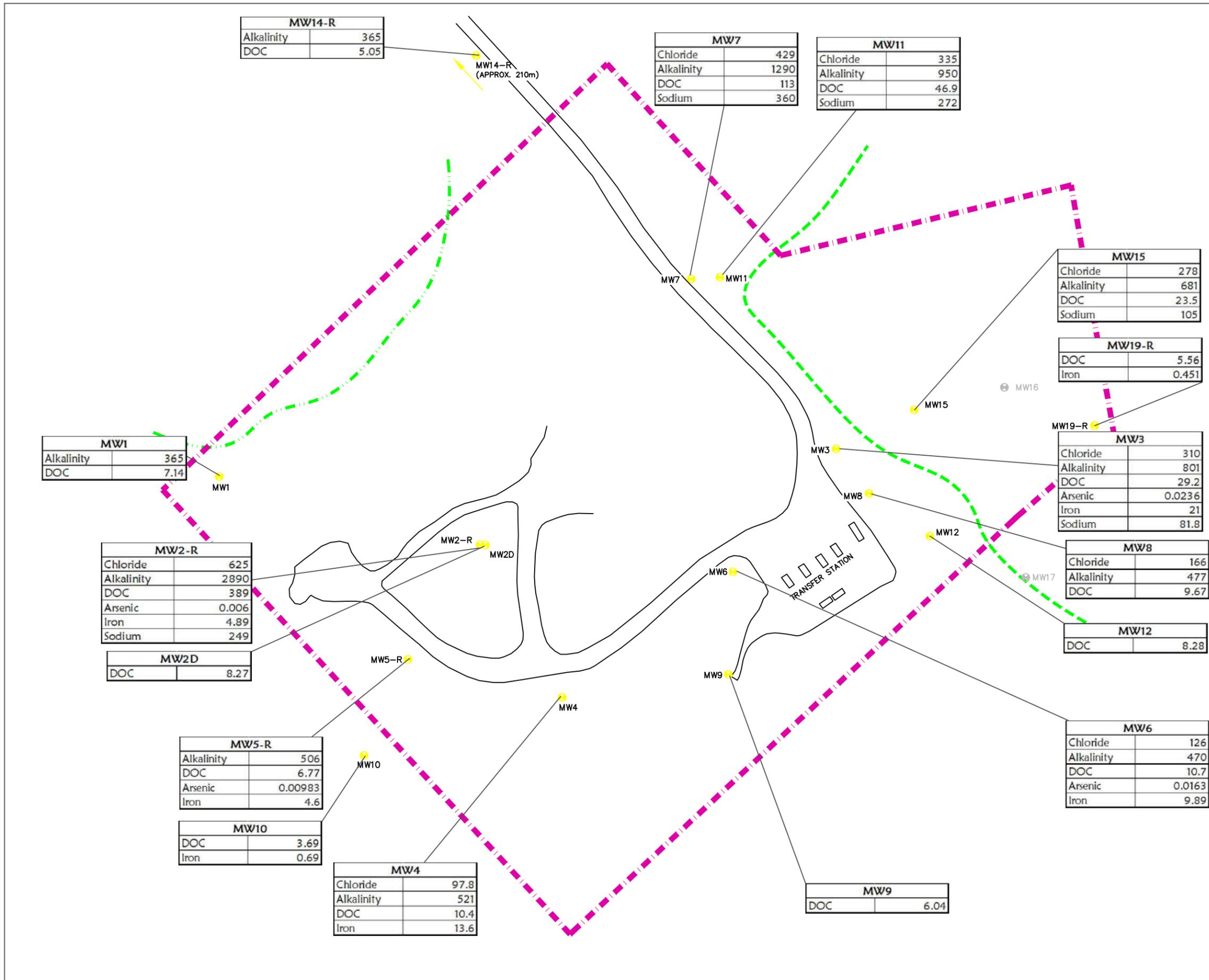
CLIENT
**MUNICIPALITY OF WEST ELGIN
 RODNEY, ON**

PROJECT
2018 SITE OPERATIONS

TITLE
**GROUNDWATER CHEMISTRY
 SPRING 2018**

BluMetric Environmental
 171 Victoria Street North
 Kitchener, Ontario N2H 5C5
 TEL: (519) 742-6685 FAX: (519) 742-9810
 Email: info@blumetric.ca
 Web: http://www.blumetric.ca

PROJECT #	180351	DATE	2019-03-28
DRAWN	WC	CHECKED	SS
DWG NO.	9	REV	0



LEGEND

- MW1 MONITORING WELL LOCATION
- MW16 FORMER MONITORING WELL LOCATION
- ACCESS ROADS
- APPROXIMATE PROPERTY BOUNDARY
- APPROXIMATE LIMIT OF WETLAND BOUNDARY
- APPROXIMATE LIMIT OF PROVINCIALLY SIGNIFICANT WETLAND

Parameter	75% of RUL
Chloride (Cl-)	95
Alkalinity	154-330
Dissolved Organic Carbon (DOC)	2.74
Arsenic (As)	0.0031
Iron (Fe)	0.417
Sodium (Na)	77

Note: Tables denote locations where leachate indicator parameter concentrations exceed the Trigger Limit (75% RUL) for three consecutive monitoring events. The table identifies the concentration analyzed during the Fall 2018 event
 Note: All units are in mg/L.

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES
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 IMAGERY: FIRST BASE, 2013



CLIENT
**MUNICIPALITY OF WEST ELGIN
 RODNEY, ON**

PROJECT
2018 SITE OPERATIONS

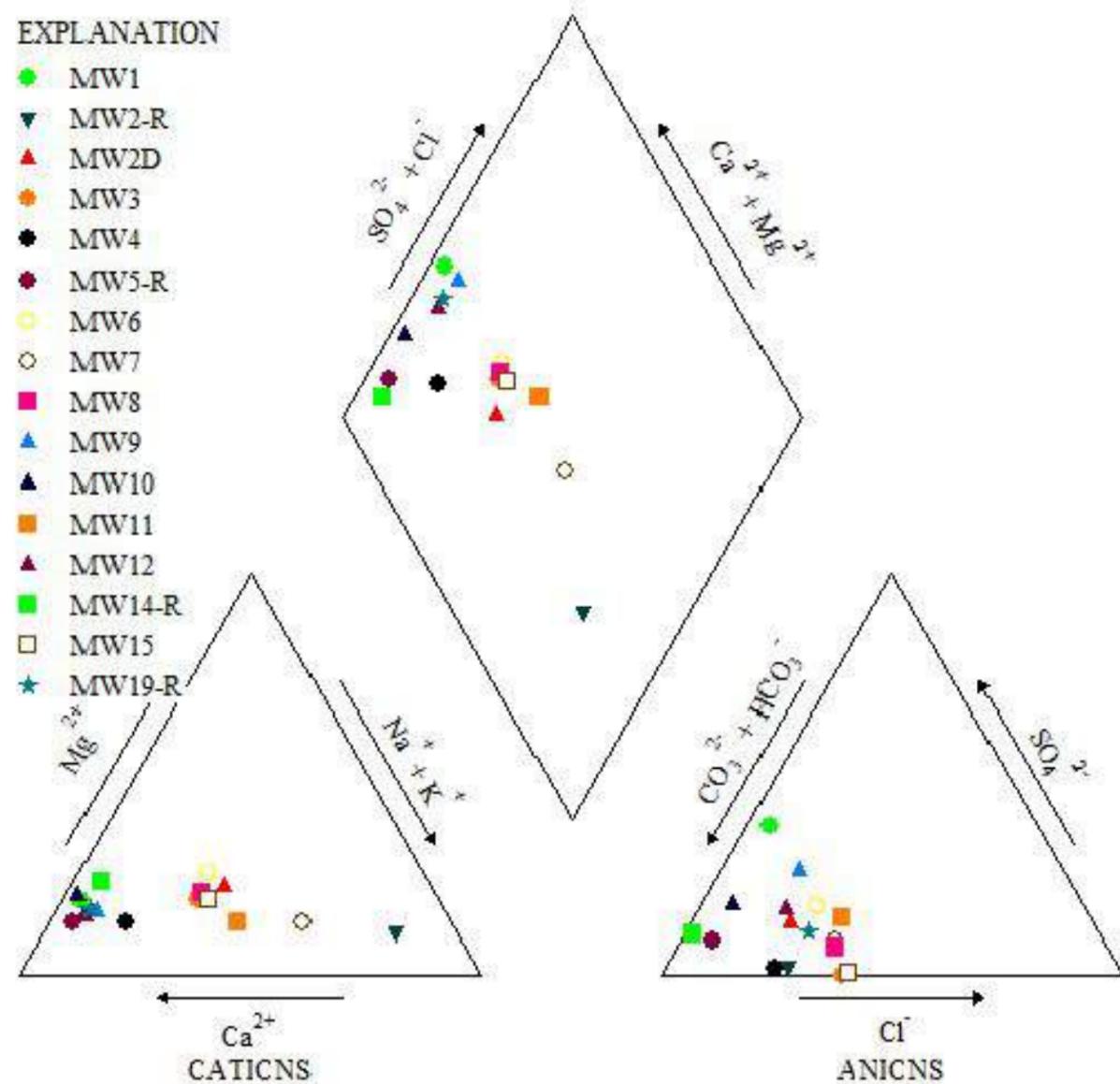
TITLE
**GROUNDWATER CHEMISTRY
 FALL 2018**

BluMetric Environmental
 171 Victoria Street North
 Kitchener, Ontario N2H 5C5
 TEL: (519) 742-6685 FAX: (519) 742-9810
 Email: info@blumetric.ca
 Web: http://www.blumetric.ca

PROJECT #	180351	DATE	2019-03-28
DRAWN	WC	CHECKED	SS
DWG NO.	10	REV	0

EXPLANATION

- MW1
- ▼ MW2-R
- ▲ MW2D
- MW3
- MW4
- MW5-R
- MW6
- MW7
- MW8
- ▲ MW9
- ▲ MW10
- MW11
- ▲ MW12
- MW14-R
- MW15
- ★ MW19-R



LEGEND

1				
REV.	DESCRIPTION	YY/MM/DD	BY	CHK

REFERENCES
 PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

CLIENT
 MUNICIPALITY OF WEST ELGIN
 RODNEY, ON

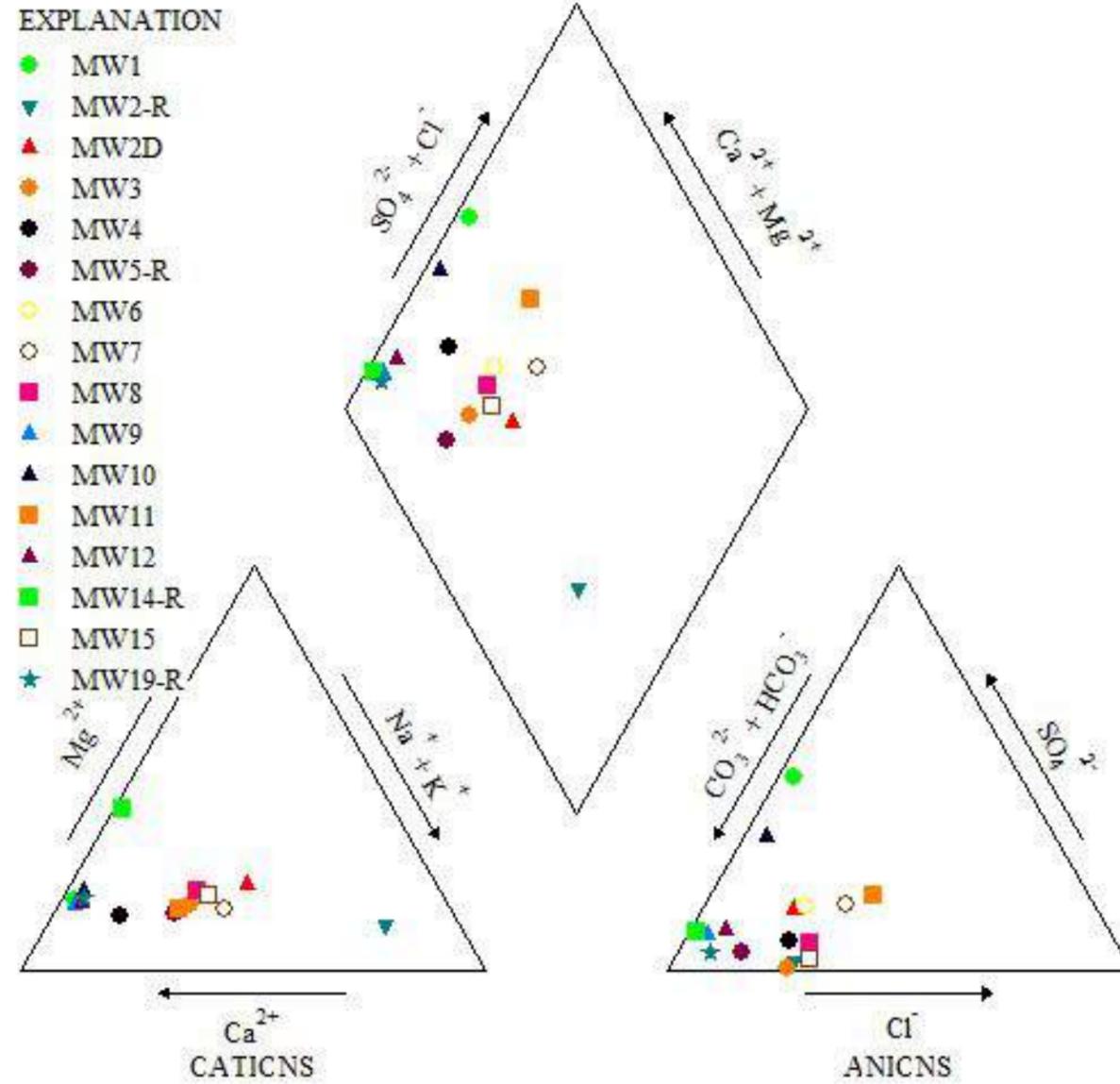
PROJECT
 2018 SITE OPERATIONS

TITLE
 TRI-LINEAR PLOT MAY 2018



171 Victoria Street North
 Kitchener, Ontario N2H 5C5
 TEL: (519) 742-6685 FAX: (519) 742-9810
 Email: info@blumetric.ca
 Web: http://www.blumetric.ca

PROJECT #	DATE		
180351	2019-03-28		
DRAWN	CHECKED	DWG NO.	REV
WC	SS	11	0



LEGEND

1				
REV.	DESCRIPTION	YY/MM/DD	BY	CHK

REFERENCES
 PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

CLIENT
 MUNICIPALITY OF WEST ELGIN
 RODNEY, ON

PROJECT
 2018 SITE OPERATIONS

TITLE
 TRI-LINEAR PLOT SEPTEMBER 2018

BluMetric Environmental
 171 Victoria Street North
 Kitchener, Ontario N2H 5C5
 TEL: (519) 742-6685 FAX: (519) 742-9810
 Email: info@blumetric.ca
 Web: http://www.blumetric.ca

PROJECT #	DATE			
180351	2019-03-28			
DRAWN	CHECKED	DWG NO.	REV	
WC	SS	12	0	



LEGEND

--- APPROXIMATE PROPERTY BOUNDARY

1				
REV.	DESCRIPTION	YY/MM/DD	BY	CHK

REFERENCES

PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

1:1000 0 m 10 m 20 m 30 m 40 m 50 m

THIS SCALE TO BE USED TO OBTAIN APPROXIMATE DIMENSIONS FOR INFORMATION

CLIENT

MUNICIPALITY OF WEST ELGIN

PROJECT

2018 SITE OPERATIONS

TITLE

2016 UAV SURVEY

BluMetric™
Environmental

171 Victoria Street North
Kitchener, Ontario N2H 5C5
TEL: (519) 742-6685
FAX: (519) 742-9810
Email: info@blumetric.ca
Web: http://www.blumetric.ca

PROJECT #	DATE		
180351	2019-03-28		
DRAWN	CHECKED	DWG NO.	REV
IB	SS	13	0



LEGEND

— — — — — APPROXIMATE PROPERTY BOUNDARY

1				
REV.	DESCRIPTION	YY/MM/DD	BY	CHK

REFERENCES

PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

1:1000 0 m 10 m 20 m 30 m 40 m 50 m

THIS SCALE TO BE USED TO OBTAIN APPROXIMATE DIMENSIONS FOR INFORMATION

CLIENT

MUNICIPALITY OF WEST ELGIN

PROJECT

2018 SITE OPERATIONS

TITLE

FINAL DESIGN COTOURS

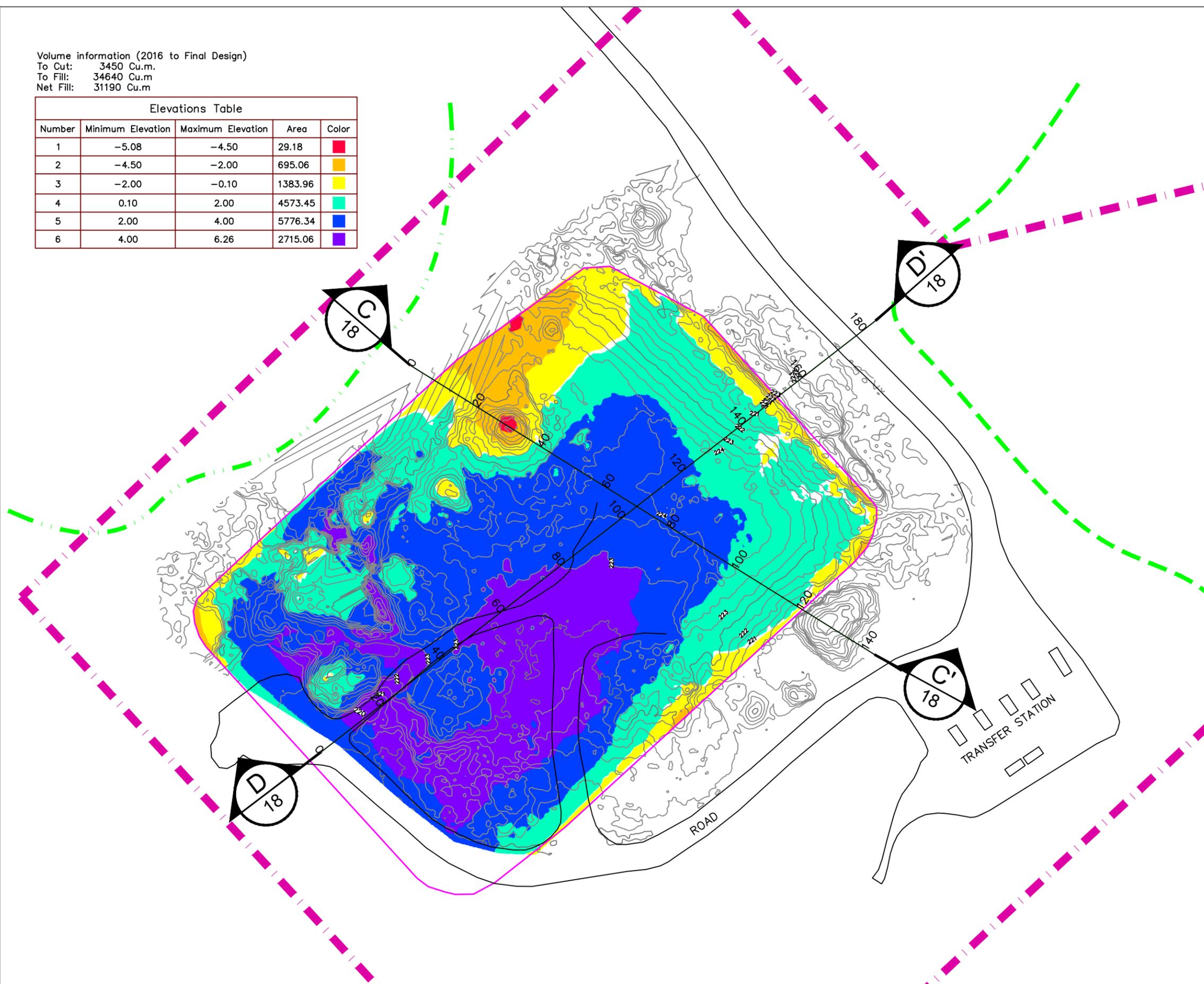
BluMetric™
Environmental

171 Victoria Street North
Kitchener, Ontario N2H 5C5
TEL: (519) 742-6685
FAX: (519) 742-9810
Email: info@blumetric.ca
Web: http://www.blumetric.ca

PROJECT #	DATE		
180351	2019-03-28		
DRAWN	CHECKED	DWG NO.	REV
IB	SS	14	0

Volume information (2016 to Final Design)
 To Cut: 3450 Cu.m.
 To Fill: 34640 Cu.m
 Net Fill: 31190 Cu.m

Elevations Table				
Number	Minimum Elevation	Maximum Elevation	Area	Color
1	-5.08	-4.50	29.18	Red
2	-4.50	-2.00	695.06	Orange
3	-2.00	-0.10	1383.96	Yellow
4	0.10	2.00	4573.45	Light Green
5	2.00	4.00	5776.34	Blue
6	4.00	6.26	2715.06	Purple

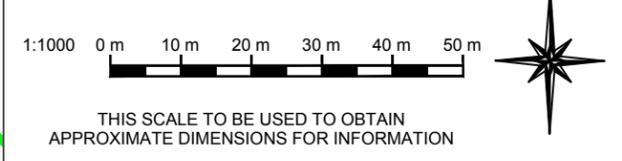


LEGEND

- APPROXIMATE FINAL DESIGN LANDFILL FOOTPRINT
- ACCESS ROADS
- APPROXIMATE PROPERTY BOUNDARY
- APPROXIMATE LIMIT OF WETLAND BOUNDARY
- APPROXIMATE LIMIT OF PROVINCIALLY SIGNIFICANT WETLAND

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES
 PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.



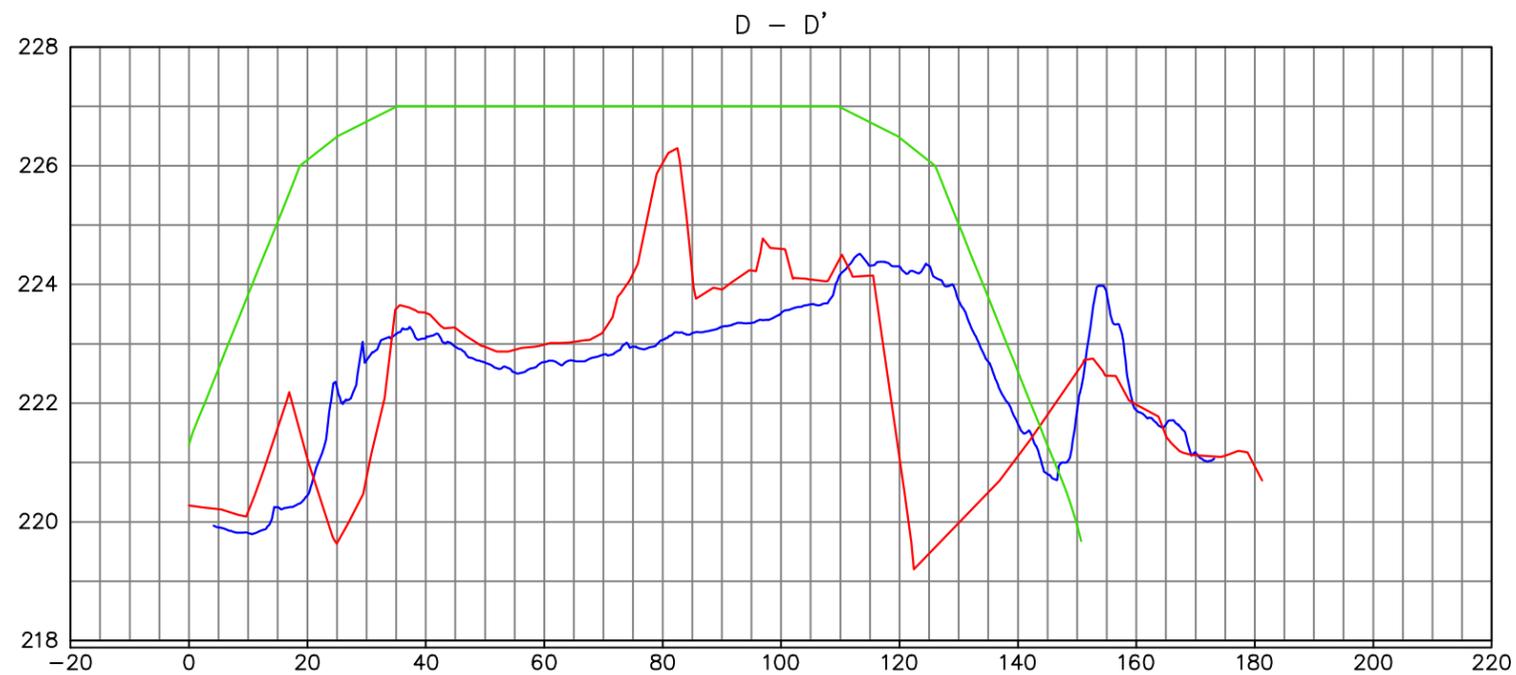
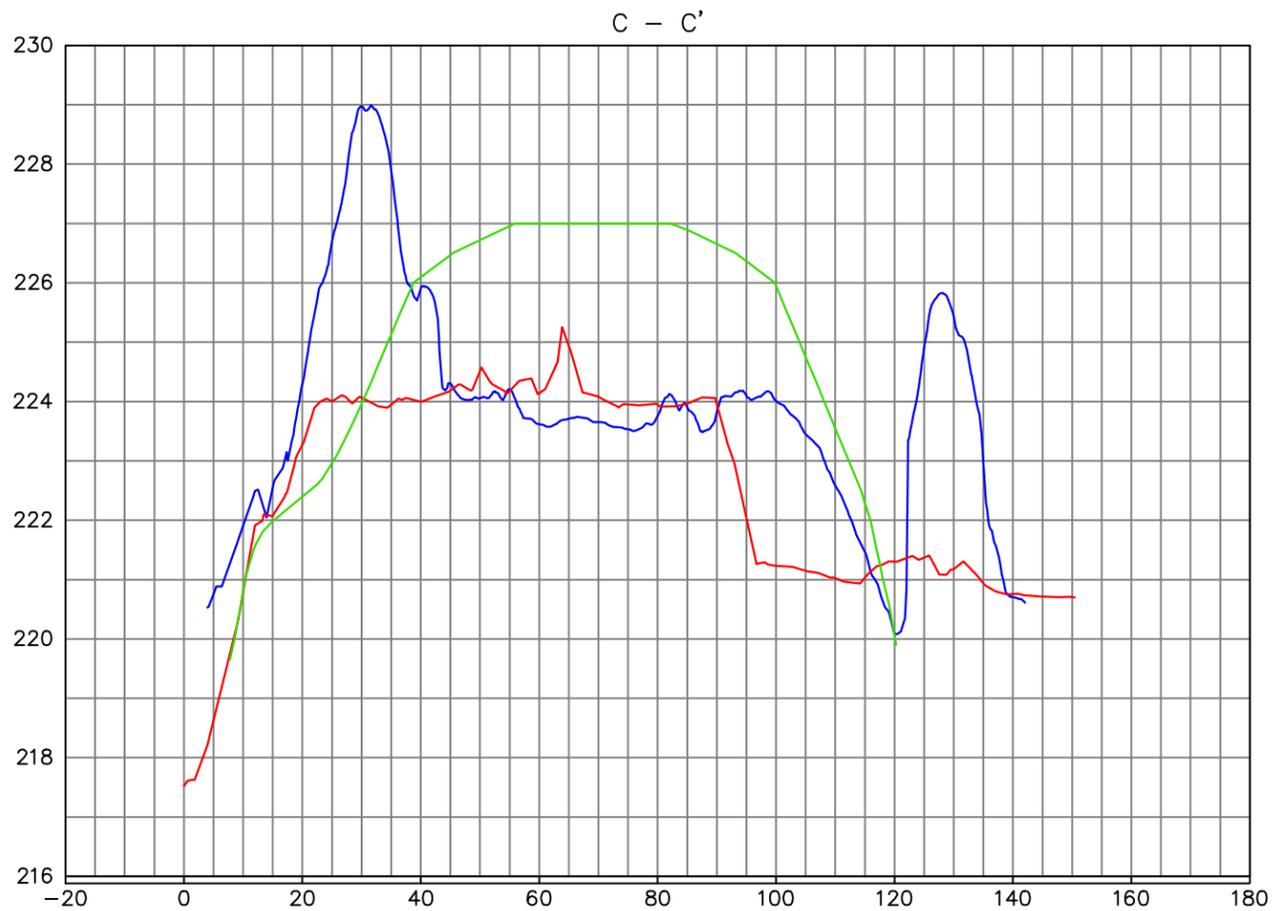
CLIENT
MUNICIPALITY OF WEST ELGIN

PROJECT
 2018 SITE OPERATIONS

TITLE
 VOLUMETRIC CALCULATION
 UAV SURVEY 2016 VS FINAL DESIGN

171 Victoria Street North
 Kitchener, Ontario N2H 5C5
 TEL: (519) 742-6685
 FAX: (519) 742-9810
 Email: info@blumetric.ca
 Web: http://www.blumetric.ca

PROJECT #	180351	DATE	2019-03-28
DRAWN	IB	CHECKED	SS
DWG NO.	15	REV	0



LEGEND

- 2010 GPS SURVEY
- 2016 UAV SURVEY
- FINAL DESIGN

1				
REV.	DESCRIPTION	YY/MM/DD	BY	CHK

REFERENCES
 PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

Vertical Exaggeration: 10x

CLIENT
 MUNICIPALITY OF WEST ELGIN

PROJECT
 2018 SITE OPERATIONS

TITLE
 CROSS SECTIONS

171 Victoria Street North
 Kitchener, Ontario N2H 5C5
 TEL: (519) 742-6685
 FAX: (519) 742-9810
 Email: info@blumetric.ca
 Web: http://www.blumetric.ca

PROJECT # 180351		DATE 2019-03-28	
DRAWN IB	CHECKED SS	DWG NO. 16	REV 0

APPENDIX A

Competent Environmental Practitioner Checklist



Appendix D-Monitoring and Screening Checklist General Information and Instructions

General Information: The checklist is to be completed, and submitted with the Monitoring Report.

Instructions: A complete checklist consists of:

- (a) a completed and signed checklist, including any additional pages of information which can be attached as needed to provide further details where indicated.
- (b) completed contact information for the Competent Environmental Practitioner (CEP)
- (c) self-declaration that CEP(s) meet(s) the qualifications as set out below and in Section 1.2 of the Technical Guidance Document.

Definition of Groundwater CEP:

For groundwater, the CEP must have expertise in hydrogeology and meet one of the following:

- (a) the person holds a licence, limited licence or temporary licence under the *Professional Engineers Act*; or
- (b) the person holds a certificate of registration under the *Professional Geoscientists Act, 2000* and is a practicing member, temporary, member or limited member of the Association of Professional Geoscientists of Ontario. O. Reg. 66/08, s. 2.

Definition of Surface water CEP:

A CEP for surface water assessments is a scientist, professional engineer or professional geoscientist as described in (a) and (b) above with demonstrated experience and post-secondary education, either a diploma or degree, in hydrology, aquatic ecology, limnology, aquatic biology, physical geography with specialization in surface water, and/or water resource management.

The type of scientific work that a CEP performs must be consistent with that person's education and experience. If an individual has appropriate training and credentials in both groundwater and surface water and is responsible for both areas of expertise, the CEP may then complete and validate both sections of the checklist.

Monitoring Report and Site Information	
Waste Disposal Site (WDS) Name	Municipality of West Elgin Landfill Site
Location (e.g. street address, lot, concession)	20385 Downie Line, Rodney, Ontario, Lot B, Concession 7, Former Township of Aldborough, West Elgin Municipality, County of Elgin
GPS Location (taken within the property boundary at front gate/ front entry)	Source: GoogleEarth 17 T 439337.53mE, 4710784.20mN elev. 213m
Municipality	West Elgin
Client and/or Site Owner	The Corporation of the Municipality of West Elgin
Monitoring Period (Year)	2018
This Monitoring Report is being submitted under the following:	
Environmental Compliance Approval (ECA) Number (formerly "Certificate of Approval" (C of A)) :	A051101
Director's Order No.:	n/a
Provincial Officer's Order No.:	n/a

Other:	n/a		
Report Submission Frequency	<input checked="" type="radio"/> Annual <input type="radio"/> Other	Specify (Type Here):	
The site is: (Operation Status)	<input checked="" type="radio"/> Open <input type="radio"/> Inactive <input type="radio"/> Closed		
Is there an active waste transfer station at the site?	<input checked="" type="radio"/> Yes <input type="radio"/> No		
Does this WDS have a Closure Plan?	<input checked="" type="radio"/> Not yet submitted <input type="radio"/> Submitted and under review <input type="radio"/> Submitted and approved		
Total Approved Capacity	106110	Units	Cubic Metres
Maximum Approved Fill Rate		Units	
Total Waste Received within Monitoring Period (Year)	1,204	Units	Tonnes
Total Waste Received within Monitoring Period (Year) <i>Describe the methodology used to determine this quantity</i>	Estimated		
Estimated Remaining Capacity	25,231	Units	Cubic Metres
Estimated Remaining Capacity <i>Describe the methodology used to determine this quantity</i>	Weight to compaction ratio		
Estimated Remaining Capacity <i>Date Last Determined</i>	12/31/2018		
Non-Hazardous Approved Waste Types	<input checked="" type="checkbox"/> Domestic <input checked="" type="checkbox"/> Industrial, Commercial & Institutional (IC&I) <input type="checkbox"/> Source Separated Organics (Green Bin) <input checked="" type="checkbox"/> Tires	<input type="checkbox"/> Contaminated Soil <input checked="" type="checkbox"/> Wood Waste <input checked="" type="checkbox"/> Blue Box Material <input type="checkbox"/> Processed Organics <input checked="" type="checkbox"/> Leaf and Yard Waste	<input type="checkbox"/> Food Processing/Preparation Operations Waste <input type="checkbox"/> Hauled Sewage Other: <input type="text"/>
Subject Waste Approved Waste Classes: Hazardous & Liquid Industrial <i>(separate waste classes by comma)</i>			

Year Site Opened <i>(enter the Calendar Year only)</i>	1971	Current ECA Issue Date	11-Apr-2012
Is your Site required to submit Financial Assurance?		<input type="radio"/> Yes <input checked="" type="radio"/> No	
Describe how your WDS is designed.		<input checked="" type="radio"/> Natural Attenuation only <input type="radio"/> Fully engineered Facility <input type="radio"/> Partially engineered Facility	
Does your Site have an approved Contaminant Attenuation Zone?		<input checked="" type="radio"/> Yes <input type="radio"/> No	
If closed, specify ECA, control or authorizing document closure date:		Select Date	
Has the nature of the operations at the site changed during this monitoring period?	<input type="radio"/> Yes <input checked="" type="radio"/> No		
If yes, provide details:			

<p>Have any measurements been taken since the last reporting period that indicate landfill gas volumes have exceeded the MOE limits for subsurface or adjacent buildings? (i.e. exceeded the LEL for methane)</p>	<p><input type="radio"/> Yes</p> <p><input checked="" type="radio"/> No</p>
---	---

Groundwater WDS Verification:

Based on all available information about the site and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

<p>1) The monitoring program continues to effectively characterize site conditions and any groundwater discharges from the site. All monitoring wells are confirmed to be in good condition and are secure:</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p>	<p>If no, list exceptions (Type Here):</p>
---	---	--

<p>2) All groundwater, leachate and landfill gas sampling and monitoring for the monitoring period being reported on was successfully completed as required by ECA or other relevant authorizing/control document(s):</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p> <p><input type="radio"/> Not Applicable</p>	<p>If no, list exceptions below or attach information.</p>
---	---	--

Groundwater Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date
		<p>Select Date</p>

		Select Date
		Select Date
3) a) Some or all groundwater, leachate and landfill gas sampling and monitoring requirements have been established or defined outside of a ministry ECA, authorizing, or control document.	<input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Not Applicable	
b) If yes, the sampling and monitoring identified under 3(a) for the monitoring period being reported on was successfully completed in accordance with established protocols, frequencies, locations, and parameters developed as per the Technical Guidance Document:	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Applicable	If no, list exceptions below or attach additional information.
Groundwater Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date
		Select Date
		Select Date
		Select Date
		Select Date

<p>4) All field work for groundwater investigations was done in accordance with Standard Operating Procedures (SOP) as established/outlined per the Technical Guidance Document (including internal/external QA/QC requirements) (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> No</p>	<p>If no, specify (Type Here):</p>
<p>Sampling and Monitoring Program Results/WDS Conditions and Assessment:</p>		
<p>5) The site has an adequate buffer, Contaminant Attenuation Zone (CAZ) and/or contingency plan in place. Design and operational measures, including the size and configuration of any CAZ, are adequate to prevent potential human health impacts and impairment of the environment.</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> No</p>	
<p>6) The site meets compliance and assessment criteria.</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> No</p>	
<p>7) The site continues to perform as anticipated. There have been no unusual trends/changes in measured leachate and groundwater levels or concentrations.</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> No</p>	<p>If no, list exceptions and explain reason for increase/change (Type Here):</p>

<p>1) Is one or more of the following risk reduction practices in place at the site:</p> <p>(a) There is minimal reliance on natural attenuation of leachate due to the presence of an effective waste liner and active leachate collection/ treatment; or</p> <p>(b) There is a predictive monitoring program in-place (modeled indicator concentrations projected over time for key locations); or</p> <p>(c) The site meets the following two conditions (typically achieved after 15 years or longer of site operation):</p> <p>i. The site has developed stable leachate mound(s) and stable leachate plume geometry/ concentrations; and</p> <p>ii. Seasonal and annual water levels and water quality fluctuations are well understood.</p>	<p><input type="radio"/> Yes</p> <p><input checked="" type="radio"/> No</p>	<p>Note which practice(s):</p>	<p><input type="checkbox"/> (a)</p> <p><input type="checkbox"/> (b)</p> <p><input type="checkbox"/> (c)</p>
--	---	--------------------------------	---

<p>9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p> <p><input type="radio"/> Not Applicable</p>	<p>Alkalinity in MW1 and DOC in MW12 exceeded 75% of the RUL over three (3) consecutive monitoring events resulting in an early warning Tier 1 alert. This initiated the Tier 2 Assessment. Time-concentration graphs do not indicate increasing trends in LIPs and Tier 3 Monitoring is not recommended at these wells.</p>
--	---	--

Groundwater CEP Declaration:

I am a licensed professional Engineer or a registered professional geoscientist in Ontario with expertise in hydrogeology, as defined in Appendix D under Instructions. Where additional expertise was needed to evaluate the site monitoring data, I have relied on individuals who I believe to be experts in the relevant discipline, who have co-signed the compliance monitoring report or monitoring program status report, and who have provided evidence to me of their credentials.

I have examined the applicable Environmental Compliance Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended), and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to ISO/IEC 17025:2005 (E)- General requirements for the competence of testing and calibration laboratories, or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature and will be rectified for the next monitoring/reporting period. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

No changes to the
 monitoring program are
recommended

The following change(s) to
 the monitoring program is/
are recommended:

No Changes to site design
 and operation are
recommended

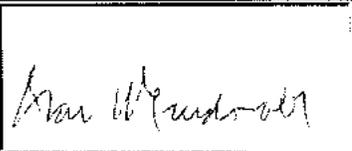
The following change(s) to
 the site design and
operation is/are
recommended:

Name:

Ian Macdonald, M.Sc., P.Geo.

Seal:



Signature:		Date:	26-Apr-2019
CEP Contact Information:	Ian Macdonald, M.Sc., P.Geo.		
Company:	BluMetric Environmental Inc.		
Address:	171 Victoria Street North Kitchener, ON N2H 5C5		
Telephone No.:	(519) 742-6685 x212	Fax No.:	(519) 742-9810
E-mail Address:	imac@blumetric.ca		
Co-signers for additional expertise provided:			
Signature:		Date:	Select Date
Signature:		Date:	Select Date
Surface Water WDS Verification:			
Provide the name of surface water body/bodies potentially receiving the WDS effluent and the approximate distance to the waterbody (including the nearest surface water body/bodies to the site):			
Name (s)			

Distance(s)	
--------------------	--

Based on all available information and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

1) The current surface water monitoring program continues to effectively characterize the surface water conditions, and includes data that relates upstream/background and downstream receiving water conditions:	<input checked="" type="radio"/> Yes <input type="radio"/> No	If no, identify issues (Type Here):
--	--	-------------------------------------

2) All surface water sampling for the monitoring period being reported was successfully completed in accordance with the ECA or relevant authorizing/control document(s) (if applicable):	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not applicable	If no, specify below or provide details in an attachment.
--	--	---

Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date
		Select Date
		Select Date
		Select Date
		Select Date

3) a) Some or all surface water sampling and monitoring program requirements for the monitoring period have been established outside of a ministry ECA or authorizing/control document.	<input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Not Applicable
--	--

b) If yes, all surface water sampling and monitoring identified under 3 (a) was successfully completed in accordance with the established program from the site, including sampling protocols, frequencies, locations and parameters) as developed per the Technical Guidance Document:	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Applicable	If no, specify below or provide details in an attachment.
--	--	---

Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date
		Select Date
		Select Date
		Select Date
		Select Date

<p>4) All field work for surface water investigations was done in accordance with SOP, including internal/external QA/QC requirements, as established/outlined as per the Technical Guidance Document, MOE 2010, or as amended. (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p>	<p>If no, specify (Type Here):</p>
--	---	------------------------------------

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

<p>5) The receiving water body meets surface water-related compliance criteria and assessment criteria: i.e., there are no exceedances of criteria, based on MOE legislation, regulations, Water Management Policies, Guidelines and Provincial Water Quality Objectives and other assessment criteria (e.g., CWQGs, APVs), as noted in Table A or Table B in the Technical Guidance Document (Section 4.6):</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p>
--	---

If no, list parameters that exceed criteria outlined above and the amount/percentage of the exceedance as per the table on the following page or provide details in an attachment:

Parameter	Compliance or Assessment Criteria or Background	Amount by which Compliance or Assessment Criteria or Background Exceeded
e.g. Nickel	e.g. ECA limit, PWQO, background	e.g. X% above PWQO
<p>6) In my opinion, any exceedances listed in Question 5 are the result of non-WDS related influences (such as background, road salting, sampling site conditions)?</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p>	<p>If yes, specify (Type Here)</p>

<p>7) All monitoring program surface water parameter concentrations fall within a stable or decreasing trend. The site is not characterized by historical ranges of concentrations above assessment and compliance criteria.</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p>	<p>If no, list parameters and stations that is outside the expected range. Identify whether parameter concentrations show an increasing trend or are within a high historical range (Type Here)</p>
<p>8) For the monitoring program parameters, does the water quality in the groundwater zones adjacent to surface water receivers exceed assessment or compliance criteria (e.g., PWQOs, CWQGs, or toxicity values for aquatic biota (APVs)):</p>	<p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p> <p><input type="radio"/> Not Known</p> <p><input checked="" type="radio"/> Not Applicable</p>	<p>If yes, provide details and whether remedial measures are necessary (Type Here)</p>
<p>9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):</p>	<p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p> <p><input checked="" type="radio"/> Not Applicable</p>	<p>If yes, list value(s) that are/have been exceeded and follow-up action taken (Type Here)</p>

Surface Water CEP Declaration:

I, the undersigned hereby declare that I am a Competent Environmental Practitioner as defined in Appendix D under Instructions, holding the necessary level of experience and education to design surface water monitoring and sampling programs, conduct appropriate surface water investigations and interpret the related data as it pertains to the site for this monitoring period.

I have examined the applicable Environmental Compliance Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended) and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to ISO/IEC 17025:2005 (E)- General requirements for the competence of testing and calibration laboratories, or as amended from time to time by the ministry.

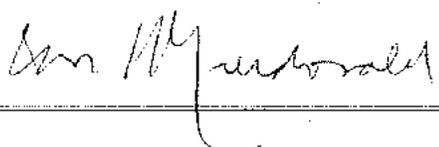
If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature or will be rectified for future monitoring events. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

Select Date

Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

<p><input checked="" type="radio"/> No Changes to the monitoring program are recommended</p> <p><input type="radio"/> The following change(s) to the monitoring program is/are recommended:</p>	
<p><input checked="" type="radio"/> No changes to the site design and operation are recommended</p> <p><input type="radio"/> The following change(s) to the site design and operation is/are recommended:</p>	

CEP Signature		
Relevant Discipline		
Date:	26-Apr-2019	
CEP Contact Information:	Ian Macdonald, M.Sc., P.Geo.	
Company:	BluMertic Environmental Inc.	
Address:	171 Victoria Street North Kitchener, ON N2H 5C5	
Telephone No.:	(519) 742-6685 x212	
Fax No. :	(519) 742-9810	
E-mail Address:	imac@blumetric.ca	
Save As		Print Form

APPENDIX B

Environmental Compliance Approval and Amendments, MOE Communications



C. 06.01.26.
C5



Ontario

Ministry of the Environment
Ministère de l'Environnement

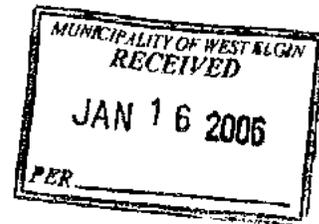
AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE

NUMBER A051101

Notice No. 1

Issue Date: December 21, 2005

The Corporation of the Municipality of West Elgin
22413 Hoskins Line, Box 490
Rodney, Ontario
N0L 2C0



Site Location: Rodney Landfill - West Elgin Landfill
Lot B, Concession Conc. 7 former twp. Aldborough
West Elgin Municipality, County of Elgin

You are hereby notified that I have amended Provisional Certificate of Approval No. A051101 issued on July 16, 1980 for a 3.2 hectare landfilling site, being known as the Rodney Landfilling Site, as follows:

I. Definitions

The following Definitions are hereby added to the Certificate:

- a) "Certificate" means this Provisional Certificate of Approval including all Notices of Amendment;
- b) "Director" means Director, Section 39, Environmental Protection act, R.S.O. 1990, C.E-19 as amended;
- c) "District Manager" means the District Manager in the London District Office, Southwestern Region, Ontario Ministry of the Environment;
- d) "EPA" means the Environmental Protection Act, R.S.O. 1990, C.E-19 as amended;
- e) "Ministry" means the Ontario Ministry of the Environment;
- f) "Ontario Regulation 101/94" means Ontario Regulation 101/94 – Recycling and Composting of Municipal Waste, as made under the Act;
- g) "Owner" means the Corporation of the Municipality of West Elgin;
- h) "OWRA" mean the Ontario Water Resource Act, R.S.O 1990, Chapter O.40;

- i) "Reasonable Use Guideline" means the Ministry Guideline B-7 entitled "Incorporation of the Reasonable Use Concept into MOE Groundwater Management Activities, dated April 1994, as amended;
- j) "Regulation 347" means Ontario Regulation 347 R.R.O. 1990 as amended from time to time; and,
- k.) "Site" means the Rodney Landfill (West Elgin Landfill) located at Lot B, Concession Conc. 7 in the West Elgin Municipality, County of Elgin.

The following Conditions are hereby added:

II. General

- 2. Except as otherwise provided by these conditions, the Site shall be designed, developed, used, maintained and operated, and all facilities, equipment and fixtures shall be built and installed, in accordance with the documentation, and plans and specifications listed in Schedule "A".
- 3. The requirements specified in this Provisional Certificate of Approval are the requirements under the **Environmental Protection Act**, R.S.O. 1990. The issuance of this Provisional Certificate of Approval in no way abrogates the Applicant's legal obligations to take all reasonable steps to avoid violating other applicable provisions of this legislation and other legislation and regulations.
- 4. The requirements of this Provisional Certificate of Approval are severable. If any requirement of this Provisional Certificate of Approval, or the application of any requirement of this Provisional Certificate of Approval to any circumstance, is held invalid, the application of such requirement to other circumstances and the remainder of this Provisional Certificate of Approval shall not be affected in any way.
- 5. The Applicant shall ensure compliance with all the terms and conditions of this Provisional Certificate of Approval. Any non-compliance constitutes a violation of the **Environmental Protection Act**, R.S.O. 1990 and is grounds for enforcement.
- 6. (a) The Applicant shall, forthwith upon request of the Director, District Manager, or Provincial Officer (as defined in the Act), furnish any information requested by such persons with respect to compliance with this Provisional Certificate of Approval, including but not limited to, any records required to be kept under this Provisional Certificate of Approval; and
(b) In the event the Applicant provides the Ministry with information, records, documentation or notification in accordance with this Provisional Certificate of Approval (for the purposes of this condition referred to as "Information"),
 - (i) the receipt of Information by the Ministry;
 - (ii) the acceptance by the Ministry of the Information's completeness or accuracy; or

- (iii) the failure of the Ministry to prosecute the Applicant, or to require the Applicant to take any action, under this Provisional Certificate of Approval or any statute or regulation in relation to the Information;

shall not be construed as an approval, excuse or justification by the Ministry of any act or omission of the Applicant relating to the Information, amounting to non-compliance with this Provisional Certificate of Approval or any statute or regulation.

- 7. The Applicant shall allow Ministry personnel, or a Ministry authorized representative(s), upon presentation of credentials, to:

- (a) carry out any and all inspections authorized by Section 156, 157 or 158 of the Environmental Protection Act, R.S.O. 1990, Section 15, 16 or 17 of the Ontario Water Resources Act, R.S.O. 1990, or Section 19 or 20 of the Pesticides Act, R.S.O. 1990, as amended from time to time, of any place to which this Provisional Certificate of Approval relates; and,

without restricting the generality of the foregoing, to:

- (b)
 - (i) enter upon the premises where the records required by the conditions of this Provisional Certificate of Approval are kept;
 - (ii) have access to and copy, at reasonable times, any records required by the conditions of this Provisional Certificate of Approval;
 - (iii) inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations required by the conditions of this Provisional Certificate of Approval; and
 - (iv) sample and monitor at reasonable times for the purposes of assuring compliance with the conditions of this Provisional Certificate of Approval.

- 8. (a) Where there is a conflict between a provision of any document referred to in Schedule "A", and the conditions of this Provisional Certificate of Approval, the conditions in this Provisional Certificate of Approval shall take precedence; and

- (b) Where there is a conflict between documents listed in Schedule "A", the document bearing the most recent date shall prevail.

- 9. The Applicant shall ensure that all communications/correspondence made pursuant to this Provisional Certificate of Approval includes reference to the Provisional Certificate of Approval number.

- 10. The Applicant shall notify the Director in writing of any of the following changes within thirty (30) days of the change occurring:

- a) change of Applicant or operator of the Site or both;
- b) change of address or address of the new Applicant;

- c) change of partners where the Applicant or operator is or at any time becomes a partnership, and a copy of the most recent declaration filed under the **Business Names Act**, 1991 shall be included in the notification to the Director;
- d) any change of name of the corporation where the Applicant or operator is or at any time becomes a corporation, and a copy of the most current "Initial Notice or Notice of Change" (form 1 or 2 of O. Reg. 182, Chapter C-39, R.R.O. 1990 as amended from time to time), filed under the **Corporations Information Act** shall be included in the notification to the Director; and
- e) change in directors or officers of the corporation where the Applicant or operator is or at any time becomes a corporation, and a copy of the most current "Initial Notice or Notice of Change" as referred to in 9(d).

- 11. In the event of any change in ownership of the Site, the Applicant shall notify, in writing, the succeeding owner of the existence of this Provisional Certificate of Approval, and a copy of such notice shall be forwarded to the Director.
- 12. Any information relating to this Provisional Certificate of Approval and contained in Ministry files may be made available to the public in accordance with the provisions of the **Freedom of Information and Protection of Privacy Act**, R.S.O. 1990, C. F-31.

III. Design and Operation

- 13. By no later than **September 1, 2006**, the owner shall submit to the Director for approval, with copies to the District Manager, an Design, Operation and Maintenance Plan pertaining to current operation procedures for landfilling at the site. The plan shall include but not be limited to the following:
 - a) A plan(s) showing the site location, site plan, site condition and approved limits of wastes;
 - b) A description of the landfill design and landfill related features such as the following:
 - i. Landfill containment features (Engineered or natural attenuation)
 - ii. Leachate Collection System;
 - iii. Landfill Sideslopes
 - iv. Any on-site drains
 - v. Monitoring wells;
 - vi. Surface water drainage structures or features; and
 - vii. Utilities;
 - c) A discussion on the landfill service area, the type of waste accepted, waste inspection procedures, theoretical site capacity, the current volume of waste landfilled and the expected remaining life expectancy;
 - d) Site operation and maintenance procedures. These items include but not limited to the following:

- i) Hours of Operation;
- ii) Security/Access
- iii) Signage;
- iii) Burning of Materials;
- iv) Daily/Interim Cover Material;
- v) Recycling Operations;
- vi) Equipment and Buildings;
- vii) Litter Control
- viii) Dust and noise Control
- viii) Animal/Vector Control

- e) Schedule for inspections at the Site, including outdoor storage facilities;
- f) Description of leachate management plan for the site and contingency plan addressing leachate outbreaks or migration off-site;
- g) Description on the steps to be taken to address complaints at the site such as odours, dust, noise, vectors, vermin, rodents;
- h) Closure plans for the landfill including but not limited to the following:

- i. description of the end use for the landfill
- ii. drawings showing the final contours;
- iii. the final waste volume;
- iii. the thickness of the final cover; and
- iv. the material to be used for the final cover.

- 14. Any changes to the Site Design and Operation Manual shall be submitted to the District Manager prior to their implementation.
- 15. By no later than **September 1, 2006**, the Owner shall clearly stake the limit of the landfill;
- 16. A sign shall be posted in a prominent location at the Site entrance clearly stating the following:
 - i. Owner's name;
 - ii. Operator's name;
 - iii. Provisional Certificate of Approval No.;
 - iii. Type of Waste Accepted
 - iv. the hours of operation; and
 - v. Contact telephone number to call with complaints or in the event of an emergency.
- 17. Only clean wood and brush shall be permitted for burning. Burning of the materials shall be completed as per the Ministry of the Environment Guideline C-7 (Burning at Landfill Sites);
- 18. Daily cover shall be placed over the entire working face with a minimum thickness of 150 mm of soil cover or an approved thickness of alternative cover material at the end of every operating

week;

19. Intermediate Cover shall be placed in areas where landfilling has been temporarily discontinued for six (6) months or more. A minimum thickness of 300 mm of soil cover or an approved thickness of alternative cover material shall be placed;
20. The owner shall undertake weekly litter pick-up around the property, including the fenceline, wooded areas and any surface water bodies on the property;
21. Vector and vermin shall be controlled at the Site using a licensed exterminator;
22. Recycling activities shall be completed as per Ontario Regulation 101/94.
23. Recyclable materials shall be properly separated and each areas properly identified. The areas shall be kept in a neat and tidy manner;
24. All storage containers/bins used to store waste and/or recyclable materials shall be maintained in good condition to prevent leakage. The Owner shall immediately remove from service any leaking container. Containers/bins used to store clean scrap metal may be equipped with drainage holes to permit the drainage of rainwater;

IV. Record Keeping

25. The owner shall establish and maintain a written record of daily operations at the Site. This record shall be in the form of a log or a dedicated electronic file and it shall include as a minimum the following information:
 - a) date of record;
 - b) hours of operation;
 - c) an approximation of the type, amount and source of waste received;
 - d) an estimate on the amount (depending on item i.e. in tonnes or number of tires, appliances, batteries) of recyclable materials received at the Site;
26. The Owner shall establish and maintain a written record of all complaints received about the site and any environmental emergency situations that occur at the Site. This record shall be in the form of a log or a dedicated electronic file and it shall include, as a minimum, the following information:
 - a) Date and time of occurrence
 - b) type of the environmental emergency situation and the resulting environmental impact;
 - c) name, address and telephone number of the complainant;
 - d) actions taken to address the impact;
 - e) actions taken to prevent the re-occurrence of a similar emergency situation in the future; and

- f) method of reporting the incident to the MOE District Office.
27. The Owner shall establish and maintain a written record of the Site inspections. This record shall be in the form of a log or a dedicated electronic file and it shall include, as a minimum, the following information:
- a) date and time of inspection;
 - b) name, title and signature of trained personnel conducting the inspection; and
 - c) a listing of all equipment, fencing, signs, etc. inspected and any deficiencies observed; and
 - d) recommendations for remedial action and the completion date of such action.
28. The Owner shall establish and maintain a written record of all occurrences of receipt of unacceptable waste at the Site. This record shall be in the form of a log or a dedicated electronic file and it shall include, as a minimum, the following information:
- a) waste generator;
 - b) type of unacceptable waste;
 - c) an estimate on the amount of unacceptable waste;
 - d) nature of unacceptable waste;
 - e) steps taken to remove waste;
 - f) actions taken by the Owner to prevent recurrence; and
29. The Owner shall retain at the Site for a minimum of two (2) years from the date of their creation, or longer if requested in writing by the District Manager, all records and information relating to or resulting from the activities approved under this Certificate, and shall make all records and information available at all times for inspection by a Provincial Officer.

V. Environmental Monitoring Plan

30. By no later than **September 1, 2006**, the owner shall submit to the Director for approval, with copies to the District Manager, an groundwater and surface water monitoring program for the site. When developing the environmental monitoring plan, the owner shall consult with the District Office to discuss the location of the various monitoring stations. The plan shall include but not be limited to the following:
- i. a drawing showing the proposed sampling locations;
 - ii. parameters that shall be analyzed;
 - iii. the sampling frequency;
 - iv. the groundwater measurement, flow measurement and sampling protocols;

V. Annual Reporting

31. By no later than **April 30, 2007**, and by April 30 of every year thereafter, the proponent shall submit, to the MOE District Manager (London District Office), a site operation, ground and surface water monitoring report prepared by an qualified person. The report shall contain, but is

not limited to, the following information:

- a) a summary of type and quantity of incoming waste accepted during the reporting period;
- b) a summary of total amount of waste received at the site, remaining capacity and remaining life expectancy of the site;
- c) a summary of the site's operation procedure and compliance;
- d) a summary of recycling operations;
- e) a discussion and/or illustration on any changes that may have occurred in the current reporting period with regards to the landfill's hydrogeologic setting, potentially sensitive groundwater and/or surface water features or changes to the landfill. If no changes occur, then author shall reference appropriate Section(s) in previous reports to direct the reviewer to the existing information.
- f) Sampling protocols, and a description of any problems encountered during the sampling events which may have impacted the reliability of analytical results;
- g) The data shall be interpreted by the author(s) and presented in a manner that is acceptable to the Director. All analytical results for all parameters shall be presented in tabular form. All analytical results for the critical contaminants must be compared to the trigger levels in accordance with the environmental contingency plan;
- h) The report shall identify the "Reasonable Use" (Guideline B-7) of the ground water that is to be impacted. The report should also identify expected and worst-case impacts;
- i) The report shall include a comparison of the results of surface water sampling to the PWQOs or Interim PWQOs described in Water Management, MOEE, July 1994, as amended from time to time;
- j.) A discussion on the contaminant attenuation zone and buffer zone requirements;
- k.) QA/QC protocol must be described; and
- l.) The report shall have the conclusions and recommendations of the author(s), especially as they concern future sampling parameters, frequency and protocol.

The reason(s) for this amendment to the Certificate of Approval is (are) as follows:

1. *The reason for Conditions (2), (3), (4), (7), (8), (9), (10), (11) and (12) is to clarify the legal rights and responsibilities of the owner.*
2. *The reason for Condition (13) is added to ensure the owner has a Design, Operation and Maintenance plan for the landfill that reflects the current operations of the site. The condition is also to ensure the landfill is operated in accordance with Ministry standards, and to ensure the long-term protection of the health and safety of the public and the environment. Once approved the Plan shall be incorporated into the Certificate.*
3. *The reason for Condition (14) is to ensure any changes in the Design and Operations Plan are approved and incorporated into the Certificate.*
4. *The reason for Condition (15) is to ensure the limits of the landfill are clearly identified for the owner the Ministry.*

5. *The reasons for Condition (17), (18), (19), (20), and (21) are to ensure the landfill is operated in accordance with Ministry standards, and to ensure the long-term protection of the health and safety of the public and the environment.*
6. *The reasons for Conditions (22), (23), and (23) are to ensure the recycling operations are completed in accordance with Ministry Standards, and to ensure the long-term protection of the health and safety of the public and the environment.*
7. *The reasons for Condition (25), (26), (27), (28) and (29) are to ensure the monitoring and reporting are completed in accordance with Ministry standards, and to ensure the long-term protection of the health and safety of the public and the environment.*
8. *The reasons for Condition (30) are to ensure the owner has an established environmental monitoring plan for the site to ensure the long term health and safety of the public and the environment.*
9. *The reasons for Condition (31) are to ensure the owner submits an annual summary report to the Ministry so that the landfilling operation can be evaluated to ensure compliance with the Ministry's requirements on annual operations and monitoring. This is to ensure the long-term protection of the health and safety of the public and the environment.*

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A051101 dated July 16, 1980

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the waste disposal site is located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
2300 Yonge St., 12th Floor
P.O. Box 2382
Toronto, Ontario
M4P 1E4

AND

The Director
Section 39, *Environmental Protection Act*
Ministry of Environment and Energy
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

* Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca

The above noted waste disposal site is approved under Section 39 of the Environmental Protection Act.

DATED AT TORONTO this 21st day of December, 2005



Greg Washuta, P.Eng.
Director
Section 39, *Environmental Protection Act*

DG/
c: District Manager, MOE London - District
Norma Bryant, The Corporation of the Municipality of West Elgin

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER A051101

Notice No. 2

Issue Date: April 11, 2012

The Corporation of the Municipality of West Elgin
22413 Hoskins Line
Post Office Box, No. 490
Rodney, Ontario
N0L 2C0

Site Location: Rodney Landfill - West Elgin Landfill
911 address - 20385 on Downie Line
Lot B, Concession Conc. 7 former twp. Aldborough
West Elgin Municipality, County of Elgin

You are hereby notified that I have amended Approval No. A051101 issued on July 16, 1980 and amended on December 21, 2005 for a 3.2 hectare landfilling site, being known as the Rodney landfilling Site, as follows:

This Notice of Amendment updates the Approval for current Site Operations, and recognizes the new CAZ lands.

The following Definitions are added to the Approval:

- l) "Approval" means this Environmental Compliance Approval and any Schedules to it, including the application and supporting documentation listed in Schedule "A".

The following Conditions are added to the Approval:

Registration on Title for the Contaminant Attenuation Zone

32. The CAZ lands, as shown on figure 3, Extent of Contaminant Attenuation Zone (CAZ), in item 2 of Schedule "A" are hereby added to the Approval.
33. As ownership to the CAZ will be obtained in fee simple:
 - i) the Owner shall provide documentation evidencing ownership of the contaminant

- attenuation zone, by December 31, 2013;
- ii) the Owner shall provide two copies of a completed certificate of requirement(s) containing registerable descriptions of the contaminant attenuation zone;
 - iii) the Owner shall, within 10 calendar days of receiving the certificate of requirements(s) signed or authorized by the Director, register the certificate of requirement in the appropriate Land Registry Office on the title to the property;
 - iv) the Owner shall submit to the Director a duplicate registered copy of the certificate of requirement(s) within 10 calendar days of registration.

Service Area

34. The approved service area for the Site is the Municipality of West Elgin.

Waste Types

35. The following wastes are allowed for receipt at the Site:

- (i) Only solid non-hazardous waste shall be accepted at the Site for landfilling. No liquid industrial wastes or hazardous wastes as defined under O.Reg. 347 as amended shall be accepted at the Site.
- (ii) White goods may be stored as shown on Figure 12, Revised Site Layout, in item 1 of Schedule "A".
- (iii) Recyclable wastes, as listed in Schedules 1 through 3 of O.Reg. 101/94 may be stored and processed at the Site.

Site Capacity

36. The approved capacity of the Site, including waste, daily and intermediate cover, and excluding final cover, is **106,110 cubic metres**.

Operations

37. The Site shall be operated and maintained at all times, including management and disposal of all waste in accordance with the EPA, Regulation 347, and the conditions of this Approval. At no time shall the discharge of a contaminant that causes or is likely to cause an adverse effect be permitted.
38. Development of the landfill and disposal of waste shall only occur as described in the Phased Development Plan, and as shown on Figures 10 and 11, of item 1 of Schedule "A".
39. No waste shall be placed above the final contours shown on Figure 13, Final Waste Contours, of item 1 of Schedule "A".

Operating Hours

40. The normal operating hours of the Site shall be as follows:

April to November (inclusive)
Wednesday and Friday - 8:00 am to 5:00 pm

Saturday - 9:00am to 4:00 pm

December to March (inclusive)

Wednesday and Friday - 10:00 am to 5:00 pm

Saturday - 9:00 am to 4:00 pm

Landfill Gas

41. The Owner shall ensure that any buildings or structures at the Site that are founded on or below grade, contain adequate ventilation systems to relieve any possible landfill gas accumulation. Routine monitoring for methane gas levels shall be conducted in all buildings or structures at the site, especially enclosed structures that are at times, occupied by people.

Environmental Monitoring

42. The Owner shall ensure that the Site groundwater monitoring program, as described in Schedule "B" of this Approval, is implemented. No changes to the groundwater monitoring program shall be done without receiving prior written concurrence from the District Manager or an Approval from the Director.
43. All monitoring wells which are no longer required as part of the groundwater monitoring program, and have been approved by the District Manager for abandonment, shall be decommissioned by the Owner, as required, in accordance with O.Reg. 903, that will prevent contamination through the abandoned well. A report on the decommissioning of the well shall be included in the Annual Report for the period during which the well was decommissioned.
44. The Site subsurface gas monitoring program, as described in item 2 of Schedule "A", shall continue to be implemented at the Site. Results from the gas monitoring shall be included in the Site Annual Report, required in Condition 31.

Trigger Mechanism and Contingency Plans

45. Within one (1) year from the date of this Approval, the Owner shall submit to the Director, for approval, and copied to the District Manager, a groundwater trigger level and contingency plan, that also reflects the new CAZ limits.

Site Closure

46. At the earlier of two years prior to the anticipated date of Site closure, or when the Site has reached 90 percent of its final approved capacity, the Owner shall submit a final plan for the closure, long-term maintenance, long-term monitoring and after use of the Site to the Director for approval. The plan shall be developed in consultation with the public. The plan shall include, but not be limited to, the following:
- (a) plans for fencing and access control;
 - (b) details of any additional cover required;
 - (c) details of any vegetative cover required;

- (d) post-closure land use plans, including any further grading, filling or landscaping and the need for any structures;
- (e) the need for any municipal or provincial approvals that would be required to implement the proposed closure plan and the schedule for obtaining such approvals;
- (g) plans for the continued monitoring of groundwater and landfill gas;
- (h) updated contingency plans to mitigate potential impacts from leachate; and
- (i) details of post-closure ownership of the Site.

Schedule "A"

1. Report entitled "2006 Annual Site Monitoring and Operations Report, West Elgin Landfill Site, Municipality of West Elgin, Rodney, Ontario", dated August 2006, prepared by Water and Earth Science Associates Ltd.
2. Letter report dated July 28th, 2011, from S'rana Scholes, Karen Greer, WESA Inc, RE: West Elgin Landfill Site, Response to MOE Comments (MOE Reference Number 5963-85EJQ9), to Lynda Mulcahy, MOE,

Schedule "B"

WELL	SAMPLING FREQUENCY	ANALYTICAL PARAMETERS
All monitoring wells (MW1, MW2, MW2D, MW3, MW4, MW5, MW6, MW7, MW8, MW9, MW10, MW11, MW12, MW 14, MW 15) + QA/QC (1 duplicate for general chemistry and metals parameters and trip blank for VOC)	Bi-annually (Spring and Fall)	General Chemistry (Alkalinity, Ammonia, Colour, Conductivity, DOC, pH, TDS, Turbidity, Nitrate, Nitrite, Total Kjeldahl Nitrogen (TKN) Phosphorus, Sulfate, Chloride, Fluoride, Anion/ Cation Sum, Hardness, Ion Balance, Langelier Index and Saturation pH), General Metals (Al, Sb, As, Ba, Be, Bi, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, P, K, Se, Si, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn, Zr), and volatile organic compounds (VOCs). combustible gas

The reasons for this amendment to the Approval are as follows:

The reason for conditions 32 and 33 is to ensure that any persons having an interest in the Site are made aware that the land has been used as a CAZ.

The reason for condition 34 is to clarify what the service area boundary is for the Site. Only waste generated within this area may be received at the Site.

The reason for condition 35 is to clarify what waste types are approved to be received at the Site.

The reason for condition 36 is to clarify the approved maximum capacity for the Site.

The reasons for condition 37 are to ensure that the Site is operated and maintained in an environmentally acceptable manner and does not result in a hazard or nuisance to the natural environment or any person.

The reasons for conditions 38 and 39 is to ensure that the landfill is developed as planned and stated in the documents considered by the Director, and not in another manner.

The reason for condition 40 is to specify the approved operating hours for the Site.

The reason for condition 41 is to ensure that landfill gas does not cause a hazard to people or structures at the site.

The reason for conditions 42, and 44 are to require the Owner to demonstrate that the Site is performing as intended and impacts on the natural environment are acceptable. Regular monitoring allows for analysis of trends over time and ensures that there is an early warning of potential problems.

The reason for condition 43 is to ensure the integrity of the groundwater monitoring network so that monitoring can be performed and the natural environment protected.

The reason for condition 45 is to ensure the Owner has a plan with an organized set of procedures for identifying and responding to potential issues related to groundwater and surfacewater quality at the Site's compliance point.

The reason for condition 46 is to ensure that final closure of the Site is completed in an aesthetically pleasing manner, in accordance with Ministry standards, and to ensure the long-term protection of the health and safety of the public and the environment.

This Notice shall constitute part of the approval issued under Approval No. A051101 dated July 16, 1980

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

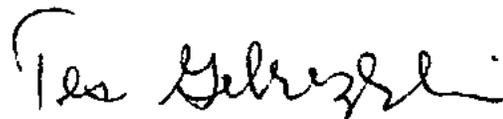
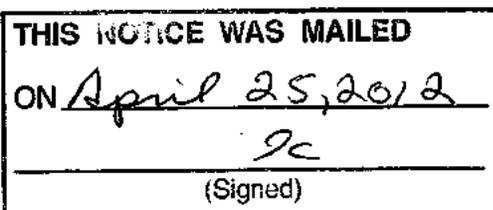
AND

The Director appointed for the purposes of
Part II.1 of the Environmental Protection Act
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 11th day of April, 2012



Tesfaye Gebrezghi, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

LM/

c: District Manager, MOE London - District
S'rana Scholes, P.Eng., WESA Inc. ✓
Karen Greer, MSc., P.Geo., WESA Inc.

OCT 19 2015

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER A051101

Issue Date: September 11, 2015

The Corporation of the Municipality of West Elgin
22413 Hoskins Line
Post Office Box, No. 490
Rodney, Ontario
N0L 2C0

Site Location: Rodney Landfill - West Elgin Landfill
911 address - 20385 on Downie Line
Lot B, Concession 7
West Elgin Municipality, County of Elgin

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

the use and operation of 3.2 hectare waste disposal/transfer site within a total site area of 6.6 hectares.

For the purpose of this environmental compliance approval, the following definitions apply:

"Approval " means this Environmental Compliance Approval and any Schedules to it, including the application and supporting documentation listed in Schedule "A";

"Contaminating Life Span" means contaminating life span as defined in Ontario Regulation 232/98;

"Director" means any *Ministry* employee appointed in writing by the Minister pursuant to section 5 of the EPA as a Director for the purposes of Part II.1 of the EPA;

"District Manager" means the District Manager of the local district office of the *Ministry* in which the *Site* is geographically located;

"EPA " means *Environmental Protection Act* , R.S.O. 1990, c. E. 19, as amended;

"Ministry" means the Ministry of the Environment and Climate Change;

"NMA " means *Nutrient Management Act* , 2002, S.O. 2002, c. 4, as amended;

"Operator" means any person, other than the *Owner's* employees, authorized by the *Owner* as having the charge, management or control of any aspect of the *Site* and includes its successors or assigns;

"Owner" means any person that is responsible for the establishment or operation of the *Site* being approved by this *Approval*, and includes the Corporation of the Municipality of West Elgin and its successors and assigns;

"OWRA " means the *Ontario Water Resources Act* , R.S.O. 1990, c. O.40, as amended;

"PA " means the *Pesticides Act* , R.S.O. 1990, c. P-11, as amended;

"Provincial Officer" means any person designated in writing by the Minister as a provincial officer pursuant to Section 5 of the *OWRA*, Section 5 of the *EPA*, Section 17 of the *PA*, Section 4 of the *NMA*, or Section 8 of the *SDWA*;

"Reasonable Use Guideline" means the Ministry Guideline B-7 entitled "Incorporation of the Reasonable Use Concept into MOE Groundwater Management Activities, dated April 1994, as amended;

"Refrigerant Appliances" means household appliances which use, or may use refrigerants, and which include, but is not restricted to, refrigerators, freezers and air-conditioning systems;

"Regional Director " means the Regional Director of the local Regional Office of the *Ministry* in which the *Site* is located;

"Regulation 347 " or "Reg. 347 " means Regulation 347, R.R.O. 1990, made under the *EPA*, as amended;

"SDWA" means *Safe Drinking Water Act*, 2002, S.O. 2002, c. 32, as amended;

"Site " means the entire waste disposal site, including the buffer lands, and contaminant attenuation zone at Rodney Landfill (West Elgin Landfill) located at Lot B, Concession 7 in the Municipality West Elgin, County of Elgin; and

"Trained Personnel" means personnel knowledgeable in the following through instruction and/or practice:

- a. relevant waste management legislation, regulations and guidelines;
- b. major environmental concerns pertaining to the waste to be handled;
- c. occupational health and safety concerns pertaining to the processes and wastes to be handled;
- d. management procedures including the use and operation of equipment for the processes and wastes to be handled;
- e. emergency response procedures;
- f. specific written procedures for the control of nuisance conditions;
- g. specific written procedures for refusal of unacceptable waste loads; and

- h. the requirements of this *Approval*.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL

Compliance

- (1) The *Owner* and *Operator* shall ensure compliance with all the conditions of this *Approval* and shall ensure that any person authorized to carry out work on or operate any aspect of the *Site* is notified of this *Approval* and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.
- (2) Any person authorized to carry out work on or operate any aspect of the *Site* shall comply with the conditions of this *Approval*.

In Accordance

- (3) Except as otherwise provided by this *Approval*, the *Site* shall be designed, developed, built, operated and maintained in accordance with the documentation listed in the attached Schedule "A".

Interpretation

- (4) Where there is a conflict between a provision of any document listed in Schedule "A" in this *Approval*, and the conditions of this *Approval*, the conditions in this *Approval* shall take precedence.
- (5) Where there is a conflict between the application and a provision in any document listed in Schedule "A", the application shall take precedence, unless it is clear that the purpose of the document was to amend the application and that the *Ministry* approved the amendment.
- (6) Where there is a conflict between any two documents listed in Schedule "A", the document bearing the most recent date shall take precedence.
- (7) The conditions of this *Approval* are severable. If any condition of this *Approval*, or the application of any condition of this *Approval* to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this *Approval* shall not be affected thereby.

Other Legal Obligations

- (8) The issuance of, and compliance with, this *Approval* does not:
- (a) relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement; or
 - (b) limit in any way the authority of the *Ministry* to require certain steps be taken or to require the *Owner* and *Operator* to furnish any further information related to compliance with this *Approval* .

Adverse Effect

- (9) The *Owner* and *Operator* shall take steps to minimize and ameliorate any adverse effect on the natural environment or impairment of water quality resulting from the *Site*, including such accelerated or additional monitoring as may be necessary to determine the nature and extent of the effect or impairment.
- (10) Despite an *Owner*, *Operator* or any other person fulfilling any obligations imposed by this *Approval* the person remains responsible for any contravention of any other condition of this *Approval* or any applicable statute, regulation, or other legal requirement resulting from any act or omission that caused the adverse effect to the natural environment or impairment of water quality.

Change of Ownership

- (11) The *Owner* shall notify the *Director*, in writing, and forward a copy of the notification to the *District Manager*, within 30 days of the occurrence of any changes in the following information:
- (a) the ownership of the *Site*;
 - (b) the *Operator* of the *Site*;
 - (c) the address of the *Owner* or *Operator*; and
 - (d) the partners, where the *Owner* or *Operator* is or at any time becomes a partnership and a copy of the most recent declaration filed under the *Business Names Act* , R. S. O. 1990, c. B.17, shall be included in the notification.
- (12) No portion of this *Site* shall be transferred or encumbered prior to or after closing of the *Site* unless the *Director* is notified in advance and sufficient financial assurance is deposited with the *Ministry* to ensure that these conditions will be carried out.
- (13) In the event of any change in ownership of the *Site*, other than change to a successor municipality, the *Owner* shall notify the successor of and provide the successor with a copy of this *Approval*, and the *Owner* shall provide a copy of the notification to the *District Manager* and the *Director*.

Registration on Title Requirement

- (14) Prior to dealing with the property in any way, the *Owner* shall provide a copy of this *Approval*

and any amendments, to any person who will acquire an interest in the property as a result of the dealing.

- (15) (a) Within thirty (30) calendar days from the date of issuance of this *Approval*, the *Owner* shall submit to the *Director* a completed Certificate of Requirement which shall include:
- (i) a plan of survey prepared, signed and sealed by an Ontario Land Surveyor, which shows the area of the *Site* where waste has been or is to be deposited at the *Site*;
 - (ii) proof of ownership of the *Site*;
 - (iii) a letter signed by a member of the Law Society of Upper Canada or other qualified legal practitioner acceptable to the *Director*, verifying the legal description provided in the Certificate of Requirement;
 - (iv) the legal abstract of the property; and
 - (v) any supporting documents including a registerable description of the *Site*.
- (b) Within fifteen (15) calendar days of receiving a Certificate of Requirement authorized by the *Director*, the *Owner* shall:
- (i) register the Certificate of Requirement in the appropriate Land Registry Office on the title to the property; and
 - (ii) submit to the *Director* written verification that the Certificate of Requirement has been registered on title.

Inspections by the Ministry

- (16) No person shall hinder or obstruct a *Provincial Officer* from carrying out any and all inspections authorized by the *OWRA*, the *EPA*, the *PA*, the *SDWA* or the *NMA*, of any place to which this *Approval* relates, and without limiting the foregoing:
- (a) to enter upon the premises where the approved works are located, or the location where the records required by the conditions of this *Approval* are kept;
 - (b) to have access to, inspect, and copy any records required to be kept by the conditions of this *Approval*;
 - (c) to inspect the *Site*, related equipment and appurtenances;
 - (d) to inspect the practices, procedures, or operations required by the conditions of this *Approval*; and
 - (e) to sample and monitor for the purposes of assessing compliance with the terms and conditions of this *Approval* or the *EPA*, the *OWRA*, the *PA*, the *SDWA* or the *NMA*.

Information and Record Retention

- (17) (a) Except as authorized in writing by the *Director*, all records required by this *Approval* shall be retained at the Municipal Offices for a minimum of two (2) years from their date of creation.
- (b) The *Owner* shall retain all documentation listed in Schedule "A" for as long as this *Approval* is valid.

- (c) All monthly summary reports are to be kept at the *Site* until they are included in the Annual Report.
 - (d) The *Owner* shall retain employee training records as long as the employee is working at the *Site*.
 - (e) The *Owner* shall make all of the above documents available for inspection upon request of *Ministry* staff.
- (18) The receipt of any information by the *Ministry* or the failure of the *Ministry* to prosecute any person or to require any person to take any action under this *Approval* or under any statute, regulation or other legal requirement, in relation to the information, shall not be construed as:
- (a) an approval, waiver, or justification by the *Ministry* of any act or omission of any person that contravenes any term or condition of this *Approval* or any statute, regulation or other legal requirement; or
 - (b) acceptance by the *Ministry* of the information's completeness or accuracy.
- (19) The *Owner* shall ensure that a copy of this *Approval*, in its entirety and including all its Notices of Amendment, and documentation listed in Schedule "A", are retained at the *Site* at all times.
- (20) Any information related to this *Approval* and contained in *Ministry* files may be made available to the public in accordance with the provisions of the Freedom of Information and Protection of Privacy Act, RSO 1990, CF-31.

2. SITE OPERATION

Operation

- (1) The *Site* shall be operated and maintained at all times including management and disposal of all waste, in accordance with the *EPA; Regulation 347*, and the conditions of this *Approval*. At no time shall the discharge of a contaminant that causes or is likely to cause an adverse effect be permitted.

Signs

- (2) A sign shall be installed and maintained at the main entrance/exit to the *Site* on which is legibly displayed the following information:
- (a) the name of the *Site* and *Owner*;
 - (b) the number of the *Approval*;
 - (c) the normal hours of operation;
 - (d) the allowable and prohibited waste types;
 - (e) the telephone number to which complaints may be directed;
 - (f) a warning against unauthorized access;
 - (g) a twenty-four (24) hour emergency telephone number (if different from above); and
 - (h) a warning against dumping outside the *Site*.

- (3) The *Owner* shall install and maintain signs to direct vehicles to working face and recycling areas.
- (4) The *Owner* shall provide signs at the recycling area informing users what materials are acceptable and directing users to appropriate storage areas.

Vermin, Vectors, Dust, Litter, Odour, Noise and Traffic

- (5) The *Site* shall be operated and maintained such that the vermin, vectors, dust, litter, odour, noise and traffic do not create a nuisance.

Burning Waste Prohibited

- (6) (a) Burning of waste at the *Site* is prohibited.
- (b) Notwithstanding Condition 2. (6) (a) above, burning of segregated, clean wood and brush at the landfill may be carried out in strict compliance with the Ministry of the Environment Document titled "Guideline C-7, Burning at Landfill Sites" dated April 1994.

Site Access

- (7) The normal operating hours of the *Site* shall be as follows:

April to November (inclusive)

Wednesday and Friday - 8:00 a.m. to 5:00 p.m.

Saturday - 9:00 a.m. to 4:00 p.m.

December to March (inclusive)

Wednesday and Friday - 10:00 a.m. to 5:00 p.m.

Saturday - 9:00 a.m. to 4:00 p.m.

- (8) On-site equipment used for daily site preparation and closing activities may be operated one (1) hour before and one (1) hour after the hours of operation approved by this *Approval*.
- (9) With the prior written approval from the *District Manager*, the time periods may be extended to accommodate seasonal or unusual quantities of waste.

Site Security

- (10) No waste shall be received, landfilled or removed from the *Site* unless a site supervisor or an attendant is present and supervises the operations during operating hours. The *Site* shall be closed when a site attendant is not present to supervise landfilling operations.
- (11) The *Site* shall be operated and maintained in a safe and secure manner. During non-operating

hours, the *Site* entrance and exit gates shall be locked and the *Site* shall be secured against access by unauthorized persons.

3. EMPLOYEE TRAINING

- (1) A training plan for all employees that operate any aspect of the *Site* shall be developed and implemented by the *Owner* or the *Operator*. Only *Trained Personnel* shall operate any aspect of the *Site* or carry out any activity required under this *Approval*.

4. COMPLAINTS RESPONSE PROCEDURE

- (1) If at any time the *Owner* receives complaints regarding the operation of the *Site*, the *Owner* shall respond to these complaints according to the following procedure:
 - (a) The *Owner* shall record and number each complaint, either electronically or in a log book, and shall include the following information: the nature of the complaint, the name, address and the telephone number of the complainant if the complainant will provide this information and the time and date of the complaint;
 - (b) The *Owner*, upon notification of the complaint, shall initiate appropriate steps to determine possible causes of the complaint, proceed to take the necessary actions to eliminate the cause of the complaint and document the action on the internal request for service form. This form will document the actions taken to resolve the complaint and any recommendations for remedial measures, and managerial or operational changes to reasonably avoid the recurrence of similar incidents; and
 - (c) The *Owner* shall complete and retain the internal request form at the Municipal Offices within one (1) week of the complaint date.

5. EMERGENCY RESPONSE

- (1) All Spills as defined in the *EPA* shall be immediately reported to the **Ministry's Spills Action Centre at 1-800-268-6060** and shall be recorded in the log book as to the nature of the emergency situation, and the action taken for clean-up, correction and prevention of future occurrences.
- (2) In addition, the *Owner* shall submit, to the *District Manager* a written report within three (3) business days of the emergency situation, outlining the nature of the incident, remedial measures taken, handling of waste generated as a result of the emergency situation and the measures taken to prevent future occurrences at the *Site*.
- (3) All wastes resulting from an emergency situation shall be managed and disposed of in accordance with *O.Reg. 347*.

- (4) All equipment and materials required to handle the emergency situations shall be:
 - (a) kept on hand at all times that waste landfilling and/or handling is undertaken at the *Site*; and
 - (b) adequately maintained and kept in good repair.
- (5) The *Owner* shall ensure that the emergency response personnel are familiar with the use of such equipment and its location(s).

6. INSPECTIONS, RECORD KEEPING AND REPORTING

Daily Log Sheets

- (1) A daily log sheet shall be maintained in written or electronic format and shall include the following information:
 - (a) the type, date and hauler (and quantities of weighed vehicles) of all waste and cover material received at the *Site*;
 - (b) a record of litter collection activities and the application of any dust suppressants;
 - (c) a record of the daily inspections; and
 - (d) a description of any out-of-service period of any control, treatment, disposal or monitoring facilities, the reasons for the loss of service, and action taken to restore and maintain service.
- (2) Any information requested, by the *Director* or a *Provincial Officer*, concerning the *Site* and its operation under this *Approval*, including but not limited to any records required to be kept by this *Approval* shall be provided to the *Ministry*, upon request.

Daily Inspections and Log Book

- (3) An inspection of the entire *Site* and all equipment on the *Site* shall be conducted each day the *Site* is in operation to ensure that: the *Site* is secure; that the operation of the *Site* is not causing any nuisances; that the operation of the *Site* is not causing any adverse effects on the environment and that the *Site* is being operated in compliance with this *Approval*. Any deficiencies discovered as a result of the inspection shall be remedied immediately, including temporarily ceasing operations at the *Site* if needed.
- (4) A record of the inspections shall be kept in a daily log book that includes:
 - (a) the name and signature of person that conducted the inspection;
 - (b) the date and time of the inspection;
 - (c) the list of any deficiencies discovered;
 - (d) the recommendations for remedial action; and
 - (e) the date, time and description of actions taken.
- (5) A record shall be kept in the daily log book of all refusals of waste shipments, the reason(s) for refusal, and the origin of the waste, if known.

Annual Report

- (6) A written report on the development, operation and monitoring of the *Site*, shall be completed annually (the "Annual Report"). The Annual Report shall be submitted to the *District Manager*, by April 30 of the year following the period being reported upon.
- (7) The Annual Report shall include but not be limited to the following information:
 - (a) the results and an interpretive analysis of the results of all leachate, groundwater surface water and landfill gas monitoring, including an assessment of the need to amend the monitoring programs;
 - (b) an assessment of the operation and performance of all engineered facilities, the need to amend the design or operation of the *Site*, and the adequacy of and need to implement the contingency plans;
 - (c) site plans showing the existing contours of the *Site*; areas of landfilling operation during the reporting period; areas of intended operation during the next reporting period; areas of excavation during the reporting period; the progress of final cover, vegetative cover, and any intermediate cover application; facilities existing, added or removed during the reporting period; and site preparations and facilities planned for installation during the next reporting period;
 - (d) calculations of the volume of waste, daily and intermediate cover, and final cover deposited or placed at the *Site* during the reporting period and a calculation of the total volume of *Site* capacity used during the reporting period;
 - (e) a calculation of the remaining capacity of the *Site* and an estimate of the remaining *Site* life;
 - (f) a summary of the weekly, maximum daily and total annual quantity (tonnes) of waste received at the *Site*;
 - (g) a summary of any complaints received and the responses made;
 - (h) a discussion of any operational problems encountered at the *Site* and corrective action taken;
 - (i) any changes to the Design and Operations Report and the Closure Plan that have been approved by the *Director* since the last *Annual Report*;
 - (j) a report on the status of all monitoring wells and a statement as to compliance with *Ontario Regulation 903*; and
 - (k) any other information with respect to the *Site* which the *Regional Director* may require from time to time.

7. LANDFILL DESIGN AND DEVELOPMENT

Approved Waste Types

- (1) (a) Only municipal waste as defined under *Reg. 347* being solid non-hazardous shall be accepted at the *Site*.
- (b) No liquid industrial wastes or hazardous wastes as defined under O.Reg. 347 as amended shall be accepted at the *Site*.
- (2) The *Owner* shall develop and implement a program to inspect waste to ensure that the waste received at the *Site* is of a type approved for acceptance under this *Approval*.
- (3) The *Owner* shall ensure that all loads of waste are properly inspected by *Trained personnel* prior to acceptance at the *Site* and that the waste vehicles are directed to the appropriate areas for disposal or transfer of the waste. The *Owner* shall notify the *District Manager*, in writing, of load rejections at the *Site* within one (1) business day from their occurrence.

Capacity

- (4) The Approved maximum volumetric capacity of the *Site*, consisting of the waste, daily cover and intermediate cover, but excluding the final cover is 106,110 cubic metres.
- (5) Development of the landfill and disposal of waste shall only occur as described in the Phased Development Plan, and as shown on Figures 10 and 11, of Item 3 of Schedule "A".
- (6) No waste shall be placed above the final contours shown on Figure 13, Final Waste Contours, of Item 3 of Schedule "A".

Service Area

- (7) Only waste that is generated within the boundaries of the West Elgin may be accepted at the *Site*.

Cover

- (8) Alternative materials to soil, or approved tarp may be used as daily and interim cover material, based on an application with supporting information and applicable fee for a trial use or permanent use, submitted by the *Owner* to the *Director*, copied to the *District Manager* and as approved by the *Director* via an amendment to this *Approval*. The alternative material shall be non-hazardous according to *Reg. 347* and will be expected to perform at least as well as soil in relation to the following functions:
 - (a) Control of blowing litter, odours, dust, landfill gas, gulls, vectors, vermin and fires;
 - (b) Provision for an aesthetic condition of the landfill during the active life of the *Site*;

- (c) Provision for vehicle access to the active tipping face; and
 - (d) Compatibility with the design of the *Site* for groundwater protection, leachate management and landfill gas management.
- (9) Cover material shall be applied as follows:
- (a) Daily cover shall be placed over the entire working face with a minimum thickness of 150 mm of soil cover or an approved thickness of alternative cover material at the end of every operating week;
 - (b) Intermediate Cover - In areas where landfilling has been temporarily discontinued for six (6) months or more, a minimum thickness of 300 millimetre of soil cover or an approved thickness of alternative cover material shall be placed; and
 - (c) Final Cover - In areas where landfilling has been completed to final contours, a minimum 600 millimetre thick layer of soil of medium permeability and 150 millimetres of top soil (vegetative cover) shall be placed. Fill areas shall be progressively completed and rehabilitated as landfill development reaches final contours.

8. LANDFILL MONITORING

Landfill Gas

- (1) (a) The *Owner* shall ensure that any buildings or structures at the *Site* contain adequate ventilation systems to relieve any possible landfill gas accumulation to prevent methane concentration reaching the levels within its explosive range. Routine monitoring for explosive methane gas levels shall be conducted in all buildings or structures at the *Site*, especially enclosed structures which at times are occupied by people.
- (b) The *Site's* subsurface gas monitoring program, as described in Item 4 of Schedule "A", shall continue to be implemented at the *Site*. Results from the gas monitoring shall be included in the Annual Report.

Compliance

- (2) The *Site* shall be operated in such a way as to ensure compliance with the Reasonable Use Guideline B-7 for the protection of the groundwater at the *Site*.

Surface Water and Groundwater

- (3) The Owner shall ensure that the *Site* groundwater monitoring program, as described in Schedule "B" of this Approval, is implemented. No changes to the groundwater monitoring program shall be done without receiving prior written concurrence from the District Manager or an Approval from the Director.
- (4) A certified Professional Geoscientist or Engineer possessing appropriate hydrogeologic training and experience shall execute or directly supervise the execution of the groundwater monitoring

and reporting program.

Groundwater Wells and Monitors

- (5) The *Owner* shall ensure that all groundwater monitoring wells which form part of the monitoring program are properly capped, locked and protected from damage.
- (6) Where landfilling is to proceed around monitoring wells, suitable extensions shall be added to the wells and the wells shall be properly re-secured.
- (7) Any groundwater monitoring well included in the on-going monitoring program that is damaged shall be assessed, repaired, replaced or decommissioned by the *Owner*, as required.
 - (a) The *Owner* shall repair or replace any monitoring well which is destroyed or in any way made to be inoperable for sampling such that no more than one regular sampling event is missed.
 - (b) All monitoring wells which are no longer required as part of the groundwater monitoring program, and have been approved by the *Director* for abandonment, shall be decommissioned by the *Owner*, as required, in accordance with *O.Reg. 903*, to prevent contamination through the abandoned well. A report on the decommissioning of the well shall be included in the Annual Report for the period during which the well was decommissioned.

Trigger Mechanisms and Contingency Plans

- (8)
 - (a) Trigger mechanisms shall be in accordance with Item 5, Schedule "A".
 - (b) Contingency plan in the event of a confirmed exceedance of a site-specific trigger level relating to leachate mounding or groundwater or surface water impacts due to leachate shall be in accordance with Item 5, Schedule "A".
- (9) In the event of a confirmed exceedance of a site-specific trigger level relating to leachate mounding or groundwater or surface water impacts due to leachate, the *Owner* shall immediately notify the *District Manager*, and an investigation into the cause and the need for implementation of remedial or contingency actions shall be carried out by the *Owner* in accordance with the approved trigger mechanisms and associated contingency plans.
- (10) If monitoring results, investigative activities and/or trigger mechanisms indicate the need to implement contingency measures, the *Owner* shall ensure that the following steps are taken:
 - (a) The *Owner* shall notify the *District Manager*, in writing of the need to implement contingency measures, no later than 30 days after confirmation of the exceedances;
 - (b) Detailed plans, specifications and descriptions for the design, operation and maintenance of the contingency measures shall be prepared and submitted by the *Owner* to the *District*

- Manager* for approval; and
 - (c) The contingency measures shall be implemented by the *Owner* upon approval by the *District Manager*.
- (11) The *Owner* shall ensure that any proposed changes to the site-specific trigger levels for leachate impacts to the surface water or groundwater, are approved in advance by the *Director* via an amendment to this *Approval*.

Changes to the Monitoring Plan

- (12) The *Owner* may request to make changes to the monitoring program(s) and/or trigger mechanism to the *District Manager* in accordance with the recommendations of the annual report. The *Owner* shall make clear reference to the proposed changes in a separate letter that shall accompany the annual report.
- (13) Within fourteen (14) days of receiving the written correspondence from the *District Manager* confirming that the *District Manager* is in agreement with the proposed changes to the environmental monitoring program, the *Owner* shall forward a letter identifying the proposed changes and a copy of the correspondences from the *District Manager* and all other correspondences and responses related to the changes to the monitoring program, to the *Director* requesting the *Approval* be amended to approve the proposed changes to the environmental monitoring plan prior to implementation.
- (14) In the event any other changes to the environmental monitoring program and/or trigger mechanisms are proposed outside of the recommendation of the annual report, the *Owner* shall follow current *Ministry* procedures for seeking approval for amending the *Approval*.

9. CLOSURE PLAN

- (1) At least 3 years prior to the anticipated date of closure of this *Site*, the *Owner* shall submit to the *Director* for approval, with copies to the *District Manager*, a detailed *Site* closure plan pertaining to the termination of landfilling operations at this *Site*, post-closure inspection, maintenance and monitoring, and end use. The plan shall include but not be limited to the following information:
 - (a) a plan showing *Site* appearance after closure;
 - (b) a description of the proposed end use of the *Site*;
 - (c) a description of the procedures for closure of the *Site*, including:
 - (i) advance notification of the public of the landfill closure;
 - (ii) posting of a sign at the *Site* entrance indicating the landfill is closed and identifying any alternative waste disposal arrangements;
 - (iii) completion, inspection and maintenance of the final cover and landscaping;
 - (iv) *Site* security;
 - (v) removal of unnecessary landfill-related structures, buildings and facilities;
 - (vi) final construction of any control, treatment, disposal and monitoring facilities for

- leachate, groundwater, surface water and landfill gas; and
 - (vii) a schedule indicating the time-period for implementing sub-conditions (i) to (vi) above;
 - (d) descriptions of the procedures for post-closure care of the *Site*, including:
 - (i) operation, inspection and maintenance of the control, treatment, disposal and monitoring facilities for leachate, groundwater, surface water and landfill gas;
 - (ii) record keeping and reporting; and
 - (iii) complaint contact and response procedures;
 - (e) an assessment of the adequacy of and need to implement the contingency plans for leachate and methane gas; and
 - (f) an updated estimate of the *contaminating life span* of the *Site*, based on the results of the monitoring programs to date.
- (2) The *Site* shall be closed in accordance with the closure plan as approved by the *Director*.

10. WASTE DIVERSION

- (1) The *Owner* shall ensure that:
- (a) all bins and waste storage areas are clearly labelled;
 - (b) all lids or doors on bins shall be kept closed during non-operating hours and during high wind events; and
 - (c) if necessary to prevent litter, waste storage areas shall be covered during high winds events.
- (2) The *Owner* shall provide a segregated area for the storage of *Refrigerant Appliances* so that the following are ensured:
- (a) all *Refrigerant Appliances* have been tagged to indicate that the refrigerant has been removed by a licensed technician. The tag number shall be recorded in the log book and shall remain affixed to the appliance until transferred from the *Site*; or
 - (b) all *Refrigerant Appliances* accepted at the *Site*, which have not been tagged by a licensed technician to verify that the equipment no longer contains refrigerants, are stored segregated, in a clearly marked area, in an upright position and in a manner which allows for the safe handling and transfer from the *Site* for removal of refrigerants as required by O.Reg. 189; and
 - (c) all *Refrigerant Appliances* received on-site shall either have the refrigerant removed prior to being transferred from the *Site* or shall be shipped off-site only to facilities where the refrigerants can be removed by a licensed technician in accordance with O.Reg. 189.
- (3) Propane cylinders shall be stored in a segregated area in a manner which prevents cylinders from being knocked over or cylinder valves from breaking.
- (4) The *Owner* shall transfer waste and recyclable materials from the *Site* as follows:
- (a) recyclable materials shall be transferred off-site once their storage bins are full;
 - (b) scrap metal shall be transferred off-site at least twice a year; and

- (c) immediately, in the event that waste is creating an odour or vector problem.
- (5) The *Owner* shall notify the appropriate contractors that waste and recyclable wastes that are to be transferred off-site are ready for removal. Appropriate notice time, as determined by the contract shall be accommodated in the notification procedure.

SCHEDULE "A"

1. Application for a Certificate of Approval for a Waste Disposal Site dated August 12, 1971 and supporting information .
2. Location plan entitled "Rodney Landfilling Site".
3. Report entitled "2006 Annual Site Monitoring and Operations Report, West Elgin Landfill Site, Municipality of West Elgin, Rodney, Ontario", dated August 2006, prepared by Water and Earth Science Associates Ltd.
4. Letter report dated July 28th, 2011, from S'rana Scholes, Karen Greer, WESA Inc, RE: West Elgin Landfill Site, Response to MOE Comments (MOE Reference Number 5963-85EJQ9), to Lynda Mulcahy, MOE,
5. Letter report dated August 20, 2015 from S'rana Scholes, Ian Macdonald, WESA Inc, RE: Final Trigger Mechanism and Contingency Plan, West Elgin Landfill Site, to Ranjani Munasinghe, Senior Review Engineer, Ministry of the Environment and Climate Change.

Schedule "B"

WELL	SAMPLING FREQUENCY	ANALYTICAL PARAMETERS
All monitoring wells (MW1, MW2, MW2D, MW3, MW4, MW5, MW6, MW7, MW8, MW9, MW10, MW11, MW12, MW 14, MW 15) + QA/QC (1 duplicate for general chemistry and metals parameters and trip blank for VOC)	Bi-annually (Spring and Fall)	General Chemistry (Alkalinity, Ammonia, Colour, Conductivity, DOC, pH, TDS, Turbidity, Nitrate, Nitrite, Total Kjeldahl Nitrogen (TKN) Phosphorus, Sulfate, Chloride, Fluoride, Anion/ Cation Sum, Hardness, Ion Balance, Langelier Index and Saturation pH), General Metals (Al, Sb, As, Ba, Be, Bi, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, P, K, Se, Si, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn, Zr), and volatile organic compounds (VOCs). combustible gas

The reasons for the imposition of these terms and conditions are as follows:

GENERAL

- The reason for Conditions 1(1), (2), (4), (5), (6), (7), (8), (9), (10), (17), (18) and (19) is to clarify the legal rights and responsibilities of the *Owner* and *Operator* under this *Approval* .
- The reasons for Condition 1(3) are to ensure that the *Site* is designed, operated, monitored and maintained in accordance with the application and supporting documentation submitted by the *Owner*, and not in a manner which the *Director* has not been asked to consider.
- The reasons for Condition 1(11) are to ensure that the *Site* is operated under the corporate name which appears on the application form submitted for this *approval* and to ensure that the *Director* is informed of any changes.
- The reasons for Condition 1(12) are to restrict potential transfer or encumbrance of the *Site* without the approval of the *Director* and to ensure that any transfer of encumbrance can be made only on the basis that it will not endanger compliance with this *Approval* .
- The reason for Condition 1(13) is to ensure that the successor is aware of its legal responsibilities.
- The reasons for Condition 1(14) and (15) are that the Part II.1 *Director* is an individual with authority pursuant to Section 197 of the Environmental Protection Act to require registration on title and provide any person with an interest in property before dealing with the property in any way to give a copy of the *Approval* to any person who will acquire an interest in the property as a result of the dealing.
- The reason for Condition 1(16) is to ensure that appropriate *Ministry* staff has ready access to the *Site* for inspection of facilities, equipment, practices and operations required by the conditions in this *Approval* . This Condition is supplementary to the powers of entry afforded a Provincial Officer pursuant to the *Act*, the *OWRA*, the *PA*, the *NMA* and the *SDWA*.
- Condition 1 (20) has been included in order to clarify what information may be subject to the Freedom of Information Act.

SITE OPERATION

- The reasons for Conditions 2(1), 2(5) and 6(3) are to ensure that the *Site* is operated, inspected and maintained in an environmentally acceptable manner and does not result in a hazard or nuisance to the natural environment or any person.
- The reason for Conditions 2 (2), 2(3) and 2(4) is to ensure that users of the *Site* are fully aware of important information and restrictions related to *Site* operations and access under this *Approval*.
- The reasons for Condition 2(6) (a) and (b) are open burning of municipal waste is unacceptable because of concerns with air emissions, smoke and other nuisance effects, and the potential fire

hazard and to make sure burning of brush and wood are carried out in accordance with Ministry guidelines.

- The reasons for Condition 2(7), 2(8) and 2(9) are to specify the hours of operation for the landfill site and a mechanism for amendment of the hours of operation, as required.
- The reasons for Condition 2(10) and 2(11) are to ensure that the *Site* is supervised by properly trained staff in a manner which does not result in a hazard or nuisance to the natural environment or any person and to ensure the controlled access and integrity of the *Site* by preventing unauthorized access when the Site is closed and no site attendant is on duty.

EMPLOYEE TRAINING

- The reason for Condition 3(1) is to ensure that the *Site* is supervised and operated by properly trained staff in a manner which does not result in a hazard or nuisance to the natural environment or any person.

COMPLAINTS RESPONSE PROCEDURE

- The reason for Condition 4(1) is to ensure that any complaints regarding landfill operations at this *Site* are responded to in a timely and efficient manner.

EMERGENCY RESPONSE

- Conditions 5(1) and 5(2) are included to ensure that emergency situations are reported to the *Ministry* to ensure public health and safety and environmental protection.
- Conditions 5(3), 5(4) and 5(5) are included to ensure that emergency situations are handled in a manner to minimize the likelihood of an adverse effect and to ensure public health and safety and environmental protection.

RECORD KEEPING AND REPORTING

- The reason for Conditions 6(1) and 6(2) is to ensure that accurate waste records are maintained to ensure compliance with the conditions in this *Approval* (such as fill rate, site capacity, record keeping, annual reporting, and financial assurance requirements), the *EPA* and its regulations.
- The reason for Conditions 6(4) and 6(5) is to ensure that detailed records of *Site* inspections are recorded and maintained for inspection and information purposes.
- The reasons for Conditions 6(6) and 6(7) are to ensure that regular review of site development, operations and monitoring data is documented and any possible improvements to site design, operations or monitoring programs are identified. An annual report is an important tool used in reviewing site activities and for determining the effectiveness of site design.

LANDFILL DESIGN AND DEVELOPMENT

- The reason for Conditions 7(1) to 7(7) inclusive is to specify the approved areas from which waste may be accepted at the *Site* and the types and amounts of waste that may be accepted for disposal at the *Site*, based on the *Owner*'s application and supporting documentation.
- Condition 7(8) is to provide the *Owner* the process for getting the approval for alternative daily and intermediate cover material.
- The reasons for Condition 7(9) are to ensure that daily/weekly and intermediate cover are used to control potential nuisance effects, to facilitate vehicle access on the *Site*, and to ensure an acceptable site appearance is maintained. The proper closure of a landfill site requires the application of a final cover which is aesthetically pleasing, controls infiltration, and is suitable for the end use planned for the *Site*.

LANDFILL MONITORING

- Reasons for Condition 8(1) are to ensure that off-site migration of landfill gas is monitored and all buildings at the *Site* are free of any landfill gas accumulation, which due to a methane gas component may be explosive and thus create a danger to any persons at the *Site*.
- Condition 8(2) is included to provide the groundwater and surface water limits to prevent water pollution at the *Site*.
- Conditions 8(3) and 8(4) are included to require the *Owner* to demonstrate that the *Site* is performing as designed and the impacts on the natural environment are acceptable. Regular monitoring allows for the analysis of trends over time and ensures that there is an early warning of potential problems so that any necessary remedial/contingency action can be taken.
- Conditions 8(5), 8(6) and 8(7) are included to ensure the integrity of the groundwater monitoring network so that accurate monitoring results are achieved and the natural environment is protected.
- Conditions 8(8) to 8(11) inclusive are added to ensure the *Owner* has a plan with an organized set of procedures for identifying and responding to potential issues relating to groundwater and surface water contamination at the *Site's* compliance point.
- Conditions 8(12), 8(13) and 8(14) are included to streamline the approval of the changes to the monitoring plan.

CLOSURE PLAN

- The reasons for Condition 9 are to ensure that final closure of the *Site* is completed in an aesthetically pleasing manner, in accordance with Ministry standards, and to ensure the long-term protection of the health and safety of the public and the environment.

WASTE DIVERSION

- Condition 10 is included to ensure that the recyclable materials are stored in their temporary storage location and transferred off-site in a manner as to minimize a likelihood of an adverse effect or a hazard to the natural environment or any person.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). A051101 issued on July 16, 1980

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

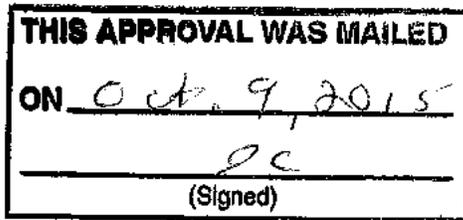
AND

The Director appointed for the purposes of Part II.1 of
the Environmental Protection Act
Ministry of the Environment and Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 314-3717 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 11th day of September, 2015



Dale Gable, P.Eng.

Director

appointed for the purposes of Part II.1 of the
Environmental Protection Act

RM/

c: District Manager, MOECC London - District
S'rana Scholes, Environmental Engineer/Project Manager, Wesa ✓

APR 11 2017



Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en
matière de changement climatique

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER A051101

Notice No. 1

Issue Date: April 4, 2017

The Corporation of the Municipality of West Elgin
22413 Hoskins Line
Post Office Box, No. 490
Rodney, Ontario
N0L 2C0

Site Location: Rodney Landfill - West Elgin Landfill
911 address - 20385 on Downie Line
Lot B, Concession 7
West Elgin Municipality, County of Elgin

You are hereby notified that I have amended Approval No. A051101 issued on September 11, 2015 for the use and operation of 3.2 hectare waste disposal/transfer site within a total site area of 6.6 hectares., as follows:

The following definition is added :

"*waste electrical and electronic equipment* " has the same meaning as in Ontario Regulation 393/04 (Waste Electrical and Electronic Equipment) made under the Waste Diversion Act.

The following Conditions are hereby revoked and replaced as follows :

- (8) (a) Trigger mechanisms shall be in accordance with item 5 and 8 in Schedule "A".
- (b) Contingency plan in the event of a confirmed exceedance of a site-specific trigger level relating to leachate mounding or groundwater or surface water impacts due to leachate shall be in accordance with Item 5 and 8 in Schedule "A".

The following conditions are added :

10. WASTE DIVERSION

- (6) (a) The owner may receive and transfer intact waste electrical and electronic equipment as per the

application for amendment in Item 6 of Schedule "A";

- (b) The amount of waste electrical and electronic equipment materials received at the *Site* shall not exceed 5 tonne per day;
 - (c) The amount of waste electrical and electronic equipment materials stored at the *Site* shall not exceed 20 tonnes, at any time;
 - (d) All waste electrical and electronic equipment received at the *Site* shall be removed from the *Site* under an approved Waste Management System, as defined under Regulation 347, R.R.O. 1990, and taken to a *Ministry* approved waste disposal *Site*; and
 - (e) Collection, storage and transfer of Waste Electrical and Electronic Equipment shall be in accordance with the documents in the Schedule "A". If there is any discrepancy between the guideline titled "Collection Site Organizing & Operating Waste Electrical and Electronic Equipment (WEEE) Guidebook" dated November 2012 as amended prepared by Ontario Electronic Stewardship and the documents in Schedule "A", the guideline shall take precedence.
- (7) (a) The *Owner* may receive, temporarily store and transfer scrap tires subject to the following:
- (i) the total amount of scrap tires stored on *Site* shall not exceed 400 tire units;and
 - (ii) a daily record is kept of the number of tire units accepted, stored and transferred from the *Site* and
 - (iii) scrap tires shall be stockpiled in accordance with a plan approved by the local Fire Department.

11. CONTAMINANT ATTENUATION ZONE

- (1) Parcels of lands Part of Lot C, Concession 7, Municipality of West Elgin for a total area of 2.85 ha are hereby added to this *Certificate* as the contaminant attenuation zone for the *Site* .
- (2) **Registration on Title for the Contaminant Attenuation Zone**
 - (i) the Owner shall provide two copies of a completed certificate of requirement(s) containing registerable descriptions of the contaminant attenuation zone;
 - (ii) the Owner shall, within 10 calendar days of receiving the certificate of requirements(s) signed or authorized by the Director, register the certificate of requirement in the appropriate Land Registry Office on the title to the property;
 - (iii) the Owner shall submit to the Director a duplicate registered copy of the certificate of requirement(s) within 10 calendar days of registration.

Schedule "A"

The following items are hereby added to Schedule A:

6. Application for amendment to Environmental Compliance Approval dated March 31, 2015 received from WESA
7. Letter dated April 18, 2016 from the Blu Metric Environmental to MoECC regarding the response to the email request for more information.
8. Letter dated 23rd January 2017 from the BluMetric Environmental to MoECC regarding the revised final trigger Mechanism and Contingency Plan.

The reasons for this amendment to the Approval are as follows:

1. *The reason for Conditions 10.6 and 10.7 are to approve the receive storage and transfer of Tires and Electronic Waste.*
2. *The reason for Condition 11 is to to add lands to the site property to bring the site into compliance with respect to Reasonable Use Guideline.*

This Notice shall constitute part of the approval issued under Approval No. A051101 dated July 16, 1980 *In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:*

1. *The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;*
2. *The grounds on which you intend to rely at the hearing in relation to each portion appealed.*

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. *The name of the appellant;*
4. *The address of the appellant;*
5. *The environmental compliance approval number;*
6. *The date of the environmental compliance approval;*
7. *The name of the Director, and;*
8. *The municipality or municipalities within which the project is to be engaged in.*

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of
the Environmental Protection Act
Ministry of the Environment and Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 4th day of April, 2017



Dale Gable, P.Eng.

Director

appointed for the purposes of Part II.1 of the
Environmental Protection Act

HV/

c: District Manager, MOECC London - District
S'rana Scholes, WESA; a division of BluMetric Environmental Inc.

APPENDIX C

Borehole Logs



Project No: W-B4718

Project: Hydrogeological Investigation

Client: Municipality of West Elgin

Location: West Elgin Landfill

Log of Borehole: BH1

Supervisor: K. Greer

SUBSURFACE PROFILE				SAMPLE			Well Completion Details
Depth	Symbol	Description	Elev.	Number	Type	Recovery	
0		Ground Surface	99.10				No Well Installation
		Topsoil grass surface					
		Fill sandy silt, black, traces of refuse (metal fitting, etc)	97.58				
		Till silty sand, trace gravel, brown, dry	95.44				
		Sand with fine gravel, trace coarse gravel, brown, moist to wet	94.53				
		Sand and Gravel wet, brown	93.92				
		Clay grey, moist	93.00				
		End of Borehole					

Drill Method: **Hollow Stem Auger**

Drill Date: **April 26, 2006**

Datum:

Checked by: **K.D.G.**

Sheet: **1 of 1**



Project No: W-B4718

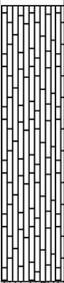
Project: Hydrogeological Investigation

Client: Municipality of West Elgin

Location: West Elgin Landfill

Log of Borehole: BH10

Supervisor: K. Greer

SUBSURFACE PROFILE				SAMPLE			Well Completion Details
Depth	Symbol	Description	Elev.	Number	Type	Recovery	
0 ft 0 m		Ground Surface	100.47				No Well Installation
		Till grass at surface, silty sand, trace gravel, brown, dry					
5							
		Gravel wet	97.87				
10							
		Sand coarse, trace gravel, brown, wet	96.50				
15							
20							
		Clay grey, moist	93.76				
25							
		End of Borehole	92.84				
30							
35							

Drill Method: Solid Stem Auger

Datum:

Drill Date: April 27, 2006

Checked by: K.D.G.

Sheet: 1 of 1

Project No: W-B4718

Project: Hydrogeological Investigation

Client: Municipality of West Elgin

Location: West Elgin Landfill

Log of Borehole: BH2

Supervisor: K. Greer

SUBSURFACE PROFILE				SAMPLE			Well Completion Details
Depth	Symbol	Description	Elev.	Number	Type	Recovery	
0 ft m 0		Ground Surface	100.45				No Well Installation
		Topsoil grass surface					
5		Fill dark brown sand, trace gravel and clay, dark brown, traces of refuse (plastic, egg shells, etc), dry					
10							
15							
20		moist	94.35				
25		Clay grey, moist	92.83				
30			91.30				
		End of Borehole					
10							
35							

Drill Method: Solid Stem Auger

Datum:

Drill Date: April 26, 2006

Checked by: K.D.G.

Sheet: 1 of 1

Project No: W-B4718

Project: Hydrogeological Investigation

Client: Municipality of West Elgin

Location: West Elgin Landfill

Log of Borehole: BH3

Supervisor: K. Greer

SUBSURFACE PROFILE				SAMPLE			Well Completion Details
Depth	Symbol	Description	Elev.	Number	Type	Recovery	
0		Ground Surface	99.75				No Well Installation
0		Topsoil grass surface					
5		Till sand, trace gravel, brown, dry					
		increase gravel with depth, brown, moist	97.47				
10							
15		Gravel grey/brown, wet	95.18				
5			94.27				
20		Clay grey, moist					
25							
30		End of Borehole	90.61				
10							
35							

Drill Method: Solid Stem Auger

Datum:

Drill Date: April 26, 2006

Checked by: K.D.G.

Sheet: 1 of 1

Project No: W-B4718

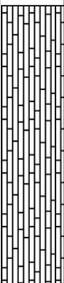
Project: Hydrogeological Investigation

Client: Municipality of West Elgin

Location: West Elgin Landfill

Log of Borehole: BH4

Supervisor: K. Greer

SUBSURFACE PROFILE				SAMPLE			Well Completion Details
Depth	Symbol	Description	Elev.	Number	Type	Recovery	
0 ft 0 m		Ground Surface	97.25				No Well Installation
		Till grass surface, sand and gravel, brown, wet					
5		Gravel grain size increase with depth, wet	95.72				
10		Clay grey, moist	94.50				
15		End of Borehole	92.67				
5							
20							

Drill Method: Solid Stem Auger

Datum:

Drill Date: April 26, 2006

Checked by: K.D.G.

Sheet: 1 of 1

Project No: W-B4718

Project: Hydrogeological Investigation

Client: Municipality of West Elgin

Location: West Elgin Landfill

Log of Borehole: BH5

Supervisor: K. Greer

SUBSURFACE PROFILE				SAMPLE			Well Completion Details
Depth	Symbol	Description	Elev.	Number	Type	Recovery	
0		Ground Surface	97.50				No Well Installation
		Topsoil grass surface	97.35				
		Sandy Silt trace gravel, brown, dry					
		wet	96.59				
			96.44				
5		Gravelly Sand brown, wet	95.98				
		Gravel brown, wet					
10			94.46				
		Clay grey, moist					
15			92.93				
		End of Borehole					
5							
20							

Drill Method: Solid Stem Auger

Datum:

Drill Date: April 26, 2006

Checked by: K.D.G.

Sheet: 1 of 1

Project No: W-B4718

Project: Hydrogeological Investigation

Client: Municipality of West Elgin

Location: West Elgin Landfill

Log of Borehole: BH6

Supervisor: K. Greer

SUBSURFACE PROFILE				SAMPLE			Well Completion Details
Depth	Symbol	Description	Elev.	Number	Type	Recovery	
0		Ground Surface	102.73				No Well Installation
0		Till grass at surface, silty sand, trace gravel, brown, dry, trace organic fibres					
5							
10							
15		Sand Silt trace gravel, light brown, damp	98.16				
20		Silt Till trace gravel, moist	96.63				
25		Gravel wet	95.57				
			94.50				
		Clay grey, moist	94.20				
30		End of Borehole					
35							

Drill Method: Solid Stem Auger

Datum:

Drill Date: April 27, 2006

Checked by: K.D.G.

Sheet: 1 of 1

Project No: W-B4718

Project: Hydrogeological Investigation

Client: Municipality of West Elgin

Location: West Elgin Landfill

Log of Borehole: MW1(BH7)

Supervisor: K. Greer

SUBSURFACE PROFILE				SAMPLE			Well Completion Details
Depth	Symbol	Description	Elev.	Number	Type	Recovery	
0		Ground Surface	97.75				<p>Concrete/Casing</p> <p>2" Schd.40 PVC</p> <p>Holeplug</p> <p>Water Level July 2006</p> <p>Silica Sand</p> <p>#10 Slot Screen</p> <p>Native</p>
0		Till grass at surface, silty sand, trace gravel, brown, dry					
		wet	96.84				
5		Gravel wet, brown	96.23				
10				SS1			
15		Clay grey, moist	93.18				
5			92.57	SS2			
		End of Borehole					
20							

Drill Method: **Hollow Stem Auger**

Drill Date: **April 27, 2006**

Datum:

Checked by: **K.D.G.**

Sheet: **1 of 1**



Project No: W-B4718

Project: Hydrogeological Investigation

Client: Municipality of West Elgin

Location: West Elgin Landfill

Log of Borehole: MW2(BH8)

Supervisor: K. Greer

SUBSURFACE PROFILE				SAMPLE			Well Completion Details
Depth	Symbol	Description	Elev.	Number	Type	Recovery	
0		Ground Surface	101.69				
0		Fill topsoil surface, black soil, miscellaneous garbage including plastic, cloth					
5							
10							
15							
20							
25		Sand coarse, wet	94.06				
30		Clay grey, moist	92.54				
30			91.93	SS1			
35		End of Borehole					

Drill Method: Hollow Stem Auger

Datum:

Drill Date: April 27, 2006

Checked by: K.D.G.

Sheet: 1 of 1



171 Victoria St. N,
Kitchener, ON, N2H 5C5
(519) 742 6685

Borehole/Well ID: MW2-R

Project No.: W-B4718-19-03

Client: Municipality of West Elgin

Location: West Elgin Landfill

SUBSURFACE PROFILE				SAMPLE			Well Completion Details
Depth	Symbol	Description	Elevation (m)	Number	Type	Recovery	
0		Ground Surface	224.09				<p>Stick up well casing (0.60m)</p> <p>Bentonite</p> <p>2" Schedule 40 PVC</p> <p>Silica sand</p> <p># 10 Slot screen</p>
0		Garbage Landfill materials- paper, bricks, metals, plastics mixed with silty clay					
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22			217.23				
23		Sand Dark brown, coarse grain, micaceous, trace silt, wet to saturated		S1	█	50%	
24							
25			216.31				
26		Clay Grey, moist		S2	█	50%	
27			215.86				
28		End of Borehole					
29							
30							

Drilled By: Direct Environmental

Drill Method: Hollow Stem / Split Spoon Sample

Drill Date: 1 April 2016

Hole Size (m): 0.20

Supervised By: MLM

Datum: Local

Sheet: 1 of 1

Project No: W-B4718

Project: Hydrogeological Investigation

Client: Municipality of West Elgin

Location: West Elgin Landfill

Log of Borehole: MW2D

Supervisor: K. Greer

SUBSURFACE PROFILE				SAMPLE			Well Completion Details
Depth	Symbol	Description	Elev.	Number	Type	Recovery	
0		Ground Surface	101.66				
0 to 30		Stratigraphy inferred from BH8 (MW2).					
30		Clay grey, moist	92.82				
35		End of Borehole	90.99				
40							

Drill Method: **Hollow Stem Auger**

Datum:

Drill Date: **April 28, 2006**

Checked by: **K.D.G.**

Sheet: 1 of 1

Project No: W-B4718

Project: Hydrogeological Investigation

Client: Municipality of West Elgin

Location: West Elgin Landfill

Log of Borehole: MW3

Supervisor: K. Greer

SUBSURFACE PROFILE				SAMPLE			Well Completion Details
Depth	Symbol	Description	Elev.	Number	Type	Recovery	
0		Ground Surface	99.82				
		Stratigraphy inferred from BH3.					
5							
10							
15							
19.5		Clay grey, moist	94.33	SS1			
20		End of Borehole	93.88				

Drill Method: Hollow Stem Auger

Drill Date: April 27, 2006

Datum:

Checked by: K.D.G.

Sheet: 1 of 1



Project No: W-B4718

Project: Hydrogeological Investigation

Client: Municipality of West Elgin

Location: West Elgin Landfill

Log of Borehole: MW4

Supervisor: K. Greer

SUBSURFACE PROFILE				SAMPLE			Well Completion Details
Depth	Symbol	Description	Elev.	Number	Type	Recovery	
0 ft m 0		Ground Surface	99.12				<p>Concrete/Casing</p> <p>2" Schd.40 PVC</p> <p>Holeplug</p> <p>Water Level July 2006</p> <p>Silica Sand</p> <p>#10 Slot Screen</p> <p>Native</p>
		Stratigraphy inferred from BH1.					
5							
10							
15							
5		Clay grey, moist	94.09 93.94	SS1			
		End of Borehole					
20							

Drill Method: **Hollow Stem Auger**

Drill Date: **April 28, 2006**

Datum:

Checked by: **K.D.G.**

Sheet: **1 of 1**



Project No: W-B4718

Project: Hydrogeological Investigation

Client: Municipality of West Elgin

Location: West Elgin Landfill

Log of Borehole: MW5

Supervisor: K. Greer

SUBSURFACE PROFILE				SAMPLE			Well Completion Details
Depth	Symbol	Description	Elev.	Number	Type	Recovery	
0 ft m ₀		Ground Surface	99.21				
		Topsoil grass surface	99.06				
		Fill black soil, sandy, garbage including plastic					
		wet	98.30				
5		Sand and Gravel brown, wet	97.69				
			96.16				
10		Sand trace gravel, brown, wet		SS1			
				SS2			
		Clay grey, moist	94.94				
15			94.64				
		End of Borehole					
5							
20							

Drill Method: **Hollow Stem Auger**

Drill Date: **April 28, 2006**

Datum:

Checked by: **K.D.G.**

Sheet: **1 of 1**



171 Victoria St. N,
Kitchener, ON, N2H 5C5
(519) 742 6685

Borehole/Well ID: MW5-R

Project No.: 160252-01

Client: Municipality of West Elgin

Location: West Elgin Landfill

SUBSURFACE PROFILE				SAMPLE			Well Completion Details
Depth	Symbol	Description	Elevation (m)	Number	Type	Recovery	
0		Ground Surface	222.15				<p>Stick up casing (0.8 m) Concrete 2" Schedule 40 PVC Holeplug Silica sand # 10 Slot screen</p>
0		Top Soil Dark brown, dry					
1			221.54				
2		Fill Landfill materials- paper, plastics mixed with silty clay/black sludge					
3							
4							
5							
6							
7		Sand/little gravel Dark brown, dominantly sand, wet	220.02				
8							
9							
10		Fine sand Dark brown, wet	219.10				
11							
12							
13							
14			217.73				
15		Clay Grey, moist	217.58				
16		End of Borehole					
17							
18							

Drilled By: Direct Environmental

Drill Method: Hollow Stem

Drill Date: 23 August 2016

Hole Size (m): 0.20

Supervised By: HH

Datum: Local

Sheet: 1 of 1

Project No: W-B4718-03

Project: Hydrogeological Investigation

Client: Municipality of West Elgin

Location: West Elgin Landfill

Log of Borehole: MW6

Supervisor: Mel Bombini

SUBSURFACE PROFILE				SAMPLE			Well Completion Details
Depth	Symbol	Description	Elev.	Number	Type	Recovery	
0 ft m 0		Ground Surface	100.23				
		Till grass at surface, sand and gravel, silty, brown, dry					
5							
10							
15			95.66				
5		Sand medium grain, brown, damp becoming wet with depth					
20			94.14				
		Clay grey, hard	93.68				
		End of Borehole					
25							

Drill Method: **Hollow Stem Auger**

Datum: **Local**

Drill Date: **October 15, 2007**

Checked by: **K.D.G.**

Sheet: **1 of 1**

Project No: W-B4718-03

Project: Hydrogeological Investigation

Client: Municipality of West Elgin

Location: West Elgin Landfill

Log of Borehole: MW7

Supervisor: Mel Bombini

SUBSURFACE PROFILE				SAMPLE			Well Completion Details
Depth	Symbol	Description	Elev.	Number	Type	Recovery	
0 ft m 0		Ground Surface	100.32				
		Till grass at surface, sand and gravel, silty, brown, dry					
5							
10							
15							
5							
		Sand medium grain, brown, damp becoming wet with depth	94.84				
20							
		Clay	93.62				
		End of Borehole					
25							

Drill Method: Hollow Stem Auger

Datum: Local

Drill Date: October 15, 2007

Checked by: K.D.G.

Sheet: 1 of 1

Project No: W-B4718-03

Project: Hydrogeological Investigation

Client: Municipality of West Elgin

Location: West Elgin Landfill

Log of Borehole: MW8

Supervisor: Mel Bombini

SUBSURFACE PROFILE				SAMPLE			Well Completion Details
Depth	Symbol	Description	Elev.	Number	Type	Recovery	
0 ft		Ground Surface	99.11				
0		Till grass at surface, sand and gravel, silty, brown, dry					
5							
10			95.45				
15		Gravel sandy, brown					
5			93.62				
20		grey, saturated Clay	93.32 93.16				
20		End of Borehole					
25							

Drill Method: Hollow Stem Auger

Datum: Local

Drill Date: October 15, 2007

Checked by: K.D.G.

Sheet: 1 of 1

Project No: W-B4718-03

Project: Hydrogeological Investigation

Client: Municipality of West Elgin

Location: West Elgin Landfill

Log of Borehole: MW9

Supervisor: Mel Bombini

SUBSURFACE PROFILE				SAMPLE			Well Completion Details
Depth	Symbol	Description	Elev.	Number	Type	Recovery	
0 ft m 0		Ground Surface	98.26				
		Till grass at surface, sand and gravel, brown					
5							
10							
15							
5							
		Clay	82.86				
		End of Borehole					
20							
25							

Drill Method: **Hollow Stem Auger**

Datum: **Local**

Drill Date: **October 16, 2007**

Checked by: **K.D.G.**

Sheet: **1 of 1**

Project No: W-B4718-03

Project: Hydrogeological Investigation

Client: Municipality of West Elgin

Location: West Elgin Landfill

Log of Borehole: MW10

Supervisor: Mel Bombini

SUBSURFACE PROFILE				SAMPLE			Well Completion Details
Depth	Symbol	Description	Elev.	Number	Type	Recovery	
0 ft m 0		Ground Surface	99.02				
		Till grass at surface, sand and gravel, well graded, round to sub-angular, brown, dry					
5			97.49				
		Gravel coarse, small cobbles, little to no sand, dry					
10							
		Sand fine, silty, clayey, grey, saturated	94.60				
15			94.14				
5		Clay	93.68				
		End of Borehole					
20							
25							

Drill Method: **Hollow Stem Auger**

Datum: **Local**

Drill Date: **November 8, 2007**

Checked by: **K.D.G.**

Sheet: **1 of 1**

Project No: W-B4718-03

Project: Hydrogeological Investigation

Client: Municipality of West Elgin

Location: West Elgin Landfill

Log of Borehole: MW11

Supervisor: Mel Bombini

SUBSURFACE PROFILE				SAMPLE			Well Completion Details
Depth	Symbol	Description	Elev.	Number	Type	Recovery	
0 ft m 0		Ground Surface	100.33				
		Sand grass at surface, fine to medium grain, trace gravel, brown, dry					
5		increase gravel with depth	98.80				
10		angular, coarse grain, silty, some gravel, brown, dry	97.28				
		Gravel small and medium grain, trace cobbles, coarse sand (pebbles)	96.67				
15							
5		Sand fine to medium, trace gravel, brown, wet	95.15				
20		silty, clayey, grey, saturated	94.54				
		Clay	93.62				
		End of Borehole	93.32				
25							

Drill Method: **Hollow Stem Auger**

Datum: **Local**

Drill Date: **November 8, 2007**

Checked by: **K.D.G.**

Sheet: **1 of 1**

Project No: W-B4718-03

Project: Hydrogeological Investigation

Client: Municipality of West Elgin

Location: West Elgin Landfill

Log of Borehole: MW12

Supervisor: Mel Bombini

SUBSURFACE PROFILE				SAMPLE			Well Completion Details
Depth	Symbol	Description	Elev.	Number	Type	Recovery	
0 ft		Ground Surface	95.92				
		Sand grass at surface, fine, organic, "peaty", brown, damp	95.01				
		medium fine grained, grey, saturated					
5		Silty Sand clayey, grey, saturated	94.09				
		Clay	93.64				
			93.18				
10		End of Borehole					
15							
20							
25							

Drill Method: **Hollow Stem Auger**

Datum: **Local**

Drill Date: **November 8, 2007**

Checked by: **K.D.G.**

Sheet: **1 of 1**

Borehole/Well ID: MW14

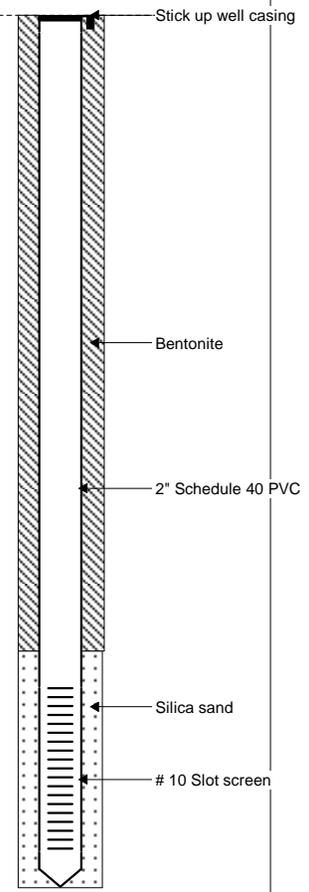
Project No.: W-B4718

Project Manager: Karen Greer

Client: Municipality of West Elgin

Location: West Elgin Landfill

SUBSURFACE PROFILE				SAMPLE			CGD/PID Headspace Reading			Well Completion Details
Depth	Symbol	Description	Elevation	Number	Type	Recovery	CGD PPM			
							100	200	300	
							PID PPMv			
							100	200	300	
0		Ground Surface	222.74							
0		Top Soil Brown		S1		5%				
2										
4			221.22							
6		Sand Light brown, coarse grain, micaceous, trace gravel at 1.98m-2.13m, moist		S2		75%				
8										
10			219.69							
12		Sand gravel Brown, coarse grained, some rounded gravel, trace angular gravel, at 3.2m to 3.35m		S3		60%				
14										
16			218.17							
18		Sand gravel Dark brown, some rounded gravel, lots of large angular gravel at 4.72m-4.87m, saturated		S4		75%				
20										
22			216.65							
24		Silty Sand Grey, very fine, saturated		S5		100%				
26										
28			215.58							
30		Clay Grey, Saturated		S6		100%				
32			214.97							
34		End of Borehole								



Drilled By: Aardvark

Template: WESA QMS- BH ONLY, No Vapour - Kitchener

Drill Method: Hollow Stem Auger/ Split Spoon Sample

Hole Size (m): 0.20

Datum: Local

Drill Date: 18/5/2010

Supervised By: Ayman Khedr

Sheet: 1 of 1



171 Victoria St. N,
Kitchener, ON, N2H 5C5

Borehole/Well ID: MW19

Project No.: W-B4718-19-01

Client: Municipality of West Elgin

Location: West Elgin Landfill

SUBSURFACE PROFILE				SAMPLE			Well Completion Details
Depth	Symbol	Description	Elevation	Number	Type	Recovery	
0		Ground Surface	217.01				
0		Clayey Silt Organic, dark brown	216.93				
2		Sand Brown grey, some subrounded gravel, trace silt and clay saturated	216.23				
4		End of Borehole					

Drilled By: BluMetric Environmental Inc.

Drill Method: Hand Auger

Drill Date: 1 April 2016

Hole Size (m): 0.06

Supervised By: M. MacLaughlin

APPENDIX D

Monitoring Well UTM Coordinates



Appendix D
Monitoring Well UTM Coordinates
West Elgin Landfill Site

Location	Elevation	GPS co-ordinates	
MW1	220.855	439552.229	4710268.433
MW2-R	224.713	439654.060	4710242.436
MW2D	224.915	439655.801	4710242.432
MW3	222.891	439794.117	4710279.110
MW4	221.994	439686.435	4710181.632
MW5-R	221.321	439625.676	4710197.588
MW6	223.392	439753.497	4710230.710
MW7	223.571	439737.306	4710345.245
MW8	222.251	439807.120	4710261.252
MW9	221.423	439751.528	4710190.614
MW10	222.145	439608.592	4710159.425
MW11	223.45	439748.745	4710346.143
MW12	218.884	439830.878	4710244.576
MW14	222.741	439513.526	4710590.759
MW15	218.298	439824.872	4710294.084
MW16	218.235	-	-
MW17	218.201	-	-
MW18	217.068	-	-
MW19-R	217.758	439888.473	4710274.481

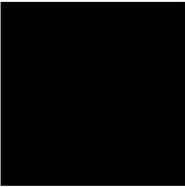
Note:
Benchmark 213.405 441184.197 4710701.462



APPENDIX E

Laboratory Reports of Groundwater Chemical Analyses





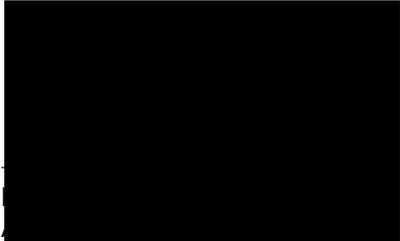
BluMetric Environmental Inc. (Kitchener)
ATTN: S'RANA SCHOLES
171 VICTORIA STREET, NORTH
KITCHENER ON N2H 5C5

Date Received: 29-MAY-18
Report Date: 05-JUN-18 13:47 (MT)
Version: FINAL

Client Phone: 519-742-6685

Certificate of Analysis

Lab Work Order #: L2102331
Project P.O. #: NOT SUBMITTED
Job Reference: 180351-01
C of C Numbers: 17-619350, 17-619383
Legal Site Desc:



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ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8, Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047



ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-1 MW1							
Sampled By: CLIENT on 29-MAY-18 @ 11:20							
Matrix: WATER							
Physical Tests							
Colour, Apparent	24.4		2.0	CU		30-MAY-18	R4062835
Conductivity	1230		3.0	umhos/cm		30-MAY-18	R4062836
pH	7.50		0.10	pH units		30-MAY-18	R4062836
Total Dissolved Solids	895	DLDS	20	mg/L		04-JUN-18	R4069782
Turbidity	19.1		0.10	NTU		30-MAY-18	R4061991
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	398		10	mg/L		01-JUN-18	R4067149
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Total (as CaCO3)	398		10	mg/L		01-JUN-18	R4067149
Ammonia, Total (as N)	<0.020		0.020	mg/L		01-JUN-18	R4064226
Bromide (Br)	<0.50	DLDS	0.50	mg/L		01-JUN-18	R4067574
Chloride (Cl)	17.0	DLDS	2.5	mg/L		01-JUN-18	R4067574
Computed Conductivity	1310			uS/cm		05-JUN-18	
Conductivity % Difference	5.9			%		05-JUN-18	
Fluoride (F)	<0.10	DLDS	0.10	mg/L		01-JUN-18	R4067574
Hardness (as CaCO3)	738			mg/L		05-JUN-18	
Ion Balance	109			%		05-JUN-18	
Langelier Index	0.9					05-JUN-18	
Nitrate and Nitrite as N	4.54		0.11	mg/L		04-JUN-18	
Nitrate (as N)	4.54	DLDS	0.10	mg/L		01-JUN-18	R4067574
Nitrite (as N)	<0.050	DLDS	0.050	mg/L		01-JUN-18	R4067574
Total Kjeldahl Nitrogen	0.53		0.15	mg/L	01-JUN-18	01-JUN-18	R4064383
Saturation pH	6.57			pH		05-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		30-MAY-18	R4062414
Phosphorus, Total	0.104		0.0030	mg/L	30-MAY-18	01-JUN-18	R4063684
TDS (Calculated)	881			mg/L		05-JUN-18	
Sulfate (SO4)	319	DLDS	1.5	mg/L		01-JUN-18	R4067574
Anion Sum	14.0			me/L		05-JUN-18	
Cation Sum	15.2			me/L		05-JUN-18	
Cation - Anion Balance	4.2			%		05-JUN-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	2.3		1.0	mg/L		03-JUN-18	R4065971
Inorganic Parameters							
Silica	12.2		0.11	mg/L		30-MAY-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					30-MAY-18	R4061854
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Arsenic (As)-Dissolved	0.00016		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Barium (Ba)-Dissolved	0.131		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-1 MW1							
Sampled By: CLIENT on 29-MAY-18 @ 11:20							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Boron (B)-Dissolved	0.214		0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Cadmium (Cd)-Dissolved	<0.000010		0.000010	mg/L	30-MAY-18	30-MAY-18	R4062229
Calcium (Ca)-Dissolved	242		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Cobalt (Co)-Dissolved	0.00027		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Copper (Cu)-Dissolved	0.00111		0.00020	mg/L	30-MAY-18	30-MAY-18	R4062229
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Magnesium (Mg)-Dissolved	32.4		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Manganese (Mn)-Dissolved	0.0656		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Molybdenum (Mo)-Dissolved	0.000316		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Nickel (Ni)-Dissolved	0.00126		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Potassium (K)-Dissolved	2.00		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Selenium (Se)-Dissolved	0.000396		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Silicon (Si)-Dissolved	5.71		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Silver (Ag)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Sodium (Na)-Dissolved	9.57		0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Strontium (Sr)-Dissolved	0.423		0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Sulfur (S)-Dissolved	113		5.0	mg/L	30-MAY-18	30-MAY-18	R4062229
Thallium (Tl)-Dissolved	0.000016		0.000010	mg/L	30-MAY-18	30-MAY-18	R4062229
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	30-MAY-18	30-MAY-18	R4062229
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Uranium (U)-Dissolved	0.00118		0.000010	mg/L	30-MAY-18	30-MAY-18	R4062229
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Zinc (Zn)-Dissolved	0.0016		0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Zirconium (Zr)-Dissolved	<0.00030		0.00030	mg/L	30-MAY-18	30-MAY-18	R4062229
Volatile Organic Compounds							
Acetone	<20		20	ug/L		31-MAY-18	R4063095
Benzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Bromodichloromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
Bromoform	<1.0		1.0	ug/L		31-MAY-18	R4063095
Bromomethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
Carbon Disulfide	<1.0		1.0	ug/L		31-MAY-18	R4063095
Carbon tetrachloride	<0.50		0.50	ug/L		31-MAY-18	R4063095
Chlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Dibromochloromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
Chloroethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
Chloroform	<1.0		1.0	ug/L		31-MAY-18	R4063095

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-1 MW1 Sampled By: CLIENT on 29-MAY-18 @ 11:20 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
1,2-Dibromoethane	<0.20		0.20	ug/L		31-MAY-18	R4063095
1,2-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,3-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,4-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Dichlorodifluoromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
1,1-Dichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,2-Dichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Dichloromethane	<2.0		2.0	ug/L		31-MAY-18	R4063095
1,2-Dichloropropane	<0.50		0.50	ug/L		31-MAY-18	R4063095
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		31-MAY-18	R4063095
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Ethylbenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
n-Hexane	<0.50		0.50	ug/L		31-MAY-18	R4063095
2-Hexanone	<20		20	ug/L		31-MAY-18	R4063095
Methyl Ethyl Ketone	<20		20	ug/L		31-MAY-18	R4063095
Methyl Isobutyl Ketone	<20		20	ug/L		31-MAY-18	R4063095
MTBE	<0.50		0.50	ug/L		31-MAY-18	R4063095
Styrene	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
Tetrachloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Toluene	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1,1-Trichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1,2-Trichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
Trichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Trichlorofluoromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
Vinyl chloride	<0.50		0.50	ug/L		31-MAY-18	R4063095
o-Xylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
m+p-Xylenes	<1.0		1.0	ug/L		31-MAY-18	R4063095
Xylenes (Total)	<1.1		1.1	ug/L		31-MAY-18	
Surrogate: 4-Bromofluorobenzene	87.7		70-130	%		31-MAY-18	R4063095
Surrogate: 1,4-Difluorobenzene	97.2		70-130	%		31-MAY-18	R4063095
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		31-MAY-18	
L2102331-2 MW2-R Sampled By: CLIENT on 29-MAY-18 @ 15:30 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-2 MW2-R							
Sampled By: CLIENT on 29-MAY-18 @ 15:30							
Matrix: WATER							
Physical Tests							
Colour, Apparent	1940	DLHC	20	CU		30-MAY-18	R4062835
Conductivity	7830		3.0	umhos/cm		30-MAY-18	R4061976
pH	7.10		0.10	pH units		30-MAY-18	R4061898
Total Dissolved Solids	3250	DLDS	20	mg/L		04-JUN-18	R4069782
Turbidity	252		0.10	NTU		30-MAY-18	R4061991
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	3330		10	mg/L		31-MAY-18	R4063182
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		31-MAY-18	R4063182
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		31-MAY-18	R4063182
Alkalinity, Total (as CaCO3)	3330	DLHC	100	mg/L		31-MAY-18	R4063182
Ammonia, Total (as N)	352	DLHC	20	mg/L		01-JUN-18	R4064226
Bromide (Br)	<2.0	DLDS	2.0	mg/L		01-JUN-18	R4067574
Chloride (Cl)	723	DLDS	10	mg/L		01-JUN-18	R4067574
Computed Conductivity	5410			uS/cm		05-JUN-18	
Conductivity % Difference	-36.5			%		05-JUN-18	
Fluoride (F)	<0.40	DLDS	0.40	mg/L		01-JUN-18	R4067574
Hardness (as CaCO3)	618			mg/L		05-JUN-18	
Ion Balance	92.4			%		05-JUN-18	
Langelier Index	1.1					05-JUN-18	
Nitrate and Nitrite as N	<0.45		0.45	mg/L		04-JUN-18	
Nitrate (as N)	<0.40	DLDS	0.40	mg/L		01-JUN-18	R4067574
Nitrite (as N)	<0.20	DLDS	0.20	mg/L		01-JUN-18	R4067574
Total Kjeldahl Nitrogen	598	DLHC	15	mg/L	01-JUN-18	01-JUN-18	R4064383
Saturation pH	6.04			pH		05-JUN-18	
Orthophosphate-Dissolved (as P)	2.10	DLHC	0.30	mg/L		30-MAY-18	R4062414
Phosphorus, Total	3.07	DLHC	0.015	mg/L	30-MAY-18	01-JUN-18	R4063684
TDS (Calculated)	3930			mg/L		05-JUN-18	
Sulfate (SO4)	74.7	DLDS	6.0	mg/L		01-JUN-18	R4067574
Anion Sum	76.7			me/L		05-JUN-18	
Cation Sum	70.9			me/L		05-JUN-18	
Cation - Anion Balance	-3.9			%		05-JUN-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	392	DLHC	20	mg/L		03-JUN-18	R4065971
Inorganic Parameters							
Silica	28.8		1.1	mg/L		01-JUN-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					31-MAY-18	R4062770
Aluminum (Al)-Dissolved	0.407	DLHC	0.050	mg/L	31-MAY-18	31-MAY-18	R4063710
Antimony (Sb)-Dissolved	0.0016	DLHC	0.0010	mg/L	31-MAY-18	31-MAY-18	R4063710
Arsenic (As)-Dissolved	0.0085	DLHC	0.0010	mg/L	31-MAY-18	31-MAY-18	R4063710
Barium (Ba)-Dissolved	0.147	DLHC	0.0010	mg/L	31-MAY-18	31-MAY-18	R4063710
Beryllium (Be)-Dissolved	<0.0010	DLHC	0.0010	mg/L	31-MAY-18	31-MAY-18	R4063710

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-2 MW2-R Sampled By: CLIENT on 29-MAY-18 @ 15:30 Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.00050	DLHC	0.00050	mg/L	31-MAY-18	31-MAY-18	R4063710
Boron (B)-Dissolved	2.64	DLHC	0.10	mg/L	31-MAY-18	31-MAY-18	R4063710
Cadmium (Cd)-Dissolved	<0.000050	DLHC	0.000050	mg/L	31-MAY-18	31-MAY-18	R4063710
Calcium (Ca)-Dissolved	146	DLHC	0.50	mg/L	31-MAY-18	31-MAY-18	R4063710
Chromium (Cr)-Dissolved	0.0945	DLHC	0.0050	mg/L	31-MAY-18	31-MAY-18	R4063710
Cobalt (Co)-Dissolved	0.0078	DLHC	0.0010	mg/L	31-MAY-18	31-MAY-18	R4063710
Copper (Cu)-Dissolved	<0.0020	DLHC	0.0020	mg/L	31-MAY-18	31-MAY-18	R4063710
Iron (Fe)-Dissolved	11.3	DLHC	0.10	mg/L	31-MAY-18	31-MAY-18	R4063710
Lead (Pb)-Dissolved	<0.00050	DLHC	0.00050	mg/L	31-MAY-18	31-MAY-18	R4063710
Magnesium (Mg)-Dissolved	61.5	DLHC	0.050	mg/L	31-MAY-18	31-MAY-18	R4063710
Manganese (Mn)-Dissolved	0.342	DLHC	0.0050	mg/L	31-MAY-18	31-MAY-18	R4063710
Molybdenum (Mo)-Dissolved	0.00289	DLHC	0.00050	mg/L	31-MAY-18	31-MAY-18	R4063710
Nickel (Ni)-Dissolved	0.0501	DLHC	0.0050	mg/L	31-MAY-18	31-MAY-18	R4063710
Phosphorus (P)-Dissolved	2.71	DLHC	0.50	mg/L	31-MAY-18	31-MAY-18	R4063710
Potassium (K)-Dissolved	374	DLHC	0.50	mg/L	31-MAY-18	31-MAY-18	R4063710
Selenium (Se)-Dissolved	<0.00050	DLHC	0.00050	mg/L	31-MAY-18	31-MAY-18	R4063710
Silicon (Si)-Dissolved	13.5	DLHC	0.50	mg/L	31-MAY-18	31-MAY-18	R4063710
Silver (Ag)-Dissolved	<0.00050	DLHC	0.00050	mg/L	31-MAY-18	31-MAY-18	R4063710
Sodium (Na)-Dissolved	547	DLHC	0.50	mg/L	31-MAY-18	31-MAY-18	R4063710
Strontium (Sr)-Dissolved	1.15	DLHC	0.010	mg/L	31-MAY-18	31-MAY-18	R4063710
Sulfur (S)-Dissolved	34.7	DLHC	5.0	mg/L	31-MAY-18	31-MAY-18	R4063710
Thallium (Tl)-Dissolved	<0.00010	DLHC	0.00010	mg/L	31-MAY-18	31-MAY-18	R4063710
Tin (Sn)-Dissolved	0.0183	DLHC	0.0010	mg/L	31-MAY-18	31-MAY-18	R4063710
Titanium (Ti)-Dissolved	0.0467	DLHC	0.0030	mg/L	31-MAY-18	31-MAY-18	R4063710
Tungsten (W)-Dissolved	0.0021	DLHC	0.0010	mg/L	31-MAY-18	31-MAY-18	R4063710
Uranium (U)-Dissolved	0.00013	DLHC	0.00010	mg/L	31-MAY-18	31-MAY-18	R4063710
Vanadium (V)-Dissolved	0.0138	DLHC	0.0050	mg/L	31-MAY-18	31-MAY-18	R4063710
Zinc (Zn)-Dissolved	<0.010	DLHC	0.010	mg/L	31-MAY-18	31-MAY-18	R4063710
Zirconium (Zr)-Dissolved	0.0228	DLHC	0.0030	mg/L	31-MAY-18	31-MAY-18	R4063710
Volatile Organic Compounds							
Acetone	<20	OWP	20	ug/L		31-MAY-18	R4063095
Benzene	0.77	OWP	0.50	ug/L		31-MAY-18	R4063095
Bromodichloromethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4063095
Bromoform	<1.0	OWP	1.0	ug/L		31-MAY-18	R4063095
Bromomethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4063095
Carbon Disulfide	<1.0	OWP	1.0	ug/L		31-MAY-18	R4063095
Carbon tetrachloride	<0.50	OWP	0.50	ug/L		31-MAY-18	R4063095
Chlorobenzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4063095
Dibromochloromethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4063095
Chloroethane	1.4	OWP	1.0	ug/L		31-MAY-18	R4063095
Chloroform	<1.0	OWP	1.0	ug/L		31-MAY-18	R4063095

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-2 MW2-R Sampled By: CLIENT on 29-MAY-18 @ 15:30 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4063095
1,2-Dibromoethane	<0.20	OWP	0.20	ug/L		31-MAY-18	R4063095
1,2-Dichlorobenzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4063095
1,3-Dichlorobenzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4063095
1,4-Dichlorobenzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4063095
Dichlorodifluoromethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4063095
1,1-Dichloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4063095
1,2-Dichloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4063095
1,1-Dichloroethylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4063095
cis-1,2-Dichloroethylene	0.86	OWP	0.50	ug/L		31-MAY-18	R4063095
trans-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4063095
Dichloromethane	<2.0	OWP	2.0	ug/L		31-MAY-18	R4063095
1,2-Dichloropropane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4063095
cis-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4063095
trans-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4063095
Ethylbenzene	3.72	OWP	0.50	ug/L		31-MAY-18	R4063095
n-Hexane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4063095
2-Hexanone	<20	OWP	20	ug/L		31-MAY-18	R4063095
Methyl Ethyl Ketone	<20	OWP	20	ug/L		31-MAY-18	R4063095
Methyl Isobutyl Ketone	<20	OWP	20	ug/L		31-MAY-18	R4063095
MTBE	<0.50	OWP	0.50	ug/L		31-MAY-18	R4063095
Styrene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4063095
1,1,1,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4063095
1,1,1,2,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4063095
Tetrachloroethylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4063095
Toluene	8.69	OWP	0.50	ug/L		31-MAY-18	R4063095
1,1,1-Trichloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4063095
1,1,2-Trichloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4063095
Trichloroethylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4063095
Trichlorofluoromethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4063095
Vinyl chloride	0.59	OWP	0.50	ug/L		31-MAY-18	R4063095
o-Xylene	6.33	OWP	0.50	ug/L		31-MAY-18	R4063095
m+p-Xylenes	9.2	OWP	1.0	ug/L		31-MAY-18	R4063095
Xylenes (Total)	15.6		1.1	ug/L		31-MAY-18	
Surrogate: 4-Bromofluorobenzene	89.0		70-130	%		31-MAY-18	R4063095
Surrogate: 1,4-Difluorobenzene	96.6		70-130	%		31-MAY-18	R4063095
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		31-MAY-18	
L2102331-3 MW2D Sampled By: CLIENT on 29-MAY-18 @ 16:20 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-3 MW2D							
Sampled By: CLIENT on 29-MAY-18 @ 16:20							
Matrix: WATER							
Physical Tests							
Colour, Apparent	154		2.0	CU		30-MAY-18	R4062835
Conductivity	609		3.0	umhos/cm		30-MAY-18	R4062836
pH	8.03		0.10	pH units		30-MAY-18	R4062836
Total Dissolved Solids	364	DLDS	20	mg/L		04-JUN-18	R4069782
Turbidity	128		0.10	NTU		30-MAY-18	R4061991
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	218		10	mg/L		01-JUN-18	R4067149
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Total (as CaCO3)	218		10	mg/L		01-JUN-18	R4067149
Ammonia, Total (as N)	0.267		0.020	mg/L		01-JUN-18	R4064226
Bromide (Br)	0.20		0.10	mg/L		01-JUN-18	R4067574
Chloride (Cl)	41.1		0.50	mg/L		01-JUN-18	R4067574
Computed Conductivity	572			uS/cm		05-JUN-18	
Conductivity % Difference	-6.3			%		05-JUN-18	
Fluoride (F)	0.573		0.020	mg/L		01-JUN-18	R4067574
Hardness (as CaCO3)	207			mg/L		05-JUN-18	
Ion Balance	117			%		05-JUN-18	
Langelier Index	0.7					05-JUN-18	
Nitrate and Nitrite as N	0.065		0.022	mg/L		04-JUN-18	
Nitrate (as N)	0.065		0.020	mg/L		01-JUN-18	R4067574
Nitrite (as N)	<0.010		0.010	mg/L		01-JUN-18	R4067574
Total Kjeldahl Nitrogen	1.21		0.15	mg/L	01-JUN-18	01-JUN-18	R4064383
Saturation pH	7.36			pH		05-JUN-18	
Orthophosphate-Dissolved (as P)	0.0054		0.0030	mg/L		30-MAY-18	R4062414
Phosphorus, Total	0.174		0.0030	mg/L	30-MAY-18	01-JUN-18	R4063684
TDS (Calculated)	348			mg/L		05-JUN-18	
Sulfate (SO4)	44.2		0.30	mg/L		01-JUN-18	R4067574
Anion Sum	5.72			me/L		05-JUN-18	
Cation Sum	6.68			me/L		05-JUN-18	
Cation - Anion Balance	7.8			%		05-JUN-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	3.1		1.0	mg/L		03-JUN-18	R4065971
Inorganic Parameters							
Silica	11.7		0.11	mg/L		30-MAY-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					30-MAY-18	R4061854
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Antimony (Sb)-Dissolved	0.00052		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Arsenic (As)-Dissolved	0.00114		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Barium (Ba)-Dissolved	0.125		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-3 MW2D							
Sampled By: CLIENT on 29-MAY-18 @ 16:20							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Boron (B)-Dissolved	0.322		0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Cadmium (Cd)-Dissolved	0.000035		0.000010	mg/L	30-MAY-18	30-MAY-18	R4062229
Calcium (Ca)-Dissolved	54.6		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Cobalt (Co)-Dissolved	0.00022		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Copper (Cu)-Dissolved	0.00235		0.00020	mg/L	30-MAY-18	30-MAY-18	R4062229
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Lead (Pb)-Dissolved	0.000213		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Magnesium (Mg)-Dissolved	17.1		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Manganese (Mn)-Dissolved	0.0424		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Molybdenum (Mo)-Dissolved	0.00958		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Nickel (Ni)-Dissolved	0.00111		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Potassium (K)-Dissolved	2.73		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Selenium (Se)-Dissolved	0.000071		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Silicon (Si)-Dissolved	5.46		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Silver (Ag)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Sodium (Na)-Dissolved	56.6		0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Strontium (Sr)-Dissolved	1.44		0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Sulfur (S)-Dissolved	15.9		5.0	mg/L	30-MAY-18	30-MAY-18	R4062229
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L	30-MAY-18	30-MAY-18	R4062229
Tin (Sn)-Dissolved	0.00020		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	30-MAY-18	30-MAY-18	R4062229
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Uranium (U)-Dissolved	0.000950		0.000010	mg/L	30-MAY-18	30-MAY-18	R4062229
Vanadium (V)-Dissolved	0.00104		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Zinc (Zn)-Dissolved	0.0064		0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Zirconium (Zr)-Dissolved	<0.00030		0.00030	mg/L	30-MAY-18	30-MAY-18	R4062229
Volatile Organic Compounds							
Acetone	<20		20	ug/L		31-MAY-18	R4063095
Benzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Bromodichloromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
Bromoform	<1.0		1.0	ug/L		31-MAY-18	R4063095
Bromomethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
Carbon Disulfide	<1.0		1.0	ug/L		31-MAY-18	R4063095
Carbon tetrachloride	<0.50		0.50	ug/L		31-MAY-18	R4063095
Chlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Dibromochloromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
Chloroethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
Chloroform	<1.0		1.0	ug/L		31-MAY-18	R4063095

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-3 MW2D Sampled By: CLIENT on 29-MAY-18 @ 16:20 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
1,2-Dibromoethane	<0.20		0.20	ug/L		31-MAY-18	R4063095
1,2-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,3-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,4-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Dichlorodifluoromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
1,1-Dichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,2-Dichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Dichloromethane	<2.0		2.0	ug/L		31-MAY-18	R4063095
1,2-Dichloropropane	<0.50		0.50	ug/L		31-MAY-18	R4063095
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		31-MAY-18	R4063095
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Ethylbenzene	0.50		0.50	ug/L		31-MAY-18	R4063095
n-Hexane	<0.50		0.50	ug/L		31-MAY-18	R4063095
2-Hexanone	<20		20	ug/L		31-MAY-18	R4063095
Methyl Ethyl Ketone	<20		20	ug/L		31-MAY-18	R4063095
Methyl Isobutyl Ketone	<20		20	ug/L		31-MAY-18	R4063095
MTBE	<0.50		0.50	ug/L		31-MAY-18	R4063095
Styrene	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
Tetrachloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Toluene	0.67		0.50	ug/L		31-MAY-18	R4063095
1,1,1-Trichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1,2-Trichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
Trichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Trichlorofluoromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
Vinyl chloride	<0.50		0.50	ug/L		31-MAY-18	R4063095
o-Xylene	1.17		0.50	ug/L		31-MAY-18	R4063095
m+p-Xylenes	1.8		1.0	ug/L		31-MAY-18	R4063095
Xylenes (Total)	3.0		1.1	ug/L		31-MAY-18	
Surrogate: 4-Bromofluorobenzene	86.8		70-130	%		31-MAY-18	R4063095
Surrogate: 1,4-Difluorobenzene	97.2		70-130	%		31-MAY-18	R4063095
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		31-MAY-18	
L2102331-4 MW3 Sampled By: CLIENT on 29-MAY-18 @ 14:20 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-4 MW3							
Sampled By: CLIENT on 29-MAY-18 @ 14:20							
Matrix: WATER							
Physical Tests							
Colour, Apparent	270	DLHC	4.0	CU		30-MAY-18	R4062835
Conductivity	1750		3.0	umhos/cm		30-MAY-18	R4062836
pH	7.47		0.10	pH units		30-MAY-18	R4062836
Total Dissolved Solids	944	DLDS	20	mg/L		04-JUN-18	R4069782
Turbidity	217		0.10	NTU		30-MAY-18	R4061991
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	721		10	mg/L		01-JUN-18	R4067149
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Total (as CaCO3)	721	DLHC	20	mg/L		01-JUN-18	R4067149
Ammonia, Total (as N)	28.3	DLHC	1.0	mg/L		01-JUN-18	R4064226
Bromide (Br)	1.05	DLDS	0.50	mg/L		01-JUN-18	R4067574
Chloride (Cl)	151	DLDS	2.5	mg/L		01-JUN-18	R4067574
Computed Conductivity	1500			uS/cm		05-JUN-18	
Conductivity % Difference	-15.0			%		05-JUN-18	
Fluoride (F)	<0.10	DLDS	0.10	mg/L		01-JUN-18	R4067574
Hardness (as CaCO3)	628			mg/L		05-JUN-18	
Ion Balance	120			%		05-JUN-18	
Langelier Index	1.1					05-JUN-18	
Nitrate and Nitrite as N	0.46		0.11	mg/L		04-JUN-18	
Nitrate (as N)	0.46	DLDS	0.10	mg/L		01-JUN-18	R4067574
Nitrite (as N)	<0.050	DLDS	0.050	mg/L		01-JUN-18	R4067574
Total Kjeldahl Nitrogen	37.7	DLHC	1.5	mg/L	01-JUN-18	01-JUN-18	R4064383
Saturation pH	6.40			pH		05-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		30-MAY-18	R4062414
Phosphorus, Total	0.322		0.0030	mg/L	30-MAY-18	01-JUN-18	R4063684
TDS (Calculated)	958			mg/L		05-JUN-18	
Sulfate (SO4)	4.1	DLDS	1.5	mg/L		01-JUN-18	R4067574
Anion Sum	16.2			me/L		05-JUN-18	
Cation Sum	19.5			me/L		05-JUN-18	
Cation - Anion Balance	9.1			%		05-JUN-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	20.3		1.0	mg/L		03-JUN-18	R4065971
Inorganic Parameters							
Silica	23.2		1.1	mg/L		30-MAY-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					30-MAY-18	R4061854
Aluminum (Al)-Dissolved	<0.050	DLHC	0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Antimony (Sb)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Arsenic (As)-Dissolved	0.0132	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Barium (Ba)-Dissolved	0.494	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Beryllium (Be)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-4 MW3							
Sampled By: CLIENT on 29-MAY-18 @ 14:20							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Boron (B)-Dissolved	0.74	DLHC	0.10	mg/L	30-MAY-18	30-MAY-18	R4062229
Cadmium (Cd)-Dissolved	<0.000050	DLHC	0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Calcium (Ca)-Dissolved	194	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Chromium (Cr)-Dissolved	<0.0050	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Cobalt (Co)-Dissolved	0.0025	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Copper (Cu)-Dissolved	0.0022	DLHC	0.0020	mg/L	30-MAY-18	30-MAY-18	R4062229
Iron (Fe)-Dissolved	12.6	DLHC	0.10	mg/L	30-MAY-18	30-MAY-18	R4062229
Lead (Pb)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Magnesium (Mg)-Dissolved	35.0	DLHC	0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Manganese (Mn)-Dissolved	0.294	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Molybdenum (Mo)-Dissolved	0.00128	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Nickel (Ni)-Dissolved	0.0062	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Phosphorus (P)-Dissolved	<0.50	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Potassium (K)-Dissolved	64.1	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Selenium (Se)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Silicon (Si)-Dissolved	10.8	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Silver (Ag)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Sodium (Na)-Dissolved	75.3	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Strontium (Sr)-Dissolved	1.16	DLHC	0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Sulfur (S)-Dissolved	<5.0	DLHC	5.0	mg/L	30-MAY-18	30-MAY-18	R4062229
Thallium (Tl)-Dissolved	<0.00010	DLHC	0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Tin (Sn)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Titanium (Ti)-Dissolved	<0.0030	DLHC	0.0030	mg/L	30-MAY-18	30-MAY-18	R4062229
Tungsten (W)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Uranium (U)-Dissolved	0.00026	DLHC	0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Vanadium (V)-Dissolved	<0.0050	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Zinc (Zn)-Dissolved	<0.010	DLHC	0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Zirconium (Zr)-Dissolved	<0.0030	DLHC	0.0030	mg/L	30-MAY-18	30-MAY-18	R4062229
Volatile Organic Compounds							
Acetone	<20		20	ug/L		31-MAY-18	R4063095
Benzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Bromodichloromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
Bromoform	<1.0		1.0	ug/L		31-MAY-18	R4063095
Bromomethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
Carbon Disulfide	<1.0		1.0	ug/L		31-MAY-18	R4063095
Carbon tetrachloride	<0.50		0.50	ug/L		31-MAY-18	R4063095
Chlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Dibromochloromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
Chloroethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
Chloroform	<1.0		1.0	ug/L		31-MAY-18	R4063095

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-4 MW3 Sampled By: CLIENT on 29-MAY-18 @ 14:20 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
1,2-Dibromoethane	<0.20		0.20	ug/L		31-MAY-18	R4063095
1,2-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,3-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,4-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Dichlorodifluoromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
1,1-Dichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,2-Dichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Dichloromethane	<2.0		2.0	ug/L		31-MAY-18	R4063095
1,2-Dichloropropane	<0.50		0.50	ug/L		31-MAY-18	R4063095
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		31-MAY-18	R4063095
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Ethylbenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
n-Hexane	<0.50		0.50	ug/L		31-MAY-18	R4063095
2-Hexanone	<20		20	ug/L		31-MAY-18	R4063095
Methyl Ethyl Ketone	<20		20	ug/L		31-MAY-18	R4063095
Methyl Isobutyl Ketone	<20		20	ug/L		31-MAY-18	R4063095
MTBE	<0.50		0.50	ug/L		31-MAY-18	R4063095
Styrene	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
Tetrachloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Toluene	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1,1-Trichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1,2-Trichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
Trichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Trichlorofluoromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
Vinyl chloride	<0.50		0.50	ug/L		31-MAY-18	R4063095
o-Xylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
m+p-Xylenes	<1.0		1.0	ug/L		31-MAY-18	R4063095
Xylenes (Total)	<1.1		1.1	ug/L		31-MAY-18	
Surrogate: 4-Bromofluorobenzene	86.3		70-130	%		31-MAY-18	R4063095
Surrogate: 1,4-Difluorobenzene	96.3		70-130	%		31-MAY-18	R4063095
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		31-MAY-18	
L2102331-5 MW4 Sampled By: CLIENT on 29-MAY-18 @ 12:10 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-5 MW4							
Sampled By: CLIENT on 29-MAY-18 @ 12:10							
Matrix: WATER							
Physical Tests							
Colour, Apparent	86.8		2.0	CU		30-MAY-18	R4062835
Conductivity	1240		3.0	umhos/cm		30-MAY-18	R4062836
pH	7.33		0.10	pH units		30-MAY-18	R4062836
Total Dissolved Solids	742	DLDS	20	mg/L		04-JUN-18	R4069782
Turbidity	117		0.10	NTU		30-MAY-18	R4061991
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	485		10	mg/L		01-JUN-18	R4067149
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Total (as CaCO3)	485	DLHC	20	mg/L		01-JUN-18	R4067149
Ammonia, Total (as N)	6.79	DLHC	0.20	mg/L		01-JUN-18	R4064226
Bromide (Br)	0.60	DLDS	0.50	mg/L		01-JUN-18	R4067574
Chloride (Cl)	96.0	DLDS	2.5	mg/L		01-JUN-18	R4067574
Computed Conductivity	1100			uS/cm		05-JUN-18	
Conductivity % Difference	-11.6			%		05-JUN-18	
Fluoride (F)	<0.10	DLDS	0.10	mg/L		01-JUN-18	R4067574
Hardness (as CaCO3)	565			mg/L		05-JUN-18	
Ion Balance	119			%		05-JUN-18	
Langelier Index	0.8					05-JUN-18	
Nitrate and Nitrite as N	<0.11		0.11	mg/L		04-JUN-18	
Nitrate (as N)	<0.10	DLDS	0.10	mg/L		01-JUN-18	R4067574
Nitrite (as N)	<0.050	DLDS	0.050	mg/L		01-JUN-18	R4067574
Total Kjeldahl Nitrogen	8.71		0.15	mg/L	01-JUN-18	01-JUN-18	R4064383
Saturation pH	6.55			pH		05-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		30-MAY-18	R4062414
Phosphorus, Total	0.101		0.0030	mg/L	01-JUN-18	03-JUN-18	R4065947
TDS (Calculated)	694			mg/L		05-JUN-18	
Sulfate (SO4)	43.3	DLDS	1.5	mg/L		01-JUN-18	R4067574
Anion Sum	11.6			me/L		05-JUN-18	
Cation Sum	13.8			me/L		05-JUN-18	
Cation - Anion Balance	8.7			%		05-JUN-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	6.8		1.0	mg/L		03-JUN-18	R4065971
Inorganic Parameters							
Silica	20.7		1.1	mg/L		30-MAY-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					30-MAY-18	R4061854
Aluminum (Al)-Dissolved	<0.050	DLHC	0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Antimony (Sb)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Arsenic (As)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Barium (Ba)-Dissolved	0.286	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Beryllium (Be)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-5 MW4							
Sampled By: CLIENT on 29-MAY-18 @ 12:10							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Boron (B)-Dissolved	0.92	DLHC	0.10	mg/L	30-MAY-18	30-MAY-18	R4062229
Cadmium (Cd)-Dissolved	<0.000050	DLHC	0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Calcium (Ca)-Dissolved	191	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Chromium (Cr)-Dissolved	<0.0050	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Cobalt (Co)-Dissolved	0.0044	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Copper (Cu)-Dissolved	0.0027	DLHC	0.0020	mg/L	30-MAY-18	30-MAY-18	R4062229
Iron (Fe)-Dissolved	3.03	DLHC	0.10	mg/L	30-MAY-18	30-MAY-18	R4062229
Lead (Pb)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Magnesium (Mg)-Dissolved	21.4	DLHC	0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Manganese (Mn)-Dissolved	0.716	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Molybdenum (Mo)-Dissolved	0.00109	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Nickel (Ni)-Dissolved	0.0064	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Phosphorus (P)-Dissolved	<0.50	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Potassium (K)-Dissolved	12.2	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Selenium (Se)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Silicon (Si)-Dissolved	9.68	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Silver (Ag)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Sodium (Na)-Dissolved	39.0	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Strontium (Sr)-Dissolved	0.645	DLHC	0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Sulfur (S)-Dissolved	13.9	DLHC	5.0	mg/L	30-MAY-18	30-MAY-18	R4062229
Thallium (Tl)-Dissolved	<0.00010	DLHC	0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Tin (Sn)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Titanium (Ti)-Dissolved	<0.0030	DLHC	0.0030	mg/L	30-MAY-18	30-MAY-18	R4062229
Tungsten (W)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Uranium (U)-Dissolved	0.00067	DLHC	0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Vanadium (V)-Dissolved	<0.0050	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Zinc (Zn)-Dissolved	<0.010	DLHC	0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Zirconium (Zr)-Dissolved	<0.0030	DLHC	0.0030	mg/L	30-MAY-18	30-MAY-18	R4062229
Volatile Organic Compounds							
Acetone	<20		20	ug/L		31-MAY-18	R4063095
Benzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Bromodichloromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
Bromoform	<1.0		1.0	ug/L		31-MAY-18	R4063095
Bromomethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
Carbon Disulfide	<1.0		1.0	ug/L		31-MAY-18	R4063095
Carbon tetrachloride	<0.50		0.50	ug/L		31-MAY-18	R4063095
Chlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Dibromochloromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
Chloroethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
Chloroform	<1.0		1.0	ug/L		31-MAY-18	R4063095

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-5 MW4 Sampled By: CLIENT on 29-MAY-18 @ 12:10 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
1,2-Dibromoethane	<0.20		0.20	ug/L		31-MAY-18	R4063095
1,2-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,3-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,4-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Dichlorodifluoromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
1,1-Dichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,2-Dichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Dichloromethane	<2.0		2.0	ug/L		31-MAY-18	R4063095
1,2-Dichloropropane	<0.50		0.50	ug/L		31-MAY-18	R4063095
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		31-MAY-18	R4063095
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Ethylbenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
n-Hexane	<0.50		0.50	ug/L		31-MAY-18	R4063095
2-Hexanone	<20		20	ug/L		31-MAY-18	R4063095
Methyl Ethyl Ketone	<20		20	ug/L		31-MAY-18	R4063095
Methyl Isobutyl Ketone	<20		20	ug/L		31-MAY-18	R4063095
MTBE	<0.50		0.50	ug/L		31-MAY-18	R4063095
Styrene	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
Tetrachloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Toluene	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1,1-Trichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1,2-Trichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
Trichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Trichlorofluoromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
Vinyl chloride	<0.50		0.50	ug/L		31-MAY-18	R4063095
o-Xylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
m+p-Xylenes	<1.0		1.0	ug/L		31-MAY-18	R4063095
Xylenes (Total)	<1.1		1.1	ug/L		31-MAY-18	
Surrogate: 4-Bromofluorobenzene	87.0		70-130	%		31-MAY-18	R4063095
Surrogate: 1,4-Difluorobenzene	97.0		70-130	%		31-MAY-18	R4063095
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		31-MAY-18	
L2102331-6 MW5-R Sampled By: CLIENT on 29-MAY-18 @ 12:05 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-6 MW5-R							
Sampled By: CLIENT on 29-MAY-18 @ 12:05							
Matrix: WATER							
Physical Tests							
Colour, Apparent	223		2.0	CU		30-MAY-18	R4062835
Conductivity	1390		3.0	umhos/cm		30-MAY-18	R4062836
pH	7.29		0.10	pH units		30-MAY-18	R4062836
Total Dissolved Solids	782	DLDS	20	mg/L		04-JUN-18	R4069782
Turbidity	1210		0.10	NTU		30-MAY-18	R4061991
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	666		10	mg/L		01-JUN-18	R4067149
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Total (as CaCO3)	666	DLHC	20	mg/L		01-JUN-18	R4067149
Ammonia, Total (as N)	19.1	DLHC	0.40	mg/L		01-JUN-18	R4064226
Bromide (Br)	0.86	DLDS	0.50	mg/L		01-JUN-18	R4067574
Chloride (Cl)	69.3	DLDS	2.5	mg/L		01-JUN-18	R4067574
Computed Conductivity	1260			uS/cm		05-JUN-18	
Conductivity % Difference	-9.9			%		05-JUN-18	
Fluoride (F)	<0.10	DLDS	0.10	mg/L		01-JUN-18	R4067574
Hardness (as CaCO3)	563			mg/L		05-JUN-18	
Ion Balance	122			%		05-JUN-18	
Langelier Index	0.8					05-JUN-18	
Nitrate and Nitrite as N	<0.11		0.11	mg/L		04-JUN-18	
Nitrate (as N)	<0.10	DLDS	0.10	mg/L		01-JUN-18	R4067574
Nitrite (as N)	<0.050	DLDS	0.050	mg/L		01-JUN-18	R4067574
Total Kjeldahl Nitrogen	26.8	DLHC	1.5	mg/L	01-JUN-18	01-JUN-18	R4064383
Saturation pH	6.44			pH		05-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		30-MAY-18	R4062414
Phosphorus, Total	0.917		0.0030	mg/L	01-JUN-18	03-JUN-18	R4065947
TDS (Calculated)	814			mg/L		05-JUN-18	
Sulfate (SO4)	31.4	DLDS	1.5	mg/L		01-JUN-18	R4067574
Anion Sum	13.5			me/L		05-JUN-18	
Cation Sum	16.6			me/L		05-JUN-18	
Cation - Anion Balance	10.0			%		05-JUN-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	17.7		1.0	mg/L		03-JUN-18	R4065971
Inorganic Parameters							
Silica	16.1		1.1	mg/L		30-MAY-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					30-MAY-18	R4061854
Aluminum (Al)-Dissolved	<0.050	DLHC	0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Antimony (Sb)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Arsenic (As)-Dissolved	0.0048	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Barium (Ba)-Dissolved	0.333	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Beryllium (Be)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-6 MW5-R Sampled By: CLIENT on 29-MAY-18 @ 12:05 Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Boron (B)-Dissolved	0.59	DLHC	0.10	mg/L	30-MAY-18	30-MAY-18	R4062229
Cadmium (Cd)-Dissolved	<0.000050	DLHC	0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Calcium (Ca)-Dissolved	183	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Chromium (Cr)-Dissolved	<0.0050	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Cobalt (Co)-Dissolved	0.0026	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Copper (Cu)-Dissolved	<0.0020	DLHC	0.0020	mg/L	30-MAY-18	30-MAY-18	R4062229
Iron (Fe)-Dissolved	12.4	DLHC	0.10	mg/L	30-MAY-18	30-MAY-18	R4062229
Lead (Pb)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Magnesium (Mg)-Dissolved	25.6	DLHC	0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Manganese (Mn)-Dissolved	1.24	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Molybdenum (Mo)-Dissolved	0.00116	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Nickel (Ni)-Dissolved	0.0083	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Phosphorus (P)-Dissolved	<0.50	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Potassium (K)-Dissolved	35.1	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Selenium (Se)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Silicon (Si)-Dissolved	7.53	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Silver (Ag)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Sodium (Na)-Dissolved	69.9	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Strontium (Sr)-Dissolved	0.428	DLHC	0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Sulfur (S)-Dissolved	10.2	DLHC	5.0	mg/L	30-MAY-18	30-MAY-18	R4062229
Thallium (Tl)-Dissolved	<0.00010	DLHC	0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Tin (Sn)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Titanium (Ti)-Dissolved	<0.0030	DLHC	0.0030	mg/L	30-MAY-18	30-MAY-18	R4062229
Tungsten (W)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Uranium (U)-Dissolved	0.00083	DLHC	0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Vanadium (V)-Dissolved	<0.0050	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Zinc (Zn)-Dissolved	<0.010	DLHC	0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Zirconium (Zr)-Dissolved	<0.0030	DLHC	0.0030	mg/L	30-MAY-18	30-MAY-18	R4062229
Volatile Organic Compounds							
Acetone	<20		20	ug/L		31-MAY-18	R4063095
Benzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Bromodichloromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
Bromoform	<1.0		1.0	ug/L		31-MAY-18	R4063095
Bromomethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
Carbon Disulfide	<1.0		1.0	ug/L		31-MAY-18	R4063095
Carbon tetrachloride	<0.50		0.50	ug/L		31-MAY-18	R4063095
Chlorobenzene	1.67		0.50	ug/L		31-MAY-18	R4063095
Dibromochloromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
Chloroethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
Chloroform	<1.0		1.0	ug/L		31-MAY-18	R4063095

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-6 MW5-R Sampled By: CLIENT on 29-MAY-18 @ 12:05 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
1,2-Dibromoethane	<0.20		0.20	ug/L		31-MAY-18	R4063095
1,2-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,3-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,4-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Dichlorodifluoromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
1,1-Dichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,2-Dichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Dichloromethane	<2.0		2.0	ug/L		31-MAY-18	R4063095
1,2-Dichloropropane	<0.50		0.50	ug/L		31-MAY-18	R4063095
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		31-MAY-18	R4063095
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Ethylbenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
n-Hexane	<0.50		0.50	ug/L		31-MAY-18	R4063095
2-Hexanone	<20		20	ug/L		31-MAY-18	R4063095
Methyl Ethyl Ketone	<20		20	ug/L		31-MAY-18	R4063095
Methyl Isobutyl Ketone	<20		20	ug/L		31-MAY-18	R4063095
MTBE	<0.50		0.50	ug/L		31-MAY-18	R4063095
Styrene	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
Tetrachloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Toluene	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1,1-Trichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1,2-Trichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
Trichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Trichlorofluoromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
Vinyl chloride	<0.50		0.50	ug/L		31-MAY-18	R4063095
o-Xylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
m+p-Xylenes	<1.0		1.0	ug/L		31-MAY-18	R4063095
Xylenes (Total)	<1.1		1.1	ug/L		31-MAY-18	
Surrogate: 4-Bromofluorobenzene	86.7		70-130	%		31-MAY-18	R4063095
Surrogate: 1,4-Difluorobenzene	97.2		70-130	%		31-MAY-18	R4063095
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		31-MAY-18	
L2102331-7 MW6 Sampled By: CLIENT on 29-MAY-18 @ 13:00 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-7 MW6							
Sampled By: CLIENT on 29-MAY-18 @ 13:00							
Matrix: WATER							
Physical Tests							
Colour, Apparent	147		2.0	CU		30-MAY-18	R4062835
Conductivity	1320		3.0	umhos/cm		30-MAY-18	R4062836
pH	7.66		0.10	pH units		30-MAY-18	R4062836
Total Dissolved Solids	762	DLDS	20	mg/L		04-JUN-18	R4069782
Turbidity	169		0.10	NTU		30-MAY-18	R4061991
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	488		10	mg/L		01-JUN-18	R4067149
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Total (as CaCO3)	488		10	mg/L		01-JUN-18	R4067149
Ammonia, Total (as N)	12.8	DLHC	0.40	mg/L		01-JUN-18	R4064226
Bromide (Br)	0.72	DLDS	0.50	mg/L		01-JUN-18	R4067574
Chloride (Cl)	103	DLDS	2.5	mg/L		01-JUN-18	R4067574
Computed Conductivity	1220			uS/cm		05-JUN-18	
Conductivity % Difference	-7.4			%		05-JUN-18	
Fluoride (F)	<0.10	DLDS	0.10	mg/L		01-JUN-18	R4067574
Hardness (as CaCO3)	496			mg/L		05-JUN-18	
Ion Balance	111			%		05-JUN-18	
Langelier Index	1.0					05-JUN-18	
Nitrate and Nitrite as N	0.18		0.11	mg/L		04-JUN-18	
Nitrate (as N)	0.18	DLDS	0.10	mg/L		01-JUN-18	R4067574
Nitrite (as N)	<0.050	DLDS	0.050	mg/L		01-JUN-18	R4067574
Total Kjeldahl Nitrogen	15.0		0.30	mg/L	01-JUN-18	01-JUN-18	R4064383
Saturation pH	6.68			pH		05-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		30-MAY-18	R4062414
Phosphorus, Total	0.0441		0.0030	mg/L	01-JUN-18	03-JUN-18	R4065947
TDS (Calculated)	783			mg/L		05-JUN-18	
Sulfate (SO4)	102	DLDS	1.5	mg/L		01-JUN-18	R4067574
Anion Sum	13.1			me/L		05-JUN-18	
Cation Sum	14.5			me/L		05-JUN-18	
Cation - Anion Balance	5.1			%		05-JUN-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	5.2		1.0	mg/L		03-JUN-18	R4065971
Inorganic Parameters							
Silica	19.2		1.1	mg/L		30-MAY-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					30-MAY-18	R4061854
Aluminum (Al)-Dissolved	<0.050	DLHC	0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Antimony (Sb)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Arsenic (As)-Dissolved	0.0107	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Barium (Ba)-Dissolved	0.229	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Beryllium (Be)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-7 MW6							
Sampled By: CLIENT on 29-MAY-18 @ 13:00							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Boron (B)-Dissolved	0.68	DLHC	0.10	mg/L	30-MAY-18	30-MAY-18	R4062229
Cadmium (Cd)-Dissolved	<0.000050	DLHC	0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Calcium (Ca)-Dissolved	143	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Chromium (Cr)-Dissolved	<0.0050	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Cobalt (Co)-Dissolved	0.0026	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Copper (Cu)-Dissolved	<0.0020	DLHC	0.0020	mg/L	30-MAY-18	30-MAY-18	R4062229
Iron (Fe)-Dissolved	6.91	DLHC	0.10	mg/L	30-MAY-18	30-MAY-18	R4062229
Lead (Pb)-Dissolved	0.00063	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Magnesium (Mg)-Dissolved	33.7	DLHC	0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Manganese (Mn)-Dissolved	0.340	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Molybdenum (Mo)-Dissolved	0.00397	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Nickel (Ni)-Dissolved	<0.0050	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Phosphorus (P)-Dissolved	<0.50	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Potassium (K)-Dissolved	55.0	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Selenium (Se)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Silicon (Si)-Dissolved	8.95	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Silver (Ag)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Sodium (Na)-Dissolved	52.2	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Strontium (Sr)-Dissolved	0.575	DLHC	0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Sulfur (S)-Dissolved	33.1	DLHC	5.0	mg/L	30-MAY-18	30-MAY-18	R4062229
Thallium (Tl)-Dissolved	<0.00010	DLHC	0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Tin (Sn)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Titanium (Ti)-Dissolved	<0.0030	DLHC	0.0030	mg/L	30-MAY-18	30-MAY-18	R4062229
Tungsten (W)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Uranium (U)-Dissolved	0.00072	DLHC	0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Vanadium (V)-Dissolved	<0.0050	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Zinc (Zn)-Dissolved	0.068	DLHC	0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Zirconium (Zr)-Dissolved	<0.0030	DLHC	0.0030	mg/L	30-MAY-18	30-MAY-18	R4062229
Volatile Organic Compounds							
Acetone	<20		20	ug/L		31-MAY-18	R4063095
Benzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Bromodichloromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
Bromoform	<1.0		1.0	ug/L		31-MAY-18	R4063095
Bromomethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
Carbon Disulfide	<1.0		1.0	ug/L		31-MAY-18	R4063095
Carbon tetrachloride	<0.50		0.50	ug/L		31-MAY-18	R4063095
Chlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Dibromochloromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
Chloroethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
Chloroform	<1.0		1.0	ug/L		31-MAY-18	R4063095

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-7 MW6 Sampled By: CLIENT on 29-MAY-18 @ 13:00 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
1,2-Dibromoethane	<0.20		0.20	ug/L		31-MAY-18	R4063095
1,2-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,3-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,4-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Dichlorodifluoromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
1,1-Dichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,2-Dichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Dichloromethane	<2.0		2.0	ug/L		31-MAY-18	R4063095
1,2-Dichloropropane	<0.50		0.50	ug/L		31-MAY-18	R4063095
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		31-MAY-18	R4063095
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Ethylbenzene	<0.50		0.50	ug/L		31-MAY-18	R4063095
n-Hexane	<0.50		0.50	ug/L		31-MAY-18	R4063095
2-Hexanone	<20		20	ug/L		31-MAY-18	R4063095
Methyl Ethyl Ketone	<20		20	ug/L		31-MAY-18	R4063095
Methyl Isobutyl Ketone	<20		20	ug/L		31-MAY-18	R4063095
MTBE	<0.50		0.50	ug/L		31-MAY-18	R4063095
Styrene	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
Tetrachloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Toluene	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1,1-Trichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
1,1,2-Trichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4063095
Trichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
Trichlorofluoromethane	<1.0		1.0	ug/L		31-MAY-18	R4063095
Vinyl chloride	<0.50		0.50	ug/L		31-MAY-18	R4063095
o-Xylene	<0.50		0.50	ug/L		31-MAY-18	R4063095
m+p-Xylenes	<1.0		1.0	ug/L		31-MAY-18	R4063095
Xylenes (Total)	<1.1		1.1	ug/L		31-MAY-18	
Surrogate: 4-Bromofluorobenzene	86.8		70-130	%		31-MAY-18	R4063095
Surrogate: 1,4-Difluorobenzene	96.2		70-130	%		31-MAY-18	R4063095
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		31-MAY-18	
L2102331-8 MW7 Sampled By: CLIENT on 29-MAY-18 @ 14:45 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-8 MW7							
Sampled By: CLIENT on 29-MAY-18 @ 14:45							
Matrix: WATER							
Physical Tests							
Colour, Apparent	135		2.0	CU		30-MAY-18	R4062835
Conductivity	2390		3.0	umhos/cm		30-MAY-18	R4062836
pH	7.42		0.10	pH units		30-MAY-18	R4062836
Total Dissolved Solids	1610	DLDS	20	mg/L		04-JUN-18	R4069782
Turbidity	48.6		0.10	NTU		30-MAY-18	R4061991
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	806		10	mg/L		01-JUN-18	R4067149
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Total (as CaCO3)	806	DLHC	20	mg/L		01-JUN-18	R4067149
Ammonia, Total (as N)	3.89	DLHC	0.10	mg/L		01-JUN-18	R4064226
Bromide (Br)	1.39	DLDS	0.50	mg/L		01-JUN-18	R4067574
Chloride (Cl)	273	DLDS	2.5	mg/L		01-JUN-18	R4067574
Computed Conductivity	2210			uS/cm		05-JUN-18	
Conductivity % Difference	-7.8			%		05-JUN-18	
Fluoride (F)	<0.10	DLDS	0.10	mg/L		01-JUN-18	R4067574
Hardness (as CaCO3)	880			mg/L		05-JUN-18	
Ion Balance	109			%		05-JUN-18	
Langelier Index	1.1					05-JUN-18	
Nitrate and Nitrite as N	8.78		0.11	mg/L		04-JUN-18	
Nitrate (as N)	8.78	DLDS	0.10	mg/L		01-JUN-18	R4067574
Nitrite (as N)	<0.050	DLDS	0.050	mg/L		01-JUN-18	R4067574
Total Kjeldahl Nitrogen	8.86		0.15	mg/L	01-JUN-18	01-JUN-18	R4064383
Saturation pH	6.27			pH		05-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		30-MAY-18	R4062414
Phosphorus, Total	0.0625		0.0030	mg/L	01-JUN-18	03-JUN-18	R4065947
TDS (Calculated)	1580			mg/L		05-JUN-18	
Sulfate (SO4)	195	DLDS	1.5	mg/L		01-JUN-18	R4067574
Anion Sum	25.6			me/L		05-JUN-18	
Cation Sum	28.0			me/L		05-JUN-18	
Cation - Anion Balance	4.4			%		05-JUN-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	33.0		1.0	mg/L		03-JUN-18	R4065971
Inorganic Parameters							
Silica	17.9		1.1	mg/L		30-MAY-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					30-MAY-18	R4061854
Aluminum (Al)-Dissolved	<0.050	DLHC	0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Antimony (Sb)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Arsenic (As)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Barium (Ba)-Dissolved	0.148	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Beryllium (Be)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-8 MW7							
Sampled By: CLIENT on 29-MAY-18 @ 14:45							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Boron (B)-Dissolved	4.72	DLHC	0.10	mg/L	30-MAY-18	30-MAY-18	R4062229
Cadmium (Cd)-Dissolved	0.000123	DLHC	0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Calcium (Ca)-Dissolved	267	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Chromium (Cr)-Dissolved	<0.0050	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Cobalt (Co)-Dissolved	0.0063	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Copper (Cu)-Dissolved	0.0333	DLHC	0.0020	mg/L	30-MAY-18	30-MAY-18	R4062229
Iron (Fe)-Dissolved	<0.10	DLHC	0.10	mg/L	30-MAY-18	30-MAY-18	R4062229
Lead (Pb)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Magnesium (Mg)-Dissolved	51.9	DLHC	0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Manganese (Mn)-Dissolved	0.398	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Molybdenum (Mo)-Dissolved	0.00262	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Nickel (Ni)-Dissolved	0.0328	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Phosphorus (P)-Dissolved	<0.50	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Potassium (K)-Dissolved	79.8	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Selenium (Se)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Silicon (Si)-Dissolved	8.36	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Silver (Ag)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Sodium (Na)-Dissolved	186	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Strontium (Sr)-Dissolved	0.995	DLHC	0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Sulfur (S)-Dissolved	65.5	DLHC	5.0	mg/L	30-MAY-18	30-MAY-18	R4062229
Thallium (Tl)-Dissolved	0.00037	DLHC	0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Tin (Sn)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Titanium (Ti)-Dissolved	<0.0030	DLHC	0.0030	mg/L	30-MAY-18	30-MAY-18	R4062229
Tungsten (W)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Uranium (U)-Dissolved	0.00287	DLHC	0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Vanadium (V)-Dissolved	<0.0050	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Zinc (Zn)-Dissolved	<0.010	DLHC	0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Zirconium (Zr)-Dissolved	<0.0030	DLHC	0.0030	mg/L	30-MAY-18	30-MAY-18	R4062229
Volatile Organic Compounds							
Acetone	<20		20	ug/L		31-MAY-18	R4062805
Benzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Bromodichloromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
Bromoform	<1.0		1.0	ug/L		31-MAY-18	R4062805
Bromomethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
Carbon Disulfide	<1.0		1.0	ug/L		31-MAY-18	R4062805
Carbon tetrachloride	<0.50		0.50	ug/L		31-MAY-18	R4062805
Chlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Dibromochloromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
Chloroethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
Chloroform	<1.0		1.0	ug/L		31-MAY-18	R4062805

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-8 MW7 Sampled By: CLIENT on 29-MAY-18 @ 14:45 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
1,2-Dibromoethane	<0.20		0.20	ug/L		31-MAY-18	R4062805
1,2-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,3-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,4-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Dichlorodifluoromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
1,1-Dichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,2-Dichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Dichloromethane	<2.0		2.0	ug/L		31-MAY-18	R4062805
1,2-Dichloropropane	<0.50		0.50	ug/L		31-MAY-18	R4062805
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		31-MAY-18	R4062805
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Ethylbenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
n-Hexane	<0.50		0.50	ug/L		31-MAY-18	R4062805
2-Hexanone	<20		20	ug/L		31-MAY-18	R4062805
Methyl Ethyl Ketone	<20		20	ug/L		31-MAY-18	R4062805
Methyl Isobutyl Ketone	<20		20	ug/L		31-MAY-18	R4062805
MTBE	<0.50		0.50	ug/L		31-MAY-18	R4062805
Styrene	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
Tetrachloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Toluene	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1,1-Trichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1,2-Trichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
Trichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Trichlorofluoromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
Vinyl chloride	<0.50		0.50	ug/L		31-MAY-18	R4062805
o-Xylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
m+p-Xylenes	<1.0		1.0	ug/L		31-MAY-18	R4062805
Xylenes (Total)	<1.1		1.1	ug/L		31-MAY-18	
Surrogate: 4-Bromofluorobenzene	99.7		70-130	%		31-MAY-18	R4062805
Surrogate: 1,4-Difluorobenzene	100.1		70-130	%		31-MAY-18	R4062805
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		31-MAY-18	
L2102331-9 MW8 Sampled By: CLIENT on 29-MAY-18 @ 13:55 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-9 MW8							
Sampled By: CLIENT on 29-MAY-18 @ 13:55							
Matrix: WATER							
Physical Tests							
Colour, Apparent	319	DLHC	4.0	CU		30-MAY-18	R4062835
Conductivity	1650		3.0	umhos/cm		30-MAY-18	R4062836
pH	7.58		0.10	pH units		30-MAY-18	R4062836
Total Dissolved Solids	915	DLDS	20	mg/L		04-JUN-18	R4069782
Turbidity	208		0.10	NTU		30-MAY-18	R4061991
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	599		10	mg/L		01-JUN-18	R4067149
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Total (as CaCO3)	599	DLHC	20	mg/L		01-JUN-18	R4067149
Ammonia, Total (as N)	24.3	DLHC	1.0	mg/L		01-JUN-18	R4064226
Bromide (Br)	1.23	DLDS	0.50	mg/L		01-JUN-18	R4067574
Chloride (Cl)	147	DLDS	2.5	mg/L		01-JUN-18	R4067574
Computed Conductivity	1450			uS/cm		05-JUN-18	
Conductivity % Difference	-13.1			%		05-JUN-18	
Fluoride (F)	<0.10	DLDS	0.10	mg/L		01-JUN-18	R4067574
Hardness (as CaCO3)	575			mg/L		05-JUN-18	
Ion Balance	117			%		05-JUN-18	
Langelier Index	1.0					05-JUN-18	
Nitrate and Nitrite as N	4.98		0.11	mg/L		04-JUN-18	
Nitrate (as N)	4.98	DLDS	0.10	mg/L		01-JUN-18	R4067574
Nitrite (as N)	<0.050	DLDS	0.050	mg/L		01-JUN-18	R4067574
Total Kjeldahl Nitrogen	31.9	DLHC	1.5	mg/L	01-JUN-18	01-JUN-18	R4064383
Saturation pH	6.54			pH		05-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		30-MAY-18	R4062414
Phosphorus, Total	0.164		0.0030	mg/L	01-JUN-18	03-JUN-18	R4065947
TDS (Calculated)	921			mg/L		05-JUN-18	
Sulfate (SO4)	49.4	DLDS	1.5	mg/L		01-JUN-18	R4067574
Anion Sum	15.4			me/L		05-JUN-18	
Cation Sum	18.0			me/L		05-JUN-18	
Cation - Anion Balance	7.9			%		05-JUN-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	11.1		1.0	mg/L		03-JUN-18	R4065971
Inorganic Parameters							
Silica	18.5		1.1	mg/L		30-MAY-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					30-MAY-18	R4061854
Aluminum (Al)-Dissolved	<0.050	DLHC	0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Antimony (Sb)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Arsenic (As)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Barium (Ba)-Dissolved	0.225	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Beryllium (Be)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-9 MW8							
Sampled By: CLIENT on 29-MAY-18 @ 13:55							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Boron (B)-Dissolved	0.92	DLHC	0.10	mg/L	30-MAY-18	30-MAY-18	R4062229
Cadmium (Cd)-Dissolved	<0.000050	DLHC	0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Calcium (Ca)-Dissolved	167	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Chromium (Cr)-Dissolved	<0.0050	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Cobalt (Co)-Dissolved	0.0011	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Copper (Cu)-Dissolved	0.0065	DLHC	0.0020	mg/L	30-MAY-18	30-MAY-18	R4062229
Iron (Fe)-Dissolved	<0.10	DLHC	0.10	mg/L	30-MAY-18	30-MAY-18	R4062229
Lead (Pb)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Magnesium (Mg)-Dissolved	38.8	DLHC	0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Manganese (Mn)-Dissolved	0.0185	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Molybdenum (Mo)-Dissolved	0.00081	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Nickel (Ni)-Dissolved	<0.0050	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Phosphorus (P)-Dissolved	<0.50	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Potassium (K)-Dissolved	68.7	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Selenium (Se)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Silicon (Si)-Dissolved	8.64	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Silver (Ag)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Sodium (Na)-Dissolved	69.1	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Strontium (Sr)-Dissolved	0.795	DLHC	0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Sulfur (S)-Dissolved	15.3	DLHC	5.0	mg/L	30-MAY-18	30-MAY-18	R4062229
Thallium (Tl)-Dissolved	<0.00010	DLHC	0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Tin (Sn)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Titanium (Ti)-Dissolved	<0.0030	DLHC	0.0030	mg/L	30-MAY-18	30-MAY-18	R4062229
Tungsten (W)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Uranium (U)-Dissolved	0.00071	DLHC	0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Vanadium (V)-Dissolved	<0.0050	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Zinc (Zn)-Dissolved	<0.010	DLHC	0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Zirconium (Zr)-Dissolved	<0.0030	DLHC	0.0030	mg/L	30-MAY-18	30-MAY-18	R4062229
Volatile Organic Compounds							
Acetone	<20		20	ug/L		31-MAY-18	R4062805
Benzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Bromodichloromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
Bromoform	<1.0		1.0	ug/L		31-MAY-18	R4062805
Bromomethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
Carbon Disulfide	<1.0		1.0	ug/L		31-MAY-18	R4062805
Carbon tetrachloride	<0.50		0.50	ug/L		31-MAY-18	R4062805
Chlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Dibromochloromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
Chloroethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
Chloroform	<1.0		1.0	ug/L		31-MAY-18	R4062805

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-9 MW8 Sampled By: CLIENT on 29-MAY-18 @ 13:55 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
1,2-Dibromoethane	<0.20		0.20	ug/L		31-MAY-18	R4062805
1,2-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,3-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,4-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Dichlorodifluoromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
1,1-Dichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,2-Dichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Dichloromethane	<2.0		2.0	ug/L		31-MAY-18	R4062805
1,2-Dichloropropane	<0.50		0.50	ug/L		31-MAY-18	R4062805
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		31-MAY-18	R4062805
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Ethylbenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
n-Hexane	<0.50		0.50	ug/L		31-MAY-18	R4062805
2-Hexanone	<20		20	ug/L		31-MAY-18	R4062805
Methyl Ethyl Ketone	<20		20	ug/L		31-MAY-18	R4062805
Methyl Isobutyl Ketone	<20		20	ug/L		31-MAY-18	R4062805
MTBE	<0.50		0.50	ug/L		31-MAY-18	R4062805
Styrene	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
Tetrachloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Toluene	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1,1-Trichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1,2-Trichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
Trichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Trichlorofluoromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
Vinyl chloride	<0.50		0.50	ug/L		31-MAY-18	R4062805
o-Xylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
m+p-Xylenes	<1.0		1.0	ug/L		31-MAY-18	R4062805
Xylenes (Total)	<1.1		1.1	ug/L		31-MAY-18	
Surrogate: 4-Bromofluorobenzene	97.8		70-130	%		31-MAY-18	R4062805
Surrogate: 1,4-Difluorobenzene	101.6		70-130	%		31-MAY-18	R4062805
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		31-MAY-18	
L2102331-10 MW9 Sampled By: CLIENT on 29-MAY-18 @ 13:00 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-10 MW9							
Sampled By: CLIENT on 29-MAY-18 @ 13:00							
Matrix: WATER							
Physical Tests							
Colour, Apparent	577	DLHC	10	CU		30-MAY-18	R4062835
Conductivity	493		3.0	umhos/cm		30-MAY-18	R4062836
pH	7.82		0.10	pH units		30-MAY-18	R4062836
Total Dissolved Solids	344	DLDS	20	mg/L		04-JUN-18	R4069782
Turbidity	2020		0.10	NTU		30-MAY-18	R4061991
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	237		10	mg/L		01-JUN-18	R4067149
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Total (as CaCO3)	237		10	mg/L		01-JUN-18	R4067149
Ammonia, Total (as N)	0.029		0.020	mg/L		01-JUN-18	R4064226
Bromide (Br)	<0.10		0.10	mg/L		01-JUN-18	R4067574
Chloride (Cl)	6.98		0.50	mg/L		01-JUN-18	R4067574
Computed Conductivity	449			uS/cm		05-JUN-18	
Conductivity % Difference	-9.4			%		05-JUN-18	
Fluoride (F)	0.082		0.020	mg/L		01-JUN-18	R4067574
Hardness (as CaCO3)	258			mg/L		05-JUN-18	
Ion Balance	117			%		05-JUN-18	
Langelier Index	0.7					05-JUN-18	
Nitrate and Nitrite as N	0.169		0.022	mg/L		04-JUN-18	
Nitrate (as N)	0.169		0.020	mg/L		01-JUN-18	R4067574
Nitrite (as N)	<0.010		0.010	mg/L		01-JUN-18	R4067574
Total Kjeldahl Nitrogen	<0.15		0.15	mg/L	01-JUN-18	01-JUN-18	R4064383
Saturation pH	7.12			pH		05-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		30-MAY-18	R4062414
Phosphorus, Total	0.631		0.0030	mg/L	01-JUN-18	03-JUN-18	R4065947
TDS (Calculated)	273			mg/L		05-JUN-18	
Sulfate (SO4)	21.4		0.30	mg/L		01-JUN-18	R4067574
Anion Sum	4.57			me/L		05-JUN-18	
Cation Sum	5.34			me/L		05-JUN-18	
Cation - Anion Balance	7.8			%		05-JUN-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	2.1		1.0	mg/L		03-JUN-18	R4065971
Inorganic Parameters							
Silica	8.24		0.11	mg/L		30-MAY-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					30-MAY-18	R4061854
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Arsenic (As)-Dissolved	0.00017		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Barium (Ba)-Dissolved	0.0494		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-10 MW9							
Sampled By: CLIENT on 29-MAY-18 @ 13:00							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Boron (B)-Dissolved	0.028		0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Cadmium (Cd)-Dissolved	<0.000010		0.000010	mg/L	30-MAY-18	30-MAY-18	R4062229
Calcium (Ca)-Dissolved	86.0		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Cobalt (Co)-Dissolved	0.00013		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Copper (Cu)-Dissolved	0.00138		0.00020	mg/L	30-MAY-18	30-MAY-18	R4062229
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Lead (Pb)-Dissolved	0.000078		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Magnesium (Mg)-Dissolved	10.4		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Manganese (Mn)-Dissolved	0.0136		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Molybdenum (Mo)-Dissolved	0.00108		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Nickel (Ni)-Dissolved	0.00056		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Potassium (K)-Dissolved	2.41		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Selenium (Se)-Dissolved	0.000095		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Silicon (Si)-Dissolved	3.85		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Silver (Ag)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Sodium (Na)-Dissolved	3.04		0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Strontium (Sr)-Dissolved	0.173		0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Sulfur (S)-Dissolved	7.1		5.0	mg/L	30-MAY-18	30-MAY-18	R4062229
Thallium (Tl)-Dissolved	0.000020		0.000010	mg/L	30-MAY-18	30-MAY-18	R4062229
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	30-MAY-18	30-MAY-18	R4062229
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Uranium (U)-Dissolved	0.000503		0.000010	mg/L	30-MAY-18	30-MAY-18	R4062229
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Zinc (Zn)-Dissolved	0.0029		0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Zirconium (Zr)-Dissolved	<0.00030		0.00030	mg/L	30-MAY-18	30-MAY-18	R4062229
Volatile Organic Compounds							
Acetone	<20	OWP	20	ug/L		31-MAY-18	R4062805
Benzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Bromodichloromethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Bromoform	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Bromomethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Carbon Disulfide	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Carbon tetrachloride	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Chlorobenzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Dibromochloromethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Chloroethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Chloroform	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-10 MW9 Sampled By: CLIENT on 29-MAY-18 @ 13:00 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
1,2-Dibromoethane	<0.20	OWP	0.20	ug/L		31-MAY-18	R4062805
1,2-Dichlorobenzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,3-Dichlorobenzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,4-Dichlorobenzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Dichlorodifluoromethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
1,1-Dichloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,2-Dichloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,1-Dichloroethylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
cis-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
trans-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Dichloromethane	<2.0	OWP	2.0	ug/L		31-MAY-18	R4062805
1,2-Dichloropropane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
cis-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
trans-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Ethylbenzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
n-Hexane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
2-Hexanone	<20	OWP	20	ug/L		31-MAY-18	R4062805
Methyl Ethyl Ketone	<20	OWP	20	ug/L		31-MAY-18	R4062805
Methyl Isobutyl Ketone	<20	OWP	20	ug/L		31-MAY-18	R4062805
MTBE	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Styrene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,1,1,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,1,1,2,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Tetrachloroethylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Toluene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,1,1-Trichloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,1,2-Trichloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Trichloroethylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Trichlorofluoromethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Vinyl chloride	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
o-Xylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
m+p-Xylenes	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Xylenes (Total)	<1.1		1.1	ug/L		31-MAY-18	
Surrogate: 4-Bromofluorobenzene	95.7		70-130	%		31-MAY-18	R4062805
Surrogate: 1,4-Difluorobenzene	100.1		70-130	%		31-MAY-18	R4062805
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		31-MAY-18	
L2102331-11 MW10 Sampled By: CLIENT on 29-MAY-18 @ 10:55 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-11 MW10							
Sampled By: CLIENT on 29-MAY-18 @ 10:55							
Matrix: WATER							
Physical Tests							
Colour, Apparent	190		2.0	CU		30-MAY-18	R4062835
Conductivity	600		3.0	umhos/cm		30-MAY-18	R4062836
pH	7.76		0.10	pH units		30-MAY-18	R4062836
Total Dissolved Solids	387	DLDS	20	mg/L		04-JUN-18	R4069782
Turbidity	146		0.10	NTU		30-MAY-18	R4061991
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	240		10	mg/L		01-JUN-18	R4067149
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Total (as CaCO3)	240		10	mg/L		01-JUN-18	R4067149
Ammonia, Total (as N)	0.041		0.020	mg/L		01-JUN-18	R4064226
Bromide (Br)	<0.10		0.10	mg/L		01-JUN-18	R4067574
Chloride (Cl)	12.6		0.50	mg/L		01-JUN-18	R4067574
Computed Conductivity	586			uS/cm		05-JUN-18	
Conductivity % Difference	-2.3			%		05-JUN-18	
Fluoride (F)	0.096		0.020	mg/L		01-JUN-18	R4067574
Hardness (as CaCO3)	276			mg/L		05-JUN-18	
Ion Balance	86.7			%		05-JUN-18	
Langelier Index	0.6					05-JUN-18	
Nitrate and Nitrite as N	<0.022		0.022	mg/L		04-JUN-18	
Nitrate (as N)	<0.020		0.020	mg/L		01-JUN-18	R4067574
Nitrite (as N)	<0.010		0.010	mg/L		01-JUN-18	R4067574
Total Kjeldahl Nitrogen	0.23		0.15	mg/L	01-JUN-18	01-JUN-18	R4064383
Saturation pH	7.13			pH		05-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		30-MAY-18	R4062414
Phosphorus, Total	0.269		0.0030	mg/L	01-JUN-18	03-JUN-18	R4065947
TDS (Calculated)	373			mg/L		05-JUN-18	
Sulfate (SO4)	110		0.30	mg/L		01-JUN-18	R4067574
Anion Sum	6.61			me/L		05-JUN-18	
Cation Sum	5.72			me/L		05-JUN-18	
Cation - Anion Balance	-7.1			%		05-JUN-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	2.1		1.0	mg/L		03-JUN-18	R4068448
Inorganic Parameters							
Silica	8.98		0.11	mg/L		30-MAY-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					30-MAY-18	R4061854
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Arsenic (As)-Dissolved	0.00035		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Barium (Ba)-Dissolved	0.0512		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-11 MW10							
Sampled By: CLIENT on 29-MAY-18 @ 10:55							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Boron (B)-Dissolved	0.013		0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Cadmium (Cd)-Dissolved	<0.000010		0.000010	mg/L	30-MAY-18	30-MAY-18	R4062229
Calcium (Ca)-Dissolved	87.6		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Chromium (Cr)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Cobalt (Co)-Dissolved	0.00011		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Copper (Cu)-Dissolved	0.00112		0.00020	mg/L	30-MAY-18	30-MAY-18	R4062229
Iron (Fe)-Dissolved	0.020		0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Magnesium (Mg)-Dissolved	13.8		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Manganese (Mn)-Dissolved	0.0175		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Molybdenum (Mo)-Dissolved	0.00163		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Nickel (Ni)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Potassium (K)-Dissolved	1.28		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Silicon (Si)-Dissolved	4.20		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Silver (Ag)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Sodium (Na)-Dissolved	4.13		0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Strontium (Sr)-Dissolved	0.221		0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Sulfur (S)-Dissolved	8.2		5.0	mg/L	30-MAY-18	30-MAY-18	R4062229
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L	30-MAY-18	30-MAY-18	R4062229
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	30-MAY-18	30-MAY-18	R4062229
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Uranium (U)-Dissolved	0.000442		0.000010	mg/L	30-MAY-18	30-MAY-18	R4062229
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Zinc (Zn)-Dissolved	<0.0010		0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Zirconium (Zr)-Dissolved	<0.00030		0.00030	mg/L	30-MAY-18	30-MAY-18	R4062229
Volatile Organic Compounds							
Acetone	<20		20	ug/L		31-MAY-18	R4062805
Benzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Bromodichloromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
Bromoform	<1.0		1.0	ug/L		31-MAY-18	R4062805
Bromomethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
Carbon Disulfide	<1.0		1.0	ug/L		31-MAY-18	R4062805
Carbon tetrachloride	<0.50		0.50	ug/L		31-MAY-18	R4062805
Chlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Dibromochloromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
Chloroethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
Chloroform	<1.0		1.0	ug/L		31-MAY-18	R4062805

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-11 MW10 Sampled By: CLIENT on 29-MAY-18 @ 10:55 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
1,2-Dibromoethane	<0.20		0.20	ug/L		31-MAY-18	R4062805
1,2-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,3-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,4-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Dichlorodifluoromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
1,1-Dichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,2-Dichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Dichloromethane	<2.0		2.0	ug/L		31-MAY-18	R4062805
1,2-Dichloropropane	<0.50		0.50	ug/L		31-MAY-18	R4062805
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		31-MAY-18	R4062805
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Ethylbenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
n-Hexane	<0.50		0.50	ug/L		31-MAY-18	R4062805
2-Hexanone	<20		20	ug/L		31-MAY-18	R4062805
Methyl Ethyl Ketone	<20		20	ug/L		31-MAY-18	R4062805
Methyl Isobutyl Ketone	<20		20	ug/L		31-MAY-18	R4062805
MTBE	<0.50		0.50	ug/L		31-MAY-18	R4062805
Styrene	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
Tetrachloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Toluene	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1,1-Trichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1,2-Trichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
Trichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Trichlorofluoromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
Vinyl chloride	<0.50		0.50	ug/L		31-MAY-18	R4062805
o-Xylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
m+p-Xylenes	<1.0		1.0	ug/L		31-MAY-18	R4062805
Xylenes (Total)	<1.1		1.1	ug/L		31-MAY-18	
Surrogate: 4-Bromofluorobenzene	95.9		70-130	%		31-MAY-18	R4062805
Surrogate: 1,4-Difluorobenzene	101.4		70-130	%		31-MAY-18	R4062805
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		31-MAY-18	
L2102331-12 MW11 Sampled By: CLIENT on 29-MAY-18 @ 14:55 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-12 MW11							
Sampled By: CLIENT on 29-MAY-18 @ 14:55							
Matrix: WATER							
Physical Tests							
Colour, Apparent	40.9		2.0	CU		30-MAY-18	R4062835
Conductivity	2390		3.0	umhos/cm		30-MAY-18	R4062836
pH	7.40		0.10	pH units		30-MAY-18	R4062836
Total Dissolved Solids	1590	DLDS	20	mg/L		04-JUN-18	R4069782
Turbidity	10.6		0.10	NTU		30-MAY-18	R4061991
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	731		10	mg/L		01-JUN-18	R4067149
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Total (as CaCO3)	731	DLHC	20	mg/L		01-JUN-18	R4067149
Ammonia, Total (as N)	13.6	DLHC	0.40	mg/L		01-JUN-18	R4064226
Bromide (Br)	1.55	DLDS	0.50	mg/L		01-JUN-18	R4067574
Chloride (Cl)	328	DLDS	2.5	mg/L		01-JUN-18	R4067574
Computed Conductivity	2280			uS/cm		05-JUN-18	
Conductivity % Difference	-4.7			%		05-JUN-18	
Fluoride (F)	<0.10	DLDS	0.10	mg/L		01-JUN-18	R4067574
Hardness (as CaCO3)	983			mg/L		05-JUN-18	
Ion Balance	105			%		05-JUN-18	
Langelier Index	1.1					05-JUN-18	
Nitrate and Nitrite as N	3.92		0.11	mg/L		04-JUN-18	
Nitrate (as N)	3.92	DLDS	0.10	mg/L		01-JUN-18	R4067574
Nitrite (as N)	<0.050	DLDS	0.050	mg/L		01-JUN-18	R4067574
Total Kjeldahl Nitrogen	21.3	DLHC	1.5	mg/L	01-JUN-18	01-JUN-18	R4064383
Saturation pH	6.25			pH		05-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		30-MAY-18	R4062414
Phosphorus, Total	0.0344		0.0030	mg/L	01-JUN-18	03-JUN-18	R4065947
TDS (Calculated)	1570			mg/L		05-JUN-18	
Sulfate (SO4)	237	DLDS	1.5	mg/L		01-JUN-18	R4067574
Anion Sum	26.5			me/L		05-JUN-18	
Cation Sum	27.7			me/L		05-JUN-18	
Cation - Anion Balance	2.2			%		05-JUN-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	30.1		1.0	mg/L		03-JUN-18	R4068448
Inorganic Parameters							
Silica	16.9		1.1	mg/L		30-MAY-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					30-MAY-18	R4061854
Aluminum (Al)-Dissolved	<0.050	DLHC	0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Antimony (Sb)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Arsenic (As)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Barium (Ba)-Dissolved	0.134	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Beryllium (Be)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-12 MW11							
Sampled By: CLIENT on 29-MAY-18 @ 14:55							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Boron (B)-Dissolved	2.38	DLHC	0.10	mg/L	30-MAY-18	30-MAY-18	R4062229
Cadmium (Cd)-Dissolved	0.000075	DLHC	0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Calcium (Ca)-Dissolved	313	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Chromium (Cr)-Dissolved	<0.0050	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Cobalt (Co)-Dissolved	0.0041	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Copper (Cu)-Dissolved	0.0138	DLHC	0.0020	mg/L	30-MAY-18	30-MAY-18	R4062229
Iron (Fe)-Dissolved	<0.10	DLHC	0.10	mg/L	30-MAY-18	30-MAY-18	R4062229
Lead (Pb)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Magnesium (Mg)-Dissolved	48.9	DLHC	0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Manganese (Mn)-Dissolved	0.771	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Molybdenum (Mo)-Dissolved	0.00089	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Nickel (Ni)-Dissolved	0.0248	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Phosphorus (P)-Dissolved	<0.50	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Potassium (K)-Dissolved	61.0	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Selenium (Se)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Silicon (Si)-Dissolved	7.88	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Silver (Ag)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Sodium (Na)-Dissolved	126	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Strontium (Sr)-Dissolved	0.794	DLHC	0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Sulfur (S)-Dissolved	69.4	DLHC	5.0	mg/L	30-MAY-18	30-MAY-18	R4062229
Thallium (Tl)-Dissolved	0.00040	DLHC	0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Tin (Sn)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Titanium (Ti)-Dissolved	<0.0030	DLHC	0.0030	mg/L	30-MAY-18	30-MAY-18	R4062229
Tungsten (W)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Uranium (U)-Dissolved	0.00166	DLHC	0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Vanadium (V)-Dissolved	<0.0050	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Zinc (Zn)-Dissolved	<0.010	DLHC	0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Zirconium (Zr)-Dissolved	<0.0030	DLHC	0.0030	mg/L	30-MAY-18	30-MAY-18	R4062229
Volatile Organic Compounds							
Acetone	<20		20	ug/L		31-MAY-18	R4062805
Benzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Bromodichloromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
Bromoform	<1.0		1.0	ug/L		31-MAY-18	R4062805
Bromomethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
Carbon Disulfide	<1.0		1.0	ug/L		31-MAY-18	R4062805
Carbon tetrachloride	<0.50		0.50	ug/L		31-MAY-18	R4062805
Chlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Dibromochloromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
Chloroethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
Chloroform	<1.0		1.0	ug/L		31-MAY-18	R4062805

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-12 MW11 Sampled By: CLIENT on 29-MAY-18 @ 14:55 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
1,2-Dibromoethane	<0.20		0.20	ug/L		31-MAY-18	R4062805
1,2-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,3-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,4-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Dichlorodifluoromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
1,1-Dichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,2-Dichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Dichloromethane	<2.0		2.0	ug/L		31-MAY-18	R4062805
1,2-Dichloropropane	<0.50		0.50	ug/L		31-MAY-18	R4062805
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		31-MAY-18	R4062805
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Ethylbenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
n-Hexane	<0.50		0.50	ug/L		31-MAY-18	R4062805
2-Hexanone	<20		20	ug/L		31-MAY-18	R4062805
Methyl Ethyl Ketone	<20		20	ug/L		31-MAY-18	R4062805
Methyl Isobutyl Ketone	<20		20	ug/L		31-MAY-18	R4062805
MTBE	<0.50		0.50	ug/L		31-MAY-18	R4062805
Styrene	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
Tetrachloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Toluene	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1,1-Trichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1,2-Trichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
Trichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Trichlorofluoromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
Vinyl chloride	<0.50		0.50	ug/L		31-MAY-18	R4062805
o-Xylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
m+p-Xylenes	<1.0		1.0	ug/L		31-MAY-18	R4062805
Xylenes (Total)	<1.1		1.1	ug/L		31-MAY-18	
Surrogate: 4-Bromofluorobenzene	96.2		70-130	%		31-MAY-18	R4062805
Surrogate: 1,4-Difluorobenzene	100.9		70-130	%		31-MAY-18	R4062805
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		31-MAY-18	
L2102331-13 MW12 Sampled By: CLIENT on 29-MAY-18 @ 13:50 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-13 MW12							
Sampled By: CLIENT on 29-MAY-18 @ 13:50							
Matrix: WATER							
Physical Tests							
Colour, Apparent	288	DLHC	4.0	CU		30-MAY-18	R4062835
Conductivity	545		3.0	umhos/cm		30-MAY-18	R4062836
pH	7.84		0.10	pH units		30-MAY-18	R4062836
Total Dissolved Solids	340	DLDS	20	mg/L		04-JUN-18	R4069782
Turbidity	392		0.10	NTU		30-MAY-18	R4061991
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	248		10	mg/L		01-JUN-18	R4067149
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Total (as CaCO3)	248		10	mg/L		01-JUN-18	R4067149
Ammonia, Total (as N)	<0.020		0.020	mg/L		01-JUN-18	R4064226
Bromide (Br)	<0.10		0.10	mg/L		01-JUN-18	R4067574
Chloride (Cl)	14.0		0.50	mg/L		01-JUN-18	R4067574
Computed Conductivity	504			uS/cm		05-JUN-18	
Conductivity % Difference	-7.8			%		05-JUN-18	
Fluoride (F)	0.090		0.020	mg/L		01-JUN-18	R4067574
Hardness (as CaCO3)	288			mg/L		05-JUN-18	
Ion Balance	120			%		05-JUN-18	
Langelier Index	0.8					05-JUN-18	
Nitrate and Nitrite as N	0.099		0.022	mg/L		04-JUN-18	
Nitrate (as N)	0.099		0.020	mg/L		01-JUN-18	R4067574
Nitrite (as N)	<0.010		0.010	mg/L		01-JUN-18	R4067574
Total Kjeldahl Nitrogen	0.27		0.15	mg/L	01-JUN-18	01-JUN-18	R4064383
Saturation pH	7.06			pH		05-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		30-MAY-18	R4062414
Phosphorus, Total	0.310		0.0030	mg/L	01-JUN-18	03-JUN-18	R4065947
TDS (Calculated)	305			mg/L		05-JUN-18	
Sulfate (SO4)	25.8		0.30	mg/L		01-JUN-18	R4067574
Anion Sum	5.04			me/L		05-JUN-18	
Cation Sum	6.07			me/L		05-JUN-18	
Cation - Anion Balance	9.3			%		05-JUN-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	3.4		1.0	mg/L		03-JUN-18	R4068448
Inorganic Parameters							
Silica	8.53		0.11	mg/L		30-MAY-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					30-MAY-18	R4061854
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Arsenic (As)-Dissolved	0.00013		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Barium (Ba)-Dissolved	0.0559		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-13 MW12							
Sampled By: CLIENT on 29-MAY-18 @ 13:50							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Boron (B)-Dissolved	0.034		0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Cadmium (Cd)-Dissolved	<0.000010		0.000010	mg/L	30-MAY-18	30-MAY-18	R4062229
Calcium (Ca)-Dissolved	94.8		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Cobalt (Co)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Copper (Cu)-Dissolved	0.00199		0.00020	mg/L	30-MAY-18	30-MAY-18	R4062229
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Lead (Pb)-Dissolved	0.000069		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Magnesium (Mg)-Dissolved	12.5		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Manganese (Mn)-Dissolved	0.00256		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Molybdenum (Mo)-Dissolved	0.00162		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Nickel (Ni)-Dissolved	0.00069		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Potassium (K)-Dissolved	3.17		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Selenium (Se)-Dissolved	0.000146		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Silicon (Si)-Dissolved	3.99		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Silver (Ag)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Sodium (Na)-Dissolved	5.13		0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Strontium (Sr)-Dissolved	0.214		0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Sulfur (S)-Dissolved	9.0		5.0	mg/L	30-MAY-18	30-MAY-18	R4062229
Thallium (Tl)-Dissolved	0.000021		0.000010	mg/L	30-MAY-18	30-MAY-18	R4062229
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	30-MAY-18	30-MAY-18	R4062229
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Uranium (U)-Dissolved	0.000596		0.000010	mg/L	30-MAY-18	30-MAY-18	R4062229
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Zinc (Zn)-Dissolved	0.0026		0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Zirconium (Zr)-Dissolved	<0.00030		0.00030	mg/L	30-MAY-18	30-MAY-18	R4062229
Volatile Organic Compounds							
Acetone	<20	OWP	20	ug/L		31-MAY-18	R4062805
Benzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Bromodichloromethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Bromoform	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Bromomethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Carbon Disulfide	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Carbon tetrachloride	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Chlorobenzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Dibromochloromethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Chloroethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Chloroform	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-13 MW12 Sampled By: CLIENT on 29-MAY-18 @ 13:50 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
1,2-Dibromoethane	<0.20	OWP	0.20	ug/L		31-MAY-18	R4062805
1,2-Dichlorobenzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,3-Dichlorobenzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,4-Dichlorobenzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Dichlorodifluoromethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
1,1-Dichloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,2-Dichloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,1-Dichloroethylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
cis-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
trans-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Dichloromethane	<2.0	OWP	2.0	ug/L		31-MAY-18	R4062805
1,2-Dichloropropane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
cis-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
trans-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Ethylbenzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
n-Hexane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
2-Hexanone	<20	OWP	20	ug/L		31-MAY-18	R4062805
Methyl Ethyl Ketone	<20	OWP	20	ug/L		31-MAY-18	R4062805
Methyl Isobutyl Ketone	<20	OWP	20	ug/L		31-MAY-18	R4062805
MTBE	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Styrene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,1,1,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,1,1,2,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Tetrachloroethylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Toluene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,1,1-Trichloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,1,2-Trichloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Trichloroethylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Trichlorofluoromethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Vinyl chloride	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
o-Xylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
m+p-Xylenes	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Xylenes (Total)	<1.1		1.1	ug/L		31-MAY-18	
Surrogate: 4-Bromofluorobenzene	95.1		70-130	%		31-MAY-18	R4062805
Surrogate: 1,4-Difluorobenzene	101.5		70-130	%		31-MAY-18	R4062805
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		31-MAY-18	
L2102331-14 MW15 Sampled By: CLIENT on 29-MAY-18 @ 13:15 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-14 MW15							
Sampled By: CLIENT on 29-MAY-18 @ 13:15							
Matrix: WATER							
Physical Tests							
Colour, Apparent	87.2		2.0	CU		30-MAY-18	R4062835
Conductivity	1640		3.0	umhos/cm		30-MAY-18	R4062836
pH	7.74		0.10	pH units		30-MAY-18	R4062836
Total Dissolved Solids	939	DLDS	20	mg/L		04-JUN-18	R4069782
Turbidity	216		0.10	NTU		30-MAY-18	R4061991
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	618		10	mg/L		01-JUN-18	R4067149
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Total (as CaCO3)	618	DLHC	20	mg/L		01-JUN-18	R4067149
Ammonia, Total (as N)	18.3	DLHC	1.0	mg/L		01-JUN-18	R4064226
Bromide (Br)	1.38	DLDS	0.50	mg/L		01-JUN-18	R4067574
Chloride (Cl)	162	DLDS	2.5	mg/L		01-JUN-18	R4067574
Computed Conductivity	1440			uS/cm		05-JUN-18	
Conductivity % Difference	-12.5			%		05-JUN-18	
Fluoride (F)	<0.10	DLDS	0.10	mg/L		01-JUN-18	R4067574
Hardness (as CaCO3)	585			mg/L		05-JUN-18	
Ion Balance	121			%		05-JUN-18	
Langelier Index	1.2					05-JUN-18	
Nitrate and Nitrite as N	<0.11		0.11	mg/L		04-JUN-18	
Nitrate (as N)	<0.10	DLDS	0.10	mg/L		01-JUN-18	R4067574
Nitrite (as N)	<0.050	DLDS	0.050	mg/L		01-JUN-18	R4067574
Total Kjeldahl Nitrogen	25.8	DLHC	1.5	mg/L	01-JUN-18	01-JUN-18	R4064383
Saturation pH	6.51			pH		05-JUN-18	
Orthophosphate-Dissolved (as P)	0.0043		0.0030	mg/L		30-MAY-18	R4062414
Phosphorus, Total	0.160		0.0030	mg/L	01-JUN-18	03-JUN-18	R4065947
TDS (Calculated)	921			mg/L		05-JUN-18	
Sulfate (SO4)	20.1	DLDS	1.5	mg/L		01-JUN-18	R4067574
Anion Sum	15.2			me/L		05-JUN-18	
Cation Sum	18.4			me/L		05-JUN-18	
Cation - Anion Balance	9.6			%		05-JUN-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	22.1		1.0	mg/L		03-JUN-18	R4068448
Inorganic Parameters							
Silica	23.9		1.1	mg/L		30-MAY-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					30-MAY-18	R4061854
Aluminum (Al)-Dissolved	<0.050	DLHC	0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Antimony (Sb)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Arsenic (As)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Barium (Ba)-Dissolved	0.664	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Beryllium (Be)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-14 MW15							
Sampled By: CLIENT on 29-MAY-18 @ 13:15							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Boron (B)-Dissolved	0.87	DLHC	0.10	mg/L	30-MAY-18	30-MAY-18	R4062229
Cadmium (Cd)-Dissolved	0.000108	DLHC	0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Calcium (Ca)-Dissolved	172	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Chromium (Cr)-Dissolved	<0.0050	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Cobalt (Co)-Dissolved	0.0014	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Copper (Cu)-Dissolved	0.0157	DLHC	0.0020	mg/L	30-MAY-18	30-MAY-18	R4062229
Iron (Fe)-Dissolved	<0.10	DLHC	0.10	mg/L	30-MAY-18	30-MAY-18	R4062229
Lead (Pb)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Magnesium (Mg)-Dissolved	38.0	DLHC	0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Manganese (Mn)-Dissolved	0.303	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Molybdenum (Mo)-Dissolved	0.00415	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Nickel (Ni)-Dissolved	0.0123	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Phosphorus (P)-Dissolved	<0.50	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Potassium (K)-Dissolved	85.9	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Selenium (Se)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Silicon (Si)-Dissolved	11.2	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Silver (Ag)-Dissolved	<0.00050	DLHC	0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Sodium (Na)-Dissolved	73.2	DLHC	0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Strontium (Sr)-Dissolved	1.20	DLHC	0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Sulfur (S)-Dissolved	8.2	DLHC	5.0	mg/L	30-MAY-18	30-MAY-18	R4062229
Thallium (Tl)-Dissolved	0.00033	DLHC	0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Tin (Sn)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Titanium (Ti)-Dissolved	<0.0030	DLHC	0.0030	mg/L	30-MAY-18	30-MAY-18	R4062229
Tungsten (W)-Dissolved	<0.0010	DLHC	0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Uranium (U)-Dissolved	0.00036	DLHC	0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Vanadium (V)-Dissolved	<0.0050	DLHC	0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Zinc (Zn)-Dissolved	0.052	DLHC	0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Zirconium (Zr)-Dissolved	<0.0030	DLHC	0.0030	mg/L	30-MAY-18	30-MAY-18	R4062229
Volatile Organic Compounds							
Acetone	<20		20	ug/L		31-MAY-18	R4062805
Benzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Bromodichloromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
Bromoform	<1.0		1.0	ug/L		31-MAY-18	R4062805
Bromomethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
Carbon Disulfide	<1.0		1.0	ug/L		31-MAY-18	R4062805
Carbon tetrachloride	<0.50		0.50	ug/L		31-MAY-18	R4062805
Chlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Dibromochloromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
Chloroethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
Chloroform	<1.0		1.0	ug/L		31-MAY-18	R4062805

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-14 MW15 Sampled By: CLIENT on 29-MAY-18 @ 13:15 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
1,2-Dibromoethane	<0.20		0.20	ug/L		31-MAY-18	R4062805
1,2-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,3-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,4-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Dichlorodifluoromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
1,1-Dichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,2-Dichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Dichloromethane	<2.0		2.0	ug/L		31-MAY-18	R4062805
1,2-Dichloropropane	<0.50		0.50	ug/L		31-MAY-18	R4062805
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		31-MAY-18	R4062805
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Ethylbenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
n-Hexane	<0.50		0.50	ug/L		01-JUN-18	R4063854
2-Hexanone	<20		20	ug/L		31-MAY-18	R4062805
Methyl Ethyl Ketone	<20		20	ug/L		31-MAY-18	R4062805
Methyl Isobutyl Ketone	<20		20	ug/L		31-MAY-18	R4062805
MTBE	<0.50		0.50	ug/L		31-MAY-18	R4062805
Styrene	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
Tetrachloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Toluene	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1,1-Trichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1,2-Trichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
Trichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Trichlorofluoromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
Vinyl chloride	<0.50		0.50	ug/L		31-MAY-18	R4062805
o-Xylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
m+p-Xylenes	<1.0		1.0	ug/L		31-MAY-18	R4062805
Xylenes (Total)	<1.1		1.1	ug/L		01-JUN-18	
Surrogate: 4-Bromofluorobenzene	96.6		70-130	%		31-MAY-18	R4062805
Surrogate: 1,4-Difluorobenzene	101.5		70-130	%		31-MAY-18	R4062805
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		01-JUN-18	
L2102331-15 MW19 Sampled By: CLIENT on 29-MAY-18 @ 13:35 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-15 MW19							
Sampled By: CLIENT on 29-MAY-18 @ 13:35							
Matrix: WATER							
Physical Tests							
Colour, Apparent	223		2.0	CU		30-MAY-18	R4062835
Conductivity	586		3.0	umhos/cm		30-MAY-18	R4062836
pH	7.81		0.10	pH units		30-MAY-18	R4062836
Total Dissolved Solids	354	DLDS	20	mg/L		04-JUN-18	R4069782
Turbidity	1420		0.10	NTU		30-MAY-18	R4061991
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	281		10	mg/L		01-JUN-18	R4067149
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Total (as CaCO3)	281		10	mg/L		01-JUN-18	R4067149
Ammonia, Total (as N)	0.314		0.020	mg/L		01-JUN-18	R4064226
Bromide (Br)	<0.10		0.10	mg/L		01-JUN-18	R4067574
Chloride (Cl)	14.2		0.50	mg/L		01-JUN-18	R4067574
Computed Conductivity	519			uS/cm		05-JUN-18	
Conductivity % Difference	-12.1			%		05-JUN-18	
Fluoride (F)	0.078		0.020	mg/L		01-JUN-18	R4067574
Hardness (as CaCO3)	302			mg/L		05-JUN-18	
Ion Balance	120			%		05-JUN-18	
Langelier Index	0.8					05-JUN-18	
Nitrate and Nitrite as N	<0.022		0.022	mg/L		04-JUN-18	
Nitrate (as N)	<0.020		0.020	mg/L		01-JUN-18	R4067574
Nitrite (as N)	<0.010		0.010	mg/L		01-JUN-18	R4067574
Total Kjeldahl Nitrogen	0.42		0.15	mg/L	01-JUN-18	01-JUN-18	R4064383
Saturation pH	7.00			pH		05-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		30-MAY-18	R4062414
Phosphorus, Total	1.99	DLM	0.0060	mg/L	01-JUN-18	03-JUN-18	R4065947
TDS (Calculated)	316			mg/L		05-JUN-18	
Sulfate (SO4)	12.7		0.30	mg/L		01-JUN-18	R4067574
Anion Sum	5.30			me/L		05-JUN-18	
Cation Sum	6.35			me/L		05-JUN-18	
Cation - Anion Balance	9.1			%		05-JUN-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	4.5		1.0	mg/L		03-JUN-18	R4068448
Inorganic Parameters							
Silica	10.9		0.11	mg/L		30-MAY-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					30-MAY-18	R4061854
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Arsenic (As)-Dissolved	0.00032		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Barium (Ba)-Dissolved	0.0960		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-15 MW19							
Sampled By: CLIENT on 29-MAY-18 @ 13:35							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Boron (B)-Dissolved	0.036		0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Cadmium (Cd)-Dissolved	<0.000010		0.000010	mg/L	30-MAY-18	30-MAY-18	R4062229
Calcium (Ca)-Dissolved	98.0		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Cobalt (Co)-Dissolved	0.00245		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Copper (Cu)-Dissolved	0.00067		0.00020	mg/L	30-MAY-18	30-MAY-18	R4062229
Iron (Fe)-Dissolved	0.472		0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Magnesium (Mg)-Dissolved	13.9		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Manganese (Mn)-Dissolved	0.149		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Molybdenum (Mo)-Dissolved	0.00124		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Nickel (Ni)-Dissolved	0.00202		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Potassium (K)-Dissolved	4.61		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Silicon (Si)-Dissolved	5.07		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Silver (Ag)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Sodium (Na)-Dissolved	4.07		0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Strontium (Sr)-Dissolved	0.224		0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Sulfur (S)-Dissolved	<5.0		5.0	mg/L	30-MAY-18	30-MAY-18	R4062229
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L	30-MAY-18	30-MAY-18	R4062229
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	30-MAY-18	30-MAY-18	R4062229
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Uranium (U)-Dissolved	0.00107		0.000010	mg/L	30-MAY-18	30-MAY-18	R4062229
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Zinc (Zn)-Dissolved	0.0017		0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Zirconium (Zr)-Dissolved	<0.00030		0.00030	mg/L	30-MAY-18	30-MAY-18	R4062229
Volatile Organic Compounds							
Acetone	<20	OWP	20	ug/L		31-MAY-18	R4062805
Benzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Bromodichloromethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Bromoform	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Bromomethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Carbon Disulfide	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Carbon tetrachloride	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Chlorobenzene	1.79	OWP	0.50	ug/L		31-MAY-18	R4062805
Dibromochloromethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Chloroethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Chloroform	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-15 MW19 Sampled By: CLIENT on 29-MAY-18 @ 13:35 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
1,2-Dibromoethane	<0.20	OWP	0.20	ug/L		31-MAY-18	R4062805
1,2-Dichlorobenzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,3-Dichlorobenzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,4-Dichlorobenzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Dichlorodifluoromethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
1,1-Dichloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,2-Dichloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,1-Dichloroethylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
cis-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
trans-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Dichloromethane	<2.0	OWP	2.0	ug/L		31-MAY-18	R4062805
1,2-Dichloropropane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
cis-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
trans-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Ethylbenzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
n-Hexane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
2-Hexanone	<20	OWP	20	ug/L		31-MAY-18	R4062805
Methyl Ethyl Ketone	<20	OWP	20	ug/L		31-MAY-18	R4062805
Methyl Isobutyl Ketone	<20	OWP	20	ug/L		31-MAY-18	R4062805
MTBE	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Styrene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,1,1,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,1,1,2,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Tetrachloroethylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Toluene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,1,1-Trichloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,1,2-Trichloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Trichloroethylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Trichlorofluoromethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Vinyl chloride	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
o-Xylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
m+p-Xylenes	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Xylenes (Total)	<1.1		1.1	ug/L		31-MAY-18	
Surrogate: 4-Bromofluorobenzene	95.7		70-130	%		31-MAY-18	R4062805
Surrogate: 1,4-Difluorobenzene	100.8		70-130	%		31-MAY-18	R4062805
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		31-MAY-18	
L2102331-16 QC1 Sampled By: CLIENT on 29-MAY-18 @ 12:10 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-16 QC1							
Sampled By: CLIENT on 29-MAY-18 @ 12:10							
Matrix: WATER							
Physical Tests							
Colour, Apparent	235		2.0	CU		30-MAY-18	R4062835
Conductivity	1380		3.0	umhos/cm		30-MAY-18	R4062836
pH	7.30		0.10	pH units		30-MAY-18	R4062836
Total Dissolved Solids	809	DLDS	20	mg/L		04-JUN-18	R4069782
Turbidity	1180		0.10	NTU		30-MAY-18	R4061991
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	663		10	mg/L		01-JUN-18	R4067149
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		01-JUN-18	R4067149
Alkalinity, Total (as CaCO3)	663	DLHC	20	mg/L		01-JUN-18	R4067149
Ammonia, Total (as N)	19.3	DLHC	0.40	mg/L		01-JUN-18	R4064226
Bromide (Br)	0.87	DLDS	0.50	mg/L		01-JUN-18	R4067574
Chloride (Cl)	71.5	DLDS	2.5	mg/L		01-JUN-18	R4067574
Computed Conductivity	1270			uS/cm		05-JUN-18	
Conductivity % Difference	-7.9			%		05-JUN-18	
Fluoride (F)	<0.10	DLDS	0.10	mg/L		01-JUN-18	R4067574
Hardness (as CaCO3)	563			mg/L		05-JUN-18	
Ion Balance	124			%		05-JUN-18	
Langelier Index	0.9					05-JUN-18	
Nitrate and Nitrite as N	<0.11		0.11	mg/L		04-JUN-18	
Nitrate (as N)	<0.10	DLDS	0.10	mg/L		01-JUN-18	R4067574
Nitrite (as N)	<0.050	DLDS	0.050	mg/L		01-JUN-18	R4067574
Total Kjeldahl Nitrogen	26.7	DLHC	1.5	mg/L	01-JUN-18	01-JUN-18	R4064383
Saturation pH	6.45			pH		05-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		30-MAY-18	R4062414
Phosphorus, Total	0.971		0.0030	mg/L	01-JUN-18	03-JUN-18	R4065947
TDS (Calculated)	825			mg/L		05-JUN-18	
Sulfate (SO4)	33.2	DLDS	1.5	mg/L		01-JUN-18	R4067574
Anion Sum	13.6			me/L		05-JUN-18	
Cation Sum	16.9			me/L		05-JUN-18	
Cation - Anion Balance	10.9			%		05-JUN-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	13.6		1.0	mg/L		03-JUN-18	R4068448
Inorganic Parameters							
Silica	17.6		0.11	mg/L		30-MAY-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					30-MAY-18	R4061854
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	30-MAY-18	30-MAY-18	R4062229
Antimony (Sb)-Dissolved	0.00016		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Arsenic (As)-Dissolved	0.00618		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Barium (Ba)-Dissolved	0.326		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-16 QC1							
Sampled By: CLIENT on 29-MAY-18 @ 12:10							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Boron (B)-Dissolved	0.596		0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Cadmium (Cd)-Dissolved	<0.000010		0.000010	mg/L	30-MAY-18	30-MAY-18	R4062229
Calcium (Ca)-Dissolved	183		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Chromium (Cr)-Dissolved	0.00080		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Cobalt (Co)-Dissolved	0.00260		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Copper (Cu)-Dissolved	0.00146		0.00020	mg/L	30-MAY-18	30-MAY-18	R4062229
Iron (Fe)-Dissolved	12.3		0.010	mg/L	30-MAY-18	30-MAY-18	R4062229
Lead (Pb)-Dissolved	0.000087		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Magnesium (Mg)-Dissolved	26.1		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Manganese (Mn)-Dissolved	1.21		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Molybdenum (Mo)-Dissolved	0.00126		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Nickel (Ni)-Dissolved	0.00795		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Potassium (K)-Dissolved	37.5		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Selenium (Se)-Dissolved	0.000202		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Silicon (Si)-Dissolved	8.23		0.050	mg/L	30-MAY-18	30-MAY-18	R4062229
Silver (Ag)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4062229
Sodium (Na)-Dissolved	76.5		0.50	mg/L	30-MAY-18	30-MAY-18	R4062229
Strontium (Sr)-Dissolved	0.436		0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Sulfur (S)-Dissolved	12.5		5.0	mg/L	30-MAY-18	30-MAY-18	R4062229
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L	30-MAY-18	30-MAY-18	R4062229
Tin (Sn)-Dissolved	0.00030		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Titanium (Ti)-Dissolved	<0.00040	DLUI	0.00040	mg/L	30-MAY-18	30-MAY-18	R4062229
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4062229
Uranium (U)-Dissolved	0.000701		0.000010	mg/L	30-MAY-18	30-MAY-18	R4062229
Vanadium (V)-Dissolved	0.00105		0.00050	mg/L	30-MAY-18	30-MAY-18	R4062229
Zinc (Zn)-Dissolved	0.0035		0.0010	mg/L	30-MAY-18	30-MAY-18	R4062229
Zirconium (Zr)-Dissolved	0.00112		0.00030	mg/L	30-MAY-18	30-MAY-18	R4062229
Volatile Organic Compounds							
Acetone	<20	OWP	20	ug/L		31-MAY-18	R4062805
Benzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Bromodichloromethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Bromoform	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Bromomethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Carbon Disulfide	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Carbon tetrachloride	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Chlorobenzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Dibromochloromethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Chloroethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Chloroform	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-16 QC1 Sampled By: CLIENT on 29-MAY-18 @ 12:10 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
1,2-Dibromoethane	<0.20	OWP	0.20	ug/L		31-MAY-18	R4062805
1,2-Dichlorobenzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,3-Dichlorobenzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,4-Dichlorobenzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Dichlorodifluoromethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
1,1-Dichloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,2-Dichloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,1-Dichloroethylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
cis-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
trans-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Dichloromethane	<2.0	OWP	2.0	ug/L		31-MAY-18	R4062805
1,2-Dichloropropane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
cis-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
trans-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Ethylbenzene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
n-Hexane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
2-Hexanone	<20	OWP	20	ug/L		31-MAY-18	R4062805
Methyl Ethyl Ketone	<20	OWP	20	ug/L		31-MAY-18	R4062805
Methyl Isobutyl Ketone	<20	OWP	20	ug/L		31-MAY-18	R4062805
MTBE	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Styrene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,1,1,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,1,1,2,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Tetrachloroethylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Toluene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,1,1-Trichloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
1,1,2-Trichloroethane	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Trichloroethylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
Trichlorofluoromethane	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Vinyl chloride	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
o-Xylene	<0.50	OWP	0.50	ug/L		31-MAY-18	R4062805
m+p-Xylenes	<1.0	OWP	1.0	ug/L		31-MAY-18	R4062805
Xylenes (Total)	<1.1		1.1	ug/L		31-MAY-18	
Surrogate: 4-Bromofluorobenzene	96.3		70-130	%		31-MAY-18	R4062805
Surrogate: 1,4-Difluorobenzene	101.3		70-130	%		31-MAY-18	R4062805
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		31-MAY-18	
L2102331-17 TRIP BLANK Sampled By: CLIENT on 29-MAY-18 Matrix: WATER							
Volatile Organic Compounds							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-17 TRIP BLANK Sampled By: CLIENT on 29-MAY-18 Matrix: WATER							
Volatile Organic Compounds							
Acetone	<20		20	ug/L		31-MAY-18	R4062805
Benzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Bromodichloromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
Bromoform	<1.0		1.0	ug/L		31-MAY-18	R4062805
Bromomethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
Carbon Disulfide	<1.0		1.0	ug/L		31-MAY-18	R4062805
Carbon tetrachloride	<0.50		0.50	ug/L		31-MAY-18	R4062805
Chlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Dibromochloromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
Chloroethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
Chloroform	<1.0		1.0	ug/L		31-MAY-18	R4062805
Chloromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
1,2-Dibromoethane	<0.20		0.20	ug/L		31-MAY-18	R4062805
1,2-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,3-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,4-Dichlorobenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Dichlorodifluoromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805
1,1-Dichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,2-Dichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Dichloromethane	<2.0		2.0	ug/L		31-MAY-18	R4062805
1,2-Dichloropropane	<0.50		0.50	ug/L		31-MAY-18	R4062805
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		31-MAY-18	R4062805
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Ethylbenzene	<0.50		0.50	ug/L		31-MAY-18	R4062805
n-Hexane	<0.50		0.50	ug/L		31-MAY-18	R4062805
2-Hexanone	<20		20	ug/L		31-MAY-18	R4062805
Methyl Ethyl Ketone	<20		20	ug/L		31-MAY-18	R4062805
Methyl Isobutyl Ketone	<20		20	ug/L		31-MAY-18	R4062805
MTBE	<0.50		0.50	ug/L		31-MAY-18	R4062805
Styrene	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
Tetrachloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Toluene	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1,1-Trichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
1,1,2-Trichloroethane	<0.50		0.50	ug/L		31-MAY-18	R4062805
Trichloroethylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
Trichlorofluoromethane	<1.0		1.0	ug/L		31-MAY-18	R4062805

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2102331-17 TRIP BLANK Sampled By: CLIENT on 29-MAY-18 Matrix: WATER							
Volatile Organic Compounds							
Vinyl chloride	<0.50		0.50	ug/L		31-MAY-18	R4062805
o-Xylene	<0.50		0.50	ug/L		31-MAY-18	R4062805
m+p-Xylenes	<1.0		1.0	ug/L		31-MAY-18	R4062805
Xylenes (Total)	<1.1		1.1	ug/L		31-MAY-18	
Surrogate: 4-Bromofluorobenzene	96.6		70-130	%		31-MAY-18	R4062805
Surrogate: 1,4-Difluorobenzene	101.1		70-130	%		31-MAY-18	R4062805
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		31-MAY-18	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L2102331-1, -10, -11, -12, -13, -14, -15, -16, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L2102331-2
Matrix Spike	Boron (B)-Dissolved	MS-B	L2102331-1, -10, -11, -12, -13, -14, -15, -16, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L2102331-1, -10, -11, -12, -13, -14, -15, -16, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L2102331-2
Matrix Spike	Iron (Fe)-Dissolved	MS-B	L2102331-2
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L2102331-1, -10, -11, -12, -13, -14, -15, -16, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L2102331-2
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L2102331-1, -10, -11, -12, -13, -14, -15, -16, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L2102331-2
Matrix Spike	Phosphorus (P)-Dissolved	MS-B	L2102331-2
Matrix Spike	Potassium (K)-Dissolved	MS-B	L2102331-1, -10, -11, -12, -13, -14, -15, -16, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Potassium (K)-Dissolved	MS-B	L2102331-2
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L2102331-1, -10, -11, -12, -13, -14, -15, -16, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L2102331-2
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L2102331-1, -10, -11, -12, -13, -14, -15, -16, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L2102331-2
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L2102331-1, -10, -11, -12, -13, -14, -15, -16, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L2102331-2
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L2102331-1, -10, -11, -12, -13, -14, -15, -16, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Uranium (U)-Dissolved	MS-B	L2102331-1, -10, -11, -12, -13, -14, -15, -16, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Ammonia, Total (as N)	MS-B	L2102331-1, -10, -11, -12, -13, -14, -15, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Phosphorus, Total	MS-B	L2102331-10, -11, -5, -6, -7, -8, -9
Matrix Spike	Total Kjeldahl Nitrogen	MS-B	L2102331-16

Qualifiers for Sample Submission Listed:

Qualifier	Description
CINT	Cooling initiated. Samples were received packed with ice or ice packs and were sampled the same day as received.

Sample Parameter Qualifier key listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
DLUI	Detection Limit Raised: Unknown Interference generated an apparent false positive test result.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
OWP	Organic water sample contained visible sediment (must be included as part of analysis). Measured concentrations of organic substances in water can be biased high due to presence of sediment.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-AUTO-WT	Water	Automated Speciated Alkalinity	EPA 310.2
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.			
ALK-SPECIATED-WT	Water	pH Measurement for Spec. Alk	APHA 4500 H-Electrode
Water samples are analyzed directly by a calibrated pH meter.			
BR-IC-N-WT	Water	Bromide in Water by IC	EPA 300.1 (mod)

Reference Information

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

C-DIS-ORG-WT Water Dissolved Organic Carbon APHA 5310B

Sample is filtered through a 0.45um filter, then injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic carbon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.

CL-IC-N-WT Water Chloride by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

COLOUR-APPARENT-WT Water Colour APHA 2120

Apparent Colour is measured spectrophotometrically by comparison to platinum-cobalt standards using the single wavelength method after sample decanting. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment. Concurrent measurement of sample pH is recommended.

EC-WT Water Conductivity APHA 2510 B

Water samples can be measured directly by immersing the conductivity cell into the sample.

ETL-N-ORGANIC-DIS-WT Water Calculate from TKN,NH3 CALCULATION

ETL-N2N3-WT Water Calculate from NO2 + NO3 APHA 4110 B

ETL-SILICA-CALC-WT Water Calculate from SI-TOT-WT EPA 200.8

F-IC-N-WT Water Fluoride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

IONBALANCE-OP03-WT Water Detailed Ion Balance Calculation APHA 1030E, 2330B, 2510A

MET-D-CCMS-WT Water Dissolved Metals in Water by CRC APHA 3030B/6020A (mod)
ICPMS

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

NH3-WT Water Ammonia, Total as N EPA 350.1

Sample is measured colorimetrically. When sample is turbid a distillation step is required, sample is distilled into a solution of boric acid and measured colorimetrically.

NO2-IC-WT Water Nitrite in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-WT Water Nitrate in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

P-T-COL-WT Water Total P in Water by Colour APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PO4-DO-COL-WT Water Diss. Orthophosphate in Water by APHA 4500-P PHOSPHORUS
Colour

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.

SO4-IC-N-WT Water Sulfate in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

SOLIDS-TDS-WT Water Total Dissolved Solids APHA 2540C

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

THM-SUM-PPB-CALC-WT Water Total Trihalomethanes (THMs) CALCULATION

Total Trihalomethanes (THMs) represents the sum of bromodichloromethane, bromoform, chlorodibromomethane and chloroform. For the purpose of calculation, results less than the detection limit (DL) are treated as zero.

Reference Information

TKN-WT	Water	Total Kjeldahl Nitrogen	APHA 4500-Norg D
This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 Celsius with analysis using an automated colorimetric method.			
TURBIDITY-WT	Water	Turbidity	APHA 2130 B
Sample result is based on a comparison of the intensity of the light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension under the same conditions. Sample readings are obtained from a Nephelometer.			
VOC-ROU-HS-WT	Water	Volatile Organic Compounds	SW846 8260
Aqueous samples are analyzed by headspace-GC/MS.			
XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
Total xylenes represents the sum of o-xylene and m&p-xylene.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

17-619350	17-619383
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GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

*mg/kg - milligrams per kilogram based on dry weight of sample
 mg/kg wwt - milligrams per kilogram based on wet weight of sample
 mg/kg lwt - milligrams per kilogram based on lipid weight of sample
 mg/L - unit of concentration based on volume, parts per million.*

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Workorder: L2102331

Report Date: 05-JUN-18

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Client: BluMetric Environmental Inc. (Kitchener)
 171 VICTORIA STREET, NORTH
 KITCHENER ON N2H 5C5

Contact: S'RANA SCHOLES

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-AUTO-WT								
	Water							
Batch	R4063182							
WG2785323-3	CRM	WT-ALK-CRM						
Alkalinity, Total (as CaCO3)			92.4		%		80-120	31-MAY-18
WG2785323-2	LCS							
Alkalinity, Total (as CaCO3)			98.7		%		85-115	31-MAY-18
WG2785323-1	MB							
Alkalinity, Total (as CaCO3)			<10		mg/L		10	31-MAY-18
Batch	R4067149							
WG2786792-3	CRM	WT-ALK-CRM						
Alkalinity, Total (as CaCO3)			87.5		%		80-120	01-JUN-18
WG2786792-2	LCS							
Alkalinity, Total (as CaCO3)			96.2		%		85-115	01-JUN-18
WG2786792-1	MB							
Alkalinity, Total (as CaCO3)			<10		mg/L		10	01-JUN-18
ALK-SPECIATED-WT								
	Water							
Batch	R4061898							
WG2783957-1	LCS							
pH			7.00		pH units		6.9-7.1	30-MAY-18
Batch	R4062836							
WG2783955-10	LCS							
pH			7.01		pH units		6.9-7.1	30-MAY-18
WG2783955-6	LCS							
pH			7.00		pH units		6.9-7.1	30-MAY-18
BR-IC-N-WT								
	Water							
Batch	R4067574							
WG2786357-2	LCS							
Bromide (Br)			99.4		%		85-115	01-JUN-18
WG2786357-1	MB							
Bromide (Br)			<0.10		mg/L		0.1	01-JUN-18
C-DIS-ORG-WT								
	Water							
Batch	R4065971							
WG2787585-2	LCS							
Dissolved Organic Carbon			97.3		%		80-120	03-JUN-18
WG2787585-1	MB							
Dissolved Organic Carbon			<1.0		mg/L		1	03-JUN-18

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
C-DIS-ORG-WT								
Batch R4068448								
WG2787620-2	LCS							
Dissolved Organic Carbon			98.3		%		80-120	03-JUN-18
WG2787620-1	MB							
Dissolved Organic Carbon			<1.0		mg/L		1	03-JUN-18
CL-IC-N-WT								
Batch R4067574								
WG2786357-2	LCS							
Chloride (Cl)			101.0		%		90-110	01-JUN-18
WG2786357-1	MB							
Chloride (Cl)			<0.50		mg/L		0.5	01-JUN-18
COLOUR-APPARENT-WT								
Batch R4062835								
WG2784395-3	DUP	L2102331-1						
Colour, Apparent			25.2		CU	3.1	20	30-MAY-18
WG2784395-2	LCS							
Colour, Apparent			106.2		%		85-115	30-MAY-18
WG2784395-1	MB							
Colour, Apparent			<2.0		CU		2	30-MAY-18
EC-WT								
Batch R4061976								
WG2783970-2	LCS							
Conductivity			101.6		%		90-110	30-MAY-18
WG2783970-1	MB							
Conductivity			<3.0		umhos/cm		3	30-MAY-18
Batch R4062836								
WG2783955-10	LCS							
Conductivity			99.9		%		90-110	30-MAY-18
WG2783955-6	LCS							
Conductivity			99.1		%		90-110	30-MAY-18
WG2783955-5	MB							
Conductivity			<3.0		umhos/cm		3	30-MAY-18
WG2783955-9	MB							
Conductivity			<3.0		umhos/cm		3	30-MAY-18
F-IC-N-WT								
Batch R4062836								

Quality Control Report

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F-IC-N-WT		Water						
Batch	R4067574							
WG2786357-2	LCS							
Fluoride (F)			102.2		%		90-110	01-JUN-18
WG2786357-1	MB							
Fluoride (F)			<0.020		mg/L		0.02	01-JUN-18
MET-D-CCMS-WT		Water						
Batch	R4062229							
WG2783900-2	LCS							
Aluminum (Al)-Dissolved			99.7		%		80-120	30-MAY-18
Antimony (Sb)-Dissolved			102.7		%		80-120	30-MAY-18
Arsenic (As)-Dissolved			96.5		%		80-120	30-MAY-18
Barium (Ba)-Dissolved			98.8		%		80-120	30-MAY-18
Beryllium (Be)-Dissolved			104.7		%		80-120	30-MAY-18
Bismuth (Bi)-Dissolved			98.3		%		80-120	30-MAY-18
Boron (B)-Dissolved			102.2		%		80-120	30-MAY-18
Cadmium (Cd)-Dissolved			101.9		%		80-120	30-MAY-18
Calcium (Ca)-Dissolved			101.7		%		80-120	30-MAY-18
Chromium (Cr)-Dissolved			98.9		%		80-120	30-MAY-18
Cobalt (Co)-Dissolved			99.0		%		80-120	30-MAY-18
Copper (Cu)-Dissolved			100.8		%		80-120	30-MAY-18
Iron (Fe)-Dissolved			98.0		%		80-120	30-MAY-18
Lead (Pb)-Dissolved			98.9		%		80-120	30-MAY-18
Magnesium (Mg)-Dissolved			103.8		%		80-120	30-MAY-18
Manganese (Mn)-Dissolved			100.4		%		80-120	30-MAY-18
Molybdenum (Mo)-Dissolved			102.9		%		80-120	30-MAY-18
Nickel (Ni)-Dissolved			98.7		%		80-120	30-MAY-18
Phosphorus (P)-Dissolved			95.7		%		80-120	30-MAY-18
Potassium (K)-Dissolved			97.4		%		80-120	30-MAY-18
Selenium (Se)-Dissolved			98.4		%		80-120	30-MAY-18
Silicon (Si)-Dissolved			102.5		%		60-140	30-MAY-18
Silver (Ag)-Dissolved			101.6		%		80-120	30-MAY-18
Sodium (Na)-Dissolved			103.2		%		80-120	30-MAY-18
Strontium (Sr)-Dissolved			104.8		%		80-120	30-MAY-18
Sulfur (S)-Dissolved			95.8		%		80-120	30-MAY-18
Thallium (Tl)-Dissolved			95.5		%		80-120	30-MAY-18
Tin (Sn)-Dissolved			99.7		%		80-120	30-MAY-18

Quality Control Report

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT								
	Water							
Batch	R4062229							
WG2783900-2	LCS							
Titanium (Ti)-Dissolved			95.7		%		80-120	30-MAY-18
Tungsten (W)-Dissolved			98.7		%		80-120	30-MAY-18
Uranium (U)-Dissolved			103.6		%		80-120	30-MAY-18
Vanadium (V)-Dissolved			100.0		%		80-120	30-MAY-18
Zinc (Zn)-Dissolved			94.0		%		80-120	30-MAY-18
Zirconium (Zr)-Dissolved			101.9		%		80-120	30-MAY-18
WG2783900-1	MB							
Aluminum (Al)-Dissolved			<0.0050		mg/L		0.005	30-MAY-18
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	30-MAY-18
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	30-MAY-18
Barium (Ba)-Dissolved			<0.00010		mg/L		0.0001	30-MAY-18
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	30-MAY-18
Bismuth (Bi)-Dissolved			<0.000050		mg/L		0.00005	30-MAY-18
Boron (B)-Dissolved			<0.010		mg/L		0.01	30-MAY-18
Cadmium (Cd)-Dissolved			<0.0000050		mg/L		0.000005	30-MAY-18
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	30-MAY-18
Chromium (Cr)-Dissolved			<0.00050		mg/L		0.0005	30-MAY-18
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	30-MAY-18
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	30-MAY-18
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	30-MAY-18
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	30-MAY-18
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	30-MAY-18
Manganese (Mn)-Dissolved			<0.00050		mg/L		0.0005	30-MAY-18
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	30-MAY-18
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	30-MAY-18
Phosphorus (P)-Dissolved			<0.050		mg/L		0.05	30-MAY-18
Potassium (K)-Dissolved			<0.050		mg/L		0.05	30-MAY-18
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	30-MAY-18
Silicon (Si)-Dissolved			<0.050		mg/L		0.05	30-MAY-18
Silver (Ag)-Dissolved			<0.000050		mg/L		0.00005	30-MAY-18
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	30-MAY-18
Strontium (Sr)-Dissolved			<0.0010		mg/L		0.001	30-MAY-18
Sulfur (S)-Dissolved			<0.50		mg/L		0.5	30-MAY-18
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	30-MAY-18

Quality Control Report

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT								
	Water							
Batch	R4062229							
WG2783900-1 MB								
Tin (Sn)-Dissolved			<0.00010		mg/L		0.0001	30-MAY-18
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	30-MAY-18
Tungsten (W)-Dissolved			<0.00010		mg/L		0.0001	30-MAY-18
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	30-MAY-18
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	30-MAY-18
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	30-MAY-18
Zirconium (Zr)-Dissolved			<0.00030		mg/L		0.0003	30-MAY-18
WG2783900-5 MS		L2102331-3						
Aluminum (Al)-Dissolved			98.4		%		70-130	30-MAY-18
Antimony (Sb)-Dissolved			105.7		%		70-130	30-MAY-18
Arsenic (As)-Dissolved			105.4		%		70-130	30-MAY-18
Barium (Ba)-Dissolved			N/A	MS-B	%		-	30-MAY-18
Beryllium (Be)-Dissolved			105.3		%		70-130	30-MAY-18
Bismuth (Bi)-Dissolved			85.6		%		70-130	30-MAY-18
Boron (B)-Dissolved			N/A	MS-B	%		-	30-MAY-18
Cadmium (Cd)-Dissolved			103.9		%		70-130	30-MAY-18
Calcium (Ca)-Dissolved			N/A	MS-B	%		-	30-MAY-18
Chromium (Cr)-Dissolved			99.6		%		70-130	30-MAY-18
Cobalt (Co)-Dissolved			99.3		%		70-130	30-MAY-18
Copper (Cu)-Dissolved			98.2		%		70-130	30-MAY-18
Iron (Fe)-Dissolved			93.7		%		70-130	30-MAY-18
Lead (Pb)-Dissolved			97.4		%		70-130	30-MAY-18
Magnesium (Mg)-Dissolved			N/A	MS-B	%		-	30-MAY-18
Manganese (Mn)-Dissolved			N/A	MS-B	%		-	30-MAY-18
Molybdenum (Mo)-Dissolved			99.8		%		70-130	30-MAY-18
Nickel (Ni)-Dissolved			96.5		%		70-130	30-MAY-18
Phosphorus (P)-Dissolved			106.0		%		70-130	30-MAY-18
Potassium (K)-Dissolved			N/A	MS-B	%		-	30-MAY-18
Selenium (Se)-Dissolved			120.3		%		70-130	30-MAY-18
Silicon (Si)-Dissolved			N/A	MS-B	%		-	30-MAY-18
Silver (Ag)-Dissolved			74.5		%		70-130	30-MAY-18
Sodium (Na)-Dissolved			N/A	MS-B	%		-	30-MAY-18
Strontium (Sr)-Dissolved			N/A	MS-B	%		-	30-MAY-18
Sulfur (S)-Dissolved			N/A	MS-B	%		-	30-MAY-18

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT								
	Water							
Batch	R4062229							
WG2783900-5	MS	L2102331-3						
Thallium (Tl)-Dissolved			90.3		%		70-130	30-MAY-18
Tin (Sn)-Dissolved			100.8		%		70-130	30-MAY-18
Titanium (Ti)-Dissolved			99.5		%		70-130	30-MAY-18
Tungsten (W)-Dissolved			101.3		%		70-130	30-MAY-18
Uranium (U)-Dissolved			N/A	MS-B	%		-	30-MAY-18
Vanadium (V)-Dissolved			102.7		%		70-130	30-MAY-18
Zinc (Zn)-Dissolved			98.0		%		70-130	30-MAY-18
Zirconium (Zr)-Dissolved			99.4		%		70-130	30-MAY-18
Batch	R4063710							
WG2784937-2	LCS							
Aluminum (Al)-Dissolved			103.3		%		80-120	31-MAY-18
Antimony (Sb)-Dissolved			100.3		%		80-120	31-MAY-18
Arsenic (As)-Dissolved			97.4		%		80-120	31-MAY-18
Barium (Ba)-Dissolved			100.8		%		80-120	31-MAY-18
Beryllium (Be)-Dissolved			95.6		%		80-120	31-MAY-18
Bismuth (Bi)-Dissolved			99.3		%		80-120	31-MAY-18
Boron (B)-Dissolved			97.0		%		80-120	31-MAY-18
Cadmium (Cd)-Dissolved			98.7		%		80-120	31-MAY-18
Calcium (Ca)-Dissolved			98.5		%		80-120	31-MAY-18
Chromium (Cr)-Dissolved			97.9		%		80-120	31-MAY-18
Cobalt (Co)-Dissolved			98.0		%		80-120	31-MAY-18
Copper (Cu)-Dissolved			97.2		%		80-120	31-MAY-18
Iron (Fe)-Dissolved			95.5		%		80-120	31-MAY-18
Lead (Pb)-Dissolved			97.9		%		80-120	31-MAY-18
Magnesium (Mg)-Dissolved			99.1		%		80-120	31-MAY-18
Manganese (Mn)-Dissolved			99.6		%		80-120	31-MAY-18
Molybdenum (Mo)-Dissolved			97.1		%		80-120	31-MAY-18
Nickel (Ni)-Dissolved			99.3		%		80-120	31-MAY-18
Phosphorus (P)-Dissolved			97.7		%		80-120	31-MAY-18
Potassium (K)-Dissolved			102.3		%		80-120	31-MAY-18
Selenium (Se)-Dissolved			94.8		%		80-120	31-MAY-18
Silicon (Si)-Dissolved			105.1		%		60-140	31-MAY-18
Silver (Ag)-Dissolved			85.5		%		80-120	31-MAY-18
Sodium (Na)-Dissolved			99.4		%		80-120	31-MAY-18

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT		Water						
Batch	R4063710							
WG2784937-2 LCS								
Strontium (Sr)-Dissolved			99.9		%		80-120	31-MAY-18
Sulfur (S)-Dissolved			101.9		%		80-120	31-MAY-18
Thallium (Tl)-Dissolved			100.1		%		80-120	31-MAY-18
Tin (Sn)-Dissolved			100.7		%		80-120	31-MAY-18
Titanium (Ti)-Dissolved			95.6		%		80-120	31-MAY-18
Tungsten (W)-Dissolved			97.6		%		80-120	31-MAY-18
Uranium (U)-Dissolved			99.4		%		80-120	31-MAY-18
Vanadium (V)-Dissolved			101.5		%		80-120	31-MAY-18
Zinc (Zn)-Dissolved			93.8		%		80-120	31-MAY-18
Zirconium (Zr)-Dissolved			98.5		%		80-120	31-MAY-18
WG2784937-1 MB								
Aluminum (Al)-Dissolved			<0.0050		mg/L		0.005	31-MAY-18
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	31-MAY-18
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	31-MAY-18
Barium (Ba)-Dissolved			<0.00010		mg/L		0.0001	31-MAY-18
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	31-MAY-18
Bismuth (Bi)-Dissolved			<0.000050		mg/L		0.00005	31-MAY-18
Boron (B)-Dissolved			<0.010		mg/L		0.01	31-MAY-18
Cadmium (Cd)-Dissolved			<0.0000050		mg/L		0.000005	31-MAY-18
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	31-MAY-18
Chromium (Cr)-Dissolved			<0.00050		mg/L		0.0005	31-MAY-18
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	31-MAY-18
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	31-MAY-18
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	31-MAY-18
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	31-MAY-18
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	31-MAY-18
Manganese (Mn)-Dissolved			<0.00050		mg/L		0.0005	31-MAY-18
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	31-MAY-18
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	31-MAY-18
Phosphorus (P)-Dissolved			<0.050		mg/L		0.05	31-MAY-18
Potassium (K)-Dissolved			<0.050		mg/L		0.05	31-MAY-18
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	31-MAY-18
Silicon (Si)-Dissolved			<0.050		mg/L		0.05	31-MAY-18
Silver (Ag)-Dissolved			<0.000050		mg/L		0.00005	31-MAY-18

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT		Water						
Batch	R4063710							
WG2784937-1	MB							
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	31-MAY-18
Strontium (Sr)-Dissolved			<0.0010		mg/L		0.001	31-MAY-18
Sulfur (S)-Dissolved			<0.50		mg/L		0.5	31-MAY-18
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	31-MAY-18
Tin (Sn)-Dissolved			<0.00010		mg/L		0.0001	31-MAY-18
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	31-MAY-18
Tungsten (W)-Dissolved			<0.00010		mg/L		0.0001	31-MAY-18
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	31-MAY-18
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	31-MAY-18
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	31-MAY-18
Zirconium (Zr)-Dissolved			<0.00030		mg/L		0.0003	31-MAY-18
NH3-WT		Water						
Batch	R4064226							
WG2786405-10	LCS							
Ammonia, Total (as N)			94.4		%		85-115	01-JUN-18
WG2786405-6	LCS							
Ammonia, Total (as N)			93.8		%		85-115	01-JUN-18
WG2786405-5	MB							
Ammonia, Total (as N)			<0.020		mg/L		0.02	01-JUN-18
WG2786405-9	MB							
Ammonia, Total (as N)			<0.020		mg/L		0.02	01-JUN-18
NO2-IC-WT		Water						
Batch	R4067574							
WG2786357-2	LCS							
Nitrite (as N)			101.6		%		70-130	01-JUN-18
WG2786357-1	MB							
Nitrite (as N)			<0.010		mg/L		0.01	01-JUN-18
NO3-IC-WT		Water						
Batch	R4067574							
WG2786357-2	LCS							
Nitrate (as N)			101.5		%		70-130	01-JUN-18
WG2786357-1	MB							
Nitrate (as N)			<0.020		mg/L		0.02	01-JUN-18
P-T-COL-WT		Water						

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-COL-WT								
Water								
Batch	R4063684							
WG2784739-2	LCS							
Phosphorus, Total			96.2		%		80-120	01-JUN-18
WG2784739-1	MB							
Phosphorus, Total			<0.0030		mg/L		0.003	01-JUN-18
Batch	R4065947							
WG2786959-3	DUP	L2102331-5						
Phosphorus, Total		0.101	0.0965		mg/L	4.5	20	03-JUN-18
WG2786961-3	DUP	L2102331-12						
Phosphorus, Total		0.0344	0.0324		mg/L	6.1	20	03-JUN-18
WG2786959-2	LCS							
Phosphorus, Total			93.5		%		80-120	03-JUN-18
WG2786961-2	LCS							
Phosphorus, Total			93.3		%		80-120	03-JUN-18
WG2786959-1	MB							
Phosphorus, Total			<0.0030		mg/L		0.003	03-JUN-18
WG2786961-1	MB							
Phosphorus, Total			<0.0030		mg/L		0.003	03-JUN-18
WG2786959-4	MS	L2102331-5						
Phosphorus, Total			N/A	MS-B	%		-	03-JUN-18
WG2786961-4	MS	L2102331-12						
Phosphorus, Total			98.9		%		70-130	03-JUN-18
PO4-DO-COL-WT								
Water								
Batch	R4062414							
WG2784397-6	LCS							
Orthophosphate-Dissolved (as P)			114.6		%		70-130	30-MAY-18
WG2784397-5	MB							
Orthophosphate-Dissolved (as P)			<0.0030		mg/L		0.003	30-MAY-18
SO4-IC-N-WT								
Water								
Batch	R4067574							
WG2786357-2	LCS							
Sulfate (SO4)			101.6		%		90-110	01-JUN-18
WG2786357-1	MB							
Sulfate (SO4)			<0.30		mg/L		0.3	01-JUN-18
SOLIDS-TDS-WT								
Water								
Batch	R4069782							
WG2787785-2	LCS							
Total Dissolved Solids			98.2		%		85-115	04-JUN-18
WG2787785-1	MB							

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SOLIDS-TDS-WT								
Batch	R4069782							
WG2787785-1 MB								
Total Dissolved Solids			<10		mg/L		10	04-JUN-18
TKN-WT								
Batch	R4064383							
WG2786199-3 DUP		L2102331-16						
Total Kjeldahl Nitrogen		26.7	25.7		mg/L	3.5	20	01-JUN-18
WG2786191-2 LCS								
Total Kjeldahl Nitrogen			115.4		%		75-125	01-JUN-18
WG2786199-2 LCS								
Total Kjeldahl Nitrogen			105.5		%		75-125	01-JUN-18
WG2786191-1 MB								
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	01-JUN-18
WG2786199-1 MB								
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	01-JUN-18
WG2786199-4 MS		L2102331-16						
Total Kjeldahl Nitrogen			N/A	MS-B	%		-	01-JUN-18
TURBIDITY-WT								
Batch	R4061991							
WG2784004-2 LCS								
Turbidity			111.0		%		85-115	30-MAY-18
WG2784004-1 MB								
Turbidity			<0.10		NTU		0.1	30-MAY-18
VOC-ROU-HS-WT								
Batch	R4062805							
WG2783921-1 LCS								
1,1,1,2-Tetrachloroethane			95.4		%		70-130	31-MAY-18
1,1,2,2-Tetrachloroethane			87.2		%		70-130	31-MAY-18
1,1,1-Trichloroethane			105.9		%		70-130	31-MAY-18
1,1,2-Trichloroethane			92.0		%		70-130	31-MAY-18
1,2-Dibromoethane			89.5		%		70-130	31-MAY-18
1,1-Dichloroethane			100.2		%		70-130	31-MAY-18
1,1-Dichloroethylene			98.0		%		70-130	31-MAY-18
1,2-Dichlorobenzene			97.1		%		70-130	31-MAY-18
1,2-Dichloroethane			99.3		%		70-130	31-MAY-18
1,2-Dichloropropane			98.8		%		70-130	31-MAY-18
1,3-Dichlorobenzene			98.4		%		70-130	31-MAY-18

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R4062805							
WG2783921-1	LCS							
1,4-Dichlorobenzene			101.0		%		70-130	31-MAY-18
2-Hexanone			72.4		%		60-140	31-MAY-18
Acetone			103.4		%		60-140	31-MAY-18
Benzene			104.2		%		70-130	31-MAY-18
Bromodichloromethane			97.2		%		70-130	31-MAY-18
Bromoform			88.8		%		70-130	31-MAY-18
Bromomethane			100.3		%		60-140	31-MAY-18
Carbon Disulfide			102.5		%		70-130	31-MAY-18
Carbon tetrachloride			106.2		%		70-130	31-MAY-18
Chlorobenzene			98.2		%		70-130	31-MAY-18
Chloroethane			102.2		%		70-130	31-MAY-18
Chloroform			104.3		%		70-130	31-MAY-18
Chloromethane			98.7		%		60-140	31-MAY-18
cis-1,2-Dichloroethylene			100.7		%		70-130	31-MAY-18
cis-1,3-Dichloropropene			95.9		%		70-130	31-MAY-18
Dibromochloromethane			95.9		%		70-130	31-MAY-18
Dichlorodifluoromethane			86.8		%		50-140	31-MAY-18
Dichloromethane			104.4		%		70-130	31-MAY-18
Ethylbenzene			89.8		%		70-130	31-MAY-18
m+p-Xylenes			95.5		%		70-130	31-MAY-18
Methyl Ethyl Ketone			90.8		%		60-140	31-MAY-18
Methyl Isobutyl Ketone			81.0		%		50-150	31-MAY-18
n-Hexane			112.1		%		70-130	31-MAY-18
MTBE			100.2		%		70-130	31-MAY-18
o-Xylene			87.9		%		70-130	31-MAY-18
Styrene			86.0		%		70-130	31-MAY-18
Tetrachloroethylene			99.8		%		70-130	31-MAY-18
Toluene			92.5		%		70-130	31-MAY-18
trans-1,2-Dichloroethylene			105.2		%		70-130	31-MAY-18
trans-1,3-Dichloropropene			83.9		%		70-130	31-MAY-18
Trichloroethylene			106.0		%		70-130	31-MAY-18
Trichlorofluoromethane			109.9		%		60-140	31-MAY-18
Vinyl chloride			96.6		%		60-140	31-MAY-18
WG2783921-2	MB							

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VOC-ROU-HS-WT								
	Water							
Batch	R4062805							
WG2783921-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	31-MAY-18
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	31-MAY-18
1,1,1-Trichloroethane			<0.50		ug/L		0.5	31-MAY-18
1,1,2-Trichloroethane			<0.50		ug/L		0.5	31-MAY-18
1,2-Dibromoethane			<0.20		ug/L		0.2	31-MAY-18
1,1-Dichloroethane			<0.50		ug/L		0.5	31-MAY-18
1,1-Dichloroethylene			<0.50		ug/L		0.5	31-MAY-18
1,2-Dichlorobenzene			<0.50		ug/L		0.5	31-MAY-18
1,2-Dichloroethane			<0.50		ug/L		0.5	31-MAY-18
1,2-Dichloropropane			<0.50		ug/L		0.5	31-MAY-18
1,3-Dichlorobenzene			<0.50		ug/L		0.5	31-MAY-18
1,4-Dichlorobenzene			<0.50		ug/L		0.5	31-MAY-18
2-Hexanone			<20		ug/L		20	31-MAY-18
Acetone			<20		ug/L		20	31-MAY-18
Benzene			<0.50		ug/L		0.5	31-MAY-18
Bromodichloromethane			<1.0		ug/L		1	31-MAY-18
Bromoform			<1.0		ug/L		1	31-MAY-18
Bromomethane			<0.50		ug/L		0.5	31-MAY-18
Carbon Disulfide			<1.0		ug/L		1	31-MAY-18
Carbon tetrachloride			<0.50		ug/L		0.5	31-MAY-18
Chlorobenzene			<0.50		ug/L		0.5	31-MAY-18
Chloroethane			<1.0		ug/L		1	31-MAY-18
Chloroform			<1.0		ug/L		1	31-MAY-18
Chloromethane			<1.0		ug/L		1	31-MAY-18
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	31-MAY-18
cis-1,3-Dichloropropene			<0.50		ug/L		0.5	31-MAY-18
Dibromochloromethane			<1.0		ug/L		1	31-MAY-18
Dichlorodifluoromethane			<1.0		ug/L		1	31-MAY-18
Dichloromethane			<2.0		ug/L		2	31-MAY-18
Ethylbenzene			<0.50		ug/L		0.5	31-MAY-18
m+p-Xylenes			<1.0		ug/L		1	31-MAY-18
Methyl Ethyl Ketone			<20		ug/L		20	31-MAY-18
Methyl Isobutyl Ketone			<20		ug/L		20	31-MAY-18
n-Hexane			<0.50		ug/L		0.5	31-MAY-18

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VOC-ROU-HS-WT								
	Water							
Batch	R4062805							
WG2783921-2	MB							
MTBE			<0.50		ug/L		0.5	31-MAY-18
o-Xylene			<0.50		ug/L		0.5	31-MAY-18
Styrene			<0.50		ug/L		0.5	31-MAY-18
Tetrachloroethylene			<0.50		ug/L		0.5	31-MAY-18
Toluene			<0.50		ug/L		0.5	31-MAY-18
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	31-MAY-18
trans-1,3-Dichloropropene			<0.50		ug/L		0.5	31-MAY-18
Trichloroethylene			<0.50		ug/L		0.5	31-MAY-18
Trichlorofluoromethane			<1.0		ug/L		1	31-MAY-18
Vinyl chloride			<0.50		ug/L		0.5	31-MAY-18
Surrogate: 1,4-Difluorobenzene			101.4		%		70-130	31-MAY-18
Surrogate: 4-Bromofluorobenzene			101.7		%		70-130	31-MAY-18
Batch	R4063095							
WG2779746-4	DUP	L2102331-7						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	31-MAY-18
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
2-Hexanone		<20	<20	RPD-NA	ug/L	N/A	30	31-MAY-18
Acetone		<20	<20	RPD-NA	ug/L	N/A	30	31-MAY-18
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
Bromodichloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	31-MAY-18
Bromoform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	31-MAY-18
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
Carbon Disulfide		<1.0	<1.0	RPD-NA	ug/L	N/A	30	31-MAY-18
Carbon tetrachloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4063095							
WG2779746-4	DUP	L2102331-7						
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
Chloroethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	31-MAY-18
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	31-MAY-18
Chloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	31-MAY-18
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
cis-1,3-Dichloropropene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
Dibromochloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	31-MAY-18
Dichlorodifluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	31-MAY-18
Dichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	31-MAY-18
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
m+p-Xylenes		<1.0	<1.0	RPD-NA	ug/L	N/A	30	31-MAY-18
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	31-MAY-18
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	31-MAY-18
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
MTBE		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
o-Xylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
trans-1,3-Dichloropropene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
Trichlorofluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	31-MAY-18
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	31-MAY-18
WG2779746-1	LCS							
1,1,1,2-Tetrachloroethane			97.3		%		70-130	31-MAY-18
1,1,2,2-Tetrachloroethane			99.8		%		70-130	31-MAY-18
1,1,1-Trichloroethane			105.5		%		70-130	31-MAY-18
1,1,2-Trichloroethane			102.6		%		70-130	31-MAY-18
1,2-Dibromoethane			101.4		%		70-130	31-MAY-18
1,1-Dichloroethane			112.1		%		70-130	31-MAY-18
1,1-Dichloroethylene			99.8		%		70-130	31-MAY-18
1,2-Dichlorobenzene			99.0		%		70-130	31-MAY-18
1,2-Dichloroethane			108.1		%		70-130	31-MAY-18

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4063095							
WG2779746-1	LCS							
1,2-Dichloropropane			111.2		%		70-130	31-MAY-18
1,3-Dichlorobenzene			97.3		%		70-130	31-MAY-18
1,4-Dichlorobenzene			100.3		%		70-130	31-MAY-18
2-Hexanone			84.8		%		60-140	31-MAY-18
Acetone			126.7		%		60-140	31-MAY-18
Benzene			111.5		%		70-130	31-MAY-18
Bromodichloromethane			105.6		%		70-130	31-MAY-18
Bromoform			94.8		%		70-130	31-MAY-18
Bromomethane			106.8		%		60-140	31-MAY-18
Carbon Disulfide			106.0		%		70-130	31-MAY-18
Carbon tetrachloride			102.7		%		70-130	31-MAY-18
Chlorobenzene			99.2		%		70-130	31-MAY-18
Chloroethane			110.7		%		70-130	31-MAY-18
Chloroform			110.0		%		70-130	31-MAY-18
Chloromethane			108.7		%		60-140	31-MAY-18
cis-1,2-Dichloroethylene			107.5		%		70-130	31-MAY-18
cis-1,3-Dichloropropene			101.7		%		70-130	31-MAY-18
Dibromochloromethane			102.1		%		70-130	31-MAY-18
Dichlorodifluoromethane			83.4		%		50-140	31-MAY-18
Dichloromethane			117.4		%		70-130	31-MAY-18
Ethylbenzene			85.1		%		70-130	31-MAY-18
m+p-Xylenes			91.5		%		70-130	31-MAY-18
Methyl Ethyl Ketone			116.1		%		60-140	31-MAY-18
Methyl Isobutyl Ketone			93.6		%		50-150	31-MAY-18
n-Hexane			117.0		%		70-130	31-MAY-18
MTBE			102.1		%		70-130	31-MAY-18
o-Xylene			85.1		%		70-130	31-MAY-18
Styrene			83.2		%		70-130	31-MAY-18
Tetrachloroethylene			93.7		%		70-130	31-MAY-18
Toluene			91.8		%		70-130	31-MAY-18
trans-1,2-Dichloroethylene			110.3		%		70-130	31-MAY-18
trans-1,3-Dichloropropene			89.6		%		70-130	31-MAY-18
Trichloroethylene			104.0		%		70-130	31-MAY-18
Trichlorofluoromethane			106.0		%		60-140	31-MAY-18

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4063095							
WG2779746-1	LCS							
Vinyl chloride			102.6		%		60-140	31-MAY-18
WG2779746-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	31-MAY-18
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	31-MAY-18
1,1,1-Trichloroethane			<0.50		ug/L		0.5	31-MAY-18
1,1,2-Trichloroethane			<0.50		ug/L		0.5	31-MAY-18
1,2-Dibromoethane			<0.20		ug/L		0.2	31-MAY-18
1,1-Dichloroethane			<0.50		ug/L		0.5	31-MAY-18
1,1-Dichloroethylene			<0.50		ug/L		0.5	31-MAY-18
1,2-Dichlorobenzene			<0.50		ug/L		0.5	31-MAY-18
1,2-Dichloroethane			<0.50		ug/L		0.5	31-MAY-18
1,2-Dichloropropane			<0.50		ug/L		0.5	31-MAY-18
1,3-Dichlorobenzene			<0.50		ug/L		0.5	31-MAY-18
1,4-Dichlorobenzene			<0.50		ug/L		0.5	31-MAY-18
2-Hexanone			<20		ug/L		20	31-MAY-18
Acetone			<20		ug/L		20	31-MAY-18
Benzene			<0.50		ug/L		0.5	31-MAY-18
Bromodichloromethane			<1.0		ug/L		1	31-MAY-18
Bromoform			<1.0		ug/L		1	31-MAY-18
Bromomethane			<0.50		ug/L		0.5	31-MAY-18
Carbon Disulfide			<1.0		ug/L		1	31-MAY-18
Carbon tetrachloride			<0.50		ug/L		0.5	31-MAY-18
Chlorobenzene			<0.50		ug/L		0.5	31-MAY-18
Chloroethane			<1.0		ug/L		1	31-MAY-18
Chloroform			<1.0		ug/L		1	31-MAY-18
Chloromethane			<1.0		ug/L		1	31-MAY-18
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	31-MAY-18
cis-1,3-Dichloropropene			<0.50		ug/L		0.5	31-MAY-18
Dibromochloromethane			<1.0		ug/L		1	31-MAY-18
Dichlorodifluoromethane			<1.0		ug/L		1	31-MAY-18
Dichloromethane			<2.0		ug/L		2	31-MAY-18
Ethylbenzene			<0.50		ug/L		0.5	31-MAY-18
m+p-Xylenes			<1.0		ug/L		1	31-MAY-18
Methyl Ethyl Ketone			<20		ug/L		20	31-MAY-18

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4063095							
WG2779746-2 MB								
Methyl Isobutyl Ketone			<20		ug/L		20	31-MAY-18
n-Hexane			<0.50		ug/L		0.5	31-MAY-18
MTBE			<0.50		ug/L		0.5	31-MAY-18
o-Xylene			<0.50		ug/L		0.5	31-MAY-18
Styrene			<0.50		ug/L		0.5	31-MAY-18
Tetrachloroethylene			<0.50		ug/L		0.5	31-MAY-18
Toluene			<0.50		ug/L		0.5	31-MAY-18
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	31-MAY-18
trans-1,3-Dichloropropene			<0.50		ug/L		0.5	31-MAY-18
Trichloroethylene			<0.50		ug/L		0.5	31-MAY-18
Trichlorofluoromethane			<1.0		ug/L		1	31-MAY-18
Vinyl chloride			<0.50		ug/L		0.5	31-MAY-18
Surrogate: 1,4-Difluorobenzene			98.3		%		70-130	31-MAY-18
Surrogate: 4-Bromofluorobenzene			87.1		%		70-130	31-MAY-18
WG2779746-5 MS		L2102331-7						
1,1,1,2-Tetrachloroethane			98.1		%		50-150	31-MAY-18
1,1,2,2-Tetrachloroethane			106.4		%		50-150	31-MAY-18
1,1,1-Trichloroethane			107.9		%		50-150	31-MAY-18
1,1,2-Trichloroethane			106.8		%		50-150	31-MAY-18
1,2-Dibromoethane			106.1		%		50-150	31-MAY-18
1,1-Dichloroethane			116.9		%		50-150	31-MAY-18
1,1-Dichloroethylene			98.9		%		50-150	31-MAY-18
1,2-Dichlorobenzene			98.5		%		50-150	31-MAY-18
1,2-Dichloroethane			116.3		%		50-150	31-MAY-18
1,2-Dichloropropane			116.5		%		50-150	31-MAY-18
1,3-Dichlorobenzene			94.4		%		50-150	31-MAY-18
1,4-Dichlorobenzene			98.2		%		50-150	31-MAY-18
2-Hexanone			89.7		%		50-150	31-MAY-18
Acetone			139.3		%		50-150	31-MAY-18
Benzene			114.0		%		50-150	31-MAY-18
Bromodichloromethane			111.9		%		50-150	31-MAY-18
Bromoform			99.6		%		50-150	31-MAY-18
Bromomethane			106.7		%		50-150	31-MAY-18
Carbon Disulfide			104.1		%		50-150	31-MAY-18

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4063095							
WG2779746-5	MS	L2102331-7						
Carbon tetrachloride			104.4		%		50-150	31-MAY-18
Chlorobenzene			98.6		%		50-150	31-MAY-18
Chloroethane			110.5		%		50-150	31-MAY-18
Chloroform			115.2		%		50-150	31-MAY-18
Chloromethane			106.8		%		50-150	31-MAY-18
cis-1,2-Dichloroethylene			109.9		%		50-150	31-MAY-18
cis-1,3-Dichloropropene			107.7		%		50-150	31-MAY-18
Dibromochloromethane			105.6		%		50-150	31-MAY-18
Dichlorodifluoromethane			77.5		%		50-150	31-MAY-18
Dichloromethane			122.7		%		50-150	31-MAY-18
Ethylbenzene			78.1		%		50-150	31-MAY-18
m+p-Xylenes			85.9		%		50-150	31-MAY-18
Methyl Ethyl Ketone			129.0		%		50-150	31-MAY-18
Methyl Isobutyl Ketone			101.9		%		50-150	31-MAY-18
n-Hexane			113.1		%		50-150	31-MAY-18
MTBE			101.5		%		50-150	31-MAY-18
o-Xylene			79.1		%		50-150	31-MAY-18
Styrene			76.9		%		50-150	31-MAY-18
Tetrachloroethylene			89.2		%		50-150	31-MAY-18
Toluene			87.1		%		50-150	31-MAY-18
trans-1,2-Dichloroethylene			110.3		%		50-150	31-MAY-18
trans-1,3-Dichloropropene			88.0		%		50-150	31-MAY-18
Trichloroethylene			103.8		%		50-150	31-MAY-18
Trichlorofluoromethane			104.7		%		50-150	31-MAY-18
Vinyl chloride			98.5		%		50-150	31-MAY-18
Batch	R4063854							
WG2780344-1	LCS							
n-Hexane			110.9		%		70-130	01-JUN-18
WG2780344-2	MB							
n-Hexane			<0.50		ug/L		0.5	01-JUN-18

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

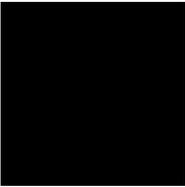
Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



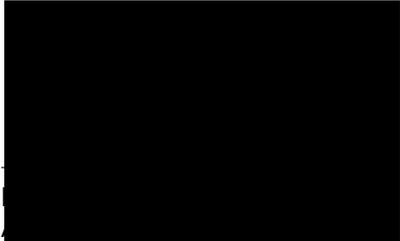
BluMetric Environmental Inc. (Kitchener)
ATTN: S'RANA SCHOLES
171 VICTORIA STREET, NORTH
KITCHENER ON N2H 5C5

Date Received: 05-JUN-18
Report Date: 11-JUN-18 11:58 (MT)
Version: FINAL

Client Phone: 519-742-6685

Certificate of Analysis

Lab Work Order #: L2106177
Project P.O. #: NOT SUBMITTED
Job Reference: 180351-02
C of C Numbers: 14-463029
Legal Site Desc:



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ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8, Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047



ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2106177-1 MW14R							
Sampled By: KC on 05-JUN-18 @ 12:45							
Matrix: WATER							
Physical Tests							
Colour, Apparent	226		2.0	CU		05-JUN-18	R4070813
Conductivity	759		3.0	umhos/cm		06-JUN-18	R4074711
pH	7.83		0.10	pH units		06-JUN-18	R4074711
Total Dissolved Solids	488	DLDS	20	mg/L		10-JUN-18	R4077932
Turbidity	574		0.10	NTU		06-JUN-18	R4072869
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	405		10	mg/L		07-JUN-18	R4075758
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		07-JUN-18	R4075758
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		07-JUN-18	R4075758
Alkalinity, Total (as CaCO3)	405		10	mg/L		07-JUN-18	R4075758
Ammonia, Total (as N)	0.045		0.020	mg/L		06-JUN-18	R4072713
Bromide (Br)	<0.10		0.10	mg/L		06-JUN-18	R4075279
Chloride (Cl)	4.57		0.50	mg/L		06-JUN-18	R4075279
Computed Conductivity	679			uS/cm		11-JUN-18	
Conductivity % Difference	-11.1			%		11-JUN-18	
Fluoride (F)	0.063		0.020	mg/L		06-JUN-18	R4075279
Hardness (as CaCO3)	403			mg/L		11-JUN-18	
Ion Balance	110			%		11-JUN-18	
Langelier Index	1.1					11-JUN-18	
Nitrate and Nitrite as N	0.048		0.022	mg/L		07-JUN-18	
Nitrate (as N)	0.048		0.020	mg/L		06-JUN-18	R4075279
Nitrite (as N)	<0.010		0.010	mg/L		06-JUN-18	R4075279
Total Kjeldahl Nitrogen	<1.5	DLM	1.5	mg/L	06-JUN-18	06-JUN-18	R4073190
Saturation pH	6.76			pH		11-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		07-JUN-18	R4075287
Phosphorus, Total	0.208		0.0030	mg/L	07-JUN-18	07-JUN-18	R4075675
TDS (Calculated)	437			mg/L		11-JUN-18	
Sulfate (SO4)	35.9		0.30	mg/L		06-JUN-18	R4075279
Anion Sum	7.57			me/L		11-JUN-18	
Cation Sum	8.29			me/L		11-JUN-18	
Cation - Anion Balance	4.5			%		11-JUN-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	2.4		1.0	mg/L		05-JUN-18	R4074147
Inorganic Parameters							
Silica	13.0		0.11	mg/L		06-JUN-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					05-JUN-18	R4071114
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	05-JUN-18	06-JUN-18	R4071539
Antimony (Sb)-Dissolved	0.00024		0.00010	mg/L	05-JUN-18	06-JUN-18	R4071539
Arsenic (As)-Dissolved	0.00224		0.00010	mg/L	05-JUN-18	06-JUN-18	R4071539
Barium (Ba)-Dissolved	0.197		0.00010	mg/L	05-JUN-18	06-JUN-18	R4071539
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	05-JUN-18	06-JUN-18	R4071539

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2106177-1 MW14R							
Sampled By: KC on 05-JUN-18 @ 12:45							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	05-JUN-18	06-JUN-18	R4071539
Boron (B)-Dissolved	0.024		0.010	mg/L	05-JUN-18	06-JUN-18	R4071539
Cadmium (Cd)-Dissolved	0.000020		0.000010	mg/L	05-JUN-18	06-JUN-18	R4071539
Calcium (Ca)-Dissolved	125		0.050	mg/L	05-JUN-18	06-JUN-18	R4071539
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	05-JUN-18	06-JUN-18	R4071539
Cobalt (Co)-Dissolved	0.00207		0.00010	mg/L	05-JUN-18	06-JUN-18	R4071539
Copper (Cu)-Dissolved	0.00069		0.00020	mg/L	05-JUN-18	06-JUN-18	R4071539
Iron (Fe)-Dissolved	0.803		0.010	mg/L	05-JUN-18	06-JUN-18	R4071539
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	05-JUN-18	06-JUN-18	R4071539
Magnesium (Mg)-Dissolved	21.9		0.050	mg/L	05-JUN-18	06-JUN-18	R4071539
Manganese (Mn)-Dissolved	0.424		0.00050	mg/L	05-JUN-18	06-JUN-18	R4071539
Molybdenum (Mo)-Dissolved	0.00210		0.000050	mg/L	05-JUN-18	06-JUN-18	R4071539
Nickel (Ni)-Dissolved	0.00243		0.00050	mg/L	05-JUN-18	06-JUN-18	R4071539
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	05-JUN-18	06-JUN-18	R4071539
Potassium (K)-Dissolved	1.76		0.050	mg/L	05-JUN-18	06-JUN-18	R4071539
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L	05-JUN-18	06-JUN-18	R4071539
Silicon (Si)-Dissolved	6.08		0.050	mg/L	05-JUN-18	06-JUN-18	R4071539
Silver (Ag)-Dissolved	<0.000050		0.000050	mg/L	05-JUN-18	06-JUN-18	R4071539
Sodium (Na)-Dissolved	4.29		0.50	mg/L	05-JUN-18	06-JUN-18	R4071539
Strontium (Sr)-Dissolved	0.474		0.0010	mg/L	05-JUN-18	06-JUN-18	R4071539
Sulfur (S)-Dissolved	12.7		5.0	mg/L	05-JUN-18	06-JUN-18	R4071539
Thallium (Tl)-Dissolved	0.000024		0.000010	mg/L	05-JUN-18	06-JUN-18	R4071539
Tin (Sn)-Dissolved	0.00011		0.00010	mg/L	05-JUN-18	06-JUN-18	R4071539
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	05-JUN-18	06-JUN-18	R4071539
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	05-JUN-18	06-JUN-18	R4071539
Uranium (U)-Dissolved	0.00213		0.000010	mg/L	05-JUN-18	06-JUN-18	R4071539
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	05-JUN-18	06-JUN-18	R4071539
Zinc (Zn)-Dissolved	0.0060		0.0010	mg/L	05-JUN-18	06-JUN-18	R4071539
Zirconium (Zr)-Dissolved	<0.00030		0.00030	mg/L	05-JUN-18	06-JUN-18	R4071539
Volatile Organic Compounds							
Acetone	<20		20	ug/L		06-JUN-18	R4071589
Benzene	<0.50		0.50	ug/L		06-JUN-18	R4071589
Bromodichloromethane	<1.0		1.0	ug/L		06-JUN-18	R4071589
Bromoform	<1.0		1.0	ug/L		06-JUN-18	R4071589
Bromomethane	<0.50		0.50	ug/L		06-JUN-18	R4071589
Carbon Disulfide	<1.0		1.0	ug/L		06-JUN-18	R4071589
Carbon tetrachloride	<0.50		0.50	ug/L		06-JUN-18	R4071589
Chlorobenzene	<0.50		0.50	ug/L		06-JUN-18	R4071589
Dibromochloromethane	<1.0		1.0	ug/L		06-JUN-18	R4071589
Chloroethane	<1.0		1.0	ug/L		06-JUN-18	R4071589
Chloroform	<1.0		1.0	ug/L		06-JUN-18	R4071589

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2106177-1 MW14R Sampled By: KC on 05-JUN-18 @ 12:45 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0		1.0	ug/L		06-JUN-18	R4071589
1,2-Dibromoethane	<0.20		0.20	ug/L		06-JUN-18	R4071589
1,2-Dichlorobenzene	<0.50		0.50	ug/L		06-JUN-18	R4071589
1,3-Dichlorobenzene	<0.50		0.50	ug/L		06-JUN-18	R4071589
1,4-Dichlorobenzene	<0.50		0.50	ug/L		06-JUN-18	R4071589
Dichlorodifluoromethane	<1.0		1.0	ug/L		06-JUN-18	R4071589
1,1-Dichloroethane	<0.50		0.50	ug/L		06-JUN-18	R4071589
1,2-Dichloroethane	<0.50		0.50	ug/L		06-JUN-18	R4071589
1,1-Dichloroethylene	<0.50		0.50	ug/L		06-JUN-18	R4071589
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		06-JUN-18	R4071589
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		06-JUN-18	R4071589
Dichloromethane	<2.0		2.0	ug/L		06-JUN-18	R4071589
1,2-Dichloropropane	<0.50		0.50	ug/L		06-JUN-18	R4071589
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		06-JUN-18	R4071589
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		06-JUN-18	R4071589
Ethylbenzene	<0.50		0.50	ug/L		06-JUN-18	R4071589
n-Hexane	<0.50		0.50	ug/L		06-JUN-18	R4071589
2-Hexanone	<20		20	ug/L		06-JUN-18	R4071589
Methyl Ethyl Ketone	<20		20	ug/L		06-JUN-18	R4071589
Methyl Isobutyl Ketone	<20		20	ug/L		06-JUN-18	R4071589
MTBE	<0.50		0.50	ug/L		06-JUN-18	R4071589
Styrene	<0.50		0.50	ug/L		06-JUN-18	R4071589
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		06-JUN-18	R4071589
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		06-JUN-18	R4071589
Tetrachloroethylene	<0.50		0.50	ug/L		06-JUN-18	R4071589
Toluene	<0.50		0.50	ug/L		06-JUN-18	R4071589
1,1,1-Trichloroethane	<0.50		0.50	ug/L		06-JUN-18	R4071589
1,1,2-Trichloroethane	<0.50		0.50	ug/L		06-JUN-18	R4071589
Trichloroethylene	<0.50		0.50	ug/L		06-JUN-18	R4071589
Trichlorofluoromethane	<1.0		1.0	ug/L		06-JUN-18	R4071589
Vinyl chloride	<0.50		0.50	ug/L		06-JUN-18	R4071589
o-Xylene	0.60		0.50	ug/L		06-JUN-18	R4071589
m+p-Xylenes	<1.0		1.0	ug/L		06-JUN-18	R4071589
Xylenes (Total)	<1.1		1.1	ug/L		06-JUN-18	
Surrogate: 4-Bromofluorobenzene	95.1		70-130	%		06-JUN-18	R4071589
Surrogate: 1,4-Difluorobenzene	99.1		70-130	%		06-JUN-18	R4071589
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		06-JUN-18	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L2106177-1
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L2106177-1
Matrix Spike	Iron (Fe)-Dissolved	MS-B	L2106177-1
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L2106177-1
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L2106177-1
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L2106177-1
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L2106177-1
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L2106177-1
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L2106177-1
Matrix Spike	Uranium (U)-Dissolved	MS-B	L2106177-1
Matrix Spike	Orthophosphate-Dissolved (as P)	MS-B	L2106177-1

Sample Parameter Qualifier key listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-AUTO-WT	Water	Automated Speciated Alkalinity	EPA 310.2
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.			
ALK-SPECIATED-WT	Water	pH Measurement for Spec. Alk	APHA 4500 H-Electrode
Water samples are analyzed directly by a calibrated pH meter.			
BR-IC-N-WT	Water	Bromide in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
C-DIS-ORG-WT	Water	Dissolved Organic Carbon	APHA 5310B
Sample is filtered through a 0.45um filter, then injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic carbon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.			
CL-IC-N-WT	Water	Chloride by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
COLOUR-APPARENT-WT	Water	Colour	APHA 2120
Apparent Colour is measured spectrophotometrically by comparison to platinum-cobalt standards using the single wavelength method after sample decanting. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment. Concurrent measurement of sample pH is recommended.			
EC-WT	Water	Conductivity	APHA 2510 B
Water samples can be measured directly by immersing the conductivity cell into the sample.			
ETL-N-ORGANIC-DIS-WT	Water	Calculate from TKN,NH3	CALCULATION
ETL-N2N3-WT	Water	Calculate from NO2 + NO3	APHA 4110 B
ETL-SILICA-CALC-WT	Water	Calculate from SI-TOT-WT	EPA 200.8
F-IC-N-WT	Water	Fluoride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
IONBALANCE-OP03-WT	Water	Detailed Ion Balance Calculation	APHA 1030E, 2330B, 2510A
MET-D-CCMS-WT	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030B/6020A (mod)
Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.			

Reference Information

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

NH3-WT	Water	Ammonia, Total as N	EPA 350.1
Sample is measured colorimetrically. When sample is turbid a distillation step is required, sample is distilled into a solution of boric acid and measured colorimetrically.			
NO2-IC-WT	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-IC-WT	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PO4-DO-COL-WT	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.			
SO4-IC-N-WT	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TDS-WT	Water	Total Dissolved Solids	APHA 2540C
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.			
THM-SUM-PPB-CALC-WT	Water	Total Trihalomethanes (THMs)	CALCULATION
Total Trihalomethanes (THMs) represents the sum of bromodichloromethane, bromoform, chlorodibromomethane and chloroform. For the purpose of calculation, results less than the detection limit (DL) are treated as zero.			
TKN-WT	Water	Total Kjeldahl Nitrogen	APHA 4500-Norg D
This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 Celsius with analysis using an automated colorimetric method.			
TURBIDITY-WT	Water	Turbidity	APHA 2130 B
Sample result is based on a comparison of the intensity of the light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension under the same conditions. Sample readings are obtained from a Nephelometer.			
VOC-ROU-HS-WT	Water	Volatile Organic Compounds	SW846 8260
Aqueous samples are analyzed by headspace-GC/MS.			
XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
Total xylenes represents the sum of o-xylene and m&p-xylene.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

14-463029

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Workorder: L2106177

Report Date: 11-JUN-18

Page 1 of 9

Client: BluMetric Environmental Inc. (Kitchener)
 171 VICTORIA STREET, NORTH
 KITCHENER ON N2H 5C5

Contact: S'RANA SCHOLES

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-AUTO-WT								
	Water							
Batch	R4075758							
WG2791360-3	CRM	WT-ALK-CRM						
Alkalinity, Total (as CaCO3)			85.6		%		80-120	07-JUN-18
WG2791360-2	LCS							
Alkalinity, Total (as CaCO3)			96.8		%		85-115	07-JUN-18
WG2791360-1	MB							
Alkalinity, Total (as CaCO3)			<10		mg/L		10	07-JUN-18
ALK-SPECIATED-WT								
	Water							
Batch	R4074711							
WG2789701-10	LCS							
pH			7.01		pH units		6.9-7.1	06-JUN-18
BR-IC-N-WT								
	Water							
Batch	R4075279							
WG2790027-7	LCS							
Bromide (Br)			98.7		%		85-115	06-JUN-18
WG2790027-6	MB							
Bromide (Br)			<0.10		mg/L		0.1	06-JUN-18
C-DIS-ORG-WT								
	Water							
Batch	R4074147							
WG2789510-2	LCS							
Dissolved Organic Carbon			98.0		%		80-120	05-JUN-18
WG2789510-1	MB							
Dissolved Organic Carbon			<1.0		mg/L		1	05-JUN-18
CL-IC-N-WT								
	Water							
Batch	R4075279							
WG2790027-7	LCS							
Chloride (Cl)			101.9		%		90-110	06-JUN-18
WG2790027-6	MB							
Chloride (Cl)			<0.50		mg/L		0.5	06-JUN-18
COLOUR-APPARENT-WT								
	Water							
Batch	R4070813							
WG2789391-3	DUP	L2106177-1						
Colour, Apparent		226	227		CU	0.5	20	05-JUN-18
WG2789391-2	LCS							
Colour, Apparent			99.3		%		85-115	05-JUN-18
WG2789391-1	MB							
Colour, Apparent			<2.0		CU		2	05-JUN-18

Quality Control Report

Workorder: L2106177

Report Date: 11-JUN-18

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
EC-WT		Water						
Batch	R4074711							
WG2789701-10	LCS							
Conductivity			96.8		%		90-110	06-JUN-18
WG2789701-9	MB							
Conductivity			<3.0		umhos/cm		3	06-JUN-18
F-IC-N-WT		Water						
Batch	R4075279							
WG2790027-7	LCS							
Fluoride (F)			102.4		%		90-110	06-JUN-18
WG2790027-6	MB							
Fluoride (F)			<0.020		mg/L		0.02	06-JUN-18
MET-D-CCMS-WT		Water						
Batch	R4071539							
WG2789474-2	LCS							
Aluminum (Al)-Dissolved			98.8		%		80-120	05-JUN-18
Antimony (Sb)-Dissolved			102.4		%		80-120	05-JUN-18
Arsenic (As)-Dissolved			96.0		%		80-120	05-JUN-18
Barium (Ba)-Dissolved			98.6		%		80-120	05-JUN-18
Beryllium (Be)-Dissolved			102.1		%		80-120	05-JUN-18
Bismuth (Bi)-Dissolved			97.1		%		80-120	05-JUN-18
Boron (B)-Dissolved			101.8		%		80-120	05-JUN-18
Cadmium (Cd)-Dissolved			102.2		%		80-120	05-JUN-18
Calcium (Ca)-Dissolved			101.9		%		80-120	05-JUN-18
Chromium (Cr)-Dissolved			93.5		%		80-120	05-JUN-18
Cobalt (Co)-Dissolved			98.9		%		80-120	05-JUN-18
Copper (Cu)-Dissolved			98.1		%		80-120	05-JUN-18
Iron (Fe)-Dissolved			96.5		%		80-120	05-JUN-18
Lead (Pb)-Dissolved			101.6		%		80-120	05-JUN-18
Magnesium (Mg)-Dissolved			103.2		%		80-120	05-JUN-18
Manganese (Mn)-Dissolved			97.3		%		80-120	05-JUN-18
Molybdenum (Mo)-Dissolved			103.0		%		80-120	05-JUN-18
Nickel (Ni)-Dissolved			99.1		%		80-120	05-JUN-18
Phosphorus (P)-Dissolved			96.9		%		80-120	05-JUN-18
Potassium (K)-Dissolved			93.4		%		80-120	05-JUN-18
Selenium (Se)-Dissolved			97.9		%		80-120	05-JUN-18
Silicon (Si)-Dissolved			101.5		%		60-140	05-JUN-18
Silver (Ag)-Dissolved			102.6		%		80-120	05-JUN-18

Quality Control Report

Workorder: L2106177

Report Date: 11-JUN-18

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT								
	Water							
Batch	R4071539							
WG2789474-2	LCS							
Sodium (Na)-Dissolved			97.9		%		80-120	05-JUN-18
Strontium (Sr)-Dissolved			103.2		%		80-120	05-JUN-18
Sulfur (S)-Dissolved			99.2		%		80-120	05-JUN-18
Thallium (Tl)-Dissolved			101.5		%		80-120	05-JUN-18
Tin (Sn)-Dissolved			102.3		%		80-120	05-JUN-18
Titanium (Ti)-Dissolved			93.9		%		80-120	05-JUN-18
Tungsten (W)-Dissolved			99.2		%		80-120	05-JUN-18
Uranium (U)-Dissolved			104.9		%		80-120	05-JUN-18
Vanadium (V)-Dissolved			98.7		%		80-120	05-JUN-18
Zinc (Zn)-Dissolved			90.6		%		80-120	05-JUN-18
Zirconium (Zr)-Dissolved			99.7		%		80-120	05-JUN-18
WG2789474-1	MB							
Aluminum (Al)-Dissolved			<0.0050		mg/L		0.005	05-JUN-18
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	05-JUN-18
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	05-JUN-18
Barium (Ba)-Dissolved			<0.00010		mg/L		0.0001	05-JUN-18
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	05-JUN-18
Bismuth (Bi)-Dissolved			<0.000050		mg/L		0.00005	05-JUN-18
Boron (B)-Dissolved			<0.010		mg/L		0.01	05-JUN-18
Cadmium (Cd)-Dissolved			<0.0000050		mg/L		0.000005	05-JUN-18
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	05-JUN-18
Chromium (Cr)-Dissolved			<0.00050		mg/L		0.0005	05-JUN-18
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	05-JUN-18
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	05-JUN-18
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	05-JUN-18
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	05-JUN-18
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	05-JUN-18
Manganese (Mn)-Dissolved			<0.00050		mg/L		0.0005	05-JUN-18
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	05-JUN-18
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	05-JUN-18
Phosphorus (P)-Dissolved			<0.050		mg/L		0.05	05-JUN-18
Potassium (K)-Dissolved			<0.050		mg/L		0.05	05-JUN-18
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	05-JUN-18
Silicon (Si)-Dissolved			<0.050		mg/L		0.05	05-JUN-18

Quality Control Report

Workorder: L2106177

Report Date: 11-JUN-18

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT		Water						
Batch	R4071539							
WG2789474-1	MB							
Silver (Ag)-Dissolved			<0.000050		mg/L		0.00005	05-JUN-18
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	05-JUN-18
Strontium (Sr)-Dissolved			<0.0010		mg/L		0.001	05-JUN-18
Sulfur (S)-Dissolved			<0.50		mg/L		0.5	05-JUN-18
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	05-JUN-18
Tin (Sn)-Dissolved			<0.00010		mg/L		0.0001	05-JUN-18
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	05-JUN-18
Tungsten (W)-Dissolved			<0.00010		mg/L		0.0001	05-JUN-18
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	05-JUN-18
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	05-JUN-18
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	05-JUN-18
Zirconium (Zr)-Dissolved			<0.00030		mg/L		0.0003	05-JUN-18
NH3-WT		Water						
Batch	R4072713							
WG2789677-6	LCS							
Ammonia, Total (as N)			92.2		%		85-115	06-JUN-18
WG2789677-5	MB							
Ammonia, Total (as N)			<0.020		mg/L		0.02	06-JUN-18
NO2-IC-WT		Water						
Batch	R4075279							
WG2790027-7	LCS							
Nitrite (as N)			100.8		%		70-130	06-JUN-18
WG2790027-6	MB							
Nitrite (as N)			<0.010		mg/L		0.01	06-JUN-18
NO3-IC-WT		Water						
Batch	R4075279							
WG2790027-7	LCS							
Nitrate (as N)			99.6		%		70-130	06-JUN-18
WG2790027-6	MB							
Nitrate (as N)			<0.020		mg/L		0.02	06-JUN-18
P-T-COL-WT		Water						
Batch	R4075675							
WG2791272-2	LCS							
Phosphorus, Total			96.6		%		80-120	07-JUN-18
WG2791272-1	MB							

Quality Control Report

Workorder: L2106177

Report Date: 11-JUN-18

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4071589							
WG2787626-1	LCS							
1,1,1,2-Tetrachloroethane			101.7		%		70-130	05-JUN-18
1,1,2,2-Tetrachloroethane			96.2		%		70-130	05-JUN-18
1,1,1-Trichloroethane			109.5		%		70-130	05-JUN-18
1,1,2-Trichloroethane			100.8		%		70-130	05-JUN-18
1,2-Dibromoethane			94.9		%		70-130	05-JUN-18
1,1-Dichloroethane			111.9		%		70-130	05-JUN-18
1,1-Dichloroethylene			104.6		%		70-130	05-JUN-18
1,2-Dichlorobenzene			99.4		%		70-130	05-JUN-18
1,2-Dichloroethane			105.6		%		70-130	05-JUN-18
1,2-Dichloropropane			106.5		%		70-130	05-JUN-18
1,3-Dichlorobenzene			100.3		%		70-130	05-JUN-18
1,4-Dichlorobenzene			103.0		%		70-130	05-JUN-18
2-Hexanone			87.9		%		60-140	05-JUN-18
Acetone			98.6		%		60-140	05-JUN-18
Benzene			107.9		%		70-130	05-JUN-18
Bromodichloromethane			101.8		%		70-130	05-JUN-18
Bromoform			93.8		%		70-130	05-JUN-18
Bromomethane			109.4		%		60-140	05-JUN-18
Carbon Disulfide			106.4		%		70-130	05-JUN-18
Carbon tetrachloride			109.7		%		70-130	05-JUN-18
Chlorobenzene			103.1		%		70-130	05-JUN-18
Chloroethane			114.0		%		70-130	05-JUN-18
Chloroform			109.1		%		70-130	05-JUN-18
Chloromethane			114.3		%		60-140	05-JUN-18
cis-1,2-Dichloroethylene			102.9		%		70-130	05-JUN-18
cis-1,3-Dichloropropene			107.3		%		70-130	05-JUN-18
Dibromochloromethane			102.3		%		70-130	05-JUN-18
Dichlorodifluoromethane			93.8		%		50-140	05-JUN-18
Dichloromethane			106.0		%		70-130	05-JUN-18
Ethylbenzene			98.8		%		70-130	05-JUN-18
m+p-Xylenes			104.0		%		70-130	05-JUN-18
Methyl Ethyl Ketone			99.7		%		60-140	05-JUN-18
Methyl Isobutyl Ketone			91.5		%		50-150	05-JUN-18
n-Hexane			122.7		%		70-130	05-JUN-18

Quality Control Report

Workorder: L2106177

Report Date: 11-JUN-18

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4071589							
WG2787626-1	LCS							
MTBE			105.5		%		70-130	05-JUN-18
o-Xylene			99.6		%		70-130	05-JUN-18
Styrene			98.6		%		70-130	05-JUN-18
Tetrachloroethylene			103.8		%		70-130	05-JUN-18
Toluene			92.3		%		70-130	05-JUN-18
trans-1,2-Dichloroethylene			115.3		%		70-130	05-JUN-18
trans-1,3-Dichloropropene			92.3		%		70-130	05-JUN-18
Trichloroethylene			105.9		%		70-130	05-JUN-18
Trichlorofluoromethane			115.7		%		60-140	05-JUN-18
Vinyl chloride			109.0		%		60-140	05-JUN-18
WG2787626-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	05-JUN-18
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	05-JUN-18
1,1,1-Trichloroethane			<0.50		ug/L		0.5	05-JUN-18
1,1,2-Trichloroethane			<0.50		ug/L		0.5	05-JUN-18
1,2-Dibromoethane			<0.20		ug/L		0.2	05-JUN-18
1,1-Dichloroethane			<0.50		ug/L		0.5	05-JUN-18
1,1-Dichloroethylene			<0.50		ug/L		0.5	05-JUN-18
1,2-Dichlorobenzene			<0.50		ug/L		0.5	05-JUN-18
1,2-Dichloroethane			<0.50		ug/L		0.5	05-JUN-18
1,2-Dichloropropane			<0.50		ug/L		0.5	05-JUN-18
1,3-Dichlorobenzene			<0.50		ug/L		0.5	05-JUN-18
1,4-Dichlorobenzene			<0.50		ug/L		0.5	05-JUN-18
2-Hexanone			<20		ug/L		20	05-JUN-18
Acetone			<20		ug/L		20	05-JUN-18
Benzene			<0.50		ug/L		0.5	05-JUN-18
Bromodichloromethane			<1.0		ug/L		1	05-JUN-18
Bromoform			<1.0		ug/L		1	05-JUN-18
Bromomethane			<0.50		ug/L		0.5	05-JUN-18
Carbon Disulfide			<1.0		ug/L		1	05-JUN-18
Carbon tetrachloride			<0.50		ug/L		0.5	05-JUN-18
Chlorobenzene			<0.50		ug/L		0.5	05-JUN-18
Chloroethane			<1.0		ug/L		1	05-JUN-18
Chloroform			<1.0		ug/L		1	05-JUN-18

Quality Control Report

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4071589							
WG2787626-2	MB							
Chloromethane			<1.0		ug/L		1	05-JUN-18
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	05-JUN-18
cis-1,3-Dichloropropene			<0.50		ug/L		0.5	05-JUN-18
Dibromochloromethane			<1.0		ug/L		1	05-JUN-18
Dichlorodifluoromethane			<1.0		ug/L		1	05-JUN-18
Dichloromethane			<2.0		ug/L		2	05-JUN-18
Ethylbenzene			<0.50		ug/L		0.5	05-JUN-18
m+p-Xylenes			<1.0		ug/L		1	05-JUN-18
Methyl Ethyl Ketone			<20		ug/L		20	05-JUN-18
Methyl Isobutyl Ketone			<20		ug/L		20	05-JUN-18
n-Hexane			<0.50		ug/L		0.5	05-JUN-18
MTBE			<0.50		ug/L		0.5	05-JUN-18
o-Xylene			<0.50		ug/L		0.5	05-JUN-18
Styrene			<0.50		ug/L		0.5	05-JUN-18
Tetrachloroethylene			<0.50		ug/L		0.5	05-JUN-18
Toluene			<0.50		ug/L		0.5	05-JUN-18
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	05-JUN-18
trans-1,3-Dichloropropene			<0.50		ug/L		0.5	05-JUN-18
Trichloroethylene			<0.50		ug/L		0.5	05-JUN-18
Trichlorofluoromethane			<1.0		ug/L		1	05-JUN-18
Vinyl chloride			<0.50		ug/L		0.5	05-JUN-18
Surrogate: 1,4-Difluorobenzene			99.2		%		70-130	05-JUN-18
Surrogate: 4-Bromofluorobenzene			94.3		%		70-130	05-JUN-18

Quality Control Report

Workorder: L2106177

Report Date: 11-JUN-18

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



L2106177-COFC

Report To		Report Format / Distribution			Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)												
Company: <u>Blumetric Environmental</u>		Select Report Format: <input checked="" type="checkbox"/> PDF <input type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)			R <input checked="" type="checkbox"/> Regular (Standard TAT if received by 3pm)												
Contact: <u>Srana Scholes</u>		Quality Control (QC) Report with Report: <input type="checkbox"/> Yes <input type="checkbox"/> No			P <input type="checkbox"/> Priority (2-4 business days if received by 3pm)												
Address: <u>171 Victoria St N, KITCHENER N2H5C5</u>		<input type="checkbox"/> Criteria on Report - provide details below if box checked			E <input type="checkbox"/> Emergency (1-2 business days if received by 3pm)												
Phone:		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			E2 <input type="checkbox"/> Same day or weekend emergency if received by 10am - contact ALS for surcharge.												
		Email 1 or Fax: <u>sscholes@blumetric.ca</u>			Specify Date Required for E2, E or P:												
		Email 2: <u>mbambini@blumetric.ca</u>			Analysis Request												
Invoice To		Invoice Distribution			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (FP) below												
Same as Report To <input type="checkbox"/> Yes <input type="checkbox"/> No		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX															
Copy of Invoice with Report <input type="checkbox"/> Yes <input type="checkbox"/> No		Email 1 or Fax:															
Company:		Email 2:															
Contact:																	
Project Information		Oil and Gas Required Fields (client use)															
ALS Quote #: <u>23987 / Q559A3</u>		Approver ID:			Cost Center:												
Job #: <u>180351-02</u>		GL Account:			Routing Code:												
PO / AFE:		Activity Code:															
LSD:		Location:															
ALS Lab Work Order # (lab use only): <u>L2106177 My</u>		ALS Contact: <u>RICK H</u>		Sampler: <u>KC</u>		Gen Chem 3 - (dissolved metals) THM conc VOC-ROV TKN, TP NH3					Number of Containers						
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)			Date (dd-mmm-yy)	Time (hh:mm)							Sample Type					
	<u>MW14R</u>			<u>05/06/18</u>	<u>12:45</u>							<u>GW</u>					7
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report (client use)			SAMPLE CONDITION AS RECEIVED (lab use only)												
Are samples taken from a Regulated DW System? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>												
Are samples for human drinking water use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Ice packs Yes <input type="checkbox"/> No <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>												
					Cooling initiated <input type="checkbox"/>												
					INITIAL COOLER TEMPERATURES °C												
					FINAL COOLER TEMPERATURES °C												
					<u>9.1°C</u>												
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)												
Released by: <u>Kim Carson</u>		Date: <u>05/06/18</u>	Time: <u>2:55</u>	Received by: <u>[Signature]</u>	Date: <u>05-Jun-18</u>	Time: <u>14:55</u>											

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

14-198001-006 Rev 02/09/2013

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



BluMetric Environmental Inc. (Kitchener)
ATTN: S'RANA SCHOLES
171 VICTORIA STREET, NORTH
KITCHENER ON N2H 5C5

Date Received: 20-SEP-18
Report Date: 03-OCT-18 11:11 (MT)
Version: FINAL

Client Phone: 519-742-6685

Certificate of Analysis

Lab Work Order #: L2168446
Project P.O. #: NOT SUBMITTED
Job Reference: 180351-01
C of C Numbers:
Legal Site Desc:

Rick Hawthorne
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-1 MW1							
Sampled By: CLIENT on 20-SEP-18 @ 14:01							
Matrix: WATER							
Physical Tests							
Colour, Apparent	3.3		2.0	CU		22-SEP-18	R4234010
Conductivity	999		3.0	umhos/cm		21-SEP-18	R4233548
pH	7.60		0.10	pH units		21-SEP-18	R4233548
Total Dissolved Solids	704	DLDS	20	mg/L		25-SEP-18	R4238987
Turbidity	112		0.10	NTU		22-SEP-18	R4233250
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	365		10	mg/L		25-SEP-18	R4239385
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Total (as CaCO3)	365		10	mg/L		25-SEP-18	R4239385
Ammonia, Total (as N)	0.159		0.020	mg/L		01-OCT-18	R4254350
Bromide (Br)	<0.10		0.10	mg/L		25-SEP-18	R4243635
Chloride (Cl)	18.2		0.50	mg/L		25-SEP-18	R4243635
Computed Conductivity	1030			uS/cm		26-SEP-18	
Conductivity % Difference	2.8			%		26-SEP-18	
Fluoride (F)	0.037		0.020	mg/L		25-SEP-18	R4243635
Hardness (as CaCO3)	588			mg/L		26-SEP-18	
Ion Balance	114			%		26-SEP-18	
Langelier Index	0.9					26-SEP-18	
Nitrate and Nitrite as N	1.6		0.022	mg/L		26-SEP-18	
Nitrate (as N)	1.60		0.020	mg/L		25-SEP-18	R4243635
Nitrite (as N)	<0.010		0.010	mg/L		25-SEP-18	R4243635
Total Kjeldahl Nitrogen	0.29		0.15	mg/L	24-SEP-18	26-SEP-18	R4244367
Saturation pH	6.68			pH		26-SEP-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		25-SEP-18	R4242191
Phosphorus, Total	0.311		0.0030	mg/L	24-SEP-18	26-SEP-18	R4241552
TDS (Calculated)	667			mg/L		26-SEP-18	
Sulfate (SO4)	194		0.30	mg/L		25-SEP-18	R4243635
Anion Sum	10.7			me/L		26-SEP-18	
Cation Sum	12.2			me/L		26-SEP-18	
Cation - Anion Balance	6.7			%		26-SEP-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	7.14		0.50	mg/L		23-SEP-18	R4238089
Inorganic Parameters							
Silica	12.0		0.11	mg/L		26-SEP-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4236625
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	24-SEP-18	25-SEP-18	R4241171
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Arsenic (As)-Dissolved	0.00016		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Barium (Ba)-Dissolved	0.0842		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-1 MW1							
Sampled By: CLIENT on 20-SEP-18 @ 14:01							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Boron (B)-Dissolved	0.198		0.010	mg/L	24-SEP-18	25-SEP-18	R4241171
Cadmium (Cd)-Dissolved	0.000017		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Calcium (Ca)-Dissolved	190		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Cobalt (Co)-Dissolved	0.00027		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Copper (Cu)-Dissolved	0.00156		0.00020	mg/L	24-SEP-18	25-SEP-18	R4241171
Iron (Fe)-Dissolved	0.022		0.010	mg/L	24-SEP-18	25-SEP-18	R4241171
Lead (Pb)-Dissolved	0.000086		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Magnesium (Mg)-Dissolved	27.7		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Manganese (Mn)-Dissolved	0.137		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Molybdenum (Mo)-Dissolved	0.000446		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Nickel (Ni)-Dissolved	0.00155		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Potassium (K)-Dissolved	1.90		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Selenium (Se)-Dissolved	0.000106		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Silicon (Si)-Dissolved	5.59		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Silver (Ag)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Sodium (Na)-Dissolved	9.45		0.50	mg/L	24-SEP-18	25-SEP-18	R4241171
Strontium (Sr)-Dissolved	0.325		0.0010	mg/L	24-SEP-18	25-SEP-18	R4241171
Sulfur (S)-Dissolved	60.2		5.0	mg/L	24-SEP-18	25-SEP-18	R4241171
Thallium (Tl)-Dissolved	0.000022		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	24-SEP-18	25-SEP-18	R4241171
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Uranium (U)-Dissolved	0.000901		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Zinc (Zn)-Dissolved	0.0040		0.0010	mg/L	24-SEP-18	25-SEP-18	R4241171
Zirconium (Zr)-Dissolved	<0.00030		0.00030	mg/L	24-SEP-18	25-SEP-18	R4241171
Volatile Organic Compounds							
Acetone	<20	OWP	20	ug/L		26-SEP-18	R4241668
Benzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Bromodichloromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Bromoform	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Bromomethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Carbon Disulfide	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Carbon tetrachloride	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Chlorobenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Dibromochloromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Chloroethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Chloroform	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-1 MW1 Sampled By: CLIENT on 20-SEP-18 @ 14:01 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
1,2-Dibromoethane	<0.20	OWP	0.20	ug/L		26-SEP-18	R4241668
1,2-Dichlorobenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,3-Dichlorobenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,4-Dichlorobenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Dichlorodifluoromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
1,1-Dichloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,2-Dichloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1-Dichloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
cis-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
trans-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Dichloromethane	<2.0	OWP	2.0	ug/L		26-SEP-18	R4241668
1,2-Dichloropropane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
cis-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
trans-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Ethylbenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
n-Hexane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
2-Hexanone	<20	OWP	20	ug/L		26-SEP-18	R4241668
Methyl Ethyl Ketone	<20	OWP	20	ug/L		26-SEP-18	R4241668
Methyl Isobutyl Ketone	<20	OWP	20	ug/L		26-SEP-18	R4241668
MTBE	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Styrene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1,1,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1,1,2,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Tetrachloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Toluene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1,1-Trichloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1,2-Trichloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Trichloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Trichlorofluoromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Vinyl chloride	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
o-Xylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
m+p-Xylenes	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Xylenes (Total)	<1.1		1.1	ug/L		26-SEP-18	
Surrogate: 4-Bromofluorobenzene	99.7		70-130	%		26-SEP-18	R4241668
Surrogate: 1,4-Difluorobenzene	100.6		70-130	%		26-SEP-18	R4241668
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		26-SEP-18	
L2168446-2 MW2-R Sampled By: CLIENT on 20-SEP-18 @ 15:15 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-2 MW2-R							
Sampled By: CLIENT on 20-SEP-18 @ 15:15							
Matrix: WATER							
Physical Tests							
Colour, Apparent	1550	DLHC	20	CU		22-SEP-18	R4234010
Conductivity	6060		3.0	umhos/cm		21-SEP-18	R4233548
pH	7.51		0.10	pH units		21-SEP-18	R4233548
Total Dissolved Solids	3120	DLDS	20	mg/L		25-SEP-18	R4238987
Turbidity	94.4		0.10	NTU		22-SEP-18	R4233250
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	2890		10	mg/L		25-SEP-18	R4239385
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Total (as CaCO3)	2890	DLHC	100	mg/L		25-SEP-18	R4239385
Ammonia, Total (as N)	329	DLHC	20	mg/L		01-OCT-18	R4254350
Bromide (Br)	<1.0	DLDS	1.0	mg/L		25-SEP-18	R4243635
Chloride (Cl)	625	DLDS	5.0	mg/L		25-SEP-18	R4243635
Computed Conductivity	3200			uS/cm		27-SEP-18	
Conductivity % Difference	-61.8			%		27-SEP-18	
Fluoride (F)	<0.20	DLDS	0.20	mg/L		25-SEP-18	R4243635
Hardness (as CaCO3)	230			mg/L		27-SEP-18	
Ion Balance	29.4			%		27-SEP-18	
Langelier Index	1.0					27-SEP-18	
Nitrate and Nitrite as N	<0.22		0.22	mg/L		26-SEP-18	
Nitrate (as N)	<0.20	DLDS	0.20	mg/L		25-SEP-18	R4243635
Nitrite (as N)	<0.10	DLDS	0.10	mg/L		25-SEP-18	R4243635
Total Kjeldahl Nitrogen	770	DLM	150	mg/L	24-SEP-18	26-SEP-18	R4244367
Saturation pH	6.48			pH		27-SEP-18	
Orthophosphate-Dissolved (as P)	1.02	DLM	0.15	mg/L		25-SEP-18	R4242191
Phosphorus, Total	2.55	DLHC	0.030	mg/L	24-SEP-18	26-SEP-18	R4241552
TDS (Calculated)	2910			mg/L		27-SEP-18	
Sulfate (SO4)	63.5	DLDS	3.0	mg/L		25-SEP-18	R4243635
Anion Sum	66.5			me/L		27-SEP-18	
Cation Sum	19.6			me/L		27-SEP-18	
Cation - Anion Balance	-54.5			%		27-SEP-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	389	DLM	10	mg/L		23-SEP-18	R4238089
Inorganic Parameters							
Silica	12.3		1.1	mg/L		27-SEP-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					25-SEP-18	R4238092
Aluminum (Al)-Dissolved	0.230	DLHC	0.050	mg/L	25-SEP-18	27-SEP-18	R4245747
Antimony (Sb)-Dissolved	<0.0010	DLHC	0.0010	mg/L	25-SEP-18	27-SEP-18	R4245747
Arsenic (As)-Dissolved	0.0060	DLHC	0.0010	mg/L	25-SEP-18	27-SEP-18	R4245747
Barium (Ba)-Dissolved	0.0618	DLHC	0.0010	mg/L	25-SEP-18	27-SEP-18	R4245747
Beryllium (Be)-Dissolved	<0.0010	DLHC	0.0010	mg/L	25-SEP-18	27-SEP-18	R4245747

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-2 MW2-R							
Sampled By: CLIENT on 20-SEP-18 @ 15:15							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.00050	DLHC	0.00050	mg/L	25-SEP-18	27-SEP-18	R4245747
Boron (B)-Dissolved	0.95	DLHC	0.10	mg/L	25-SEP-18	27-SEP-18	R4245747
Cadmium (Cd)-Dissolved	<0.000050	DLHC	0.000050	mg/L	25-SEP-18	27-SEP-18	R4245747
Calcium (Ca)-Dissolved	49.7	DLHC	0.50	mg/L	25-SEP-18	27-SEP-18	R4245747
Chromium (Cr)-Dissolved	0.0569	DLHC	0.0050	mg/L	25-SEP-18	27-SEP-18	R4245747
Cobalt (Co)-Dissolved	0.0040	DLHC	0.0010	mg/L	25-SEP-18	27-SEP-18	R4245747
Copper (Cu)-Dissolved	<0.0020	DLHC	0.0020	mg/L	25-SEP-18	27-SEP-18	R4245747
Iron (Fe)-Dissolved	4.89	DLHC	0.10	mg/L	25-SEP-18	27-SEP-18	R4245747
Lead (Pb)-Dissolved	<0.00050	DLHC	0.00050	mg/L	25-SEP-18	27-SEP-18	R4245747
Magnesium (Mg)-Dissolved	25.7	DLHC	0.050	mg/L	25-SEP-18	27-SEP-18	R4245747
Manganese (Mn)-Dissolved	0.116	DLHC	0.0050	mg/L	25-SEP-18	27-SEP-18	R4245747
Molybdenum (Mo)-Dissolved	0.00197	DLHC	0.00050	mg/L	25-SEP-18	27-SEP-18	R4245747
Nickel (Ni)-Dissolved	0.0241	DLHC	0.0050	mg/L	25-SEP-18	27-SEP-18	R4245747
Phosphorus (P)-Dissolved	1.29	DLHC	0.50	mg/L	25-SEP-18	27-SEP-18	R4245747
Potassium (K)-Dissolved	161	DLHC	0.50	mg/L	25-SEP-18	27-SEP-18	R4245747
Selenium (Se)-Dissolved	<0.00050	DLHC	0.00050	mg/L	25-SEP-18	27-SEP-18	R4245747
Silicon (Si)-Dissolved	5.74	DLHC	0.50	mg/L	25-SEP-18	27-SEP-18	R4245747
Silver (Ag)-Dissolved	<0.00050	DLHC	0.00050	mg/L	25-SEP-18	27-SEP-18	R4245747
Sodium (Na)-Dissolved	249	DLHC	0.50	mg/L	25-SEP-18	27-SEP-18	R4245747
Strontium (Sr)-Dissolved	0.464	DLHC	0.010	mg/L	25-SEP-18	27-SEP-18	R4245747
Sulfur (S)-Dissolved	13.6	DLHC	5.0	mg/L	25-SEP-18	27-SEP-18	R4245747
Thallium (Tl)-Dissolved	<0.00010	DLHC	0.00010	mg/L	25-SEP-18	27-SEP-18	R4245747
Tin (Sn)-Dissolved	0.0102	DLHC	0.0010	mg/L	25-SEP-18	27-SEP-18	R4245747
Titanium (Ti)-Dissolved	0.0290	DLHC	0.0030	mg/L	25-SEP-18	27-SEP-18	R4245747
Tungsten (W)-Dissolved	0.0012	DLHC	0.0010	mg/L	25-SEP-18	27-SEP-18	R4245747
Uranium (U)-Dissolved	0.00010	DLHC	0.00010	mg/L	25-SEP-18	27-SEP-18	R4245747
Vanadium (V)-Dissolved	0.0092	DLHC	0.0050	mg/L	25-SEP-18	27-SEP-18	R4245747
Zinc (Zn)-Dissolved	<0.010	DLHC	0.010	mg/L	25-SEP-18	27-SEP-18	R4245747
Zirconium (Zr)-Dissolved	0.0157	DLHC	0.0030	mg/L	25-SEP-18	27-SEP-18	R4245747
Volatile Organic Compounds							
Acetone	<20	OWP	20	ug/L		26-SEP-18	R4241668
Benzene	0.55	OWP	0.50	ug/L		26-SEP-18	R4241668
Bromodichloromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Bromoform	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Bromomethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Carbon Disulfide	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Carbon tetrachloride	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Chlorobenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Dibromochloromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Chloroethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Chloroform	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-2 MW2-R Sampled By: CLIENT on 20-SEP-18 @ 15:15 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
1,2-Dibromoethane	<0.20	OWP	0.20	ug/L		26-SEP-18	R4241668
1,2-Dichlorobenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,3-Dichlorobenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,4-Dichlorobenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Dichlorodifluoromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
1,1-Dichloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,2-Dichloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1-Dichloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
cis-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
trans-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Dichloromethane	<2.0	OWP	2.0	ug/L		26-SEP-18	R4241668
1,2-Dichloropropane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
cis-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
trans-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Ethylbenzene	4.73	OWP	0.50	ug/L		26-SEP-18	R4241668
n-Hexane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
2-Hexanone	<20	OWP	20	ug/L		26-SEP-18	R4241668
Methyl Ethyl Ketone	<20	OWP	20	ug/L		26-SEP-18	R4241668
Methyl Isobutyl Ketone	<20	OWP	20	ug/L		26-SEP-18	R4241668
MTBE	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Styrene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1,1,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1,1,2,2-Tetrachloroethane	<1.1	DLQ	1.1	ug/L		26-SEP-18	R4241668
Tetrachloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Toluene	5.04	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1,1-Trichloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1,2-Trichloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Trichloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Trichlorofluoromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Vinyl chloride	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
o-Xylene	8.51	OWP	0.50	ug/L		26-SEP-18	R4241668
m+p-Xylenes	14.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Xylenes (Total)	22.5		1.1	ug/L		26-SEP-18	
Surrogate: 4-Bromofluorobenzene	103.3		70-130	%		26-SEP-18	R4241668
Surrogate: 1,4-Difluorobenzene	102.5		70-130	%		26-SEP-18	R4241668
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		26-SEP-18	
L2168446-3 MW2D Sampled By: CLIENT on 20-SEP-18 @ 16:20 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-3 MW2D							
Sampled By: CLIENT on 20-SEP-18 @ 16:20							
Matrix: WATER							
Physical Tests							
Colour, Apparent	16.1		2.0	CU		22-SEP-18	R4234010
Conductivity	784		3.0	umhos/cm		21-SEP-18	R4233548
pH	7.66		0.10	pH units		21-SEP-18	R4233548
Total Dissolved Solids	482	DLDS	20	mg/L		25-SEP-18	R4238987
Turbidity	143		0.10	NTU		22-SEP-18	R4233250
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	290		10	mg/L		25-SEP-18	R4239385
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Total (as CaCO3)	290		10	mg/L		25-SEP-18	R4239385
Ammonia, Total (as N)	0.341		0.020	mg/L		01-OCT-18	R4254350
Bromide (Br)	0.21		0.10	mg/L		25-SEP-18	R4243635
Chloride (Cl)	58.7		0.50	mg/L		25-SEP-18	R4243635
Computed Conductivity	730			uS/cm		26-SEP-18	
Conductivity % Difference	-7.2			%		26-SEP-18	
Fluoride (F)	0.467		0.020	mg/L		25-SEP-18	R4243635
Hardness (as CaCO3)	293			mg/L		26-SEP-18	
Ion Balance	118			%		26-SEP-18	
Langelier Index	0.6					26-SEP-18	
Nitrate and Nitrite as N	0.091		0.022	mg/L		26-SEP-18	
Nitrate (as N)	0.091		0.020	mg/L		25-SEP-18	R4243635
Nitrite (as N)	<0.010		0.010	mg/L		25-SEP-18	R4243635
Total Kjeldahl Nitrogen	1.25		0.15	mg/L	24-SEP-18	26-SEP-18	R4244367
Saturation pH	7.10			pH		26-SEP-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		25-SEP-18	R4242191
Phosphorus, Total	0.114		0.0030	mg/L	24-SEP-18	26-SEP-18	R4241552
TDS (Calculated)	453			mg/L		26-SEP-18	
Sulfate (SO4)	47.7		0.30	mg/L		25-SEP-18	R4243635
Anion Sum	7.46			me/L		26-SEP-18	
Cation Sum	8.80			me/L		26-SEP-18	
Cation - Anion Balance	8.3			%		26-SEP-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	8.27		0.50	mg/L		23-SEP-18	R4238089
Inorganic Parameters							
Silica	12.9		0.11	mg/L		26-SEP-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4236625
Aluminum (Al)-Dissolved	0.0058		0.0050	mg/L	24-SEP-18	25-SEP-18	R4241171
Antimony (Sb)-Dissolved	0.00023		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Arsenic (As)-Dissolved	0.00150		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Barium (Ba)-Dissolved	0.203		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-3 MW2D							
Sampled By: CLIENT on 20-SEP-18 @ 16:20							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Boron (B)-Dissolved	0.349		0.010	mg/L	24-SEP-18	25-SEP-18	R4241171
Cadmium (Cd)-Dissolved	0.000038		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Calcium (Ca)-Dissolved	79.0		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Chromium (Cr)-Dissolved	0.00066		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Cobalt (Co)-Dissolved	0.00081		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Copper (Cu)-Dissolved	0.00151		0.00020	mg/L	24-SEP-18	25-SEP-18	R4241171
Iron (Fe)-Dissolved	0.024		0.010	mg/L	24-SEP-18	25-SEP-18	R4241171
Lead (Pb)-Dissolved	0.000224		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Magnesium (Mg)-Dissolved	23.2		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Manganese (Mn)-Dissolved	0.145		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Molybdenum (Mo)-Dissolved	0.00680		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Nickel (Ni)-Dissolved	0.00424		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Potassium (K)-Dissolved	3.74		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Silicon (Si)-Dissolved	6.03		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Silver (Ag)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Sodium (Na)-Dissolved	65.7		0.50	mg/L	24-SEP-18	25-SEP-18	R4241171
Strontium (Sr)-Dissolved	2.00	DLHC	0.010	mg/L	24-SEP-18	25-SEP-18	R4241171
Sulfur (S)-Dissolved	16.6		5.0	mg/L	24-SEP-18	25-SEP-18	R4241171
Thallium (Tl)-Dissolved	0.000010		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Tin (Sn)-Dissolved	0.00011		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	24-SEP-18	25-SEP-18	R4241171
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Uranium (U)-Dissolved	0.00115		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Vanadium (V)-Dissolved	0.00070		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Zinc (Zn)-Dissolved	0.0101		0.0010	mg/L	24-SEP-18	25-SEP-18	R4241171
Zirconium (Zr)-Dissolved	<0.00030		0.00030	mg/L	24-SEP-18	25-SEP-18	R4241171
Volatile Organic Compounds							
Acetone	<20	OWP	20	ug/L		26-SEP-18	R4241668
Benzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Bromodichloromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Bromoform	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Bromomethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Carbon Disulfide	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Carbon tetrachloride	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Chlorobenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Dibromochloromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Chloroethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Chloroform	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-3 MW2D Sampled By: CLIENT on 20-SEP-18 @ 16:20 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
1,2-Dibromoethane	<0.20	OWP	0.20	ug/L		26-SEP-18	R4241668
1,2-Dichlorobenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,3-Dichlorobenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,4-Dichlorobenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Dichlorodifluoromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
1,1-Dichloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,2-Dichloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1-Dichloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
cis-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
trans-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Dichloromethane	<2.0	OWP	2.0	ug/L		26-SEP-18	R4241668
1,2-Dichloropropane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
cis-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
trans-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Ethylbenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
n-Hexane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
2-Hexanone	<20	OWP	20	ug/L		26-SEP-18	R4241668
Methyl Ethyl Ketone	<20	OWP	20	ug/L		26-SEP-18	R4241668
Methyl Isobutyl Ketone	<20	OWP	20	ug/L		26-SEP-18	R4241668
MTBE	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Styrene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1,1,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1,1,2,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Tetrachloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Toluene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1,1-Trichloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1,2-Trichloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Trichloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Trichlorofluoromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Vinyl chloride	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
o-Xylene	0.57	OWP	0.50	ug/L		26-SEP-18	R4241668
m+p-Xylenes	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Xylenes (Total)	<1.1		1.1	ug/L		26-SEP-18	
Surrogate: 4-Bromofluorobenzene	102.9		70-130	%		26-SEP-18	R4241668
Surrogate: 1,4-Difluorobenzene	100.5		70-130	%		26-SEP-18	R4241668
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		26-SEP-18	
L2168446-4 MW3 Sampled By: CLIENT on 20-SEP-18 @ 12:40 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-4 MW3							
Sampled By: CLIENT on 20-SEP-18 @ 12:40							
Matrix: WATER							
Physical Tests							
Colour, Apparent	51.3		2.0	CU		22-SEP-18	R4234010
Conductivity	2370		3.0	umhos/cm		21-SEP-18	R4233548
pH	7.40		0.10	pH units		21-SEP-18	R4233548
Total Dissolved Solids	1340	DLDS	20	mg/L		25-SEP-18	R4238987
Turbidity	388		0.10	NTU		22-SEP-18	R4233250
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	801		10	mg/L		25-SEP-18	R4239385
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Total (as CaCO3)	801	DLHC	20	mg/L		25-SEP-18	R4239385
Ammonia, Total (as N)	66.2	DLHC	2.0	mg/L		01-OCT-18	R4254350
Bromide (Br)	2.51	DLDS	0.50	mg/L		25-SEP-18	R4243635
Chloride (Cl)	310	DLDS	2.5	mg/L		25-SEP-18	R4243635
Computed Conductivity	1810			uS/cm		26-SEP-18	
Conductivity % Difference	-26.6			%		26-SEP-18	
Fluoride (F)	<0.10	DLDS	0.10	mg/L		25-SEP-18	R4243635
Hardness (as CaCO3)	722			mg/L		26-SEP-18	
Ion Balance	91.5			%		26-SEP-18	
Langelier Index	1.1					26-SEP-18	
Nitrate and Nitrite as N	6.922		0.11	mg/L		26-SEP-18	
Nitrate (as N)	6.36	DLDS	0.10	mg/L		25-SEP-18	R4243635
Nitrite (as N)	0.562	DLDS	0.050	mg/L		25-SEP-18	R4243635
Total Kjeldahl Nitrogen	104	DLM	15	mg/L	24-SEP-18	26-SEP-18	R4244367
Saturation pH	6.34			pH		26-SEP-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		25-SEP-18	R4242191
Phosphorus, Total	0.642		0.0030	mg/L	24-SEP-18	26-SEP-18	R4241552
TDS (Calculated)	1260			mg/L		26-SEP-18	
Sulfate (SO4)	<1.5	DLDS	1.5	mg/L		25-SEP-18	R4243635
Anion Sum	22.4			me/L		26-SEP-18	
Cation Sum	20.5			me/L		26-SEP-18	
Cation - Anion Balance	-4.4			%		26-SEP-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	29.2		0.50	mg/L		23-SEP-18	R4238089
Inorganic Parameters							
Silica	25.4		1.1	mg/L		26-SEP-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4236625
Aluminum (Al)-Dissolved	<0.050	DLHC	0.050	mg/L	24-SEP-18	24-SEP-18	R4241171
Antimony (Sb)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Arsenic (As)-Dissolved	0.0236	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Barium (Ba)-Dissolved	0.695	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Beryllium (Be)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-4 MW3							
Sampled By: CLIENT on 20-SEP-18 @ 12:40							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.00050	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Boron (B)-Dissolved	0.93	DLHC	0.10	mg/L	24-SEP-18	24-SEP-18	R4241171
Cadmium (Cd)-Dissolved	<0.000050	DLHC	0.000050	mg/L	24-SEP-18	24-SEP-18	R4241171
Calcium (Ca)-Dissolved	214	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Chromium (Cr)-Dissolved	<0.0050	DLHC	0.0050	mg/L	24-SEP-18	24-SEP-18	R4241171
Cobalt (Co)-Dissolved	0.0032	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Copper (Cu)-Dissolved	0.0024	DLHC	0.0020	mg/L	24-SEP-18	24-SEP-18	R4241171
Iron (Fe)-Dissolved	21.0	DLHC	0.10	mg/L	24-SEP-18	24-SEP-18	R4241171
Lead (Pb)-Dissolved	<0.00050	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Magnesium (Mg)-Dissolved	45.7	DLHC	0.050	mg/L	24-SEP-18	24-SEP-18	R4241171
Manganese (Mn)-Dissolved	0.377	DLHC	0.0050	mg/L	24-SEP-18	24-SEP-18	R4241171
Molybdenum (Mo)-Dissolved	0.00142	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Nickel (Ni)-Dissolved	0.0067	DLHC	0.0050	mg/L	24-SEP-18	24-SEP-18	R4241171
Phosphorus (P)-Dissolved	<0.50	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Potassium (K)-Dissolved	98.4	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Selenium (Se)-Dissolved	<0.00050	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Silicon (Si)-Dissolved	11.9	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Silver (Ag)-Dissolved	<0.00050	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Sodium (Na)-Dissolved	81.8	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Strontium (Sr)-Dissolved	1.23	DLHC	0.010	mg/L	24-SEP-18	24-SEP-18	R4241171
Sulfur (S)-Dissolved	<5.0	DLHC	5.0	mg/L	24-SEP-18	24-SEP-18	R4241171
Thallium (Tl)-Dissolved	<0.00010	DLHC	0.00010	mg/L	24-SEP-18	24-SEP-18	R4241171
Tin (Sn)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Titanium (Ti)-Dissolved	<0.0030	DLHC	0.0030	mg/L	24-SEP-18	24-SEP-18	R4241171
Tungsten (W)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Uranium (U)-Dissolved	<0.00010	DLHC	0.00010	mg/L	24-SEP-18	24-SEP-18	R4241171
Vanadium (V)-Dissolved	<0.0050	DLHC	0.0050	mg/L	24-SEP-18	24-SEP-18	R4241171
Zinc (Zn)-Dissolved	0.013	DLHC	0.010	mg/L	24-SEP-18	24-SEP-18	R4241171
Zirconium (Zr)-Dissolved	<0.0030	DLHC	0.0030	mg/L	24-SEP-18	24-SEP-18	R4241171
Volatile Organic Compounds							
Acetone	<20		20	ug/L		28-SEP-18	R4242588
Benzene	<0.50		0.50	ug/L		28-SEP-18	R4242588
Bromodichloromethane	<1.0		1.0	ug/L		28-SEP-18	R4242588
Bromoform	<1.0		1.0	ug/L		28-SEP-18	R4242588
Bromomethane	<0.50		0.50	ug/L		28-SEP-18	R4242588
Carbon Disulfide	<1.0		1.0	ug/L		28-SEP-18	R4242588
Carbon tetrachloride	<0.50		0.50	ug/L		28-SEP-18	R4242588
Chlorobenzene	<0.50		0.50	ug/L		28-SEP-18	R4242588
Dibromochloromethane	<1.0		1.0	ug/L		28-SEP-18	R4242588
Chloroethane	<1.0		1.0	ug/L		28-SEP-18	R4242588
Chloroform	<1.0		1.0	ug/L		28-SEP-18	R4242588

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-4 MW3 Sampled By: CLIENT on 20-SEP-18 @ 12:40 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0		1.0	ug/L		28-SEP-18	R4242588
1,2-Dibromoethane	<0.20		0.20	ug/L		28-SEP-18	R4242588
1,2-Dichlorobenzene	<0.50		0.50	ug/L		28-SEP-18	R4242588
1,3-Dichlorobenzene	<0.50		0.50	ug/L		28-SEP-18	R4242588
1,4-Dichlorobenzene	<0.50		0.50	ug/L		28-SEP-18	R4242588
Dichlorodifluoromethane	<1.0		1.0	ug/L		28-SEP-18	R4242588
1,1-Dichloroethane	<0.50		0.50	ug/L		28-SEP-18	R4242588
1,2-Dichloroethane	<0.50		0.50	ug/L		28-SEP-18	R4242588
1,1-Dichloroethylene	<0.50		0.50	ug/L		28-SEP-18	R4242588
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		28-SEP-18	R4242588
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		28-SEP-18	R4242588
Dichloromethane	<2.0		2.0	ug/L		28-SEP-18	R4242588
1,2-Dichloropropane	<0.50		0.50	ug/L		28-SEP-18	R4242588
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		28-SEP-18	R4242588
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		28-SEP-18	R4242588
Ethylbenzene	<0.50		0.50	ug/L		28-SEP-18	R4242588
n-Hexane	<0.50		0.50	ug/L		28-SEP-18	R4242588
2-Hexanone	<20		20	ug/L		28-SEP-18	R4242588
Methyl Ethyl Ketone	<20		20	ug/L		28-SEP-18	R4242588
Methyl Isobutyl Ketone	<20		20	ug/L		28-SEP-18	R4242588
MTBE	<0.50		0.50	ug/L		28-SEP-18	R4242588
Styrene	<0.50		0.50	ug/L		28-SEP-18	R4242588
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		28-SEP-18	R4242588
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		28-SEP-18	R4242588
Tetrachloroethylene	<0.50		0.50	ug/L		28-SEP-18	R4242588
Toluene	<0.50		0.50	ug/L		28-SEP-18	R4242588
1,1,1-Trichloroethane	<0.50		0.50	ug/L		28-SEP-18	R4242588
1,1,2-Trichloroethane	<0.50		0.50	ug/L		28-SEP-18	R4242588
Trichloroethylene	<0.50		0.50	ug/L		28-SEP-18	R4242588
Trichlorofluoromethane	<1.0		1.0	ug/L		28-SEP-18	R4242588
Vinyl chloride	<0.50		0.50	ug/L		28-SEP-18	R4242588
o-Xylene	<0.50		0.50	ug/L		28-SEP-18	R4242588
m+p-Xylenes	<1.0		1.0	ug/L		28-SEP-18	R4242588
Xylenes (Total)	<1.1		1.1	ug/L		28-SEP-18	
Surrogate: 4-Bromofluorobenzene	96.5		70-130	%		28-SEP-18	R4242588
Surrogate: 1,4-Difluorobenzene	99.7		70-130	%		28-SEP-18	R4242588
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		28-SEP-18	
L2168446-5 MW4 Sampled By: CLIENT on 20-SEP-18 @ 15:10 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-5 MW4							
Sampled By: CLIENT on 20-SEP-18 @ 15:10							
Matrix: WATER							
Physical Tests							
Colour, Apparent	57.9		2.0	CU		22-SEP-18	R4234010
Conductivity	1290		3.0	umhos/cm		21-SEP-18	R4233548
pH	7.24		0.10	pH units		21-SEP-18	R4233548
Total Dissolved Solids	736	DLDS	20	mg/L		25-SEP-18	R4238987
Turbidity	208		0.10	NTU		22-SEP-18	R4233250
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	521		10	mg/L		25-SEP-18	R4239385
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Total (as CaCO3)	521	DLHC	20	mg/L		25-SEP-18	R4239385
Ammonia, Total (as N)	10.0	DLHC	0.40	mg/L		01-OCT-18	R4254350
Bromide (Br)	<0.50	DLDS	0.50	mg/L		25-SEP-18	R4243635
Chloride (Cl)	97.8	DLDS	2.5	mg/L		25-SEP-18	R4243635
Computed Conductivity	1080			uS/cm		26-SEP-18	
Conductivity % Difference	-17.5			%		26-SEP-18	
Fluoride (F)	<0.10	DLDS	0.10	mg/L		25-SEP-18	R4243635
Hardness (as CaCO3)	576			mg/L		26-SEP-18	
Ion Balance	120			%		26-SEP-18	
Langelier Index	0.7					26-SEP-18	
Nitrate and Nitrite as N	<0.11		0.11	mg/L		26-SEP-18	
Nitrate (as N)	<0.10	DLDS	0.10	mg/L		25-SEP-18	R4243635
Nitrite (as N)	<0.050	DLDS	0.050	mg/L		25-SEP-18	R4243635
Total Kjeldahl Nitrogen	12.8	DLHC	0.30	mg/L	24-SEP-18	26-SEP-18	R4244367
Saturation pH	6.51			pH		26-SEP-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		25-SEP-18	R4242191
Phosphorus, Total	0.109		0.0030	mg/L	24-SEP-18	26-SEP-18	R4241552
TDS (Calculated)	698			mg/L		26-SEP-18	
Sulfate (SO4)	10.8	DLDS	1.5	mg/L		25-SEP-18	R4243635
Anion Sum	11.5			me/L		26-SEP-18	
Cation Sum	13.8			me/L		26-SEP-18	
Cation - Anion Balance	9.0			%		26-SEP-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	10.4		0.50	mg/L		23-SEP-18	R4238089
Inorganic Parameters							
Silica	24.4		1.1	mg/L		26-SEP-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4236625
Aluminum (Al)-Dissolved	<0.050	DLHC	0.050	mg/L	24-SEP-18	24-SEP-18	R4241171
Antimony (Sb)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Arsenic (As)-Dissolved	0.0020	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Barium (Ba)-Dissolved	0.397	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Beryllium (Be)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-5 MW4							
Sampled By: CLIENT on 20-SEP-18 @ 15:10							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.00050	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Boron (B)-Dissolved	0.87	DLHC	0.10	mg/L	24-SEP-18	24-SEP-18	R4241171
Cadmium (Cd)-Dissolved	<0.000050	DLHC	0.000050	mg/L	24-SEP-18	24-SEP-18	R4241171
Calcium (Ca)-Dissolved	195	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Chromium (Cr)-Dissolved	<0.0050	DLHC	0.0050	mg/L	24-SEP-18	24-SEP-18	R4241171
Cobalt (Co)-Dissolved	0.0047	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Copper (Cu)-Dissolved	<0.0020	DLHC	0.0020	mg/L	24-SEP-18	24-SEP-18	R4241171
Iron (Fe)-Dissolved	13.6	DLHC	0.10	mg/L	24-SEP-18	24-SEP-18	R4241171
Lead (Pb)-Dissolved	<0.00050	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Magnesium (Mg)-Dissolved	21.4	DLHC	0.050	mg/L	24-SEP-18	24-SEP-18	R4241171
Manganese (Mn)-Dissolved	0.706	DLHC	0.0050	mg/L	24-SEP-18	24-SEP-18	R4241171
Molybdenum (Mo)-Dissolved	<0.00050	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Nickel (Ni)-Dissolved	0.0067	DLHC	0.0050	mg/L	24-SEP-18	24-SEP-18	R4241171
Phosphorus (P)-Dissolved	<0.50	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Potassium (K)-Dissolved	16.3	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Selenium (Se)-Dissolved	<0.00050	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Silicon (Si)-Dissolved	11.4	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Silver (Ag)-Dissolved	<0.00050	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Sodium (Na)-Dissolved	43.4	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Strontium (Sr)-Dissolved	0.687	DLHC	0.010	mg/L	24-SEP-18	24-SEP-18	R4241171
Sulfur (S)-Dissolved	<5.0	DLHC	5.0	mg/L	24-SEP-18	24-SEP-18	R4241171
Thallium (Tl)-Dissolved	<0.00010	DLHC	0.00010	mg/L	24-SEP-18	24-SEP-18	R4241171
Tin (Sn)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Titanium (Ti)-Dissolved	<0.0030	DLHC	0.0030	mg/L	24-SEP-18	24-SEP-18	R4241171
Tungsten (W)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Uranium (U)-Dissolved	0.00048	DLHC	0.00010	mg/L	24-SEP-18	24-SEP-18	R4241171
Vanadium (V)-Dissolved	<0.0050	DLHC	0.0050	mg/L	24-SEP-18	24-SEP-18	R4241171
Zinc (Zn)-Dissolved	<0.010	DLHC	0.010	mg/L	24-SEP-18	24-SEP-18	R4241171
Zirconium (Zr)-Dissolved	<0.0030	DLHC	0.0030	mg/L	24-SEP-18	24-SEP-18	R4241171
Volatile Organic Compounds							
Acetone	<20	OWP	20	ug/L		26-SEP-18	R4241668
Benzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Bromodichloromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Bromoform	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Bromomethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Carbon Disulfide	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Carbon tetrachloride	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Chlorobenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Dibromochloromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Chloroethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Chloroform	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-5 MW4 Sampled By: CLIENT on 20-SEP-18 @ 15:10 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
1,2-Dibromoethane	<0.20	OWP	0.20	ug/L		26-SEP-18	R4241668
1,2-Dichlorobenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,3-Dichlorobenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,4-Dichlorobenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Dichlorodifluoromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
1,1-Dichloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,2-Dichloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1-Dichloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
cis-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
trans-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Dichloromethane	<2.0	OWP	2.0	ug/L		26-SEP-18	R4241668
1,2-Dichloropropane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
cis-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
trans-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Ethylbenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
n-Hexane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
2-Hexanone	<20	OWP	20	ug/L		26-SEP-18	R4241668
Methyl Ethyl Ketone	<20	OWP	20	ug/L		26-SEP-18	R4241668
Methyl Isobutyl Ketone	<20	OWP	20	ug/L		26-SEP-18	R4241668
MTBE	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Styrene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1,1,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1,1,2,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Tetrachloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Toluene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1,1-Trichloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1,2-Trichloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Trichloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Trichlorofluoromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Vinyl chloride	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
o-Xylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
m+p-Xylenes	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Xylenes (Total)	<1.1		1.1	ug/L		26-SEP-18	
Surrogate: 4-Bromofluorobenzene	97.8		70-130	%		26-SEP-18	R4241668
Surrogate: 1,4-Difluorobenzene	101.6		70-130	%		26-SEP-18	R4241668
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		26-SEP-18	
L2168446-6 MW5-R Sampled By: CLIENT on 20-SEP-18 @ 14:30 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-6 MW5-R Sampled By: CLIENT on 20-SEP-18 @ 14:30 Matrix: WATER							
Physical Tests							
Colour, Apparent	10.1		2.0	CU		22-SEP-18	R4234010
Conductivity	1070		3.0	umhos/cm		21-SEP-18	R4233548
pH	7.20		0.10	pH units		21-SEP-18	R4233548
Total Dissolved Solids	669	DLDS	20	mg/L		25-SEP-18	R4238987
Turbidity	1190		0.10	NTU		22-SEP-18	R4233250
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	506		10	mg/L		25-SEP-18	R4239385
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Total (as CaCO3)	506	DLHC	20	mg/L		25-SEP-18	R4239385
Ammonia, Total (as N)	2.08	DLHC	0.10	mg/L		01-OCT-18	R4254350
Bromide (Br)	0.14		0.10	mg/L		25-SEP-18	R4243635
Chloride (Cl)	26.0		0.50	mg/L		25-SEP-18	R4243635
Computed Conductivity	952			uS/cm		26-SEP-18	
Conductivity % Difference	-11.8			%		26-SEP-18	
Fluoride (F)	0.070		0.020	mg/L		25-SEP-18	R4243635
Hardness (as CaCO3)	602			mg/L		26-SEP-18	
Ion Balance	129			%		26-SEP-18	
Langelier Index	0.7					26-SEP-18	
Nitrate and Nitrite as N	<0.022		0.022	mg/L		26-SEP-18	
Nitrate (as N)	<0.020		0.020	mg/L		25-SEP-18	R4243635
Nitrite (as N)	<0.010		0.010	mg/L		25-SEP-18	R4243635
Total Kjeldahl Nitrogen	4.24		0.15	mg/L	24-SEP-18	26-SEP-18	R4244367
Saturation pH	6.49			pH		26-SEP-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		25-SEP-18	R4242191
Phosphorus, Total	1.24	DLHC	0.030	mg/L	24-SEP-18	26-SEP-18	R4241552
TDS (Calculated)	616			mg/L		26-SEP-18	
Sulfate (SO4)	40.2		0.30	mg/L		25-SEP-18	R4243635
Anion Sum	9.88			me/L		26-SEP-18	
Cation Sum	12.7			me/L		26-SEP-18	
Cation - Anion Balance	12.5			%		26-SEP-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	6.77		0.50	mg/L		23-SEP-18	R4238089
Inorganic Parameters							
Silica	13.2		0.11	mg/L		26-SEP-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4236625
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	24-SEP-18	25-SEP-18	R4241171
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Arsenic (As)-Dissolved	0.00983		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Barium (Ba)-Dissolved	0.232		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-6 MW5-R Sampled By: CLIENT on 20-SEP-18 @ 14:30 Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Boron (B)-Dissolved	0.324		0.010	mg/L	24-SEP-18	25-SEP-18	R4241171
Cadmium (Cd)-Dissolved	<0.000010		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Calcium (Ca)-Dissolved	209		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Cobalt (Co)-Dissolved	0.00015		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Copper (Cu)-Dissolved	0.00026		0.00020	mg/L	24-SEP-18	25-SEP-18	R4241171
Iron (Fe)-Dissolved	4.60		0.010	mg/L	24-SEP-18	25-SEP-18	R4241171
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Magnesium (Mg)-Dissolved	19.8		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Manganese (Mn)-Dissolved	2.46	DLHC	0.0050	mg/L	24-SEP-18	25-SEP-18	R4241171
Molybdenum (Mo)-Dissolved	0.00153		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Nickel (Ni)-Dissolved	0.00111		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Potassium (K)-Dissolved	6.54		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Silicon (Si)-Dissolved	6.19		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Silver (Ag)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Sodium (Na)-Dissolved	11.6		0.50	mg/L	24-SEP-18	25-SEP-18	R4241171
Strontium (Sr)-Dissolved	0.376		0.0010	mg/L	24-SEP-18	25-SEP-18	R4241171
Sulfur (S)-Dissolved	13.3		5.0	mg/L	24-SEP-18	25-SEP-18	R4241171
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	24-SEP-18	25-SEP-18	R4241171
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Uranium (U)-Dissolved	0.000913		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Zinc (Zn)-Dissolved	0.0022		0.0010	mg/L	24-SEP-18	25-SEP-18	R4241171
Zirconium (Zr)-Dissolved	<0.00030		0.00030	mg/L	24-SEP-18	25-SEP-18	R4241171
Volatile Organic Compounds							
Acetone	<20	OWP	20	ug/L		26-SEP-18	R4241668
Benzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Bromodichloromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Bromoform	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Bromomethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Carbon Disulfide	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Carbon tetrachloride	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Chlorobenzene	2.13	OWP	0.50	ug/L		26-SEP-18	R4241668
Dibromochloromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Chloroethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Chloroform	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-6 MW5-R Sampled By: CLIENT on 20-SEP-18 @ 14:30 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
1,2-Dibromoethane	<0.20	OWP	0.20	ug/L		26-SEP-18	R4241668
1,2-Dichlorobenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,3-Dichlorobenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,4-Dichlorobenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Dichlorodifluoromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
1,1-Dichloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,2-Dichloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1-Dichloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
cis-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
trans-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Dichloromethane	<2.0	OWP	2.0	ug/L		26-SEP-18	R4241668
1,2-Dichloropropane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
cis-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
trans-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Ethylbenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
n-Hexane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
2-Hexanone	<20	OWP	20	ug/L		26-SEP-18	R4241668
Methyl Ethyl Ketone	<20	OWP	20	ug/L		26-SEP-18	R4241668
Methyl Isobutyl Ketone	<20	OWP	20	ug/L		26-SEP-18	R4241668
MTBE	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Styrene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1,1,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1,1,2,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Tetrachloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Toluene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1,1-Trichloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1,2-Trichloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Trichloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Trichlorofluoromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Vinyl chloride	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
o-Xylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
m+p-Xylenes	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Xylenes (Total)	<1.1		1.1	ug/L		26-SEP-18	
Surrogate: 4-Bromofluorobenzene	101.1		70-130	%		26-SEP-18	R4241668
Surrogate: 1,4-Difluorobenzene	101.3		70-130	%		26-SEP-18	R4241668
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		26-SEP-18	
L2168446-7 MW6 Sampled By: CLIENT on 20-SEP-18 @ 13:20 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-7 MW6							
Sampled By: CLIENT on 20-SEP-18 @ 13:20							
Matrix: WATER							
Physical Tests							
Colour, Apparent	21.8		2.0	CU		22-SEP-18	R4234010
Conductivity	1390		3.0	umhos/cm		21-SEP-18	R4233548
pH	7.50		0.10	pH units		21-SEP-18	R4233548
Total Dissolved Solids	854	DLDS	20	mg/L		25-SEP-18	R4238987
Turbidity	138		0.10	NTU		22-SEP-18	R4233250
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	470		10	mg/L		25-SEP-18	R4239385
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Total (as CaCO3)	470		10	mg/L		25-SEP-18	R4239385
Ammonia, Total (as N)	14.0	DLHC	0.40	mg/L		01-OCT-18	R4254350
Bromide (Br)	0.75	DLDS	0.50	mg/L		25-SEP-18	R4243635
Chloride (Cl)	126	DLDS	2.5	mg/L		25-SEP-18	R4243635
Computed Conductivity	1260			uS/cm		26-SEP-18	
Conductivity % Difference	-9.5			%		26-SEP-18	
Fluoride (F)	<0.10	DLDS	0.10	mg/L		25-SEP-18	R4243635
Hardness (as CaCO3)	532			mg/L		26-SEP-18	
Ion Balance	109			%		26-SEP-18	
Langelier Index	0.8					26-SEP-18	
Nitrate and Nitrite as N	<0.11		0.11	mg/L		26-SEP-18	
Nitrate (as N)	<0.10	DLDS	0.10	mg/L		25-SEP-18	R4243635
Nitrite (as N)	<0.050	DLDS	0.050	mg/L		25-SEP-18	R4243635
Total Kjeldahl Nitrogen	17.4	DLHC	0.30	mg/L	24-SEP-18	26-SEP-18	R4244367
Saturation pH	6.72			pH		26-SEP-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		25-SEP-18	R4242191
Phosphorus, Total	0.0191		0.0030	mg/L	24-SEP-18	26-SEP-18	R4241552
TDS (Calculated)	829			mg/L		26-SEP-18	
Sulfate (SO4)	113	DLDS	1.5	mg/L		25-SEP-18	R4243635
Anion Sum	13.6			me/L		26-SEP-18	
Cation Sum	14.9			me/L		26-SEP-18	
Cation - Anion Balance	4.4			%		26-SEP-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	10.7		0.50	mg/L		23-SEP-18	R4238089
Inorganic Parameters							
Silica	21.2		1.1	mg/L		26-SEP-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4236625
Aluminum (Al)-Dissolved	<0.050	DLHC	0.050	mg/L	24-SEP-18	24-SEP-18	R4241171
Antimony (Sb)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Arsenic (As)-Dissolved	0.0163	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Barium (Ba)-Dissolved	0.200	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Beryllium (Be)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-7 MW6							
Sampled By: CLIENT on 20-SEP-18 @ 13:20							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.00050	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Boron (B)-Dissolved	0.78	DLHC	0.10	mg/L	24-SEP-18	24-SEP-18	R4241171
Cadmium (Cd)-Dissolved	<0.000050	DLHC	0.000050	mg/L	24-SEP-18	24-SEP-18	R4241171
Calcium (Ca)-Dissolved	138	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Chromium (Cr)-Dissolved	<0.0050	DLHC	0.0050	mg/L	24-SEP-18	24-SEP-18	R4241171
Cobalt (Co)-Dissolved	0.0033	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Copper (Cu)-Dissolved	<0.0020	DLHC	0.0020	mg/L	24-SEP-18	24-SEP-18	R4241171
Iron (Fe)-Dissolved	9.89	DLHC	0.10	mg/L	24-SEP-18	24-SEP-18	R4241171
Lead (Pb)-Dissolved	<0.00050	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Magnesium (Mg)-Dissolved	45.6	DLHC	0.050	mg/L	24-SEP-18	24-SEP-18	R4241171
Manganese (Mn)-Dissolved	0.401	DLHC	0.0050	mg/L	24-SEP-18	24-SEP-18	R4241171
Molybdenum (Mo)-Dissolved	0.00458	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Nickel (Ni)-Dissolved	0.0066	DLHC	0.0050	mg/L	24-SEP-18	24-SEP-18	R4241171
Phosphorus (P)-Dissolved	<0.50	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Potassium (K)-Dissolved	63.8	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Selenium (Se)-Dissolved	<0.00050	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Silicon (Si)-Dissolved	9.92	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Silver (Ag)-Dissolved	<0.00050	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Sodium (Na)-Dissolved	60.7	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Strontium (Sr)-Dissolved	0.690	DLHC	0.010	mg/L	24-SEP-18	24-SEP-18	R4241171
Sulfur (S)-Dissolved	38.8	DLHC	5.0	mg/L	24-SEP-18	24-SEP-18	R4241171
Thallium (Tl)-Dissolved	<0.00010	DLHC	0.00010	mg/L	24-SEP-18	24-SEP-18	R4241171
Tin (Sn)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Titanium (Ti)-Dissolved	<0.0030	DLHC	0.0030	mg/L	24-SEP-18	24-SEP-18	R4241171
Tungsten (W)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Uranium (U)-Dissolved	0.00051	DLHC	0.00010	mg/L	24-SEP-18	24-SEP-18	R4241171
Vanadium (V)-Dissolved	<0.0050	DLHC	0.0050	mg/L	24-SEP-18	24-SEP-18	R4241171
Zinc (Zn)-Dissolved	<0.010	DLHC	0.010	mg/L	24-SEP-18	24-SEP-18	R4241171
Zirconium (Zr)-Dissolved	<0.0030	DLHC	0.0030	mg/L	24-SEP-18	24-SEP-18	R4241171
Volatile Organic Compounds							
Acetone	<20	OWP	20	ug/L		26-SEP-18	R4241668
Benzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Bromodichloromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Bromoform	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Bromomethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Carbon Disulfide	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Carbon tetrachloride	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Chlorobenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Dibromochloromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Chloroethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Chloroform	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-7 MW6 Sampled By: CLIENT on 20-SEP-18 @ 13:20 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
1,2-Dibromoethane	<0.20	OWP	0.20	ug/L		26-SEP-18	R4241668
1,2-Dichlorobenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,3-Dichlorobenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,4-Dichlorobenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Dichlorodifluoromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
1,1-Dichloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,2-Dichloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1-Dichloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
cis-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
trans-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Dichloromethane	<2.0	OWP	2.0	ug/L		26-SEP-18	R4241668
1,2-Dichloropropane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
cis-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
trans-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Ethylbenzene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
n-Hexane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
2-Hexanone	<20	OWP	20	ug/L		26-SEP-18	R4241668
Methyl Ethyl Ketone	<20	OWP	20	ug/L		26-SEP-18	R4241668
Methyl Isobutyl Ketone	<20	OWP	20	ug/L		26-SEP-18	R4241668
MTBE	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Styrene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1,1,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1,1,2,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Tetrachloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Toluene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1,1-Trichloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
1,1,2-Trichloroethane	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Trichloroethylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
Trichlorofluoromethane	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Vinyl chloride	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
o-Xylene	<0.50	OWP	0.50	ug/L		26-SEP-18	R4241668
m+p-Xylenes	<1.0	OWP	1.0	ug/L		26-SEP-18	R4241668
Xylenes (Total)	<1.1		1.1	ug/L		26-SEP-18	
Surrogate: 4-Bromofluorobenzene	100.3		70-130	%		26-SEP-18	R4241668
Surrogate: 1,4-Difluorobenzene	101.4		70-130	%		26-SEP-18	R4241668
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		26-SEP-18	
L2168446-8 MW7 Sampled By: CLIENT on 20-SEP-18 @ 15:30 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-8 MW7							
Sampled By: CLIENT on 20-SEP-18 @ 15:30							
Matrix: WATER							
Physical Tests							
Colour, Apparent	139		2.0	CU		22-SEP-18	R4234010
Conductivity	3620		3.0	umhos/cm		21-SEP-18	R4233548
pH	7.23		0.10	pH units		21-SEP-18	R4233548
Total Dissolved Solids	2350	DLDS	20	mg/L		25-SEP-18	R4238987
Turbidity	349		0.10	NTU		22-SEP-18	R4233250
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	1290		10	mg/L		25-SEP-18	R4239385
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Total (as CaCO3)	1290	DLHC	50	mg/L		25-SEP-18	R4239385
Ammonia, Total (as N)	83.8	DLHC	2.0	mg/L		01-OCT-18	R4254350
Bromide (Br)	1.3	DLDS	1.0	mg/L		25-SEP-18	R4243635
Chloride (Cl)	429	DLDS	5.0	mg/L		25-SEP-18	R4243635
Computed Conductivity	2820			uS/cm		27-SEP-18	
Conductivity % Difference	-25.0			%		27-SEP-18	
Fluoride (F)	<0.20	DLDS	0.20	mg/L		25-SEP-18	R4243635
Hardness (as CaCO3)	801			mg/L		27-SEP-18	
Ion Balance	97.7			%		27-SEP-18	
Langelier Index	1.1					27-SEP-18	
Nitrate and Nitrite as N	0.66		0.22	mg/L		26-SEP-18	
Nitrate (as N)	<0.20	DLDS	0.20	mg/L		25-SEP-18	R4243635
Nitrite (as N)	0.66	DLDS	0.10	mg/L		25-SEP-18	R4243635
Total Kjeldahl Nitrogen	129	DLHC	15	mg/L	24-SEP-18	26-SEP-18	R4244367
Saturation pH	6.17			pH		27-SEP-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		25-SEP-18	R4242191
Phosphorus, Total	0.197		0.0030	mg/L	25-SEP-18	27-SEP-18	R4245151
TDS (Calculated)	2150			mg/L		27-SEP-18	
Sulfate (SO4)	150	DLDS	3.0	mg/L		25-SEP-18	R4243635
Anion Sum	36.4			me/L		27-SEP-18	
Cation Sum	35.5			me/L		27-SEP-18	
Cation - Anion Balance	-1.2			%		27-SEP-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	113	DLHC	5.0	mg/L		23-SEP-18	R4238089
Inorganic Parameters							
Silica	18.6		1.1	mg/L		27-SEP-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					25-SEP-18	R4238092
Aluminum (Al)-Dissolved	<0.050	DLHC	0.050	mg/L	25-SEP-18	26-SEP-18	R4245747
Antimony (Sb)-Dissolved	<0.0010	DLHC	0.0010	mg/L	25-SEP-18	26-SEP-18	R4245747
Arsenic (As)-Dissolved	0.0012	DLHC	0.0010	mg/L	25-SEP-18	26-SEP-18	R4245747
Barium (Ba)-Dissolved	0.176	DLHC	0.0010	mg/L	25-SEP-18	26-SEP-18	R4245747
Beryllium (Be)-Dissolved	<0.0010	DLHC	0.0010	mg/L	25-SEP-18	26-SEP-18	R4245747

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-8 MW7							
Sampled By: CLIENT on 20-SEP-18 @ 15:30							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.00050	DLHC	0.00050	mg/L	25-SEP-18	26-SEP-18	R4245747
Boron (B)-Dissolved	8.47	DLHC	0.10	mg/L	25-SEP-18	26-SEP-18	R4245747
Cadmium (Cd)-Dissolved	0.000141	DLHC	0.000050	mg/L	25-SEP-18	26-SEP-18	R4245747
Calcium (Ca)-Dissolved	229	DLHC	0.50	mg/L	25-SEP-18	26-SEP-18	R4245747
Chromium (Cr)-Dissolved	0.0061	DLHC	0.0050	mg/L	25-SEP-18	26-SEP-18	R4245747
Cobalt (Co)-Dissolved	0.0180	DLHC	0.0010	mg/L	25-SEP-18	26-SEP-18	R4245747
Copper (Cu)-Dissolved	0.0657	DLHC	0.0020	mg/L	25-SEP-18	26-SEP-18	R4245747
Iron (Fe)-Dissolved	0.29	DLHC	0.10	mg/L	25-SEP-18	26-SEP-18	R4245747
Lead (Pb)-Dissolved	0.00121	DLHC	0.00050	mg/L	25-SEP-18	26-SEP-18	R4245747
Magnesium (Mg)-Dissolved	55.8	DLHC	0.050	mg/L	25-SEP-18	26-SEP-18	R4245747
Manganese (Mn)-Dissolved	0.658	DLHC	0.0050	mg/L	25-SEP-18	26-SEP-18	R4245747
Molybdenum (Mo)-Dissolved	0.00389	DLHC	0.00050	mg/L	25-SEP-18	26-SEP-18	R4245747
Nickel (Ni)-Dissolved	0.0813	DLHC	0.0050	mg/L	25-SEP-18	26-SEP-18	R4245747
Phosphorus (P)-Dissolved	<0.50	DLHC	0.50	mg/L	25-SEP-18	26-SEP-18	R4245747
Potassium (K)-Dissolved	152	DLHC	0.50	mg/L	25-SEP-18	26-SEP-18	R4245747
Selenium (Se)-Dissolved	0.00066	DLHC	0.00050	mg/L	25-SEP-18	26-SEP-18	R4245747
Silicon (Si)-Dissolved	8.71	DLHC	0.50	mg/L	25-SEP-18	26-SEP-18	R4245747
Silver (Ag)-Dissolved	<0.00050	DLHC	0.00050	mg/L	25-SEP-18	26-SEP-18	R4245747
Sodium (Na)-Dissolved	360	DLHC	0.50	mg/L	25-SEP-18	26-SEP-18	R4245747
Strontium (Sr)-Dissolved	1.23	DLHC	0.010	mg/L	25-SEP-18	26-SEP-18	R4245747
Sulfur (S)-Dissolved	54.3	DLHC	5.0	mg/L	25-SEP-18	26-SEP-18	R4245747
Thallium (Tl)-Dissolved	0.00115	DLHC	0.00010	mg/L	25-SEP-18	26-SEP-18	R4245747
Tin (Sn)-Dissolved	<0.0010	DLHC	0.0010	mg/L	25-SEP-18	26-SEP-18	R4245747
Titanium (Ti)-Dissolved	<0.0030	DLHC	0.0030	mg/L	25-SEP-18	26-SEP-18	R4245747
Tungsten (W)-Dissolved	<0.0010	DLHC	0.0010	mg/L	25-SEP-18	26-SEP-18	R4245747
Uranium (U)-Dissolved	0.00676	DLHC	0.00010	mg/L	25-SEP-18	26-SEP-18	R4245747
Vanadium (V)-Dissolved	<0.0050	DLHC	0.0050	mg/L	25-SEP-18	26-SEP-18	R4245747
Zinc (Zn)-Dissolved	0.012	DLHC	0.010	mg/L	25-SEP-18	26-SEP-18	R4245747
Zirconium (Zr)-Dissolved	<0.0030	DLHC	0.0030	mg/L	25-SEP-18	26-SEP-18	R4245747
Volatile Organic Compounds							
Acetone	<20		20	ug/L		28-SEP-18	R4242588
Benzene	<0.50		0.50	ug/L		28-SEP-18	R4242588
Bromodichloromethane	<1.0		1.0	ug/L		28-SEP-18	R4242588
Bromoform	<1.0		1.0	ug/L		28-SEP-18	R4242588
Bromomethane	<0.50		0.50	ug/L		28-SEP-18	R4242588
Carbon Disulfide	<1.0		1.0	ug/L		28-SEP-18	R4242588
Carbon tetrachloride	<0.50		0.50	ug/L		28-SEP-18	R4242588
Chlorobenzene	<0.50		0.50	ug/L		28-SEP-18	R4242588
Dibromochloromethane	<1.0		1.0	ug/L		28-SEP-18	R4242588
Chloroethane	<1.0		1.0	ug/L		28-SEP-18	R4242588
Chloroform	<1.0		1.0	ug/L		28-SEP-18	R4242588

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-8 MW7 Sampled By: CLIENT on 20-SEP-18 @ 15:30 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0		1.0	ug/L		28-SEP-18	R4242588
1,2-Dibromoethane	<0.20		0.20	ug/L		28-SEP-18	R4242588
1,2-Dichlorobenzene	<0.50		0.50	ug/L		28-SEP-18	R4242588
1,3-Dichlorobenzene	<0.50		0.50	ug/L		28-SEP-18	R4242588
1,4-Dichlorobenzene	<0.50		0.50	ug/L		28-SEP-18	R4242588
Dichlorodifluoromethane	<1.0		1.0	ug/L		28-SEP-18	R4242588
1,1-Dichloroethane	<0.50		0.50	ug/L		28-SEP-18	R4242588
1,2-Dichloroethane	<0.50		0.50	ug/L		28-SEP-18	R4242588
1,1-Dichloroethylene	<0.50		0.50	ug/L		28-SEP-18	R4242588
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		28-SEP-18	R4242588
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		28-SEP-18	R4242588
Dichloromethane	<2.0		2.0	ug/L		28-SEP-18	R4242588
1,2-Dichloropropane	<0.50		0.50	ug/L		28-SEP-18	R4242588
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		28-SEP-18	R4242588
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		28-SEP-18	R4242588
Ethylbenzene	<0.50		0.50	ug/L		28-SEP-18	R4242588
n-Hexane	<0.50		0.50	ug/L		28-SEP-18	R4242588
2-Hexanone	<20		20	ug/L		28-SEP-18	R4242588
Methyl Ethyl Ketone	<20		20	ug/L		28-SEP-18	R4242588
Methyl Isobutyl Ketone	<20		20	ug/L		28-SEP-18	R4242588
MTBE	<0.50		0.50	ug/L		28-SEP-18	R4242588
Styrene	<0.50		0.50	ug/L		28-SEP-18	R4242588
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		28-SEP-18	R4242588
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		28-SEP-18	R4242588
Tetrachloroethylene	<0.50		0.50	ug/L		28-SEP-18	R4242588
Toluene	<0.50		0.50	ug/L		28-SEP-18	R4242588
1,1,1-Trichloroethane	<0.50		0.50	ug/L		28-SEP-18	R4242588
1,1,2-Trichloroethane	<0.50		0.50	ug/L		28-SEP-18	R4242588
Trichloroethylene	<0.50		0.50	ug/L		28-SEP-18	R4242588
Trichlorofluoromethane	<1.0		1.0	ug/L		28-SEP-18	R4242588
Vinyl chloride	<0.50		0.50	ug/L		28-SEP-18	R4242588
o-Xylene	<0.50		0.50	ug/L		28-SEP-18	R4242588
m+p-Xylenes	<1.0		1.0	ug/L		28-SEP-18	R4242588
Xylenes (Total)	<1.1		1.1	ug/L		28-SEP-18	
Surrogate: 4-Bromofluorobenzene	96.6		70-130	%		28-SEP-18	R4242588
Surrogate: 1,4-Difluorobenzene	99.1		70-130	%		28-SEP-18	R4242588
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		28-SEP-18	
L2168446-9 MW8 Sampled By: CLIENT on 20-SEP-18 @ 13:00 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-9 MW8							
Sampled By: CLIENT on 20-SEP-18 @ 13:00							
Matrix: WATER							
Physical Tests							
Colour, Apparent	26.5		2.0	CU		22-SEP-18	R4234010
Conductivity	1460		3.0	umhos/cm		21-SEP-18	R4233548
pH	7.42		0.10	pH units		21-SEP-18	R4233548
Total Dissolved Solids	925	DLDS	20	mg/L		25-SEP-18	R4238987
Turbidity	789		0.10	NTU		22-SEP-18	R4233250
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	477		10	mg/L		25-SEP-18	R4239385
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Total (as CaCO3)	477	DLHC	20	mg/L		25-SEP-18	R4239385
Ammonia, Total (as N)	9.77	DLHC	0.40	mg/L		01-OCT-18	R4254350
Bromide (Br)	1.10	DLDS	0.50	mg/L		25-SEP-18	R4243635
Chloride (Cl)	166	DLDS	2.5	mg/L		25-SEP-18	R4243635
Computed Conductivity	1300			uS/cm		26-SEP-18	
Conductivity % Difference	-11.5			%		26-SEP-18	
Fluoride (F)	<0.10	DLDS	0.10	mg/L		25-SEP-18	R4243635
Hardness (as CaCO3)	558			mg/L		26-SEP-18	
Ion Balance	113			%		26-SEP-18	
Langelier Index	0.8					26-SEP-18	
Nitrate and Nitrite as N	6.21		0.11	mg/L		26-SEP-18	
Nitrate (as N)	6.21	DLDS	0.10	mg/L		25-SEP-18	R4243635
Nitrite (as N)	<0.050	DLDS	0.050	mg/L		25-SEP-18	R4243635
Total Kjeldahl Nitrogen	11.4	DLHC	0.30	mg/L	24-SEP-18	26-SEP-18	R4244367
Saturation pH	6.65			pH		26-SEP-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		25-SEP-18	R4242191
Phosphorus, Total	0.360		0.0030	mg/L	25-SEP-18	27-SEP-18	R4245151
TDS (Calculated)	853			mg/L		26-SEP-18	
Sulfate (SO4)	45.3	DLDS	1.5	mg/L		25-SEP-18	R4243635
Anion Sum	13.9			me/L		26-SEP-18	
Cation Sum	15.7			me/L		26-SEP-18	
Cation - Anion Balance	6.0			%		26-SEP-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	9.67		0.50	mg/L		23-SEP-18	R4238089
Inorganic Parameters							
Silica	17.6		1.1	mg/L		26-SEP-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4236625
Aluminum (Al)-Dissolved	<0.050	DLHC	0.050	mg/L	24-SEP-18	24-SEP-18	R4241171
Antimony (Sb)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Arsenic (As)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Barium (Ba)-Dissolved	0.213	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Beryllium (Be)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-9 MW8							
Sampled By: CLIENT on 20-SEP-18 @ 13:00							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.00050	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Boron (B)-Dissolved	0.85	DLHC	0.10	mg/L	24-SEP-18	24-SEP-18	R4241171
Cadmium (Cd)-Dissolved	<0.000050	DLHC	0.000050	mg/L	24-SEP-18	24-SEP-18	R4241171
Calcium (Ca)-Dissolved	159	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Chromium (Cr)-Dissolved	<0.0050	DLHC	0.0050	mg/L	24-SEP-18	24-SEP-18	R4241171
Cobalt (Co)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Copper (Cu)-Dissolved	0.0035	DLHC	0.0020	mg/L	24-SEP-18	24-SEP-18	R4241171
Iron (Fe)-Dissolved	<0.10	DLHC	0.10	mg/L	24-SEP-18	24-SEP-18	R4241171
Lead (Pb)-Dissolved	<0.00050	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Magnesium (Mg)-Dissolved	38.9	DLHC	0.050	mg/L	24-SEP-18	24-SEP-18	R4241171
Manganese (Mn)-Dissolved	0.293	DLHC	0.0050	mg/L	24-SEP-18	24-SEP-18	R4241171
Molybdenum (Mo)-Dissolved	0.00099	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Nickel (Ni)-Dissolved	0.0069	DLHC	0.0050	mg/L	24-SEP-18	24-SEP-18	R4241171
Phosphorus (P)-Dissolved	<0.50	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Potassium (K)-Dissolved	60.9	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Selenium (Se)-Dissolved	<0.00050	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Silicon (Si)-Dissolved	8.21	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Silver (Ag)-Dissolved	<0.00050	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Sodium (Na)-Dissolved	68.7	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Strontium (Sr)-Dissolved	0.705	DLHC	0.010	mg/L	24-SEP-18	24-SEP-18	R4241171
Sulfur (S)-Dissolved	14.8	DLHC	5.0	mg/L	24-SEP-18	24-SEP-18	R4241171
Thallium (Tl)-Dissolved	0.00024	DLHC	0.00010	mg/L	24-SEP-18	24-SEP-18	R4241171
Tin (Sn)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Titanium (Ti)-Dissolved	<0.0030	DLHC	0.0030	mg/L	24-SEP-18	24-SEP-18	R4241171
Tungsten (W)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Uranium (U)-Dissolved	0.00048	DLHC	0.00010	mg/L	24-SEP-18	24-SEP-18	R4241171
Vanadium (V)-Dissolved	<0.0050	DLHC	0.0050	mg/L	24-SEP-18	24-SEP-18	R4241171
Zinc (Zn)-Dissolved	<0.010	DLHC	0.010	mg/L	24-SEP-18	24-SEP-18	R4241171
Zirconium (Zr)-Dissolved	<0.0030	DLHC	0.0030	mg/L	24-SEP-18	24-SEP-18	R4241171
Volatile Organic Compounds							
Acetone	<20	OWP	20	ug/L		27-SEP-18	R4246311
Benzene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
Bromodichloromethane	<1.0	OWP	1.0	ug/L		27-SEP-18	R4246311
Bromoform	<1.0	OWP	1.0	ug/L		27-SEP-18	R4246311
Bromomethane	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
Carbon Disulfide	<1.0	OWP	1.0	ug/L		27-SEP-18	R4246311
Carbon tetrachloride	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
Chlorobenzene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
Dibromochloromethane	<1.0	OWP	1.0	ug/L		27-SEP-18	R4246311
Chloroethane	<1.0	OWP	1.0	ug/L		27-SEP-18	R4246311
Chloroform	<1.0	OWP	1.0	ug/L		27-SEP-18	R4246311

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-9 MW8 Sampled By: CLIENT on 20-SEP-18 @ 13:00 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0	OWP	1.0	ug/L		27-SEP-18	R4246311
1,2-Dibromoethane	<0.20	OWP	0.20	ug/L		27-SEP-18	R4246311
1,2-Dichlorobenzene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
1,3-Dichlorobenzene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
1,4-Dichlorobenzene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
Dichlorodifluoromethane	<1.0	OWP	1.0	ug/L		27-SEP-18	R4246311
1,1-Dichloroethane	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
1,2-Dichloroethane	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
1,1-Dichloroethylene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
cis-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
trans-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
Dichloromethane	<2.0	OWP	2.0	ug/L		27-SEP-18	R4246311
1,2-Dichloropropane	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
cis-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
trans-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
Ethylbenzene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
n-Hexane	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
2-Hexanone	<20	OWP	20	ug/L		27-SEP-18	R4246311
Methyl Ethyl Ketone	<20	OWP	20	ug/L		27-SEP-18	R4246311
Methyl Isobutyl Ketone	<20	OWP	20	ug/L		27-SEP-18	R4246311
MTBE	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
Styrene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
1,1,1,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
1,1,1,2,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
Tetrachloroethylene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
Toluene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
1,1,1-Trichloroethane	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
1,1,2-Trichloroethane	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
Trichloroethylene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
Trichlorofluoromethane	<1.0	OWP	1.0	ug/L		27-SEP-18	R4246311
Vinyl chloride	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
o-Xylene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
m+p-Xylenes	<1.0	OWP	1.0	ug/L		27-SEP-18	R4246311
Xylenes (Total)	<1.1		1.1	ug/L		27-SEP-18	
Surrogate: 4-Bromofluorobenzene	97.7		70-130	%		27-SEP-18	R4246311
Surrogate: 1,4-Difluorobenzene	99.1		70-130	%		27-SEP-18	R4246311
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		27-SEP-18	
L2168446-10 MW9 Sampled By: CLIENT on 20-SEP-18 @ 13:05 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-10 MW9							
Sampled By: CLIENT on 20-SEP-18 @ 13:05							
Matrix: WATER							
Physical Tests							
Colour, Apparent	29.8		2.0	CU		22-SEP-18	R4234010
Conductivity	926		3.0	umhos/cm		21-SEP-18	R4233548
pH	7.60		0.10	pH units		21-SEP-18	R4233548
Total Dissolved Solids	687	DLDS	20	mg/L		25-SEP-18	R4238987
Turbidity	745		0.10	NTU		22-SEP-18	R4233250
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	312		10	mg/L		25-SEP-18	R4239385
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Total (as CaCO3)	312		10	mg/L		25-SEP-18	R4239385
Ammonia, Total (as N)	0.438		0.020	mg/L		01-OCT-18	R4254350
Bromide (Br)	0.26		0.10	mg/L		25-SEP-18	R4243635
Chloride (Cl)	56.4		0.50	mg/L		25-SEP-18	R4243635
Computed Conductivity	910			uS/cm		26-SEP-18	
Conductivity % Difference	-1.8			%		26-SEP-18	
Fluoride (F)	0.076		0.020	mg/L		25-SEP-18	R4243635
Hardness (as CaCO3)	486			mg/L		26-SEP-18	
Ion Balance	115			%		26-SEP-18	
Langelier Index	0.8					26-SEP-18	
Nitrate and Nitrite as N	0.66		0.022	mg/L		26-SEP-18	
Nitrate (as N)	0.643		0.020	mg/L		25-SEP-18	R4243635
Nitrite (as N)	0.017		0.010	mg/L		25-SEP-18	R4243635
Total Kjeldahl Nitrogen	0.65		0.15	mg/L	24-SEP-18	26-SEP-18	R4244367
Saturation pH	6.79			pH		26-SEP-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		25-SEP-18	R4242191
Phosphorus, Total	0.229		0.0030	mg/L	25-SEP-18	27-SEP-18	R4245151
TDS (Calculated)	571			mg/L		26-SEP-18	
Sulfate (SO4)	118		0.30	mg/L		25-SEP-18	R4243635
Anion Sum	9.25			me/L		26-SEP-18	
Cation Sum	10.6			me/L		26-SEP-18	
Cation - Anion Balance	6.9			%		26-SEP-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	6.04		0.50	mg/L		23-SEP-18	R4238089
Inorganic Parameters							
Silica	12.1		0.11	mg/L		26-SEP-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4236625
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	24-SEP-18	25-SEP-18	R4241171
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Arsenic (As)-Dissolved	0.00016		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Barium (Ba)-Dissolved	0.145		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-10 MW9							
Sampled By: CLIENT on 20-SEP-18 @ 13:05							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Boron (B)-Dissolved	0.181		0.010	mg/L	24-SEP-18	25-SEP-18	R4241171
Cadmium (Cd)-Dissolved	0.000026		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Calcium (Ca)-Dissolved	162		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Cobalt (Co)-Dissolved	0.00023		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Copper (Cu)-Dissolved	0.00131		0.00020	mg/L	24-SEP-18	25-SEP-18	R4241171
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	24-SEP-18	25-SEP-18	R4241171
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Magnesium (Mg)-Dissolved	20.1		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Manganese (Mn)-Dissolved	0.302		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Molybdenum (Mo)-Dissolved	0.00178		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Nickel (Ni)-Dissolved	0.00163		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Potassium (K)-Dissolved	7.96		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Silicon (Si)-Dissolved	5.64		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Silver (Ag)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Sodium (Na)-Dissolved	15.8		0.50	mg/L	24-SEP-18	25-SEP-18	R4241171
Strontium (Sr)-Dissolved	0.402		0.0010	mg/L	24-SEP-18	25-SEP-18	R4241171
Sulfur (S)-Dissolved	39.4		5.0	mg/L	24-SEP-18	25-SEP-18	R4241171
Thallium (Tl)-Dissolved	0.000142		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	24-SEP-18	25-SEP-18	R4241171
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Uranium (U)-Dissolved	0.00119		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Zinc (Zn)-Dissolved	0.0023		0.0010	mg/L	24-SEP-18	25-SEP-18	R4241171
Zirconium (Zr)-Dissolved	<0.00030		0.00030	mg/L	24-SEP-18	25-SEP-18	R4241171
Volatile Organic Compounds							
Acetone	<20	OWP	20	ug/L		27-SEP-18	R4246311
Benzene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
Bromodichloromethane	<1.0	OWP	1.0	ug/L		27-SEP-18	R4246311
Bromoform	<1.0	OWP	1.0	ug/L		27-SEP-18	R4246311
Bromomethane	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
Carbon Disulfide	<1.0	OWP	1.0	ug/L		27-SEP-18	R4246311
Carbon tetrachloride	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
Chlorobenzene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
Dibromochloromethane	<1.0	OWP	1.0	ug/L		27-SEP-18	R4246311
Chloroethane	<1.0	OWP	1.0	ug/L		27-SEP-18	R4246311
Chloroform	<1.0	OWP	1.0	ug/L		27-SEP-18	R4246311

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-10 MW9 Sampled By: CLIENT on 20-SEP-18 @ 13:05 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0	OWP	1.0	ug/L		27-SEP-18	R4246311
1,2-Dibromoethane	<0.20	OWP	0.20	ug/L		27-SEP-18	R4246311
1,2-Dichlorobenzene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
1,3-Dichlorobenzene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
1,4-Dichlorobenzene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
Dichlorodifluoromethane	<1.0	OWP	1.0	ug/L		27-SEP-18	R4246311
1,1-Dichloroethane	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
1,2-Dichloroethane	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
1,1-Dichloroethylene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
cis-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
trans-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
Dichloromethane	<2.0	OWP	2.0	ug/L		27-SEP-18	R4246311
1,2-Dichloropropane	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
cis-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
trans-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
Ethylbenzene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
n-Hexane	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
2-Hexanone	<20	OWP	20	ug/L		27-SEP-18	R4246311
Methyl Ethyl Ketone	<20	OWP	20	ug/L		27-SEP-18	R4246311
Methyl Isobutyl Ketone	<20	OWP	20	ug/L		27-SEP-18	R4246311
MTBE	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
Styrene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
1,1,1,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
1,1,1,2,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
Tetrachloroethylene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
Toluene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
1,1,1-Trichloroethane	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
1,1,2-Trichloroethane	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
Trichloroethylene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
Trichlorofluoromethane	<1.0	OWP	1.0	ug/L		27-SEP-18	R4246311
Vinyl chloride	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
o-Xylene	<0.50	OWP	0.50	ug/L		27-SEP-18	R4246311
m+p-Xylenes	<1.0	OWP	1.0	ug/L		27-SEP-18	R4246311
Xylenes (Total)	<1.1		1.1	ug/L		27-SEP-18	
Surrogate: 4-Bromofluorobenzene	97.1		70-130	%		27-SEP-18	R4246311
Surrogate: 1,4-Difluorobenzene	100.0		70-130	%		27-SEP-18	R4246311
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		27-SEP-18	
L2168446-11 MW10 Sampled By: CLIENT on 20-SEP-18 @ 14:40 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-11 MW10							
Sampled By: CLIENT on 20-SEP-18 @ 14:40							
Matrix: WATER							
Physical Tests							
Colour, Apparent	14.9		2.0	CU		22-SEP-18	R4234010
Conductivity	645		3.0	umhos/cm		21-SEP-18	R4233548
pH	7.64		0.10	pH units		21-SEP-18	R4233548
Total Dissolved Solids	425	DLDS	20	mg/L		25-SEP-18	R4238987
Turbidity	229		0.10	NTU		22-SEP-18	R4233250
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	274		10	mg/L		25-SEP-18	R4239385
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Total (as CaCO3)	274		10	mg/L		25-SEP-18	R4239385
Ammonia, Total (as N)	0.067		0.020	mg/L		02-OCT-18	R4258044
Bromide (Br)	<0.10		0.10	mg/L		25-SEP-18	R4243635
Chloride (Cl)	15.1		0.50	mg/L		25-SEP-18	R4243635
Computed Conductivity	606			uS/cm		26-SEP-18	
Conductivity % Difference	-6.1			%		26-SEP-18	
Fluoride (F)	0.077		0.020	mg/L		25-SEP-18	R4243635
Hardness (as CaCO3)	356			mg/L		26-SEP-18	
Ion Balance	122			%		26-SEP-18	
Langelier Index	0.7					26-SEP-18	
Nitrate and Nitrite as N	<0.022		0.022	mg/L		26-SEP-18	
Nitrate (as N)	<0.020		0.020	mg/L		25-SEP-18	R4243635
Nitrite (as N)	<0.010		0.010	mg/L		25-SEP-18	R4243635
Total Kjeldahl Nitrogen	<0.15		0.15	mg/L	24-SEP-18	26-SEP-18	R4244367
Saturation pH	6.96			pH		26-SEP-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		25-SEP-18	R4242191
Phosphorus, Total	0.0905		0.0030	mg/L	25-SEP-18	27-SEP-18	R4245151
TDS (Calculated)	370			mg/L		26-SEP-18	
Sulfate (SO4)	52.8		0.30	mg/L		25-SEP-18	R4243635
Anion Sum	6.04			me/L		26-SEP-18	
Cation Sum	7.36			me/L		26-SEP-18	
Cation - Anion Balance	9.8			%		26-SEP-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	3.69		0.50	mg/L		23-SEP-18	R4238089
Inorganic Parameters							
Silica	9.97		0.11	mg/L		26-SEP-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4236625
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	24-SEP-18	25-SEP-18	R4241171
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Arsenic (As)-Dissolved	0.00100		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Barium (Ba)-Dissolved	0.0751		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-11 MW10							
Sampled By: CLIENT on 20-SEP-18 @ 14:40							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Boron (B)-Dissolved	0.021		0.010	mg/L	24-SEP-18	25-SEP-18	R4241171
Cadmium (Cd)-Dissolved	<0.000010		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Calcium (Ca)-Dissolved	114		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Cobalt (Co)-Dissolved	0.00099		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Copper (Cu)-Dissolved	0.00056		0.00020	mg/L	24-SEP-18	25-SEP-18	R4241171
Iron (Fe)-Dissolved	0.690		0.010	mg/L	24-SEP-18	25-SEP-18	R4241171
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Magnesium (Mg)-Dissolved	17.4		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Manganese (Mn)-Dissolved	0.161		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Molybdenum (Mo)-Dissolved	0.00200		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Nickel (Ni)-Dissolved	0.00133		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Potassium (K)-Dissolved	1.20		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Selenium (Se)-Dissolved	0.000096		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Silicon (Si)-Dissolved	4.66		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Silver (Ag)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Sodium (Na)-Dissolved	4.98		0.50	mg/L	24-SEP-18	25-SEP-18	R4241171
Strontium (Sr)-Dissolved	0.320		0.0010	mg/L	24-SEP-18	25-SEP-18	R4241171
Sulfur (S)-Dissolved	17.3		5.0	mg/L	24-SEP-18	25-SEP-18	R4241171
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	24-SEP-18	25-SEP-18	R4241171
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Uranium (U)-Dissolved	0.000947		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Zinc (Zn)-Dissolved	0.0056		0.0010	mg/L	24-SEP-18	25-SEP-18	R4241171
Zirconium (Zr)-Dissolved	<0.00030		0.00030	mg/L	24-SEP-18	25-SEP-18	R4241171
Volatile Organic Compounds							
Acetone	<20		20	ug/L		27-SEP-18	R4246311
Benzene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Bromodichloromethane	<1.0		1.0	ug/L		27-SEP-18	R4246311
Bromoform	<1.0		1.0	ug/L		27-SEP-18	R4246311
Bromomethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
Carbon Disulfide	<1.0		1.0	ug/L		27-SEP-18	R4246311
Carbon tetrachloride	<0.50		0.50	ug/L		27-SEP-18	R4246311
Chlorobenzene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Dibromochloromethane	<1.0		1.0	ug/L		27-SEP-18	R4246311
Chloroethane	<1.0		1.0	ug/L		27-SEP-18	R4246311
Chloroform	<1.0		1.0	ug/L		27-SEP-18	R4246311

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-11 MW10 Sampled By: CLIENT on 20-SEP-18 @ 14:40 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0		1.0	ug/L		27-SEP-18	R4246311
1,2-Dibromoethane	<0.20		0.20	ug/L		27-SEP-18	R4246311
1,2-Dichlorobenzene	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,3-Dichlorobenzene	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,4-Dichlorobenzene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Dichlorodifluoromethane	<1.0		1.0	ug/L		27-SEP-18	R4246311
1,1-Dichloroethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,2-Dichloroethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,1-Dichloroethylene	<0.50		0.50	ug/L		27-SEP-18	R4246311
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		27-SEP-18	R4246311
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Dichloromethane	<2.0		2.0	ug/L		27-SEP-18	R4246311
1,2-Dichloropropane	<0.50		0.50	ug/L		27-SEP-18	R4246311
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		27-SEP-18	R4246311
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Ethylbenzene	<0.50		0.50	ug/L		27-SEP-18	R4246311
n-Hexane	<0.50		0.50	ug/L		27-SEP-18	R4246311
2-Hexanone	<20		20	ug/L		27-SEP-18	R4246311
Methyl Ethyl Ketone	<20		20	ug/L		27-SEP-18	R4246311
Methyl Isobutyl Ketone	<20		20	ug/L		27-SEP-18	R4246311
MTBE	<0.50		0.50	ug/L		27-SEP-18	R4246311
Styrene	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
Tetrachloroethylene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Toluene	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,1,1-Trichloroethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,1,2-Trichloroethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
Trichloroethylene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Trichlorofluoromethane	<1.0		1.0	ug/L		27-SEP-18	R4246311
Vinyl chloride	<0.50		0.50	ug/L		27-SEP-18	R4246311
o-Xylene	<0.50		0.50	ug/L		27-SEP-18	R4246311
m+p-Xylenes	<1.0		1.0	ug/L		27-SEP-18	R4246311
Xylenes (Total)	<1.1		1.1	ug/L		27-SEP-18	
Surrogate: 4-Bromofluorobenzene	95.1		70-130	%		27-SEP-18	R4246311
Surrogate: 1,4-Difluorobenzene	100.0		70-130	%		27-SEP-18	R4246311
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		27-SEP-18	
L2168446-12 MW11 Sampled By: CLIENT on 20-SEP-18 @ 15:45 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-12 MW11							
Sampled By: CLIENT on 20-SEP-18 @ 15:45							
Matrix: WATER							
Physical Tests							
Colour, Apparent	58.1		2.0	CU		22-SEP-18	R4234010
Conductivity	2760		3.0	umhos/cm		21-SEP-18	R4233548
pH	7.39		0.10	pH units		21-SEP-18	R4233548
Total Dissolved Solids	1930	DLDS	20	mg/L		25-SEP-18	R4238987
Turbidity	8.67		0.10	NTU		22-SEP-18	R4233250
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	950		10	mg/L		25-SEP-18	R4239385
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Total (as CaCO3)	950	DLHC	20	mg/L		25-SEP-18	R4239385
Ammonia, Total (as N)	11.1	DLHC	0.40	mg/L		01-OCT-18	R4254350
Bromide (Br)	1.27	DLDS	0.50	mg/L		25-SEP-18	R4243635
Chloride (Cl)	335	DLDS	2.5	mg/L		25-SEP-18	R4243635
Computed Conductivity	2510			uS/cm		26-SEP-18	
Conductivity % Difference	-9.7			%		26-SEP-18	
Fluoride (F)	<0.10	DLDS	0.10	mg/L		25-SEP-18	R4243635
Hardness (as CaCO3)	995			mg/L		26-SEP-18	
Ion Balance	114			%		26-SEP-18	
Langelier Index	1.2					26-SEP-18	
Nitrate and Nitrite as N	0.75		0.11	mg/L		26-SEP-18	
Nitrate (as N)	0.75	DLDS	0.10	mg/L		25-SEP-18	R4243635
Nitrite (as N)	<0.050	DLDS	0.050	mg/L		25-SEP-18	R4243635
Total Kjeldahl Nitrogen	17.2	DLHC	0.30	mg/L	24-SEP-18	26-SEP-18	R4244367
Saturation pH	6.16			pH		26-SEP-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		25-SEP-18	R4242191
Phosphorus, Total	0.0358		0.0030	mg/L	25-SEP-18	27-SEP-18	R4245151
TDS (Calculated)	1820			mg/L		26-SEP-18	
Sulfate (SO4)	200	DLDS	1.5	mg/L		25-SEP-18	R4243635
Anion Sum	29.3			me/L		26-SEP-18	
Cation Sum	33.5			me/L		26-SEP-18	
Cation - Anion Balance	6.7			%		26-SEP-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	46.9		0.50	mg/L		23-SEP-18	R4238089
Inorganic Parameters							
Silica	20.1		1.1	mg/L		26-SEP-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4236625
Aluminum (Al)-Dissolved	<0.050	DLHC	0.050	mg/L	24-SEP-18	24-SEP-18	R4241171
Antimony (Sb)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Arsenic (As)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Barium (Ba)-Dissolved	0.0873	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Beryllium (Be)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-12 MW11							
Sampled By: CLIENT on 20-SEP-18 @ 15:45							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.00050	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Boron (B)-Dissolved	5.81	DLHC	0.10	mg/L	24-SEP-18	24-SEP-18	R4241171
Cadmium (Cd)-Dissolved	0.000124	DLHC	0.000050	mg/L	24-SEP-18	24-SEP-18	R4241171
Calcium (Ca)-Dissolved	313	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Chromium (Cr)-Dissolved	<0.0050	DLHC	0.0050	mg/L	24-SEP-18	24-SEP-18	R4241171
Cobalt (Co)-Dissolved	0.0117	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Copper (Cu)-Dissolved	0.0254	DLHC	0.0020	mg/L	24-SEP-18	24-SEP-18	R4241171
Iron (Fe)-Dissolved	<0.10	DLHC	0.10	mg/L	24-SEP-18	24-SEP-18	R4241171
Lead (Pb)-Dissolved	0.00064	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Magnesium (Mg)-Dissolved	51.8	DLHC	0.050	mg/L	24-SEP-18	24-SEP-18	R4241171
Manganese (Mn)-Dissolved	1.38	DLHC	0.0050	mg/L	24-SEP-18	24-SEP-18	R4241171
Molybdenum (Mo)-Dissolved	0.00153	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Nickel (Ni)-Dissolved	0.0438	DLHC	0.0050	mg/L	24-SEP-18	24-SEP-18	R4241171
Phosphorus (P)-Dissolved	<0.50	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Potassium (K)-Dissolved	69.8	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Selenium (Se)-Dissolved	0.00087	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Silicon (Si)-Dissolved	9.38	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Silver (Ag)-Dissolved	<0.00050	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Sodium (Na)-Dissolved	272	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Strontium (Sr)-Dissolved	1.06	DLHC	0.010	mg/L	24-SEP-18	24-SEP-18	R4241171
Sulfur (S)-Dissolved	65.0	DLHC	5.0	mg/L	24-SEP-18	24-SEP-18	R4241171
Thallium (Tl)-Dissolved	0.00038	DLHC	0.00010	mg/L	24-SEP-18	24-SEP-18	R4241171
Tin (Sn)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Titanium (Ti)-Dissolved	<0.0030	DLHC	0.0030	mg/L	24-SEP-18	24-SEP-18	R4241171
Tungsten (W)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Uranium (U)-Dissolved	0.00264	DLHC	0.00010	mg/L	24-SEP-18	24-SEP-18	R4241171
Vanadium (V)-Dissolved	<0.0050	DLHC	0.0050	mg/L	24-SEP-18	24-SEP-18	R4241171
Zinc (Zn)-Dissolved	<0.010	DLHC	0.010	mg/L	24-SEP-18	24-SEP-18	R4241171
Zirconium (Zr)-Dissolved	<0.0030	DLHC	0.0030	mg/L	24-SEP-18	24-SEP-18	R4241171
Volatile Organic Compounds							
Acetone	<20		20	ug/L		27-SEP-18	R4246311
Benzene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Bromodichloromethane	<1.0		1.0	ug/L		27-SEP-18	R4246311
Bromoform	<1.0		1.0	ug/L		27-SEP-18	R4246311
Bromomethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
Carbon Disulfide	<1.0		1.0	ug/L		27-SEP-18	R4246311
Carbon tetrachloride	<0.50		0.50	ug/L		27-SEP-18	R4246311
Chlorobenzene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Dibromochloromethane	<1.0		1.0	ug/L		27-SEP-18	R4246311
Chloroethane	<1.0		1.0	ug/L		27-SEP-18	R4246311
Chloroform	<1.0		1.0	ug/L		27-SEP-18	R4246311

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-12 MW11 Sampled By: CLIENT on 20-SEP-18 @ 15:45 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0		1.0	ug/L		27-SEP-18	R4246311
1,2-Dibromoethane	<0.20		0.20	ug/L		27-SEP-18	R4246311
1,2-Dichlorobenzene	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,3-Dichlorobenzene	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,4-Dichlorobenzene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Dichlorodifluoromethane	<1.0		1.0	ug/L		27-SEP-18	R4246311
1,1-Dichloroethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,2-Dichloroethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,1-Dichloroethylene	<0.50		0.50	ug/L		27-SEP-18	R4246311
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		27-SEP-18	R4246311
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Dichloromethane	<2.0		2.0	ug/L		27-SEP-18	R4246311
1,2-Dichloropropane	<0.50		0.50	ug/L		27-SEP-18	R4246311
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		27-SEP-18	R4246311
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Ethylbenzene	<0.50		0.50	ug/L		27-SEP-18	R4246311
n-Hexane	<0.50		0.50	ug/L		27-SEP-18	R4246311
2-Hexanone	<20		20	ug/L		27-SEP-18	R4246311
Methyl Ethyl Ketone	<20		20	ug/L		27-SEP-18	R4246311
Methyl Isobutyl Ketone	<20		20	ug/L		27-SEP-18	R4246311
MTBE	<0.50		0.50	ug/L		27-SEP-18	R4246311
Styrene	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
Tetrachloroethylene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Toluene	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,1,1-Trichloroethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,1,2-Trichloroethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
Trichloroethylene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Trichlorofluoromethane	<1.0		1.0	ug/L		27-SEP-18	R4246311
Vinyl chloride	<0.50		0.50	ug/L		27-SEP-18	R4246311
o-Xylene	<0.50		0.50	ug/L		27-SEP-18	R4246311
m+p-Xylenes	<1.0		1.0	ug/L		27-SEP-18	R4246311
Xylenes (Total)	<1.1		1.1	ug/L		27-SEP-18	
Surrogate: 4-Bromofluorobenzene	97.7		70-130	%		27-SEP-18	R4246311
Surrogate: 1,4-Difluorobenzene	99.8		70-130	%		27-SEP-18	R4246311
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		27-SEP-18	
L2168446-13 MW12 Sampled By: CLIENT on 20-SEP-18 @ 12:30 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-13 MW12							
Sampled By: CLIENT on 20-SEP-18 @ 12:30							
Matrix: WATER							
Physical Tests							
Colour, Apparent	25.7		2.0	CU		22-SEP-18	R4234010
Conductivity	744		3.0	umhos/cm		21-SEP-18	R4233548
pH	7.68		0.10	pH units		21-SEP-18	R4233548
Total Dissolved Solids	577	DLDS	20	mg/L		25-SEP-18	R4238987
Turbidity	1140		0.10	NTU		22-SEP-18	R4233250
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	272		10	mg/L		25-SEP-18	R4239385
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Total (as CaCO3)	272		10	mg/L		25-SEP-18	R4239385
Ammonia, Total (as N)	0.119		0.020	mg/L		01-OCT-18	R4254350
Bromide (Br)	0.24		0.10	mg/L		25-SEP-18	R4243635
Chloride (Cl)	48.4		0.50	mg/L		25-SEP-18	R4243635
Computed Conductivity	715			uS/cm		26-SEP-18	
Conductivity % Difference	-3.9			%		26-SEP-18	
Fluoride (F)	0.104		0.020	mg/L		25-SEP-18	R4243635
Hardness (as CaCO3)	393			mg/L		26-SEP-18	
Ion Balance	119			%		26-SEP-18	
Langelier Index	0.8					26-SEP-18	
Nitrate and Nitrite as N	0.6		0.022	mg/L		26-SEP-18	
Nitrate (as N)	0.600		0.020	mg/L		25-SEP-18	R4243635
Nitrite (as N)	<0.010		0.010	mg/L		25-SEP-18	R4243635
Total Kjeldahl Nitrogen	0.38		0.15	mg/L	24-SEP-18	26-SEP-18	R4244367
Saturation pH	6.91			pH		26-SEP-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		25-SEP-18	R4242191
Phosphorus, Total	0.679		0.0030	mg/L	25-SEP-18	27-SEP-18	R4245151
TDS (Calculated)	434			mg/L		26-SEP-18	
Sulfate (SO4)	57.4		0.30	mg/L		25-SEP-18	R4243635
Anion Sum	7.08			me/L		26-SEP-18	
Cation Sum	8.45			me/L		26-SEP-18	
Cation - Anion Balance	8.8			%		26-SEP-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	8.28		0.50	mg/L		23-SEP-18	R4238089
Inorganic Parameters							
Silica	9.59		0.11	mg/L		26-SEP-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4236625
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	24-SEP-18	25-SEP-18	R4241171
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Arsenic (As)-Dissolved	0.00012		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Barium (Ba)-Dissolved	0.0886		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-13 MW12							
Sampled By: CLIENT on 20-SEP-18 @ 12:30							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Boron (B)-Dissolved	0.053		0.010	mg/L	24-SEP-18	25-SEP-18	R4241171
Cadmium (Cd)-Dissolved	0.000011		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Calcium (Ca)-Dissolved	132		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Cobalt (Co)-Dissolved	0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Copper (Cu)-Dissolved	0.00131		0.00020	mg/L	24-SEP-18	25-SEP-18	R4241171
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	24-SEP-18	25-SEP-18	R4241171
Lead (Pb)-Dissolved	0.000052		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Magnesium (Mg)-Dissolved	15.2		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Manganese (Mn)-Dissolved	0.0110		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Molybdenum (Mo)-Dissolved	0.00118		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Nickel (Ni)-Dissolved	0.00069		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Potassium (K)-Dissolved	3.95		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Selenium (Se)-Dissolved	0.000062		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Silicon (Si)-Dissolved	4.48		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Silver (Ag)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Sodium (Na)-Dissolved	11.4		0.50	mg/L	24-SEP-18	25-SEP-18	R4241171
Strontium (Sr)-Dissolved	0.266		0.0010	mg/L	24-SEP-18	25-SEP-18	R4241171
Sulfur (S)-Dissolved	18.5		5.0	mg/L	24-SEP-18	25-SEP-18	R4241171
Thallium (Tl)-Dissolved	0.000040		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	24-SEP-18	25-SEP-18	R4241171
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Uranium (U)-Dissolved	0.000898		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Zinc (Zn)-Dissolved	0.0033		0.0010	mg/L	24-SEP-18	25-SEP-18	R4241171
Zirconium (Zr)-Dissolved	<0.00030		0.00030	mg/L	24-SEP-18	25-SEP-18	R4241171
Volatile Organic Compounds							
Acetone	<20		20	ug/L		27-SEP-18	R4246311
Benzene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Bromodichloromethane	<1.0		1.0	ug/L		27-SEP-18	R4246311
Bromoform	<1.0		1.0	ug/L		27-SEP-18	R4246311
Bromomethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
Carbon Disulfide	<1.0		1.0	ug/L		27-SEP-18	R4246311
Carbon tetrachloride	<0.50		0.50	ug/L		27-SEP-18	R4246311
Chlorobenzene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Dibromochloromethane	<1.0		1.0	ug/L		27-SEP-18	R4246311
Chloroethane	<1.0		1.0	ug/L		27-SEP-18	R4246311
Chloroform	<1.0		1.0	ug/L		27-SEP-18	R4246311

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-13 MW12 Sampled By: CLIENT on 20-SEP-18 @ 12:30 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0		1.0	ug/L		27-SEP-18	R4246311
1,2-Dibromoethane	<0.20		0.20	ug/L		27-SEP-18	R4246311
1,2-Dichlorobenzene	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,3-Dichlorobenzene	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,4-Dichlorobenzene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Dichlorodifluoromethane	<1.0		1.0	ug/L		27-SEP-18	R4246311
1,1-Dichloroethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,2-Dichloroethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,1-Dichloroethylene	<0.50		0.50	ug/L		27-SEP-18	R4246311
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		27-SEP-18	R4246311
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Dichloromethane	<2.0		2.0	ug/L		27-SEP-18	R4246311
1,2-Dichloropropane	<0.50		0.50	ug/L		27-SEP-18	R4246311
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		27-SEP-18	R4246311
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Ethylbenzene	<0.50		0.50	ug/L		27-SEP-18	R4246311
n-Hexane	<0.50		0.50	ug/L		27-SEP-18	R4246311
2-Hexanone	<20		20	ug/L		27-SEP-18	R4246311
Methyl Ethyl Ketone	<20		20	ug/L		27-SEP-18	R4246311
Methyl Isobutyl Ketone	<20		20	ug/L		27-SEP-18	R4246311
MTBE	<0.50		0.50	ug/L		27-SEP-18	R4246311
Styrene	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
Tetrachloroethylene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Toluene	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,1,1-Trichloroethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,1,2-Trichloroethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
Trichloroethylene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Trichlorofluoromethane	<1.0		1.0	ug/L		27-SEP-18	R4246311
Vinyl chloride	<0.50		0.50	ug/L		27-SEP-18	R4246311
o-Xylene	<0.50		0.50	ug/L		27-SEP-18	R4246311
m+p-Xylenes	<1.0		1.0	ug/L		27-SEP-18	R4246311
Xylenes (Total)	<1.1		1.1	ug/L		27-SEP-18	
Surrogate: 4-Bromofluorobenzene	95.6		70-130	%		27-SEP-18	R4246311
Surrogate: 1,4-Difluorobenzene	98.5		70-130	%		27-SEP-18	R4246311
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		27-SEP-18	
L2168446-14 MW14-R Sampled By: CLIENT on 20-SEP-18 @ 16:05 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-14 MW14-R							
Sampled By: CLIENT on 20-SEP-18 @ 16:05							
Matrix: WATER							
Physical Tests							
Colour, Apparent	27.5		2.0	CU		22-SEP-18	R4234010
Conductivity	713		3.0	umhos/cm		21-SEP-18	R4233548
pH	7.78		0.10	pH units		21-SEP-18	R4233548
Total Dissolved Solids	441	DLDS	20	mg/L		26-SEP-18	R4246199
Turbidity	276		0.10	NTU		22-SEP-18	R4233250
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	365		10	mg/L		25-SEP-18	R4239385
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Total (as CaCO3)	365		10	mg/L		25-SEP-18	R4239385
Ammonia, Total (as N)	0.060		0.020	mg/L		01-OCT-18	R4254350
Bromide (Br)	<0.10		0.10	mg/L		25-SEP-18	R4243635
Chloride (Cl)	4.16		0.50	mg/L		25-SEP-18	R4243635
Computed Conductivity	621			uS/cm		27-SEP-18	
Conductivity % Difference	-13.7			%		27-SEP-18	
Fluoride (F)	0.084		0.020	mg/L		25-SEP-18	R4243635
Hardness (as CaCO3)	353			mg/L		27-SEP-18	
Ion Balance	110			%		27-SEP-18	
Langelier Index	0.9					27-SEP-18	
Nitrate and Nitrite as N	<0.022		0.022	mg/L		26-SEP-18	
Nitrate (as N)	<0.020		0.020	mg/L		25-SEP-18	R4243635
Nitrite (as N)	<0.010		0.010	mg/L		25-SEP-18	R4243635
Total Kjeldahl Nitrogen	<0.15		0.15	mg/L	24-SEP-18	26-SEP-18	R4244367
Saturation pH	6.87			pH		27-SEP-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		25-SEP-18	R4242191
Phosphorus, Total	0.0868		0.0030	mg/L	25-SEP-18	27-SEP-18	R4245151
TDS (Calculated)	397			mg/L		27-SEP-18	
Sulfate (SO4)	34.0		0.30	mg/L		25-SEP-18	R4243635
Anion Sum	6.84			me/L		27-SEP-18	
Cation Sum	7.53			me/L		27-SEP-18	
Cation - Anion Balance	4.8			%		27-SEP-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	5.05		0.50	mg/L		23-SEP-18	R4238089
Inorganic Parameters							
Silica	14.7		0.11	mg/L		26-SEP-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4236625
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	24-SEP-18	25-SEP-18	R4241171
Antimony (Sb)-Dissolved	0.00016		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Arsenic (As)-Dissolved	0.00307		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Barium (Ba)-Dissolved	0.257		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-14 MW14-R							
Sampled By: CLIENT on 20-SEP-18 @ 16:05							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Boron (B)-Dissolved	0.059		0.010	mg/L	24-SEP-18	25-SEP-18	R4241171
Cadmium (Cd)-Dissolved	0.000012		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Calcium (Ca)-Dissolved	107		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Cobalt (Co)-Dissolved	0.00193		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Copper (Cu)-Dissolved	0.00140		0.00020	mg/L	24-SEP-18	25-SEP-18	R4241171
Iron (Fe)-Dissolved	0.082		0.010	mg/L	24-SEP-18	25-SEP-18	R4241171
Lead (Pb)-Dissolved	0.000083		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Magnesium (Mg)-Dissolved	21.0		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Manganese (Mn)-Dissolved	0.794		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Molybdenum (Mo)-Dissolved	0.00399		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Nickel (Ni)-Dissolved	0.00475		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Potassium (K)-Dissolved	2.98		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Silicon (Si)-Dissolved	6.86		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Silver (Ag)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Sodium (Na)-Dissolved	9.04		0.50	mg/L	24-SEP-18	25-SEP-18	R4241171
Strontium (Sr)-Dissolved	0.856		0.0010	mg/L	24-SEP-18	25-SEP-18	R4241171
Sulfur (S)-Dissolved	8.7		5.0	mg/L	24-SEP-18	25-SEP-18	R4241171
Thallium (Tl)-Dissolved	0.000050		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Tin (Sn)-Dissolved	0.00031		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	24-SEP-18	25-SEP-18	R4241171
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Uranium (U)-Dissolved	0.00257		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Zinc (Zn)-Dissolved	0.0034		0.0010	mg/L	24-SEP-18	25-SEP-18	R4241171
Zirconium (Zr)-Dissolved	<0.00030		0.00030	mg/L	24-SEP-18	25-SEP-18	R4241171
Volatile Organic Compounds							
Acetone	<20		20	ug/L		27-SEP-18	R4246311
Benzene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Bromodichloromethane	<1.0		1.0	ug/L		27-SEP-18	R4246311
Bromoform	<1.0		1.0	ug/L		27-SEP-18	R4246311
Bromomethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
Carbon Disulfide	<1.0		1.0	ug/L		27-SEP-18	R4246311
Carbon tetrachloride	<0.50		0.50	ug/L		27-SEP-18	R4246311
Chlorobenzene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Dibromochloromethane	<1.0		1.0	ug/L		27-SEP-18	R4246311
Chloroethane	<1.0		1.0	ug/L		27-SEP-18	R4246311
Chloroform	<1.0		1.0	ug/L		27-SEP-18	R4246311

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-14 MW14-R Sampled By: CLIENT on 20-SEP-18 @ 16:05 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0		1.0	ug/L		27-SEP-18	R4246311
1,2-Dibromoethane	<0.20		0.20	ug/L		27-SEP-18	R4246311
1,2-Dichlorobenzene	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,3-Dichlorobenzene	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,4-Dichlorobenzene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Dichlorodifluoromethane	<1.0		1.0	ug/L		27-SEP-18	R4246311
1,1-Dichloroethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,2-Dichloroethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,1-Dichloroethylene	<0.50		0.50	ug/L		27-SEP-18	R4246311
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		27-SEP-18	R4246311
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Dichloromethane	<2.0		2.0	ug/L		27-SEP-18	R4246311
1,2-Dichloropropane	<0.50		0.50	ug/L		27-SEP-18	R4246311
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		27-SEP-18	R4246311
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Ethylbenzene	<0.50		0.50	ug/L		27-SEP-18	R4246311
n-Hexane	<0.50		0.50	ug/L		27-SEP-18	R4246311
2-Hexanone	<20		20	ug/L		27-SEP-18	R4246311
Methyl Ethyl Ketone	<20		20	ug/L		27-SEP-18	R4246311
Methyl Isobutyl Ketone	<20		20	ug/L		27-SEP-18	R4246311
MTBE	<0.50		0.50	ug/L		27-SEP-18	R4246311
Styrene	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
Tetrachloroethylene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Toluene	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,1,1-Trichloroethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
1,1,2-Trichloroethane	<0.50		0.50	ug/L		27-SEP-18	R4246311
Trichloroethylene	<0.50		0.50	ug/L		27-SEP-18	R4246311
Trichlorofluoromethane	<1.0		1.0	ug/L		27-SEP-18	R4246311
Vinyl chloride	<0.50		0.50	ug/L		27-SEP-18	R4246311
o-Xylene	<0.50		0.50	ug/L		27-SEP-18	R4246311
m+p-Xylenes	<1.0		1.0	ug/L		27-SEP-18	R4246311
Xylenes (Total)	<1.1		1.1	ug/L		27-SEP-18	
Surrogate: 4-Bromofluorobenzene	95.5		70-130	%		27-SEP-18	R4246311
Surrogate: 1,4-Difluorobenzene	99.8		70-130	%		27-SEP-18	R4246311
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		27-SEP-18	
L2168446-15 MW15 Sampled By: CLIENT on 20-SEP-18 @ 11:35 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-15 MW15							
Sampled By: CLIENT on 20-SEP-18 @ 11:35							
Matrix: WATER							
Physical Tests							
Colour, Apparent	30.2		2.0	CU		22-SEP-18	R4234010
Conductivity	2100		3.0	umhos/cm		21-SEP-18	R4233548
pH	7.61		0.10	pH units		21-SEP-18	R4233548
Total Dissolved Solids	1240	DLDS	20	mg/L		25-SEP-18	R4239047
Turbidity	89.0		0.10	NTU		22-SEP-18	R4233250
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	681		10	mg/L		25-SEP-18	R4239385
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Total (as CaCO3)	681	DLHC	20	mg/L		25-SEP-18	R4239385
Ammonia, Total (as N)	35.4	DLHC	2.0	mg/L		01-OCT-18	R4254350
Bromide (Br)	1.83	DLDS	0.50	mg/L		25-SEP-18	R4243635
Chloride (Cl)	278	DLDS	2.5	mg/L		25-SEP-18	R4243635
Computed Conductivity	1730			uS/cm		26-SEP-18	
Conductivity % Difference	-19.2			%		26-SEP-18	
Fluoride (F)	<0.10	DLDS	0.10	mg/L		25-SEP-18	R4243635
Hardness (as CaCO3)	729			mg/L		26-SEP-18	
Ion Balance	110			%		26-SEP-18	
Langelier Index	1.2					26-SEP-18	
Nitrate and Nitrite as N	3.58		0.11	mg/L		26-SEP-18	
Nitrate (as N)	3.58	DLDS	0.10	mg/L		25-SEP-18	R4243635
Nitrite (as N)	<0.050	DLDS	0.050	mg/L		25-SEP-18	R4243635
Total Kjeldahl Nitrogen	55	DLHC	15	mg/L	24-SEP-18	26-SEP-18	R4244367
Saturation pH	6.40			pH		26-SEP-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		25-SEP-18	R4242191
Phosphorus, Total	0.337		0.0030	mg/L	25-SEP-18	27-SEP-18	R4245151
TDS (Calculated)	1160			mg/L		26-SEP-18	
Sulfate (SO4)	5.6	DLDS	1.5	mg/L		25-SEP-18	R4243635
Anion Sum	19.4			me/L		26-SEP-18	
Cation Sum	21.4			me/L		26-SEP-18	
Cation - Anion Balance	4.8			%		26-SEP-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	23.5		0.50	mg/L		23-SEP-18	R4238089
Inorganic Parameters							
Silica	28.9		1.1	mg/L		26-SEP-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4236625
Aluminum (Al)-Dissolved	<0.050	DLHC	0.050	mg/L	24-SEP-18	24-SEP-18	R4241171
Antimony (Sb)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Arsenic (As)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Barium (Ba)-Dissolved	1.13	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Beryllium (Be)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-15 MW15							
Sampled By: CLIENT on 20-SEP-18 @ 11:35							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.00050	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Boron (B)-Dissolved	0.91	DLHC	0.10	mg/L	24-SEP-18	24-SEP-18	R4241171
Cadmium (Cd)-Dissolved	0.000066	DLHC	0.000050	mg/L	24-SEP-18	24-SEP-18	R4241171
Calcium (Ca)-Dissolved	214	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Chromium (Cr)-Dissolved	<0.0050	DLHC	0.0050	mg/L	24-SEP-18	24-SEP-18	R4241171
Cobalt (Co)-Dissolved	0.0042	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Copper (Cu)-Dissolved	0.0164	DLHC	0.0020	mg/L	24-SEP-18	24-SEP-18	R4241171
Iron (Fe)-Dissolved	0.25	DLHC	0.10	mg/L	24-SEP-18	24-SEP-18	R4241171
Lead (Pb)-Dissolved	<0.00050	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Magnesium (Mg)-Dissolved	47.6	DLHC	0.050	mg/L	24-SEP-18	24-SEP-18	R4241171
Manganese (Mn)-Dissolved	1.22	DLHC	0.0050	mg/L	24-SEP-18	24-SEP-18	R4241171
Molybdenum (Mo)-Dissolved	0.00165	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Nickel (Ni)-Dissolved	0.0159	DLHC	0.0050	mg/L	24-SEP-18	24-SEP-18	R4241171
Phosphorus (P)-Dissolved	<0.50	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Potassium (K)-Dissolved	88.8	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Selenium (Se)-Dissolved	<0.00050	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Silicon (Si)-Dissolved	13.5	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Silver (Ag)-Dissolved	<0.00050	DLHC	0.00050	mg/L	24-SEP-18	24-SEP-18	R4241171
Sodium (Na)-Dissolved	105	DLHC	0.50	mg/L	24-SEP-18	24-SEP-18	R4241171
Strontium (Sr)-Dissolved	1.45	DLHC	0.010	mg/L	24-SEP-18	24-SEP-18	R4241171
Sulfur (S)-Dissolved	<5.0	DLHC	5.0	mg/L	24-SEP-18	24-SEP-18	R4241171
Thallium (Tl)-Dissolved	0.00014	DLHC	0.00010	mg/L	24-SEP-18	24-SEP-18	R4241171
Tin (Sn)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Titanium (Ti)-Dissolved	<0.0030	DLHC	0.0030	mg/L	24-SEP-18	24-SEP-18	R4241171
Tungsten (W)-Dissolved	<0.0010	DLHC	0.0010	mg/L	24-SEP-18	24-SEP-18	R4241171
Uranium (U)-Dissolved	0.00018	DLHC	0.00010	mg/L	24-SEP-18	24-SEP-18	R4241171
Vanadium (V)-Dissolved	<0.0050	DLHC	0.0050	mg/L	24-SEP-18	24-SEP-18	R4241171
Zinc (Zn)-Dissolved	0.087	DLHC	0.010	mg/L	24-SEP-18	24-SEP-18	R4241171
Zirconium (Zr)-Dissolved	<0.0030	DLHC	0.0030	mg/L	24-SEP-18	24-SEP-18	R4241171
Volatile Organic Compounds							
Acetone	<20		20	ug/L		24-SEP-18	R4235008
Benzene	<0.50		0.50	ug/L		24-SEP-18	R4235008
Bromodichloromethane	<1.0		1.0	ug/L		24-SEP-18	R4235008
Bromoform	<1.0		1.0	ug/L		24-SEP-18	R4235008
Bromomethane	<0.50		0.50	ug/L		24-SEP-18	R4235008
Carbon Disulfide	<1.0		1.0	ug/L		24-SEP-18	R4235008
Carbon tetrachloride	<0.50		0.50	ug/L		24-SEP-18	R4235008
Chlorobenzene	<0.50		0.50	ug/L		24-SEP-18	R4235008
Dibromochloromethane	<1.0		1.0	ug/L		24-SEP-18	R4235008
Chloroethane	<1.0		1.0	ug/L		24-SEP-18	R4235008
Chloroform	<1.0		1.0	ug/L		24-SEP-18	R4235008

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-15 MW15 Sampled By: CLIENT on 20-SEP-18 @ 11:35 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0		1.0	ug/L		24-SEP-18	R4235008
1,2-Dibromoethane	<0.20		0.20	ug/L		24-SEP-18	R4235008
1,2-Dichlorobenzene	<0.50		0.50	ug/L		24-SEP-18	R4235008
1,3-Dichlorobenzene	<0.50		0.50	ug/L		24-SEP-18	R4235008
1,4-Dichlorobenzene	<0.50		0.50	ug/L		24-SEP-18	R4235008
Dichlorodifluoromethane	<1.0		1.0	ug/L		24-SEP-18	R4235008
1,1-Dichloroethane	<0.50		0.50	ug/L		24-SEP-18	R4235008
1,2-Dichloroethane	<0.50		0.50	ug/L		24-SEP-18	R4235008
1,1-Dichloroethylene	<0.50		0.50	ug/L		24-SEP-18	R4235008
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		24-SEP-18	R4235008
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		24-SEP-18	R4235008
Dichloromethane	<2.0		2.0	ug/L		24-SEP-18	R4235008
1,2-Dichloropropane	<0.50		0.50	ug/L		24-SEP-18	R4235008
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		24-SEP-18	R4235008
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		24-SEP-18	R4235008
Ethylbenzene	<0.50		0.50	ug/L		24-SEP-18	R4235008
n-Hexane	<0.50		0.50	ug/L		24-SEP-18	R4235008
2-Hexanone	<20		20	ug/L		24-SEP-18	R4235008
Methyl Ethyl Ketone	<20		20	ug/L		24-SEP-18	R4235008
Methyl Isobutyl Ketone	<20		20	ug/L		24-SEP-18	R4235008
MTBE	<0.50		0.50	ug/L		24-SEP-18	R4235008
Styrene	<0.50		0.50	ug/L		24-SEP-18	R4235008
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		24-SEP-18	R4235008
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		24-SEP-18	R4235008
Tetrachloroethylene	<0.50		0.50	ug/L		24-SEP-18	R4235008
Toluene	<0.50		0.50	ug/L		24-SEP-18	R4235008
1,1,1-Trichloroethane	<0.50		0.50	ug/L		24-SEP-18	R4235008
1,1,2-Trichloroethane	<0.50		0.50	ug/L		24-SEP-18	R4235008
Trichloroethylene	<0.50		0.50	ug/L		24-SEP-18	R4235008
Trichlorofluoromethane	<1.0		1.0	ug/L		24-SEP-18	R4235008
Vinyl chloride	<0.50		0.50	ug/L		24-SEP-18	R4235008
o-Xylene	<0.50		0.50	ug/L		24-SEP-18	R4235008
m+p-Xylenes	<1.0		1.0	ug/L		24-SEP-18	R4235008
Xylenes (Total)	<1.1		1.1	ug/L		24-SEP-18	
Surrogate: 4-Bromofluorobenzene	93.4		70-130	%		24-SEP-18	R4235008
Surrogate: 1,4-Difluorobenzene	99.7		70-130	%		24-SEP-18	R4235008
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		24-SEP-18	
L2168446-16 MW19 Sampled By: CLIENT on 20-SEP-18 @ 12:10 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-16 MW19							
Sampled By: CLIENT on 20-SEP-18 @ 12:10							
Matrix: WATER							
Physical Tests							
Colour, Apparent	25.6		2.0	CU		22-SEP-18	R4234010
Conductivity	818		3.0	umhos/cm		21-SEP-18	R4233548
pH	7.69		0.10	pH units		21-SEP-18	R4233548
Total Dissolved Solids	563	DLDS	20	mg/L		25-SEP-18	R4239047
Turbidity	1210		0.10	NTU		22-SEP-18	R4233250
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	293		10	mg/L		25-SEP-18	R4239385
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Total (as CaCO3)	293		10	mg/L		25-SEP-18	R4239385
Ammonia, Total (as N)	0.340		0.020	mg/L		01-OCT-18	R4254350
Bromide (Br)	0.43		0.10	mg/L		25-SEP-18	R4243635
Chloride (Cl)	75.4		0.50	mg/L		25-SEP-18	R4243635
Computed Conductivity	767			uS/cm		26-SEP-18	
Conductivity % Difference	-6.4			%		26-SEP-18	
Fluoride (F)	0.069		0.020	mg/L		25-SEP-18	R4243635
Hardness (as CaCO3)	411			mg/L		26-SEP-18	
Ion Balance	113			%		26-SEP-18	
Langelier Index	0.8					26-SEP-18	
Nitrate and Nitrite as N	<0.022		0.022	mg/L		26-SEP-18	
Nitrate (as N)	<0.020		0.020	mg/L		25-SEP-18	R4243635
Nitrite (as N)	<0.010		0.010	mg/L		25-SEP-18	R4243635
Total Kjeldahl Nitrogen	<1.5	DLM	1.5	mg/L	24-SEP-18	26-SEP-18	R4244367
Saturation pH	6.87			pH		26-SEP-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		25-SEP-18	R4242191
Phosphorus, Total	3.37	DLHC	0.015	mg/L	25-SEP-18	27-SEP-18	R4245151
TDS (Calculated)	464			mg/L		26-SEP-18	
Sulfate (SO4)	42.2		0.30	mg/L		25-SEP-18	R4243635
Anion Sum	7.84			me/L		26-SEP-18	
Cation Sum	8.85			me/L		26-SEP-18	
Cation - Anion Balance	6.1			%		26-SEP-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	5.56		0.50	mg/L		23-SEP-18	R4238089
Inorganic Parameters							
Silica	11.3		0.11	mg/L		26-SEP-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4236625
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	24-SEP-18	25-SEP-18	R4241171
Antimony (Sb)-Dissolved	0.00026		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Arsenic (As)-Dissolved	0.00128		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Barium (Ba)-Dissolved	0.166		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-16 MW19							
Sampled By: CLIENT on 20-SEP-18 @ 12:10							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Boron (B)-Dissolved	0.126		0.010	mg/L	24-SEP-18	25-SEP-18	R4241171
Cadmium (Cd)-Dissolved	<0.000010		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Calcium (Ca)-Dissolved	136		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Cobalt (Co)-Dissolved	0.00187		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Copper (Cu)-Dissolved	0.00070		0.00020	mg/L	24-SEP-18	25-SEP-18	R4241171
Iron (Fe)-Dissolved	0.451		0.010	mg/L	24-SEP-18	25-SEP-18	R4241171
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Magnesium (Mg)-Dissolved	17.2		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Manganese (Mn)-Dissolved	0.126		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Molybdenum (Mo)-Dissolved	0.00189		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Nickel (Ni)-Dissolved	0.0141		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Potassium (K)-Dissolved	5.81		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Silicon (Si)-Dissolved	5.27		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Silver (Ag)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Sodium (Na)-Dissolved	11.1		0.50	mg/L	24-SEP-18	25-SEP-18	R4241171
Strontium (Sr)-Dissolved	0.316		0.0010	mg/L	24-SEP-18	25-SEP-18	R4241171
Sulfur (S)-Dissolved	13.3		5.0	mg/L	24-SEP-18	25-SEP-18	R4241171
Thallium (Tl)-Dissolved	0.000025		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	24-SEP-18	25-SEP-18	R4241171
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Uranium (U)-Dissolved	0.00380		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Zinc (Zn)-Dissolved	0.0017		0.0010	mg/L	24-SEP-18	25-SEP-18	R4241171
Zirconium (Zr)-Dissolved	<0.00030		0.00030	mg/L	24-SEP-18	25-SEP-18	R4241171
Volatile Organic Compounds							
Acetone	<20	OWP	20	ug/L		24-SEP-18	R4235008
Benzene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
Bromodichloromethane	<1.0	OWP	1.0	ug/L		24-SEP-18	R4235008
Bromoform	<1.0	OWP	1.0	ug/L		24-SEP-18	R4235008
Bromomethane	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
Carbon Disulfide	<1.0	OWP	1.0	ug/L		24-SEP-18	R4235008
Carbon tetrachloride	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
Chlorobenzene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
Dibromochloromethane	<1.0	OWP	1.0	ug/L		24-SEP-18	R4235008
Chloroethane	<1.0	OWP	1.0	ug/L		24-SEP-18	R4235008
Chloroform	<1.0	OWP	1.0	ug/L		24-SEP-18	R4235008

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-16 MW19 Sampled By: CLIENT on 20-SEP-18 @ 12:10 Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0	OWP	1.0	ug/L		24-SEP-18	R4235008
1,2-Dibromoethane	<0.20	OWP	0.20	ug/L		24-SEP-18	R4235008
1,2-Dichlorobenzene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
1,3-Dichlorobenzene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
1,4-Dichlorobenzene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
Dichlorodifluoromethane	<1.0	OWP	1.0	ug/L		24-SEP-18	R4235008
1,1-Dichloroethane	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
1,2-Dichloroethane	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
1,1-Dichloroethylene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
cis-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
trans-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
Dichloromethane	<2.0	OWP	2.0	ug/L		24-SEP-18	R4235008
1,2-Dichloropropane	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
cis-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
trans-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
Ethylbenzene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
n-Hexane	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
2-Hexanone	<20	OWP	20	ug/L		24-SEP-18	R4235008
Methyl Ethyl Ketone	<20	OWP	20	ug/L		24-SEP-18	R4235008
Methyl Isobutyl Ketone	<20	OWP	20	ug/L		24-SEP-18	R4235008
MTBE	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
Styrene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
1,1,1,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
1,1,1,2,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
Tetrachloroethylene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
Toluene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
1,1,1-Trichloroethane	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
1,1,2-Trichloroethane	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
Trichloroethylene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
Trichlorofluoromethane	<1.0	OWP	1.0	ug/L		24-SEP-18	R4235008
Vinyl chloride	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
o-Xylene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
m+p-Xylenes	<1.0	OWP	1.0	ug/L		24-SEP-18	R4235008
Xylenes (Total)	<1.1		1.1	ug/L		24-SEP-18	
Surrogate: 4-Bromofluorobenzene	92.8		70-130	%		24-SEP-18	R4235008
Surrogate: 1,4-Difluorobenzene	99.3		70-130	%		24-SEP-18	R4235008
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		24-SEP-18	
L2168446-17 QC1 Sampled By: CLIENT on 20-SEP-18 @ 14:35 Matrix: WATER							
Physical Tests							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-17 QC1							
Sampled By: CLIENT on 20-SEP-18 @ 14:35							
Matrix: WATER							
Physical Tests							
Colour, Apparent	13.8		2.0	CU		22-SEP-18	R4234010
Conductivity	1070		3.0	umhos/cm		21-SEP-18	R4233548
pH	7.24		0.10	pH units		21-SEP-18	R4233548
Total Dissolved Solids	696	DLDS	20	mg/L		25-SEP-18	R4239047
Turbidity	942		0.10	NTU		22-SEP-18	R4233250
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	507		10	mg/L		25-SEP-18	R4239385
Alkalinity, Carbonate (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Hydroxide (as CaCO3)	<10		10	mg/L		25-SEP-18	R4239385
Alkalinity, Total (as CaCO3)	507	DLHC	20	mg/L		25-SEP-18	R4239385
Ammonia, Total (as N)	2.17	DLHC	0.20	mg/L		01-OCT-18	R4254350
Bromide (Br)	0.14		0.10	mg/L		25-SEP-18	R4243635
Chloride (Cl)	25.9		0.50	mg/L		25-SEP-18	R4243635
Computed Conductivity	939			uS/cm		26-SEP-18	
Conductivity % Difference	-13.1			%		26-SEP-18	
Fluoride (F)	0.081		0.020	mg/L		25-SEP-18	R4243635
Hardness (as CaCO3)	585			mg/L		26-SEP-18	
Ion Balance	125			%		26-SEP-18	
Langelier Index	0.7					26-SEP-18	
Nitrate and Nitrite as N	<0.022		0.022	mg/L		26-SEP-18	
Nitrate (as N)	<0.020		0.020	mg/L		25-SEP-18	R4243635
Nitrite (as N)	<0.010		0.010	mg/L		25-SEP-18	R4243635
Total Kjeldahl Nitrogen	3.7	DLM	1.5	mg/L	24-SEP-18	26-SEP-18	R4244367
Saturation pH	6.49			pH		26-SEP-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		25-SEP-18	R4242191
Phosphorus, Total	1.01	DLHC	0.0060	mg/L	25-SEP-18	27-SEP-18	R4245151
TDS (Calculated)	610			mg/L		26-SEP-18	
Sulfate (SO4)	39.9		0.30	mg/L		25-SEP-18	R4243635
Anion Sum	9.89			me/L		26-SEP-18	
Cation Sum	12.4			me/L		26-SEP-18	
Cation - Anion Balance	11.1			%		26-SEP-18	
Organic / Inorganic Carbon							
Dissolved Organic Carbon	5.35		0.50	mg/L		23-SEP-18	R4238089
Inorganic Parameters							
Silica	12.4		0.11	mg/L		26-SEP-18	
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4236625
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	24-SEP-18	25-SEP-18	R4241171
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Arsenic (As)-Dissolved	0.00979		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Barium (Ba)-Dissolved	0.236		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-17 QC1							
Sampled By: CLIENT on 20-SEP-18 @ 14:35							
Matrix: WATER							
Dissolved Metals							
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Boron (B)-Dissolved	0.323		0.010	mg/L	24-SEP-18	25-SEP-18	R4241171
Cadmium (Cd)-Dissolved	<0.000010		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Calcium (Ca)-Dissolved	203		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Cobalt (Co)-Dissolved	0.00014		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Copper (Cu)-Dissolved	0.00022		0.00020	mg/L	24-SEP-18	25-SEP-18	R4241171
Iron (Fe)-Dissolved	4.43		0.010	mg/L	24-SEP-18	25-SEP-18	R4241171
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Magnesium (Mg)-Dissolved	19.2		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Manganese (Mn)-Dissolved	2.48	DLHC	0.0050	mg/L	24-SEP-18	25-SEP-18	R4241171
Molybdenum (Mo)-Dissolved	0.00162		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Nickel (Ni)-Dissolved	0.00111		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Potassium (K)-Dissolved	6.66		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Silicon (Si)-Dissolved	5.78		0.050	mg/L	24-SEP-18	25-SEP-18	R4241171
Silver (Ag)-Dissolved	<0.000050		0.000050	mg/L	24-SEP-18	25-SEP-18	R4241171
Sodium (Na)-Dissolved	11.4		0.50	mg/L	24-SEP-18	25-SEP-18	R4241171
Strontium (Sr)-Dissolved	0.376		0.0010	mg/L	24-SEP-18	25-SEP-18	R4241171
Sulfur (S)-Dissolved	12.4		5.0	mg/L	24-SEP-18	25-SEP-18	R4241171
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	24-SEP-18	25-SEP-18	R4241171
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	24-SEP-18	25-SEP-18	R4241171
Uranium (U)-Dissolved	0.000907		0.000010	mg/L	24-SEP-18	25-SEP-18	R4241171
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	24-SEP-18	25-SEP-18	R4241171
Zinc (Zn)-Dissolved	0.0030		0.0010	mg/L	24-SEP-18	25-SEP-18	R4241171
Zirconium (Zr)-Dissolved	<0.00030		0.00030	mg/L	24-SEP-18	25-SEP-18	R4241171
Volatile Organic Compounds							
Acetone	<20	OWP	20	ug/L		24-SEP-18	R4235008
Benzene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
Bromodichloromethane	<1.0	OWP	1.0	ug/L		24-SEP-18	R4235008
Bromoform	<1.0	OWP	1.0	ug/L		24-SEP-18	R4235008
Bromomethane	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
Carbon Disulfide	<1.0	OWP	1.0	ug/L		24-SEP-18	R4235008
Carbon tetrachloride	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
Chlorobenzene	3.04	OWP	0.50	ug/L		24-SEP-18	R4235008
Dibromochloromethane	<1.0	OWP	1.0	ug/L		24-SEP-18	R4235008
Chloroethane	<1.0	OWP	1.0	ug/L		24-SEP-18	R4235008
Chloroform	<1.0	OWP	1.0	ug/L		24-SEP-18	R4235008

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168446-17 QC1							
Sampled By: CLIENT on 20-SEP-18 @ 14:35							
Matrix: WATER							
Volatile Organic Compounds							
Chloromethane	<1.0	OWP	1.0	ug/L		24-SEP-18	R4235008
1,2-Dibromoethane	<0.20	OWP	0.20	ug/L		24-SEP-18	R4235008
1,2-Dichlorobenzene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
1,3-Dichlorobenzene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
1,4-Dichlorobenzene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
Dichlorodifluoromethane	<1.0	OWP	1.0	ug/L		24-SEP-18	R4235008
1,1-Dichloroethane	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
1,2-Dichloroethane	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
1,1-Dichloroethylene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
cis-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
trans-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
Dichloromethane	<2.0	OWP	2.0	ug/L		24-SEP-18	R4235008
1,2-Dichloropropane	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
cis-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
trans-1,3-Dichloropropene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
Ethylbenzene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
n-Hexane	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
2-Hexanone	<20	OWP	20	ug/L		24-SEP-18	R4235008
Methyl Ethyl Ketone	<20	OWP	20	ug/L		24-SEP-18	R4235008
Methyl Isobutyl Ketone	<20	OWP	20	ug/L		24-SEP-18	R4235008
MTBE	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
Styrene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
1,1,1,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
1,1,1,2,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
Tetrachloroethylene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
Toluene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
1,1,1-Trichloroethane	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
1,1,2-Trichloroethane	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
Trichloroethylene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
Trichlorofluoromethane	<1.0	OWP	1.0	ug/L		24-SEP-18	R4235008
Vinyl chloride	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
o-Xylene	<0.50	OWP	0.50	ug/L		24-SEP-18	R4235008
m+p-Xylenes	<1.0	OWP	1.0	ug/L		24-SEP-18	R4235008
Xylenes (Total)	<1.1		1.1	ug/L		24-SEP-18	
Surrogate: 4-Bromofluorobenzene	93.0		70-130	%		24-SEP-18	R4235008
Surrogate: 1,4-Difluorobenzene	99.5		70-130	%		24-SEP-18	R4235008
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		24-SEP-18	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Laboratory Control Sample	Dichlorodifluoromethane	LCS-H	L2168446-1, -2, -3, -5, -6, -7
Laboratory Control Sample	Dichlorodifluoromethane	LCS-H	L2168446-4, -8
Laboratory Control Sample	Dichlorodifluoromethane	MES	L2168446-10, -11, -12, -13, -14, -9
Laboratory Control Sample	n-Hexane	MES	L2168446-4, -8
Laboratory Control Sample	trans-1,3-Dichloropropene	MES	L2168446-1, -2, -3, -5, -6, -7
Matrix Spike	Chloride (Cl)	MS-B	L2168446-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Aluminum (Al)-Dissolved	MS-B	L2168446-2, -8
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L2168446-1, -10, -11, -12, -13, -14, -15, -16, -17, -3, -4, -5, -6, -7, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L2168446-2, -8
Matrix Spike	Boron (B)-Dissolved	MS-B	L2168446-1, -10, -11, -12, -13, -14, -15, -16, -17, -3, -4, -5, -6, -7, -9
Matrix Spike	Boron (B)-Dissolved	MS-B	L2168446-2, -8
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L2168446-1, -10, -11, -12, -13, -14, -15, -16, -17, -3, -4, -5, -6, -7, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L2168446-2, -8
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L2168446-1, -10, -11, -12, -13, -14, -15, -16, -17, -3, -4, -5, -6, -7, -9
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L2168446-2, -8
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L2168446-1, -10, -11, -12, -13, -14, -15, -16, -17, -3, -4, -5, -6, -7, -9
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L2168446-2, -8
Matrix Spike	Potassium (K)-Dissolved	MS-B	L2168446-1, -10, -11, -12, -13, -14, -15, -16, -17, -3, -4, -5, -6, -7, -9
Matrix Spike	Potassium (K)-Dissolved	MS-B	L2168446-2, -8
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L2168446-1, -10, -11, -12, -13, -14, -15, -16, -17, -3, -4, -5, -6, -7, -9
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L2168446-2, -8
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L2168446-1, -10, -11, -12, -13, -14, -15, -16, -17, -3, -4, -5, -6, -7, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L2168446-2, -8
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L2168446-1, -10, -11, -12, -13, -14, -15, -16, -17, -3, -4, -5, -6, -7, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L2168446-2, -8
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L2168446-1, -10, -11, -12, -13, -14, -15, -16, -17, -3, -4, -5, -6, -7, -9
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L2168446-2, -8
Matrix Spike	Uranium (U)-Dissolved	MS-B	L2168446-1, -10, -11, -12, -13, -14, -15, -16, -17, -3, -4, -5, -6, -7, -9
Matrix Spike	Ammonia, Total (as N)	MS-B	L2168446-1, -10, -12, -13, -14, -15, -16, -17, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Ammonia, Total (as N)	MS-B	L2168446-1, -10, -12, -13, -14, -15, -16, -17, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Phosphorus, Total	MS-B	L2168446-7
Matrix Spike	Phosphorus, Total	MS-B	L2168446-8, -9
Matrix Spike	Phosphorus, Total	MS-B	L2168446-10, -11, -12, -13, -14, -15, -16, -17

Sample Parameter Qualifier key listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
DLQ	Detection Limit raised due to co-eluting interference. GCMS qualifier ion ratio did not meet acceptance criteria.
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
OWP	Organic water sample contained visible sediment (must be included as part of analysis). Measured concentrations of organic substances in water can be biased high due to presence of sediment.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-AUTO-WT	Water	Automated Speciated Alkalinity	EPA 310.2
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.			
ALK-SPECIATED-WT	Water	pH Measurement for Spec. Alk	APHA 4500 H-Electrode
Water samples are analyzed directly by a calibrated pH meter.			
BR-IC-N-WT	Water	Bromide in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
C-DIS-ORG-WT	Water	Dissolved Organic Carbon	APHA 5310B
Sample is filtered through a 0.45um filter, then injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic carbon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.			
CL-IC-N-WT	Water	Chloride by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
COLOUR-APPARENT-WT	Water	Colour	APHA 2120
Apparent Colour is measured spectrophotometrically by comparison to platinum-cobalt standards using the single wavelength method after sample decanting. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment. Concurrent measurement of sample pH is recommended.			
EC-WT	Water	Conductivity	APHA 2510 B
Water samples can be measured directly by immersing the conductivity cell into the sample.			
ETL-N2N3-WT	Water	Calculate from NO2 + NO3	APHA 4110 B
ETL-SILICA-CALC-WT	Water	Calculate from SI-TOT-WT	EPA 200.8
F-IC-N-WT	Water	Fluoride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
IONBALANCE-OP03-WT	Water	Detailed Ion Balance Calculation	APHA 1030E, 2330B, 2510A
MET-D-CCMS-WT	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030B/6020A (mod)
Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
NH3-WT	Water	Ammonia, Total as N	EPA 350.1
Sample is measured colorimetrically. When sample is turbid a distillation step is required, sample is distilled into a solution of boric acid and measured colorimetrically.			
NO2-IC-WT	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-IC-WT	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PO4-DO-COL-WT	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.			
SO4-IC-N-WT	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TDS-WT	Water	Total Dissolved Solids	APHA 2540C

Reference Information

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

THM-SUM-PPB-CALC-WT Water Total Trihalomethanes (THMs) CALCULATION

Total Trihalomethanes (THMs) represents the sum of bromodichloromethane, bromoform, chlorodibromomethane and chloroform. For the purpose of calculation, results less than the detection limit (DL) are treated as zero.

TKN-WT Water Total Kjeldahl Nitrogen APHA 4500-Norg D

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 Celsius with analysis using an automated colorimetric method.

TURBIDITY-WT Water Turbidity APHA 2130 B

Sample result is based on a comparison of the intensity of the light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension under the same conditions. Sample readings are obtained from a Nephelometer.

VOC-ROU-HS-WT Water Volatile Organic Compounds SW846 8260

Aqueous samples are analyzed by headspace-GC/MS.

XYLENES-SUM-CALC-WT Water Sum of Xylene Isomer Concentrations CALCULATION

Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
----------------------------	---------------------

WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
----	---

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2168446

Report Date: 03-OCT-18

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Client: BluMetric Environmental Inc. (Kitchener)
 171 VICTORIA STREET, NORTH
 KITCHENER ON N2H 5C5

Contact: S'RANA SCHOLES

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-AUTO-WT		Water						
Batch	R4239385							
WG2885843-11	CRM	WT-ALK-CRM						
Alkalinity, Total (as CaCO3)			91.8		%		80-120	25-SEP-18
WG2885843-10	LCS							
Alkalinity, Total (as CaCO3)			96.4		%		85-115	25-SEP-18
WG2885843-9	MB							
Alkalinity, Total (as CaCO3)			<10		mg/L		10	25-SEP-18
ALK-SPECIATED-WT		Water						
Batch	R4233548							
WG2882715-42	LCS							
pH			7.00		pH units		6.9-7.1	21-SEP-18
WG2882715-46	LCS							
pH			7.01		pH units		6.9-7.1	21-SEP-18
BR-IC-N-WT		Water						
Batch	R4243635							
WG2886436-9	DUP	L2168446-11						
Bromide (Br)		<0.10	<0.10	RPD-NA	mg/L	N/A	20	25-SEP-18
WG2886436-2	LCS							
Bromide (Br)			103.1		%		85-115	25-SEP-18
WG2886436-7	LCS							
Bromide (Br)			104.4		%		85-115	25-SEP-18
WG2886436-1	MB							
Bromide (Br)			<0.10		mg/L		0.1	25-SEP-18
WG2886436-6	MB							
Bromide (Br)			<0.10		mg/L		0.1	25-SEP-18
WG2886436-10	MS	L2168446-11						
Bromide (Br)			83.5		%		75-125	25-SEP-18
C-DIS-ORG-WT		Water						
Batch	R4238089							
WG2884580-7	DUP	L2168446-1						
Dissolved Organic Carbon		7.14	8.13		mg/L	13	20	23-SEP-18
WG2884580-6	LCS							
Dissolved Organic Carbon			105.5		%		80-120	23-SEP-18
WG2884580-5	MB							
Dissolved Organic Carbon			<0.50		mg/L		0.5	23-SEP-18
WG2884580-8	MS	L2168446-1						
Dissolved Organic Carbon			82.9		%		70-130	23-SEP-18
CL-IC-N-WT		Water						

Quality Control Report

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CL-IC-N-WT								
Water								
Batch	R4243635							
WG2886436-9	DUP	L2168446-11						
Chloride (Cl)		15.1	15.2		mg/L	0.2	20	25-SEP-18
WG2886436-2	LCS							
Chloride (Cl)			101.8		%		90-110	25-SEP-18
WG2886436-7	LCS							
Chloride (Cl)			101.4		%		90-110	25-SEP-18
WG2886436-1	MB							
Chloride (Cl)			<0.50		mg/L		0.5	25-SEP-18
WG2886436-6	MB							
Chloride (Cl)			<0.50		mg/L		0.5	25-SEP-18
WG2886436-10	MS	L2168446-11						
Chloride (Cl)			102.8		%		75-125	25-SEP-18
COLOUR-APPARENT-WT								
Water								
Batch	R4234010							
WG2884029-3	DUP	L2168446-12						
Colour, Apparent		58.1	60.9		CU	4.7	20	22-SEP-18
WG2884029-2	LCS							
Colour, Apparent			95.9		%		85-115	22-SEP-18
WG2884029-1	MB							
Colour, Apparent			<2.0		CU		2	22-SEP-18
EC-WT								
Water								
Batch	R4233548							
WG2882715-42	LCS							
Conductivity			97.3		%		90-110	21-SEP-18
WG2882715-46	LCS							
Conductivity			97.2		%		90-110	21-SEP-18
WG2882715-41	MB							
Conductivity			<3.0		umhos/cm		3	21-SEP-18
WG2882715-45	MB							
Conductivity			<3.0		umhos/cm		3	21-SEP-18
F-IC-N-WT								
Water								
Batch	R4243635							
WG2886436-9	DUP	L2168446-11						
Fluoride (F)		0.077	0.080		mg/L	2.9	20	25-SEP-18
WG2886436-2	LCS							
Fluoride (F)			102.4		%		90-110	25-SEP-18
WG2886436-7	LCS							
Fluoride (F)			99.7		%		90-110	25-SEP-18



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F-IC-N-WT								
	Water							
Batch	R4243635							
WG2886436-1	MB							
Fluoride (F)			<0.020		mg/L		0.02	25-SEP-18
WG2886436-6	MB							
Fluoride (F)			<0.020		mg/L		0.02	25-SEP-18
WG2886436-10	MS	L2168446-11						
Fluoride (F)			99.9		%		75-125	25-SEP-18
MET-D-CCMS-WT								
	Water							
Batch	R4241171							
WG2885197-2	LCS							
Aluminum (Al)-Dissolved			100.6		%		80-120	24-SEP-18
Antimony (Sb)-Dissolved			92.2		%		80-120	24-SEP-18
Arsenic (As)-Dissolved			96.3		%		80-120	24-SEP-18
Barium (Ba)-Dissolved			96.5		%		80-120	24-SEP-18
Beryllium (Be)-Dissolved			99.8		%		80-120	24-SEP-18
Bismuth (Bi)-Dissolved			91.8		%		80-120	24-SEP-18
Boron (B)-Dissolved			93.7		%		80-120	24-SEP-18
Cadmium (Cd)-Dissolved			95.4		%		80-120	24-SEP-18
Calcium (Ca)-Dissolved			95.7		%		80-120	24-SEP-18
Chromium (Cr)-Dissolved			98.8		%		80-120	24-SEP-18
Cobalt (Co)-Dissolved			95.8		%		80-120	24-SEP-18
Copper (Cu)-Dissolved			95.2		%		80-120	24-SEP-18
Iron (Fe)-Dissolved			85.0		%		80-120	24-SEP-18
Lead (Pb)-Dissolved			88.3		%		80-120	24-SEP-18
Magnesium (Mg)-Dissolved			96.0		%		80-120	24-SEP-18
Manganese (Mn)-Dissolved			97.9		%		80-120	24-SEP-18
Molybdenum (Mo)-Dissolved			94.2		%		80-120	24-SEP-18
Nickel (Ni)-Dissolved			95.8		%		80-120	24-SEP-18
Phosphorus (P)-Dissolved			102.5		%		80-120	24-SEP-18
Potassium (K)-Dissolved			91.8		%		80-120	24-SEP-18
Selenium (Se)-Dissolved			94.0		%		80-120	24-SEP-18
Silicon (Si)-Dissolved			96.1		%		60-140	24-SEP-18
Silver (Ag)-Dissolved			96.3		%		80-120	24-SEP-18
Sodium (Na)-Dissolved			98.6		%		80-120	24-SEP-18
Strontium (Sr)-Dissolved			87.8		%		80-120	24-SEP-18
Sulfur (S)-Dissolved			101.8		%		80-120	24-SEP-18
Thallium (Tl)-Dissolved			85.1		%		80-120	24-SEP-18



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Workorder: L2168446

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT		Water						
Batch	R4241171							
WG2885197-2	LCS							
Tin (Sn)-Dissolved			93.8		%		80-120	24-SEP-18
Titanium (Ti)-Dissolved			94.9		%		80-120	24-SEP-18
Tungsten (W)-Dissolved			86.3		%		80-120	24-SEP-18
Uranium (U)-Dissolved			84.6		%		80-120	24-SEP-18
Vanadium (V)-Dissolved			99.1		%		80-120	24-SEP-18
Zinc (Zn)-Dissolved			91.8		%		80-120	24-SEP-18
Zirconium (Zr)-Dissolved			85.8		%		80-120	24-SEP-18
WG2885197-1	MB							
Aluminum (Al)-Dissolved			<0.0050		mg/L		0.005	24-SEP-18
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	24-SEP-18
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	24-SEP-18
Barium (Ba)-Dissolved			<0.00010		mg/L		0.0001	24-SEP-18
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	24-SEP-18
Bismuth (Bi)-Dissolved			<0.000050		mg/L		0.00005	24-SEP-18
Boron (B)-Dissolved			<0.010		mg/L		0.01	24-SEP-18
Cadmium (Cd)-Dissolved			<0.0000050		mg/L		0.000005	24-SEP-18
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	24-SEP-18
Chromium (Cr)-Dissolved			<0.00050		mg/L		0.0005	24-SEP-18
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	24-SEP-18
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	24-SEP-18
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	24-SEP-18
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	24-SEP-18
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	24-SEP-18
Manganese (Mn)-Dissolved			<0.00050		mg/L		0.0005	24-SEP-18
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	24-SEP-18
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	24-SEP-18
Phosphorus (P)-Dissolved			<0.050		mg/L		0.05	24-SEP-18
Potassium (K)-Dissolved			<0.050		mg/L		0.05	24-SEP-18
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	24-SEP-18
Silicon (Si)-Dissolved			<0.050		mg/L		0.05	24-SEP-18
Silver (Ag)-Dissolved			<0.000050		mg/L		0.00005	24-SEP-18
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	24-SEP-18
Strontium (Sr)-Dissolved			<0.0010		mg/L		0.001	24-SEP-18
Sulfur (S)-Dissolved			<0.50		mg/L		0.5	24-SEP-18



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT								
	Water							
Batch	R4241171							
WG2885197-1	MB							
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	24-SEP-18
Tin (Sn)-Dissolved			<0.00010		mg/L		0.0001	24-SEP-18
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	24-SEP-18
Tungsten (W)-Dissolved			<0.00010		mg/L		0.0001	24-SEP-18
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	24-SEP-18
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	24-SEP-18
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	24-SEP-18
Zirconium (Zr)-Dissolved			<0.00030		mg/L		0.0003	24-SEP-18
WG2885197-5	MS	L2168446-3						
Aluminum (Al)-Dissolved			99.1		%		70-130	25-SEP-18
Antimony (Sb)-Dissolved			93.4		%		70-130	25-SEP-18
Arsenic (As)-Dissolved			99.6		%		70-130	25-SEP-18
Barium (Ba)-Dissolved			N/A	MS-B	%		-	25-SEP-18
Beryllium (Be)-Dissolved			100.4		%		70-130	25-SEP-18
Bismuth (Bi)-Dissolved			81.3		%		70-130	25-SEP-18
Boron (B)-Dissolved			N/A	MS-B	%		-	25-SEP-18
Cadmium (Cd)-Dissolved			98.3		%		70-130	25-SEP-18
Calcium (Ca)-Dissolved			N/A	MS-B	%		-	25-SEP-18
Chromium (Cr)-Dissolved			96.8		%		70-130	25-SEP-18
Cobalt (Co)-Dissolved			94.1		%		70-130	25-SEP-18
Copper (Cu)-Dissolved			92.5		%		70-130	25-SEP-18
Iron (Fe)-Dissolved			90.0		%		70-130	25-SEP-18
Lead (Pb)-Dissolved			91.2		%		70-130	25-SEP-18
Magnesium (Mg)-Dissolved			N/A	MS-B	%		-	25-SEP-18
Manganese (Mn)-Dissolved			N/A	MS-B	%		-	25-SEP-18
Molybdenum (Mo)-Dissolved			98.7		%		70-130	25-SEP-18
Nickel (Ni)-Dissolved			92.4		%		70-130	25-SEP-18
Phosphorus (P)-Dissolved			106.0		%		70-130	25-SEP-18
Potassium (K)-Dissolved			N/A	MS-B	%		-	25-SEP-18
Selenium (Se)-Dissolved			104.3		%		70-130	25-SEP-18
Silicon (Si)-Dissolved			N/A	MS-B	%		-	25-SEP-18
Silver (Ag)-Dissolved			83.9		%		70-130	26-SEP-18
Sodium (Na)-Dissolved			N/A	MS-B	%		-	25-SEP-18
Strontium (Sr)-Dissolved			N/A	MS-B	%		-	25-SEP-18



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT								
	Water							
Batch	R4241171							
WG2885197-5	MS	L2168446-3						
Sulfur (S)-Dissolved			N/A	MS-B	%	-		25-SEP-18
Thallium (Tl)-Dissolved			96.1		%		70-130	25-SEP-18
Tin (Sn)-Dissolved			98.2		%		70-130	25-SEP-18
Titanium (Ti)-Dissolved			97.0		%		70-130	25-SEP-18
Tungsten (W)-Dissolved			94.6		%		70-130	25-SEP-18
Uranium (U)-Dissolved			N/A	MS-B	%	-		25-SEP-18
Vanadium (V)-Dissolved			101.3		%		70-130	25-SEP-18
Zinc (Zn)-Dissolved			93.3		%		70-130	25-SEP-18
Zirconium (Zr)-Dissolved			99.4		%		70-130	25-SEP-18
Batch	R4245747							
WG2885624-2	LCS							
Aluminum (Al)-Dissolved			97.7		%		80-120	26-SEP-18
Antimony (Sb)-Dissolved			98.2		%		80-120	26-SEP-18
Arsenic (As)-Dissolved			96.2		%		80-120	26-SEP-18
Barium (Ba)-Dissolved			92.6		%		80-120	26-SEP-18
Beryllium (Be)-Dissolved			90.4		%		80-120	26-SEP-18
Bismuth (Bi)-Dissolved			96.5		%		80-120	26-SEP-18
Boron (B)-Dissolved			86.8		%		80-120	26-SEP-18
Cadmium (Cd)-Dissolved			94.7		%		80-120	26-SEP-18
Calcium (Ca)-Dissolved			93.0		%		80-120	26-SEP-18
Chromium (Cr)-Dissolved			93.8		%		80-120	26-SEP-18
Cobalt (Co)-Dissolved			93.6		%		80-120	26-SEP-18
Copper (Cu)-Dissolved			92.8		%		80-120	26-SEP-18
Iron (Fe)-Dissolved			97.8		%		80-120	26-SEP-18
Lead (Pb)-Dissolved			98.0		%		80-120	26-SEP-18
Magnesium (Mg)-Dissolved			95.6		%		80-120	26-SEP-18
Manganese (Mn)-Dissolved			93.6		%		80-120	26-SEP-18
Molybdenum (Mo)-Dissolved			94.5		%		80-120	26-SEP-18
Nickel (Ni)-Dissolved			94.4		%		80-120	26-SEP-18
Phosphorus (P)-Dissolved			94.2		%		80-120	26-SEP-18
Potassium (K)-Dissolved			96.3		%		80-120	26-SEP-18
Selenium (Se)-Dissolved			96.1		%		80-120	26-SEP-18
Silicon (Si)-Dissolved			95.9		%		60-140	26-SEP-18
Silver (Ag)-Dissolved			99.6		%		80-120	26-SEP-18



Quality Control Report

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT								
	Water							
Batch	R4245747							
WG2885624-2	LCS							
Sodium (Na)-Dissolved			94.9		%		80-120	26-SEP-18
Strontium (Sr)-Dissolved			94.2		%		80-120	26-SEP-18
Sulfur (S)-Dissolved			97.3		%		80-120	26-SEP-18
Thallium (Tl)-Dissolved			96.0		%		80-120	26-SEP-18
Tin (Sn)-Dissolved			94.0		%		80-120	26-SEP-18
Titanium (Ti)-Dissolved			91.4		%		80-120	26-SEP-18
Tungsten (W)-Dissolved			96.7		%		80-120	26-SEP-18
Uranium (U)-Dissolved			98.7		%		80-120	26-SEP-18
Vanadium (V)-Dissolved			96.8		%		80-120	26-SEP-18
Zinc (Zn)-Dissolved			90.7		%		80-120	26-SEP-18
Zirconium (Zr)-Dissolved			94.9		%		80-120	26-SEP-18
WG2885624-1	MB							
Aluminum (Al)-Dissolved			<0.0050		mg/L		0.005	26-SEP-18
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	26-SEP-18
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	26-SEP-18
Barium (Ba)-Dissolved			<0.00010		mg/L		0.0001	26-SEP-18
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	26-SEP-18
Bismuth (Bi)-Dissolved			<0.000050		mg/L		0.00005	26-SEP-18
Boron (B)-Dissolved			<0.010		mg/L		0.01	26-SEP-18
Cadmium (Cd)-Dissolved			<0.0000050		mg/L		0.000005	26-SEP-18
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	26-SEP-18
Chromium (Cr)-Dissolved			<0.00050		mg/L		0.0005	26-SEP-18
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	26-SEP-18
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	26-SEP-18
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	26-SEP-18
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	26-SEP-18
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	26-SEP-18
Manganese (Mn)-Dissolved			<0.00050		mg/L		0.0005	26-SEP-18
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	26-SEP-18
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	26-SEP-18
Phosphorus (P)-Dissolved			<0.050		mg/L		0.05	26-SEP-18
Potassium (K)-Dissolved			<0.050		mg/L		0.05	26-SEP-18
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	26-SEP-18
Silicon (Si)-Dissolved			<0.050		mg/L		0.05	26-SEP-18



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT								
	Water							
Batch	R4245747							
WG2885624-1	MB							
Silver (Ag)-Dissolved			<0.000050		mg/L		0.00005	26-SEP-18
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	26-SEP-18
Strontium (Sr)-Dissolved			<0.0010		mg/L		0.001	26-SEP-18
Sulfur (S)-Dissolved			<0.50		mg/L		0.5	26-SEP-18
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	26-SEP-18
Tin (Sn)-Dissolved			<0.00010		mg/L		0.0001	26-SEP-18
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	26-SEP-18
Tungsten (W)-Dissolved			<0.00010		mg/L		0.0001	26-SEP-18
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	26-SEP-18
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	26-SEP-18
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	26-SEP-18
Zirconium (Zr)-Dissolved			<0.00030		mg/L		0.0003	26-SEP-18
NH3-WT								
	Water							
Batch	R4254350							
WG2891788-7	DUP	L2168446-15						
Ammonia, Total (as N)		35.4	40.2		mg/L	13	20	01-OCT-18
WG2891788-2	LCS							
Ammonia, Total (as N)			96.2		%		85-115	01-OCT-18
WG2891788-6	LCS							
Ammonia, Total (as N)			95.3		%		85-115	01-OCT-18
WG2891788-1	MB							
Ammonia, Total (as N)			<0.020		mg/L		0.02	01-OCT-18
WG2891788-5	MB							
Ammonia, Total (as N)			<0.020		mg/L		0.02	01-OCT-18
WG2891788-8	MS	L2168446-15						
Ammonia, Total (as N)			N/A	MS-B	%		-	01-OCT-18
Batch	R4258044							
WG2892654-3	DUP	L2168446-11						
Ammonia, Total (as N)		0.067	0.049	J	mg/L	0.018	0.04	02-OCT-18
WG2892654-2	LCS							
Ammonia, Total (as N)			105.3		%		85-115	02-OCT-18
WG2892654-1	MB							
Ammonia, Total (as N)			<0.020		mg/L		0.02	02-OCT-18
WG2892654-4	MS	L2168446-11						
Ammonia, Total (as N)			92.5		%		75-125	02-OCT-18
NO2-IC-WT	Water							



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-IC-WT								
Water								
Batch	R4243635							
WG2886436-9	DUP	L2168446-11						
Nitrite (as N)		<0.010	<0.010	RPD-NA	mg/L	N/A	25	25-SEP-18
WG2886436-2	LCS							
Nitrite (as N)			102.0		%		70-130	25-SEP-18
WG2886436-7	LCS							
Nitrite (as N)			101.6		%		70-130	25-SEP-18
WG2886436-1	MB							
Nitrite (as N)			<0.010		mg/L		0.01	25-SEP-18
WG2886436-6	MB							
Nitrite (as N)			<0.010		mg/L		0.01	25-SEP-18
WG2886436-10	MS	L2168446-11						
Nitrite (as N)			95.6		%		70-130	25-SEP-18
NO3-IC-WT								
Water								
Batch	R4243635							
WG2886436-9	DUP	L2168446-11						
Nitrate (as N)		<0.020	<0.020	RPD-NA	mg/L	N/A	25	25-SEP-18
WG2886436-2	LCS							
Nitrate (as N)			100.9		%		70-130	25-SEP-18
WG2886436-7	LCS							
Nitrate (as N)			100.5		%		70-130	25-SEP-18
WG2886436-1	MB							
Nitrate (as N)			<0.020		mg/L		0.02	25-SEP-18
WG2886436-6	MB							
Nitrate (as N)			<0.020		mg/L		0.02	25-SEP-18
WG2886436-10	MS	L2168446-11						
Nitrate (as N)			100.3		%		70-130	25-SEP-18
P-T-COL-WT								
Water								
Batch	R4241552							
WG2885508-2	LCS							
Phosphorus, Total			96.7		%		80-120	26-SEP-18
WG2885509-2	LCS							
Phosphorus, Total			94.7		%		80-120	26-SEP-18
WG2885510-2	LCS							
Phosphorus, Total			97.5		%		80-120	26-SEP-18
WG2885508-1	MB							
Phosphorus, Total			<0.0030		mg/L		0.003	26-SEP-18
WG2885509-1	MB							
Phosphorus, Total			<0.0030		mg/L		0.003	26-SEP-18



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-COL-WT								
Water								
Batch	R4241552							
WG2885510-1	MB							
Phosphorus, Total			<0.0030		mg/L		0.003	26-SEP-18
Batch	R4245151							
WG2886675-3	DUP	L2168446-10						
Phosphorus, Total		0.229	0.218		mg/L	4.8	20	27-SEP-18
WG2886365-2	LCS							
Phosphorus, Total			95.0		%		80-120	27-SEP-18
WG2886675-2	LCS							
Phosphorus, Total			97.5		%		80-120	27-SEP-18
WG2886365-1	MB							
Phosphorus, Total			<0.0030		mg/L		0.003	27-SEP-18
WG2886675-1	MB							
Phosphorus, Total			<0.0030		mg/L		0.003	27-SEP-18
WG2886675-4	MS	L2168446-10						
Phosphorus, Total			N/A	MS-B	%		-	27-SEP-18
PO4-DO-COL-WT								
Water								
Batch	R4242191							
WG2886070-11	DUP	L2168446-6						
Orthophosphate-Dissolved (as P)		<0.0030	<0.0030	RPD-NA	mg/L	N/A	30	25-SEP-18
WG2886070-10	LCS							
Orthophosphate-Dissolved (as P)			99.1		%		80-120	25-SEP-18
WG2886070-6	LCS							
Orthophosphate-Dissolved (as P)			96.0		%		80-120	25-SEP-18
WG2886070-5	MB							
Orthophosphate-Dissolved (as P)			<0.0030		mg/L		0.003	25-SEP-18
WG2886070-9	MB							
Orthophosphate-Dissolved (as P)			<0.0030		mg/L		0.003	25-SEP-18
WG2886070-12	MS	L2168446-6						
Orthophosphate-Dissolved (as P)			103.9		%		70-130	25-SEP-18
SO4-IC-N-WT								
Water								
Batch	R4243635							
WG2886436-9	DUP	L2168446-11						
Sulfate (SO4)		52.8	52.7		mg/L	0.1	20	25-SEP-18
WG2886436-2	LCS							
Sulfate (SO4)			102.5		%		90-110	25-SEP-18
WG2886436-7	LCS							
Sulfate (SO4)			101.9		%		90-110	25-SEP-18



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SO4-IC-N-WT								
Water								
Batch	R4243635							
WG2886436-1	MB							
Sulfate (SO4)			<0.30		mg/L		0.3	25-SEP-18
WG2886436-6	MB							
Sulfate (SO4)			<0.30		mg/L		0.3	25-SEP-18
WG2886436-10	MS	L2168446-11						
Sulfate (SO4)			104.2		%		75-125	25-SEP-18
SOLIDS-TDS-WT								
Water								
Batch	R4238987							
WG2884689-8	LCS							
Total Dissolved Solids			93.4		%		85-115	25-SEP-18
WG2884689-7	MB							
Total Dissolved Solids			<10		mg/L		10	25-SEP-18
Batch	R4239047							
WG2884691-2	LCS							
Total Dissolved Solids			96.3		%		85-115	25-SEP-18
WG2884691-1	MB							
Total Dissolved Solids			<10		mg/L		10	25-SEP-18
Batch	R4246199							
WG2886890-3	DUP	L2168446-14						
Total Dissolved Solids		441	444		mg/L	0.8	20	26-SEP-18
WG2886890-2	LCS							
Total Dissolved Solids			94.2		%		85-115	26-SEP-18
WG2886890-1	MB							
Total Dissolved Solids			<10		mg/L		10	26-SEP-18
TKN-WT								
Water								
Batch	R4244367							
WG2885234-3	DUP	L2168446-14						
Total Kjeldahl Nitrogen		<0.15	0.16	RPD-NA	mg/L	N/A	20	26-SEP-18
WG2884906-2	LCS							
Total Kjeldahl Nitrogen			121.3		%		75-125	26-SEP-18
WG2885234-2	LCS							
Total Kjeldahl Nitrogen			106.1		%		75-125	26-SEP-18
WG2884906-1	MB							
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	26-SEP-18
WG2885234-1	MB							
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	26-SEP-18
WG2885234-4	MS	L2168446-14						
Total Kjeldahl Nitrogen			92.4		%		70-130	26-SEP-18



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TURBIDITY-WT								
	Water							
Batch	R4233250							
WG2883856-3	DUP	L2168446-8						
Turbidity		349	343		NTU	1.7	15	22-SEP-18
WG2883856-2	LCS							
Turbidity			107.0		%		85-115	22-SEP-18
WG2883856-5	LCS							
Turbidity			104.0		%		85-115	22-SEP-18
WG2883856-1	MB							
Turbidity			<0.10		NTU		0.1	22-SEP-18
WG2883856-4	MB							
Turbidity			<0.10		NTU		0.1	22-SEP-18
VOC-ROU-HS-WT								
	Water							
Batch	R4235008							
WG2879221-1	LCS							
1,1,1,2-Tetrachloroethane			106.5		%		70-130	24-SEP-18
1,1,2,2-Tetrachloroethane			96.9		%		70-130	24-SEP-18
1,1,1-Trichloroethane			109.7		%		70-130	24-SEP-18
1,1,2-Trichloroethane			105.7		%		70-130	24-SEP-18
1,2-Dibromoethane			102.5		%		70-130	24-SEP-18
1,1-Dichloroethane			110.2		%		70-130	24-SEP-18
1,1-Dichloroethylene			106.1		%		70-130	24-SEP-18
1,2-Dichlorobenzene			112.1		%		70-130	24-SEP-18
1,2-Dichloroethane			104.3		%		70-130	24-SEP-18
1,2-Dichloropropane			104.4		%		70-130	24-SEP-18
1,3-Dichlorobenzene			112.1		%		70-130	24-SEP-18
1,4-Dichlorobenzene			110.6		%		70-130	24-SEP-18
2-Hexanone			90.9		%		60-140	24-SEP-18
Acetone			100.0		%		60-140	24-SEP-18
Benzene			109.2		%		70-130	24-SEP-18
Bromodichloromethane			105.1		%		70-130	24-SEP-18
Bromoform			96.2		%		70-130	24-SEP-18
Bromomethane			83.7		%		60-140	24-SEP-18
Carbon Disulfide			118.7		%		70-130	24-SEP-18
Carbon tetrachloride			109.4		%		70-130	24-SEP-18
Chlorobenzene			110.1		%		70-130	24-SEP-18
Chloroethane			100.1		%		70-130	24-SEP-18
Chloroform			108.3		%		70-130	24-SEP-18



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VOC-ROU-HS-WT		Water						
Batch	R4235008							
WG2879221-1	LCS							
Chloromethane			92.4		%		60-140	24-SEP-18
cis-1,2-Dichloroethylene			106.9		%		70-130	24-SEP-18
cis-1,3-Dichloropropene			104.9		%		70-130	24-SEP-18
Dibromochloromethane			100.0		%		70-130	24-SEP-18
Dichlorodifluoromethane			111.9		%		50-140	24-SEP-18
Dichloromethane			104.3		%		70-130	24-SEP-18
Ethylbenzene			113.4		%		70-130	24-SEP-18
m+p-Xylenes			113.1		%		70-130	24-SEP-18
Methyl Ethyl Ketone			96.4		%		60-140	24-SEP-18
Methyl Isobutyl Ketone			91.2		%		50-150	24-SEP-18
n-Hexane			96.8		%		70-130	24-SEP-18
MTBE			109.3		%		70-130	24-SEP-18
o-Xylene			110.1		%		70-130	24-SEP-18
Styrene			112.5		%		70-130	24-SEP-18
Tetrachloroethylene			115.5		%		70-130	24-SEP-18
Toluene			114.0		%		70-130	24-SEP-18
trans-1,2-Dichloroethylene			107.1		%		70-130	24-SEP-18
trans-1,3-Dichloropropene			105.1		%		70-130	24-SEP-18
Trichloroethylene			112.4		%		70-130	24-SEP-18
Trichlorofluoromethane			118.3		%		60-140	24-SEP-18
Vinyl chloride			101.2		%		60-140	24-SEP-18
WG2879221-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	24-SEP-18
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	24-SEP-18
1,1,1-Trichloroethane			<0.50		ug/L		0.5	24-SEP-18
1,1,2-Trichloroethane			<0.50		ug/L		0.5	24-SEP-18
1,2-Dibromoethane			<0.20		ug/L		0.2	24-SEP-18
1,1-Dichloroethane			<0.50		ug/L		0.5	24-SEP-18
1,1-Dichloroethylene			<0.50		ug/L		0.5	24-SEP-18
1,2-Dichlorobenzene			<0.50		ug/L		0.5	24-SEP-18
1,2-Dichloroethane			<0.50		ug/L		0.5	24-SEP-18
1,2-Dichloropropane			<0.50		ug/L		0.5	24-SEP-18
1,3-Dichlorobenzene			<0.50		ug/L		0.5	24-SEP-18
1,4-Dichlorobenzene			<0.50		ug/L		0.5	24-SEP-18



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VOC-ROU-HS-WT		Water						
Batch	R4235008							
WG2879221-2	MB							
2-Hexanone			<20		ug/L		20	24-SEP-18
Acetone			<20		ug/L		20	24-SEP-18
Benzene			<0.50		ug/L		0.5	24-SEP-18
Bromodichloromethane			<1.0		ug/L		1	24-SEP-18
Bromoform			<1.0		ug/L		1	24-SEP-18
Bromomethane			<0.50		ug/L		0.5	24-SEP-18
Carbon Disulfide			<1.0		ug/L		1	24-SEP-18
Carbon tetrachloride			<0.50		ug/L		0.5	24-SEP-18
Chlorobenzene			<0.50		ug/L		0.5	24-SEP-18
Chloroethane			<1.0		ug/L		1	24-SEP-18
Chloroform			<1.0		ug/L		1	24-SEP-18
Chloromethane			<1.0		ug/L		1	24-SEP-18
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	24-SEP-18
cis-1,3-Dichloropropene			<0.50		ug/L		0.5	24-SEP-18
Dibromochloromethane			<1.0		ug/L		1	24-SEP-18
Dichlorodifluoromethane			<1.0		ug/L		1	24-SEP-18
Dichloromethane			<2.0		ug/L		2	24-SEP-18
Ethylbenzene			<0.50		ug/L		0.5	24-SEP-18
m+p-Xylenes			<1.0		ug/L		1	24-SEP-18
Methyl Ethyl Ketone			<20		ug/L		20	24-SEP-18
Methyl Isobutyl Ketone			<20		ug/L		20	24-SEP-18
n-Hexane			<0.50		ug/L		0.5	24-SEP-18
MTBE			<0.50		ug/L		0.5	24-SEP-18
o-Xylene			<0.50		ug/L		0.5	24-SEP-18
Styrene			<0.50		ug/L		0.5	24-SEP-18
Tetrachloroethylene			<0.50		ug/L		0.5	24-SEP-18
Toluene			<0.50		ug/L		0.5	24-SEP-18
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	24-SEP-18
trans-1,3-Dichloropropene			<0.50		ug/L		0.5	24-SEP-18
Trichloroethylene			<0.50		ug/L		0.5	24-SEP-18
Trichlorofluoromethane			<1.0		ug/L		1	24-SEP-18
Vinyl chloride			<0.50		ug/L		0.5	24-SEP-18
Surrogate: 1,4-Difluorobenzene			100.3		%		70-130	24-SEP-18
Surrogate: 4-Bromofluorobenzene			96.2		%		70-130	24-SEP-18



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VOC-ROU-HS-WT		Water						
Batch	R4241668							
WG2881577-1	LCS							
1,1,1,2-Tetrachloroethane			110.7		%		70-130	26-SEP-18
1,1,2,2-Tetrachloroethane			97.3		%		70-130	26-SEP-18
1,1,1-Trichloroethane			115.0		%		70-130	26-SEP-18
1,1,2-Trichloroethane			105.9		%		70-130	26-SEP-18
1,2-Dibromoethane			107.0		%		70-130	26-SEP-18
1,1-Dichloroethane			107.3		%		70-130	26-SEP-18
1,1-Dichloroethylene			111.8		%		70-130	26-SEP-18
1,2-Dichlorobenzene			114.6		%		70-130	26-SEP-18
1,2-Dichloroethane			119.9		%		70-130	26-SEP-18
1,2-Dichloropropane			108.2		%		70-130	26-SEP-18
1,3-Dichlorobenzene			117.5		%		70-130	26-SEP-18
1,4-Dichlorobenzene			120.9		%		70-130	26-SEP-18
2-Hexanone			106.5		%		60-140	26-SEP-18
Acetone			117.2		%		60-140	26-SEP-18
Benzene			109.6		%		70-130	26-SEP-18
Bromodichloromethane			113.3		%		70-130	26-SEP-18
Bromoform			111.0		%		70-130	26-SEP-18
Bromomethane			94.1		%		60-140	26-SEP-18
Carbon Disulfide			115.7		%		70-130	26-SEP-18
Carbon tetrachloride			117.3		%		70-130	26-SEP-18
Chlorobenzene			112.3		%		70-130	26-SEP-18
Chloroethane			106.9		%		70-130	26-SEP-18
Chloroform			114.0		%		70-130	26-SEP-18
Chloromethane			109.0		%		60-140	26-SEP-18
cis-1,2-Dichloroethylene			109.6		%		70-130	26-SEP-18
cis-1,3-Dichloropropene			126.3		%		70-130	26-SEP-18
Dibromochloromethane			112.1		%		70-130	26-SEP-18
Dichlorodifluoromethane			151.4	LCS-H	%		50-140	26-SEP-18
Dichloromethane			106.5		%		70-130	26-SEP-18
Ethylbenzene			116.0		%		70-130	26-SEP-18
m+p-Xylenes			117.8		%		70-130	26-SEP-18
Methyl Ethyl Ketone			111.6		%		60-140	26-SEP-18
Methyl Isobutyl Ketone			110.0		%		50-150	26-SEP-18
n-Hexane			127.7		%		70-130	26-SEP-18



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R4241668							
WG2881577-1	LCS							
MTBE			113.4		%		70-130	26-SEP-18
o-Xylene			113.2		%		70-130	26-SEP-18
Styrene			115.4		%		70-130	26-SEP-18
Tetrachloroethylene			121.1		%		70-130	26-SEP-18
Toluene			108.6		%		70-130	26-SEP-18
trans-1,2-Dichloroethylene			118.0		%		70-130	26-SEP-18
trans-1,3-Dichloropropene			131.0	MES	%		70-130	26-SEP-18
Trichloroethylene			120.5		%		70-130	26-SEP-18
Trichlorofluoromethane			129.9		%		60-140	26-SEP-18
Vinyl chloride			111.7		%		60-140	26-SEP-18
WG2881577-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	26-SEP-18
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	26-SEP-18
1,1,1-Trichloroethane			<0.50		ug/L		0.5	26-SEP-18
1,1,2-Trichloroethane			<0.50		ug/L		0.5	26-SEP-18
1,2-Dibromoethane			<0.20		ug/L		0.2	26-SEP-18
1,1-Dichloroethane			<0.50		ug/L		0.5	26-SEP-18
1,1-Dichloroethylene			<0.50		ug/L		0.5	26-SEP-18
1,2-Dichlorobenzene			<0.50		ug/L		0.5	26-SEP-18
1,2-Dichloroethane			<0.50		ug/L		0.5	26-SEP-18
1,2-Dichloropropane			<0.50		ug/L		0.5	26-SEP-18
1,3-Dichlorobenzene			<0.50		ug/L		0.5	26-SEP-18
1,4-Dichlorobenzene			<0.50		ug/L		0.5	26-SEP-18
2-Hexanone			<20		ug/L		20	26-SEP-18
Acetone			<20		ug/L		20	26-SEP-18
Benzene			<0.50		ug/L		0.5	26-SEP-18
Bromodichloromethane			<1.0		ug/L		1	26-SEP-18
Bromoform			<1.0		ug/L		1	26-SEP-18
Bromomethane			<0.50		ug/L		0.5	26-SEP-18
Carbon Disulfide			<1.0		ug/L		1	26-SEP-18
Carbon tetrachloride			<0.50		ug/L		0.5	26-SEP-18
Chlorobenzene			<0.50		ug/L		0.5	26-SEP-18
Chloroethane			<1.0		ug/L		1	26-SEP-18
Chloroform			<1.0		ug/L		1	26-SEP-18



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R4241668							
WG2881577-2	MB							
Chloromethane			<1.0		ug/L		1	26-SEP-18
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	26-SEP-18
cis-1,3-Dichloropropene			<0.50		ug/L		0.5	26-SEP-18
Dibromochloromethane			<1.0		ug/L		1	26-SEP-18
Dichlorodifluoromethane			<1.0		ug/L		1	26-SEP-18
Dichloromethane			<2.0		ug/L		2	26-SEP-18
Ethylbenzene			<0.50		ug/L		0.5	26-SEP-18
m+p-Xylenes			<1.0		ug/L		1	26-SEP-18
Methyl Ethyl Ketone			<20		ug/L		20	26-SEP-18
Methyl Isobutyl Ketone			<20		ug/L		20	26-SEP-18
n-Hexane			<0.50		ug/L		0.5	26-SEP-18
MTBE			<0.50		ug/L		0.5	26-SEP-18
o-Xylene			<0.50		ug/L		0.5	26-SEP-18
Styrene			<0.50		ug/L		0.5	26-SEP-18
Tetrachloroethylene			<0.50		ug/L		0.5	26-SEP-18
Toluene			<0.50		ug/L		0.5	26-SEP-18
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	26-SEP-18
trans-1,3-Dichloropropene			<0.50		ug/L		0.5	26-SEP-18
Trichloroethylene			<0.50		ug/L		0.5	26-SEP-18
Trichlorofluoromethane			<1.0		ug/L		1	26-SEP-18
Vinyl chloride			<0.50		ug/L		0.5	26-SEP-18
Surrogate: 1,4-Difluorobenzene			102.8		%		70-130	26-SEP-18
Surrogate: 4-Bromofluorobenzene			99.2		%		70-130	26-SEP-18
Batch	R4242588							
WG2884953-1	LCS							
1,1,1,2-Tetrachloroethane			112.5		%		70-130	27-SEP-18
1,1,2,2-Tetrachloroethane			113.0		%		70-130	27-SEP-18
1,1,1-Trichloroethane			113.1		%		70-130	27-SEP-18
1,1,2-Trichloroethane			112.7		%		70-130	27-SEP-18
1,2-Dibromoethane			115.2		%		70-130	27-SEP-18
1,1-Dichloroethane			115.3		%		70-130	27-SEP-18
1,1-Dichloroethylene			109.9		%		70-130	27-SEP-18
1,2-Dichlorobenzene			116.7		%		70-130	27-SEP-18
1,2-Dichloroethane			114.2		%		70-130	27-SEP-18



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R4242588							
WG2884953-1	LCS							
1,2-Dichloropropane			114.7		%		70-130	27-SEP-18
1,3-Dichlorobenzene			115.0		%		70-130	27-SEP-18
1,4-Dichlorobenzene			115.9		%		70-130	27-SEP-18
2-Hexanone			121.4		%		60-140	27-SEP-18
Acetone			126.8		%		60-140	27-SEP-18
Benzene			116.7		%		70-130	27-SEP-18
Bromodichloromethane			114.7		%		70-130	27-SEP-18
Bromoform			109.5		%		70-130	27-SEP-18
Bromomethane			96.7		%		60-140	27-SEP-18
Carbon Disulfide			111.7		%		70-130	27-SEP-18
Carbon tetrachloride			114.5		%		70-130	27-SEP-18
Chlorobenzene			115.2		%		70-130	27-SEP-18
Chloroethane			113.4		%		70-130	27-SEP-18
Chloroform			114.4		%		70-130	27-SEP-18
Chloromethane			112.4		%		60-140	27-SEP-18
cis-1,2-Dichloroethylene			113.2		%		70-130	27-SEP-18
cis-1,3-Dichloropropene			118.4		%		70-130	27-SEP-18
Dibromochloromethane			113.6		%		70-130	27-SEP-18
Dichlorodifluoromethane			152.9	LCS-H	%		50-140	27-SEP-18
Dichloromethane			114.7		%		70-130	27-SEP-18
Ethylbenzene			114.8		%		70-130	27-SEP-18
m+p-Xylenes			114.6		%		70-130	27-SEP-18
Methyl Ethyl Ketone			123.5		%		60-140	27-SEP-18
Methyl Isobutyl Ketone			120.5		%		50-150	27-SEP-18
n-Hexane			134.8	MES	%		70-130	27-SEP-18
MTBE			115.9		%		70-130	27-SEP-18
o-Xylene			113.1		%		70-130	27-SEP-18
Styrene			112.5		%		70-130	27-SEP-18
Tetrachloroethylene			113.8		%		70-130	27-SEP-18
Toluene			114.1		%		70-130	27-SEP-18
trans-1,2-Dichloroethylene			113.0		%		70-130	27-SEP-18
trans-1,3-Dichloropropene			113.0		%		70-130	27-SEP-18
Trichloroethylene			117.5		%		70-130	27-SEP-18
Trichlorofluoromethane			128.4		%		60-140	27-SEP-18



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R4242588							
WG2884953-1	LCS							
Vinyl chloride			117.8		%		60-140	27-SEP-18
WG2884953-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	27-SEP-18
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	27-SEP-18
1,1,1-Trichloroethane			<0.50		ug/L		0.5	27-SEP-18
1,1,2-Trichloroethane			<0.50		ug/L		0.5	27-SEP-18
1,2-Dibromoethane			<0.20		ug/L		0.2	27-SEP-18
1,1-Dichloroethane			<0.50		ug/L		0.5	27-SEP-18
1,1-Dichloroethylene			<0.50		ug/L		0.5	27-SEP-18
1,2-Dichlorobenzene			<0.50		ug/L		0.5	27-SEP-18
1,2-Dichloroethane			<0.50		ug/L		0.5	27-SEP-18
1,2-Dichloropropane			<0.50		ug/L		0.5	27-SEP-18
1,3-Dichlorobenzene			<0.50		ug/L		0.5	27-SEP-18
1,4-Dichlorobenzene			<0.50		ug/L		0.5	27-SEP-18
2-Hexanone			<20		ug/L		20	27-SEP-18
Acetone			<20		ug/L		20	27-SEP-18
Benzene			<0.50		ug/L		0.5	27-SEP-18
Bromodichloromethane			<1.0		ug/L		1	27-SEP-18
Bromoform			<1.0		ug/L		1	27-SEP-18
Bromomethane			<0.50		ug/L		0.5	27-SEP-18
Carbon Disulfide			<1.0		ug/L		1	27-SEP-18
Carbon tetrachloride			<0.50		ug/L		0.5	27-SEP-18
Chlorobenzene			<0.50		ug/L		0.5	27-SEP-18
Chloroethane			<1.0		ug/L		1	27-SEP-18
Chloroform			<1.0		ug/L		1	27-SEP-18
Chloromethane			<1.0		ug/L		1	27-SEP-18
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	27-SEP-18
cis-1,3-Dichloropropene			<0.50		ug/L		0.5	27-SEP-18
Dibromochloromethane			<1.0		ug/L		1	27-SEP-18
Dichlorodifluoromethane			<1.0		ug/L		1	27-SEP-18
Dichloromethane			<2.0		ug/L		2	27-SEP-18
Ethylbenzene			<0.50		ug/L		0.5	27-SEP-18
m+p-Xylenes			<1.0		ug/L		1	27-SEP-18
Methyl Ethyl Ketone			<20		ug/L		20	27-SEP-18



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R4242588							
WG2884953-2	MB							
Methyl Isobutyl Ketone			<20		ug/L		20	27-SEP-18
n-Hexane			<0.50		ug/L		0.5	27-SEP-18
MTBE			<0.50		ug/L		0.5	27-SEP-18
o-Xylene			<0.50		ug/L		0.5	27-SEP-18
Styrene			<0.50		ug/L		0.5	27-SEP-18
Tetrachloroethylene			<0.50		ug/L		0.5	27-SEP-18
Toluene			<0.50		ug/L		0.5	27-SEP-18
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	27-SEP-18
trans-1,3-Dichloropropene			<0.50		ug/L		0.5	27-SEP-18
Trichloroethylene			<0.50		ug/L		0.5	27-SEP-18
Trichlorofluoromethane			<1.0		ug/L		1	27-SEP-18
Vinyl chloride			<0.50		ug/L		0.5	27-SEP-18
Surrogate: 1,4-Difluorobenzene			98.8		%		70-130	27-SEP-18
Surrogate: 4-Bromofluorobenzene			96.1		%		70-130	27-SEP-18
Batch	R4246311							
WG2882679-1	LCS							
1,1,1,2-Tetrachloroethane			110.1		%		70-130	27-SEP-18
1,1,1,2,2-Tetrachloroethane			100.4		%		70-130	27-SEP-18
1,1,1-Trichloroethane			114.8		%		70-130	27-SEP-18
1,1,2-Trichloroethane			106.8		%		70-130	27-SEP-18
1,2-Dibromoethane			106.0		%		70-130	27-SEP-18
1,1-Dichloroethane			112.6		%		70-130	27-SEP-18
1,1-Dichloroethylene			106.0		%		70-130	27-SEP-18
1,2-Dichlorobenzene			116.5		%		70-130	27-SEP-18
1,2-Dichloroethane			107.9		%		70-130	27-SEP-18
1,2-Dichloropropane			106.2		%		70-130	27-SEP-18
1,3-Dichlorobenzene			116.6		%		70-130	27-SEP-18
1,4-Dichlorobenzene			117.6		%		70-130	27-SEP-18
2-Hexanone			86.3		%		60-140	27-SEP-18
Acetone			93.6		%		60-140	27-SEP-18
Benzene			113.0		%		70-130	27-SEP-18
Bromodichloromethane			110.0		%		70-130	27-SEP-18
Bromoform			102.0		%		70-130	27-SEP-18
Bromomethane			91.7		%		60-140	27-SEP-18



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R4246311							
WG2882679-1	LCS							
Carbon Disulfide			106.0		%		70-130	27-SEP-18
Carbon tetrachloride			115.3		%		70-130	27-SEP-18
Chlorobenzene			114.6		%		70-130	27-SEP-18
Chloroethane			104.6		%		70-130	27-SEP-18
Chloroform			112.2		%		70-130	27-SEP-18
Chloromethane			99.6		%		60-140	27-SEP-18
cis-1,2-Dichloroethylene			110.4		%		70-130	27-SEP-18
cis-1,3-Dichloropropene			108.4		%		70-130	27-SEP-18
Dibromochloromethane			106.4		%		70-130	27-SEP-18
Dichlorodifluoromethane			145.3	MES	%		50-140	27-SEP-18
Dichloromethane			108.2		%		70-130	27-SEP-18
Ethylbenzene			110.0		%		70-130	27-SEP-18
m+p-Xylenes			113.8		%		70-130	27-SEP-18
Methyl Ethyl Ketone			92.2		%		60-140	27-SEP-18
Methyl Isobutyl Ketone			87.9		%		50-150	27-SEP-18
n-Hexane			127.0		%		70-130	27-SEP-18
MTBE			114.4		%		70-130	27-SEP-18
o-Xylene			107.6		%		70-130	27-SEP-18
Styrene			104.6		%		70-130	27-SEP-18
Tetrachloroethylene			117.2		%		70-130	27-SEP-18
Toluene			111.3		%		70-130	27-SEP-18
trans-1,2-Dichloroethylene			109.1		%		70-130	27-SEP-18
trans-1,3-Dichloropropene			105.9		%		70-130	27-SEP-18
Trichloroethylene			117.2		%		70-130	27-SEP-18
Trichlorofluoromethane			128.5		%		60-140	27-SEP-18
Vinyl chloride			108.5		%		60-140	27-SEP-18
WG2882679-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	27-SEP-18
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	27-SEP-18
1,1,1-Trichloroethane			<0.50		ug/L		0.5	27-SEP-18
1,1,2-Trichloroethane			<0.50		ug/L		0.5	27-SEP-18
1,2-Dibromoethane			<0.20		ug/L		0.2	27-SEP-18
1,1-Dichloroethane			<0.50		ug/L		0.5	27-SEP-18
1,1-Dichloroethylene			<0.50		ug/L		0.5	27-SEP-18



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4246311							
WG2882679-2	MB							
1,2-Dichlorobenzene			<0.50		ug/L		0.5	27-SEP-18
1,2-Dichloroethane			<0.50		ug/L		0.5	27-SEP-18
1,2-Dichloropropane			<0.50		ug/L		0.5	27-SEP-18
1,3-Dichlorobenzene			<0.50		ug/L		0.5	27-SEP-18
1,4-Dichlorobenzene			<0.50		ug/L		0.5	27-SEP-18
2-Hexanone			<20		ug/L		20	27-SEP-18
Acetone			<20		ug/L		20	27-SEP-18
Benzene			<0.50		ug/L		0.5	27-SEP-18
Bromodichloromethane			<1.0		ug/L		1	27-SEP-18
Bromoform			<1.0		ug/L		1	27-SEP-18
Bromomethane			<0.50		ug/L		0.5	27-SEP-18
Carbon Disulfide			<1.0		ug/L		1	27-SEP-18
Carbon tetrachloride			<0.50		ug/L		0.5	27-SEP-18
Chlorobenzene			<0.50		ug/L		0.5	27-SEP-18
Chloroethane			<1.0		ug/L		1	27-SEP-18
Chloroform			<1.0		ug/L		1	27-SEP-18
Chloromethane			<1.0		ug/L		1	27-SEP-18
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	27-SEP-18
cis-1,3-Dichloropropene			<0.50		ug/L		0.5	27-SEP-18
Dibromochloromethane			<1.0		ug/L		1	27-SEP-18
Dichlorodifluoromethane			<1.0		ug/L		1	27-SEP-18
Dichloromethane			<2.0		ug/L		2	27-SEP-18
Ethylbenzene			<0.50		ug/L		0.5	27-SEP-18
m+p-Xylenes			<1.0		ug/L		1	27-SEP-18
Methyl Ethyl Ketone			<20		ug/L		20	27-SEP-18
Methyl Isobutyl Ketone			<20		ug/L		20	27-SEP-18
n-Hexane			<0.50		ug/L		0.5	27-SEP-18
MTBE			<0.50		ug/L		0.5	27-SEP-18
o-Xylene			<0.50		ug/L		0.5	27-SEP-18
Styrene			<0.50		ug/L		0.5	27-SEP-18
Tetrachloroethylene			<0.50		ug/L		0.5	27-SEP-18
Toluene			<0.50		ug/L		0.5	27-SEP-18
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	27-SEP-18
trans-1,3-Dichloropropene			<0.50		ug/L		0.5	27-SEP-18



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT	Water							
Batch	R4246311							
WG2882679-2 MB								
Trichloroethylene			<0.50		ug/L		0.5	27-SEP-18
Trichlorofluoromethane			<1.0		ug/L		1	27-SEP-18
Vinyl chloride			<0.50		ug/L		0.5	27-SEP-18
Surrogate: 1,4-Difluorobenzene			99.4		%		70-130	27-SEP-18
Surrogate: 4-Bromofluorobenzene			97.5		%		70-130	27-SEP-18

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878



L2168446-COFC

Report To Contact and company name below will appear on the final report: **Report Format / Distribution**

Company: Blumetric Environmental
 Contact: Srana Scholes
 Phone: 519-742-6685

Street: 171 Victoria St N
 City/Province: Kitchener, ON
 Postal Code: N2H5C5

Invoice To: Same as Report To YES NO
 Copy of Invoice with Report YES NO

Company:
 Contact:

Project Information

ALS Account # / Quote #: 23987, Q55593
 Job #: 180351-01
 PO / AFE:
 LSD:

ALS Lab Work Order # (lab use only): **L2168446**

ALS Contact: RICK H
 Sampler:

Oil and Gas Required Fields (client use)

AFE/Coal Center: PO#
 Major/Minor Code: Routing Code:
 Requisitioner:
 Location:

Report Format / Distribution

Select Report Format: PDF EXCEL EDD (DIGITAL)
 Quality Control (QC) Report with Report YES NO
 Compare Results to Critera on Report - provide details below if box checked
 Select Distribution: EMAIL MAIL FAX

Email 1 or Fax: dkavanagh@blumetric.ca, sscholes@blumetric.ca
 Email 2: mbombini@blumetric.ca
 Email 3:

Invoice Distribution

Select Invoice Distribution: EMAIL MAIL FAX

Email 1 or Fax:
 Email 2:

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (FP) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	GENCHEM3-GW	VOC-ROUHS-WT	TKN,TP	ET-N-ORGANIC-DIS-WT	Number of Containers
	MW12	20-Sep-18	12:30	WATER	R	R	R	R	7
	MW14-R		16:05	WATER	R	R	R	R	7
	MW15		11:35	WATER	R	R	R	R	7
	MW19		12:10	WATER	R	R	R	R	7
	QC1		14:35	WATER	R	R	R	R	7
				WATER	R	R	R	R	7
				WATER	R	R	R	R	7
				WATER	R	R	R	R	7
				WATER	R	R	R	R	7
				WATER	R	R	R	R	7
				WATER	R	R	R	R	7
				WATER	R	R	R	R	7
				WATER	R	R	R	R	7
				WATER	R	R	R	R	7

Drinking Water (DW) Samples¹ (client use)

Are samples taken from a Regulated DW System?
 YES NO

Are samples for human drinking water use?
 YES NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen SIF Observations Yes No
 Ice Packs Ice Cubes Custody seal intact Yes No
 Cooling Initiated

INITIAL COOLER TEMPERATURES °C: **8.5** FINAL COOLER TEMPERATURES °C

SHIPMENT RELEASE (client use)

Released by: *[Signature]* Date: 2018/09/20 Time: 14:15
 Received by: *[Signature]* Date: **September 18 2018** Time: **14:15**

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

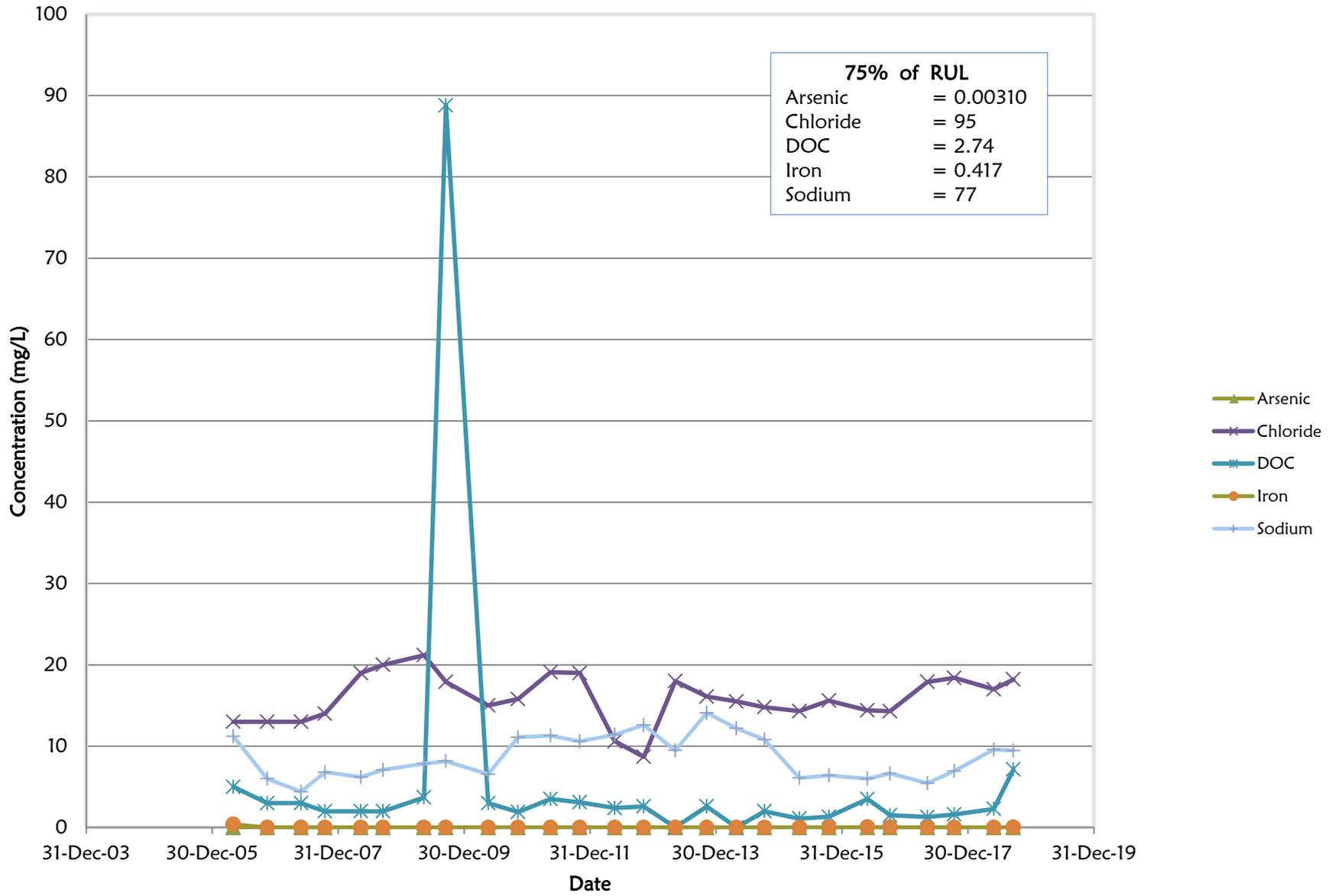
REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION
 Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the White - report copy.
 1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

APPENDIX F

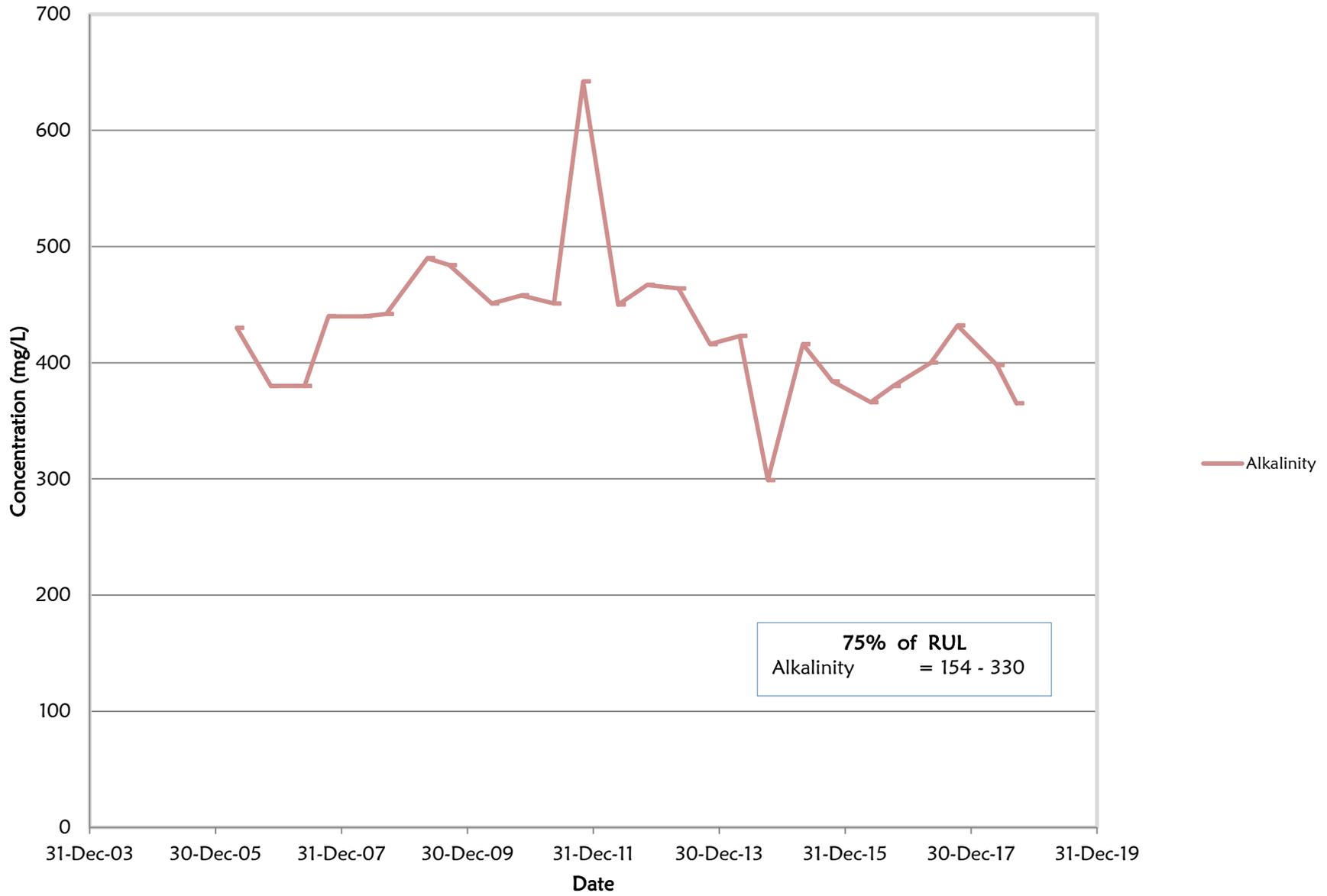
Time-Series Plots of Monitoring Wells



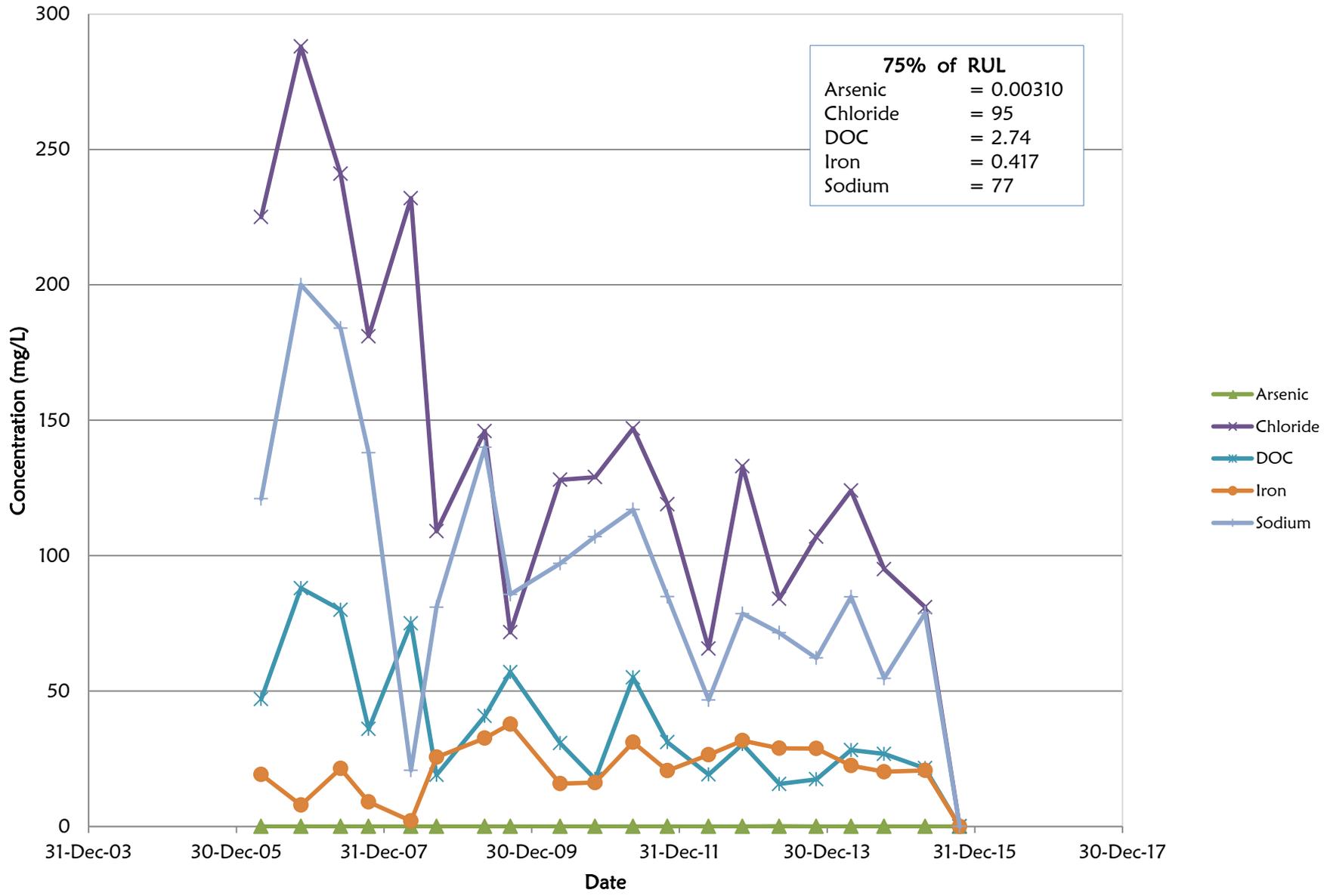
MW1- Northwest



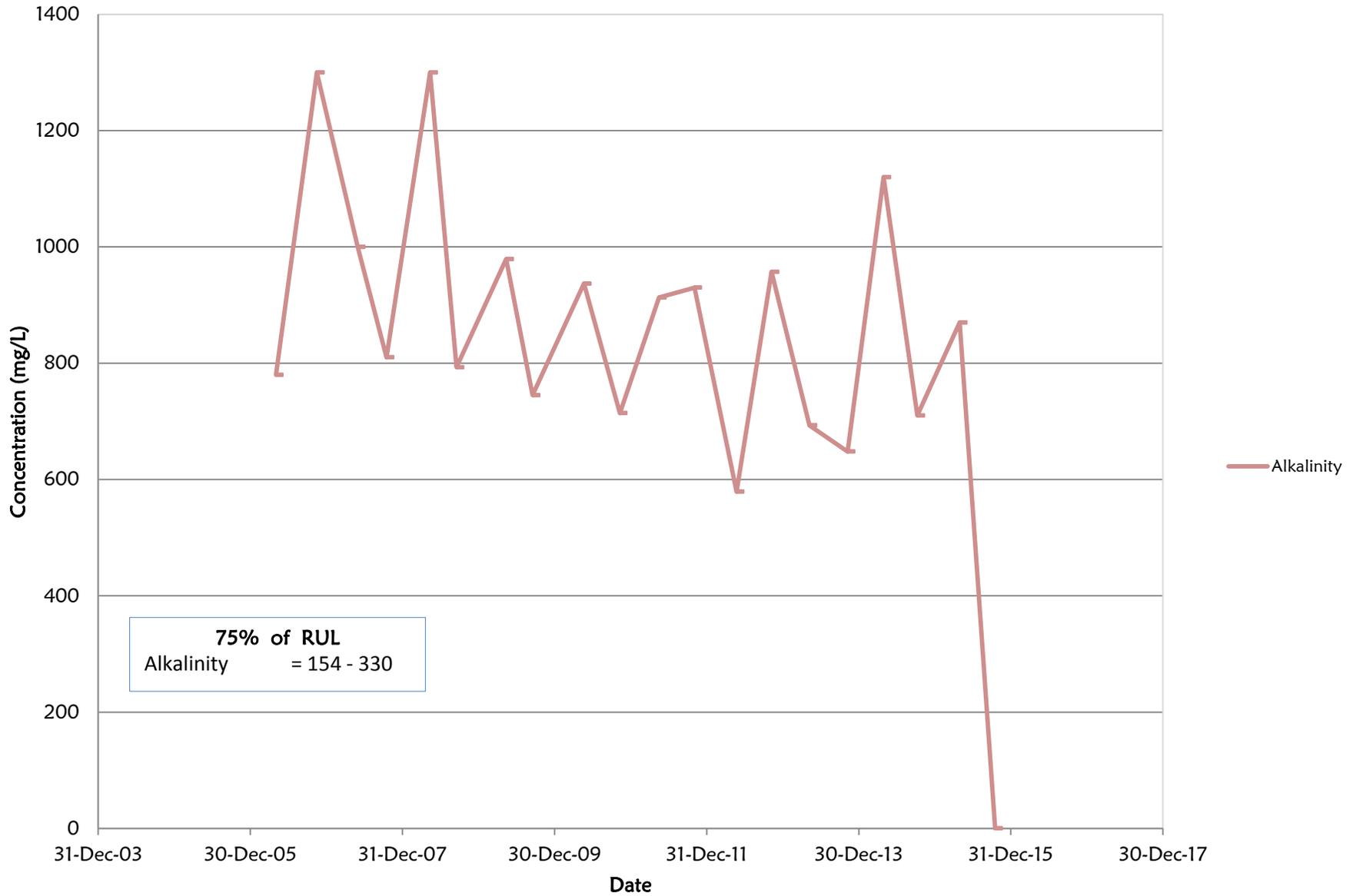
MW1- Northwest



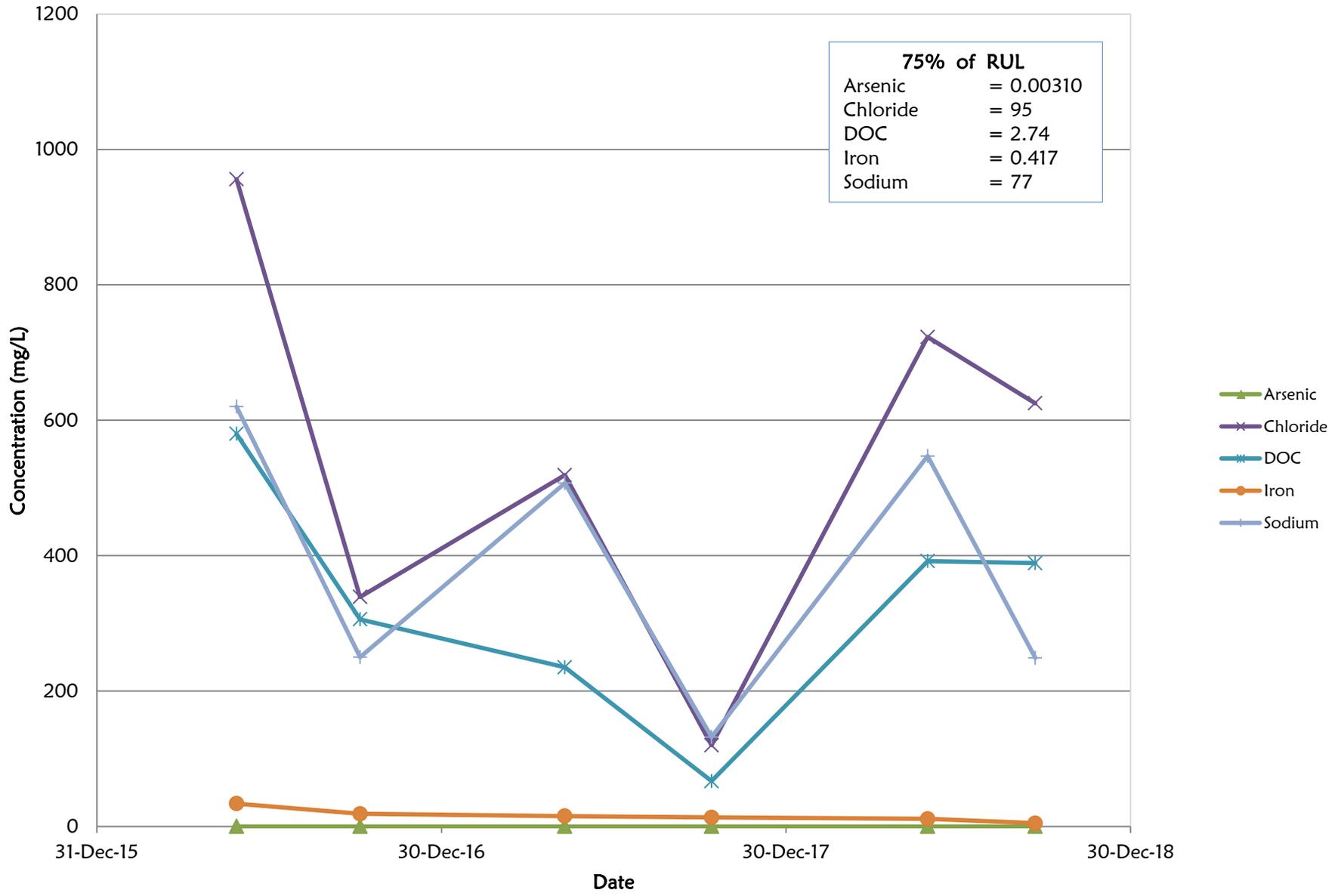
MW2- Leachate



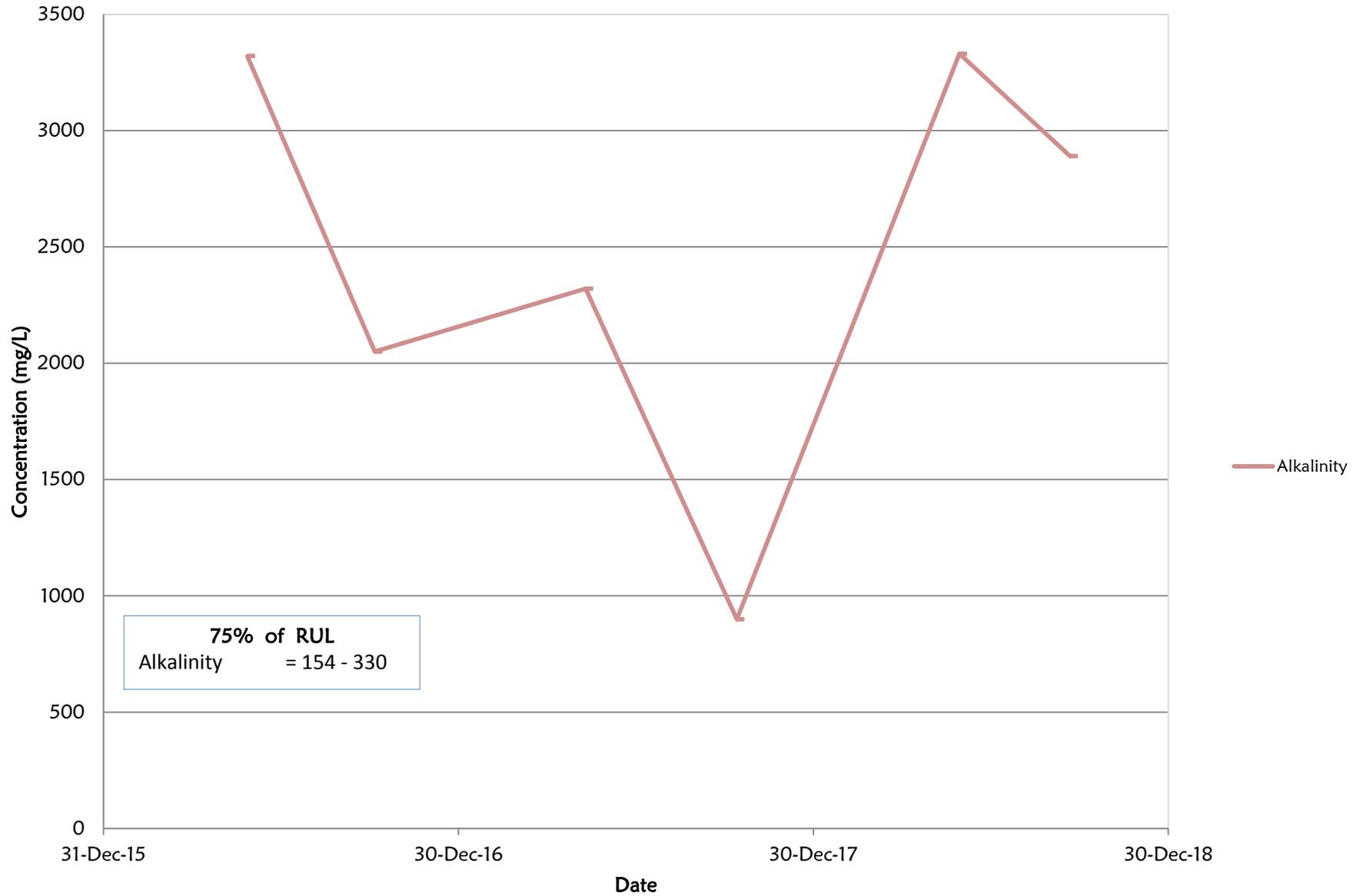
MW2- Leachate



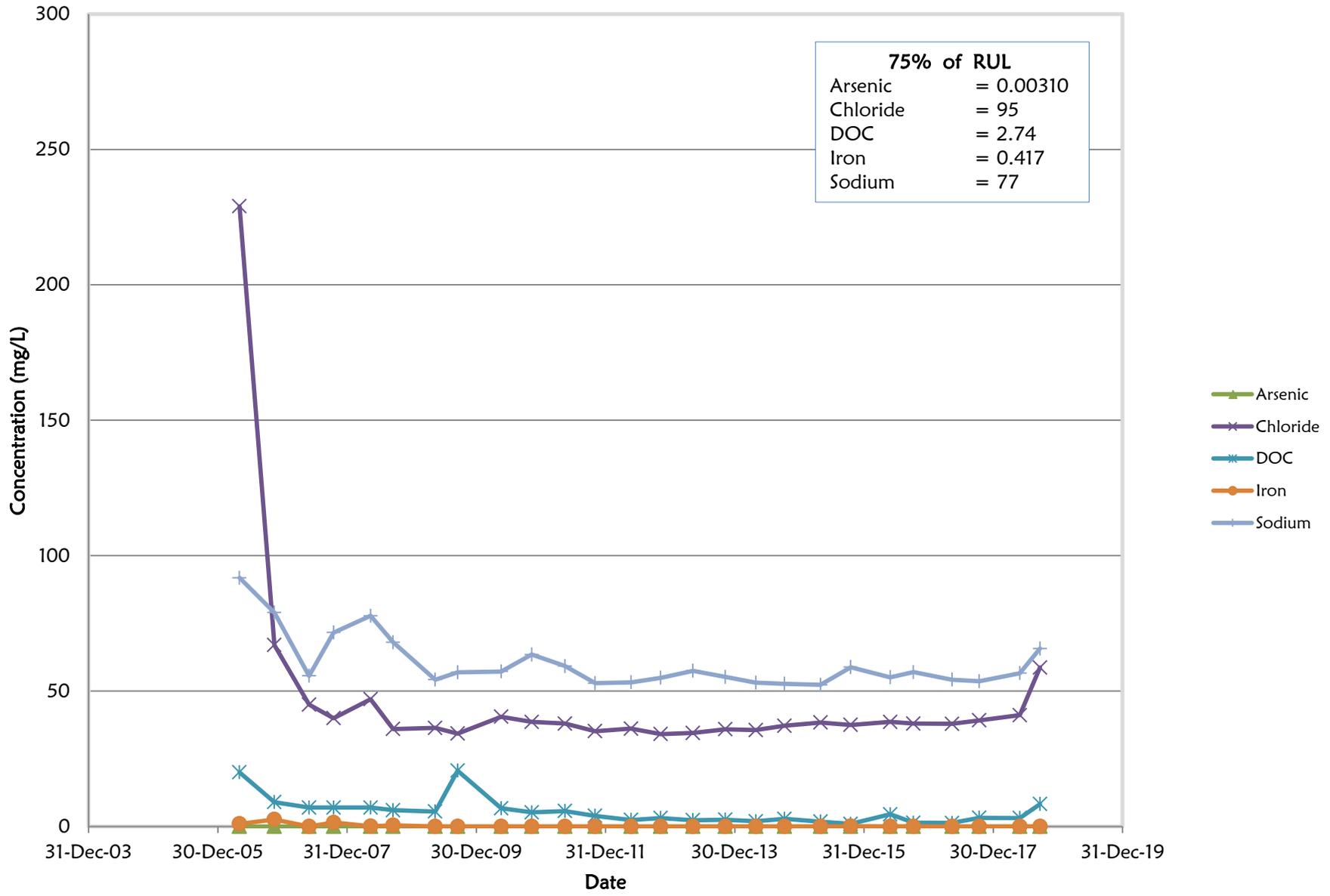
MW2-R- Leachate



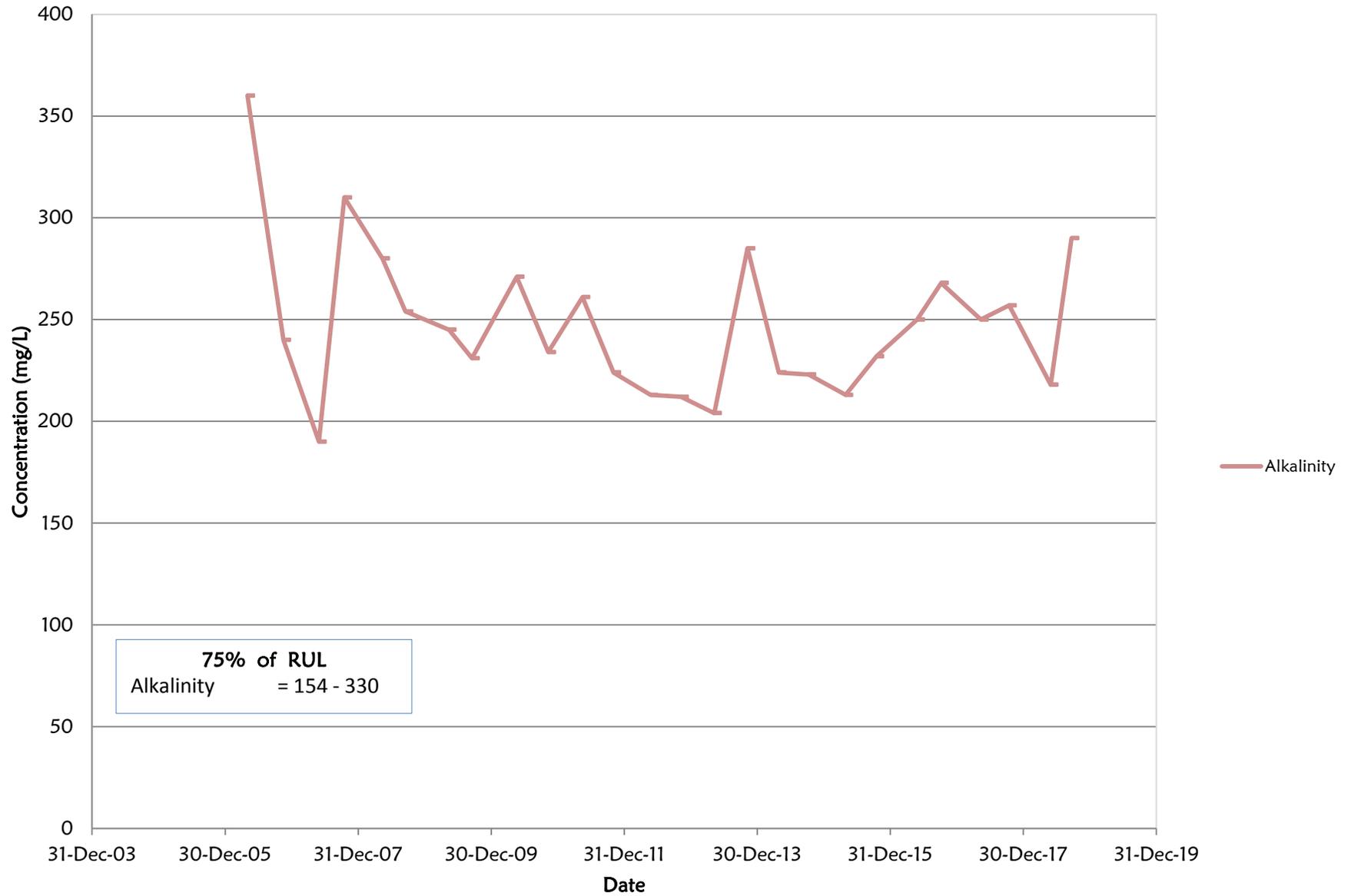
MW2- Leachate



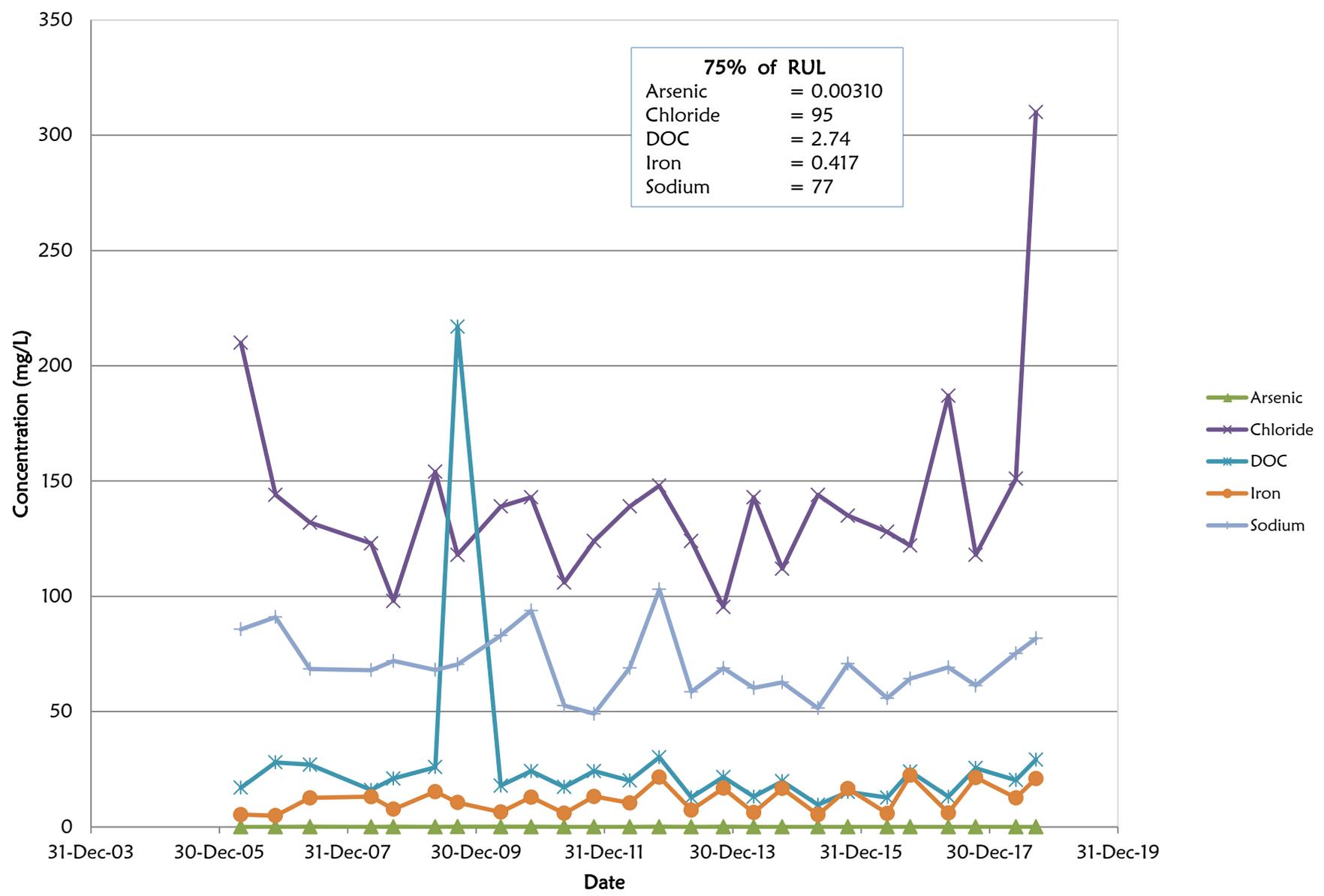
MW2D- Leachate Clay



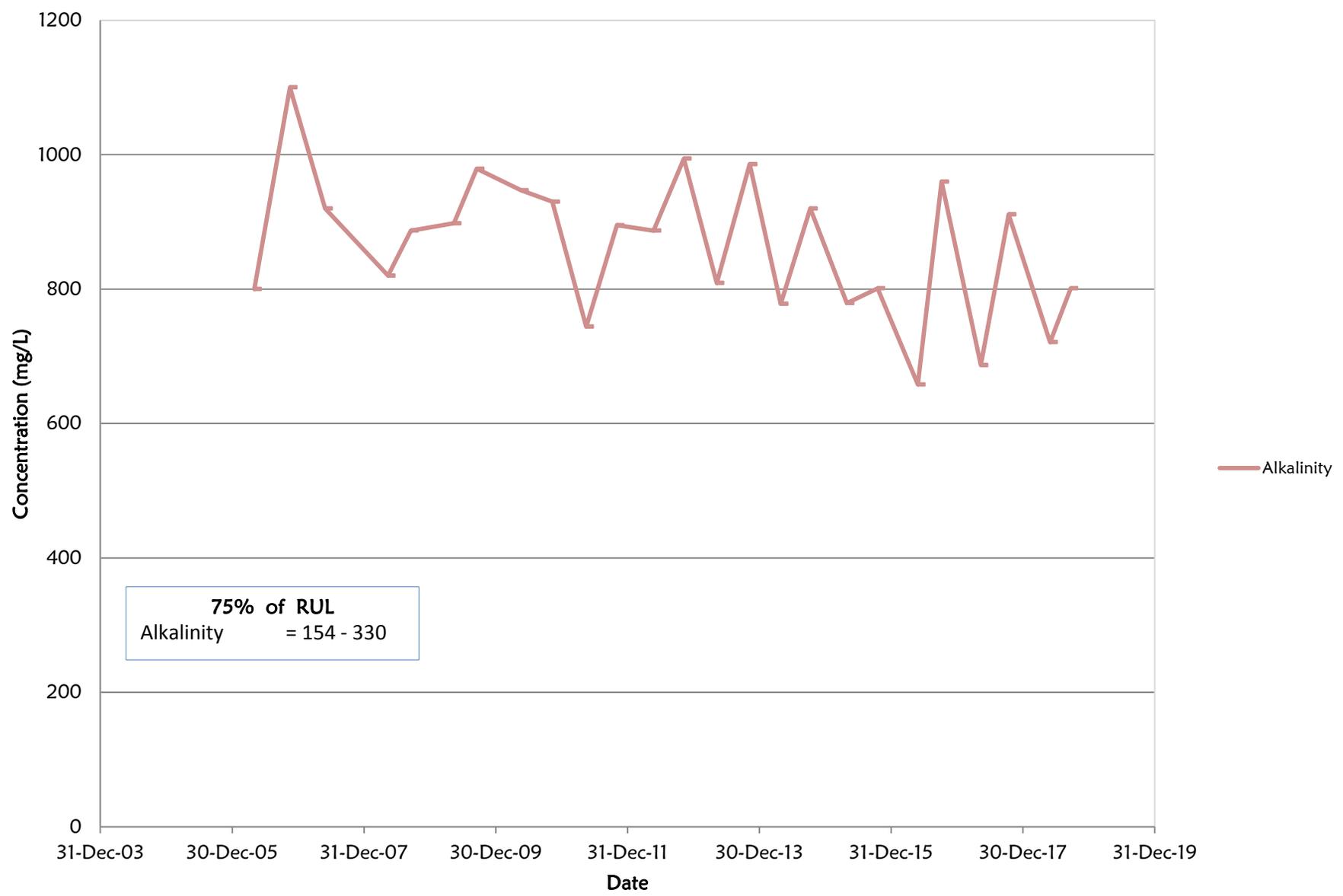
MW2D- Leachate Clay



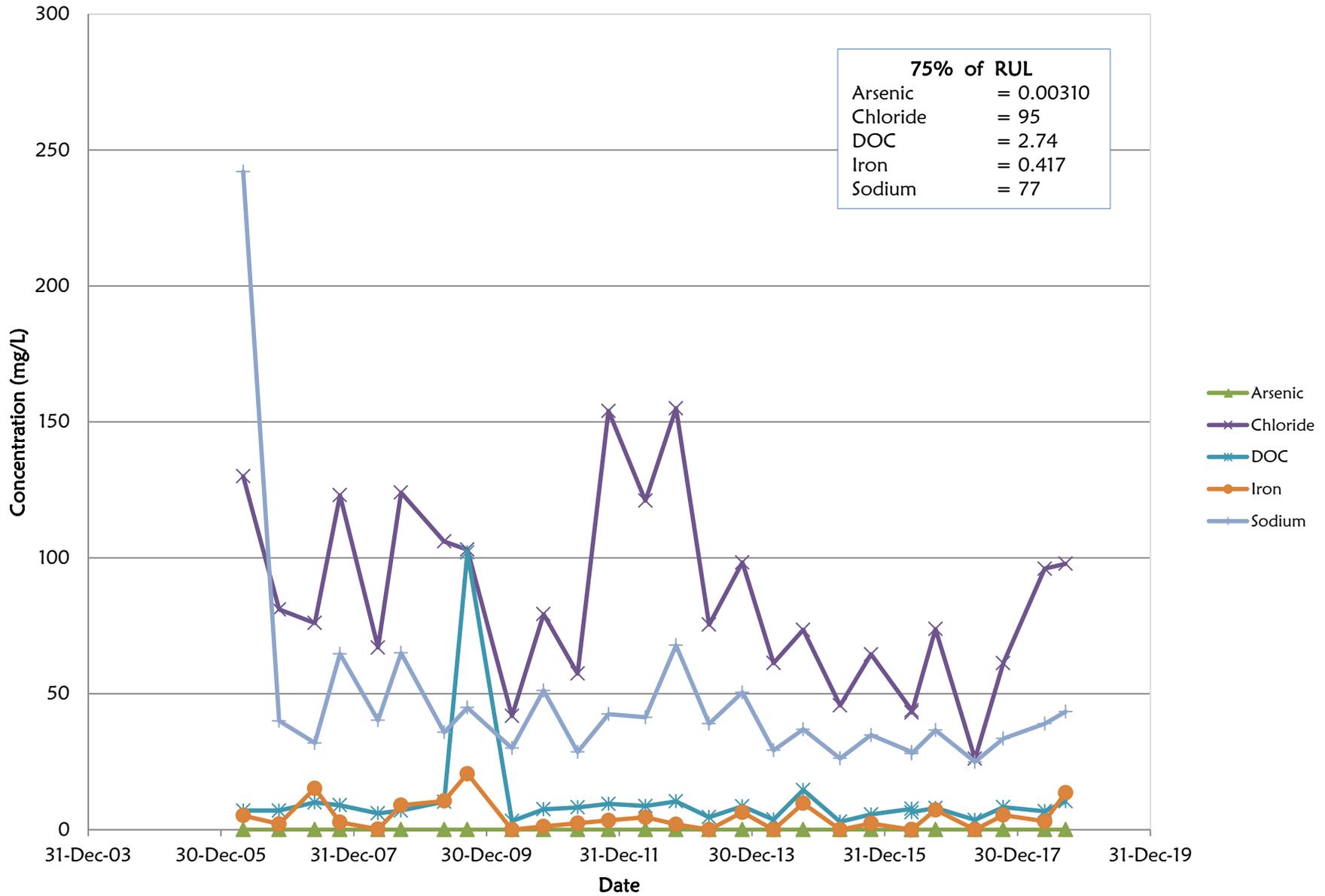
MW3 -Down-gradient - East



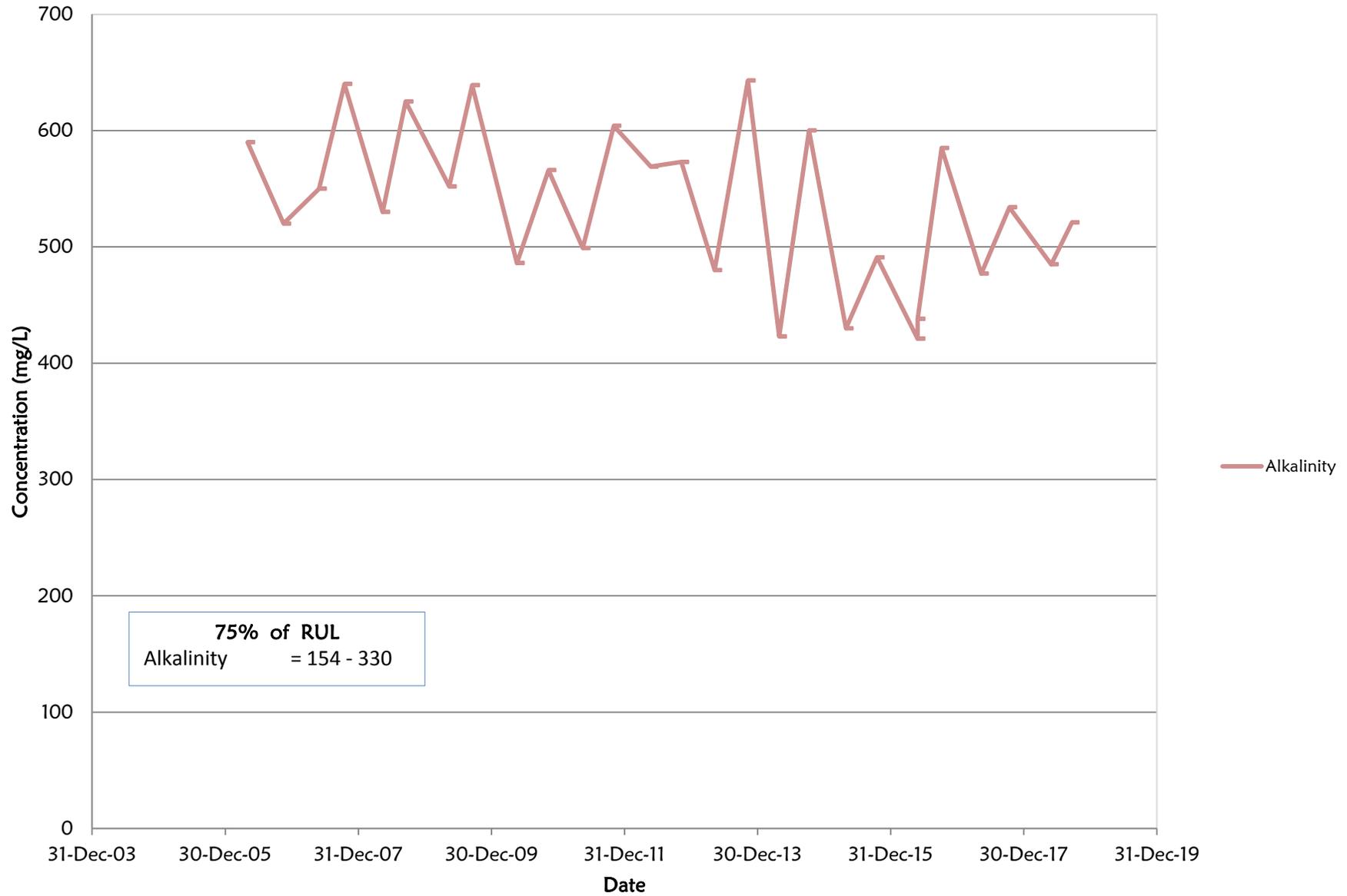
MW3 -Down-gradient - East



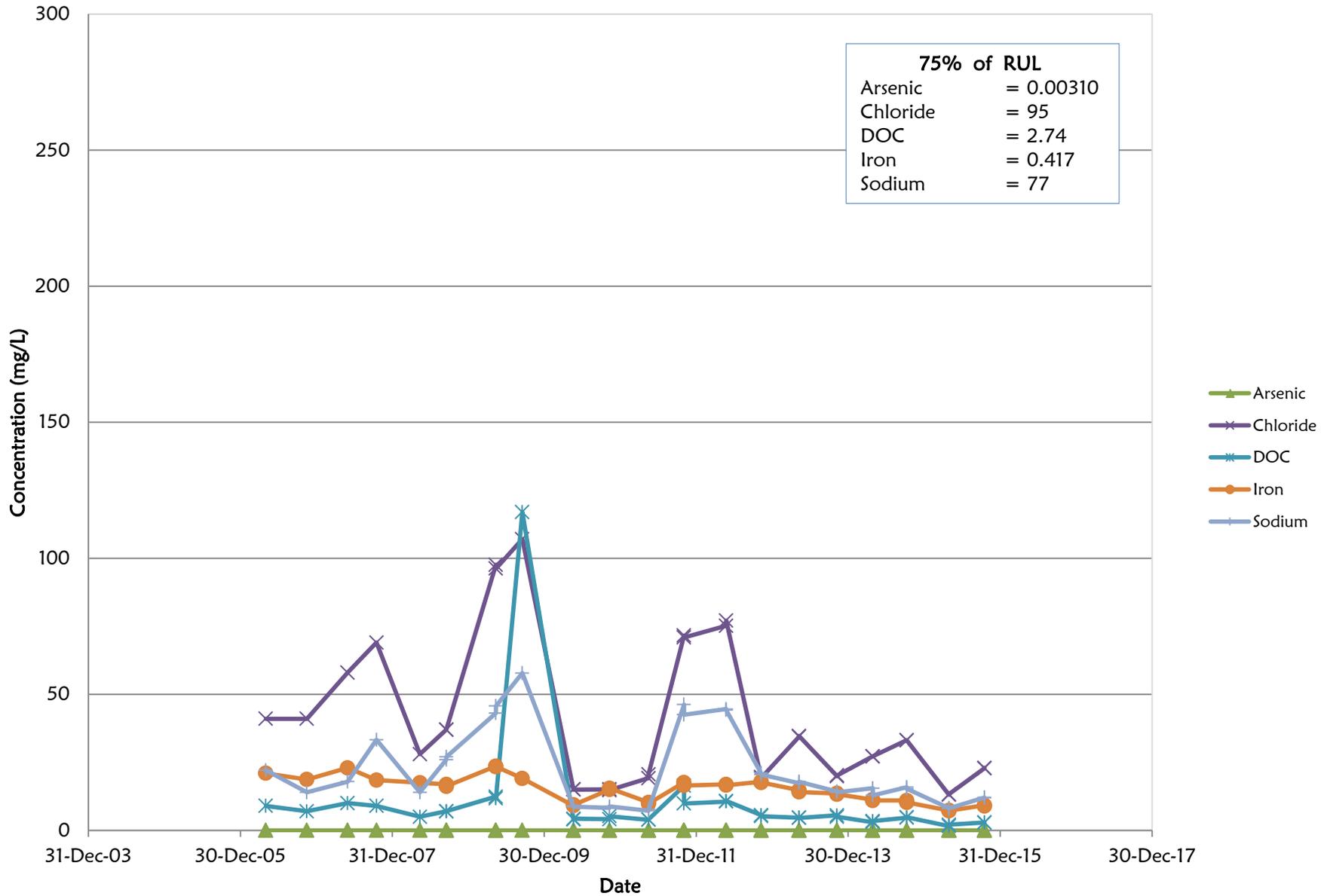
MW4 -Down-gradient - Southeast



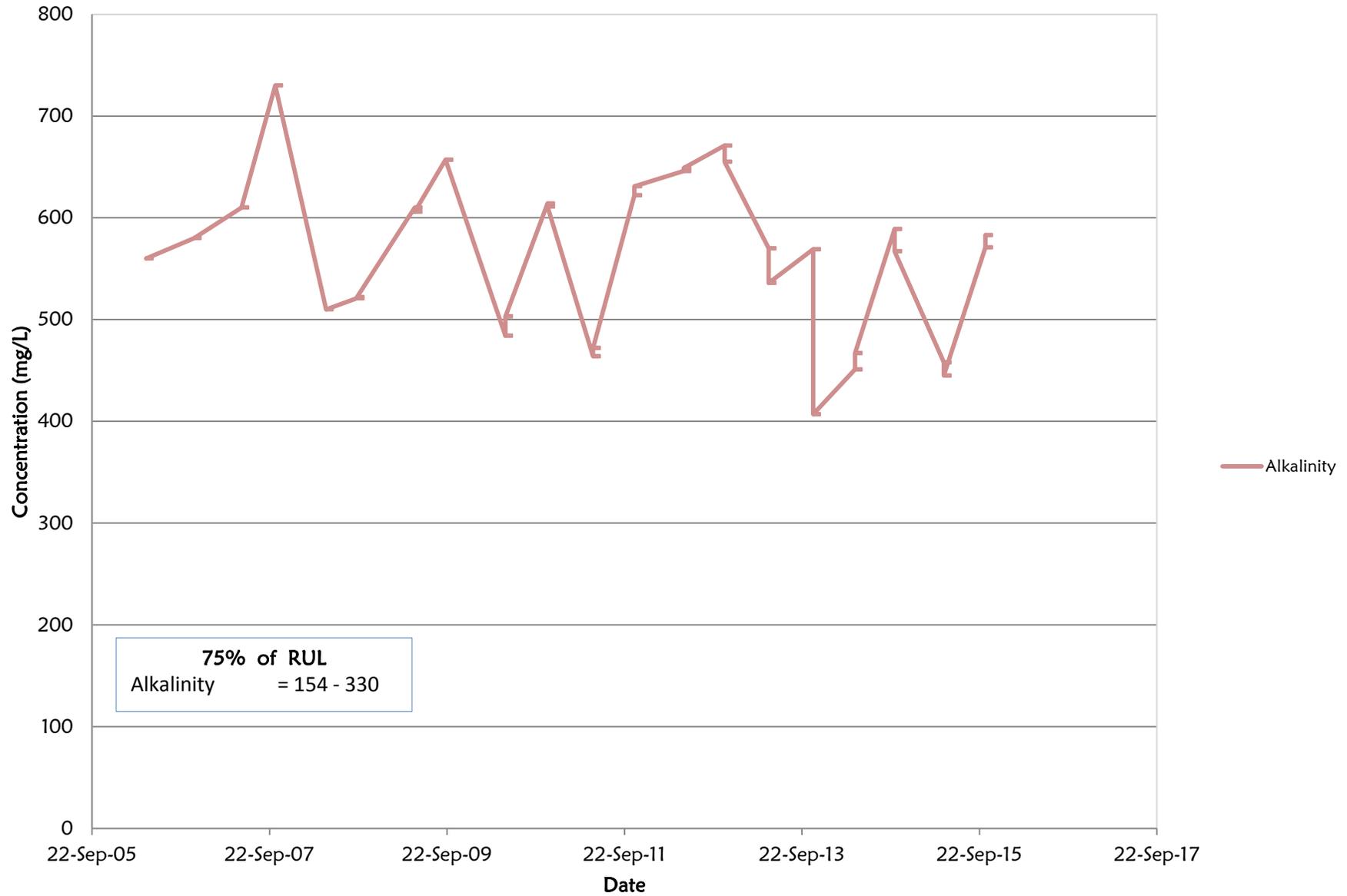
MW4- Down-gradient - Southeast



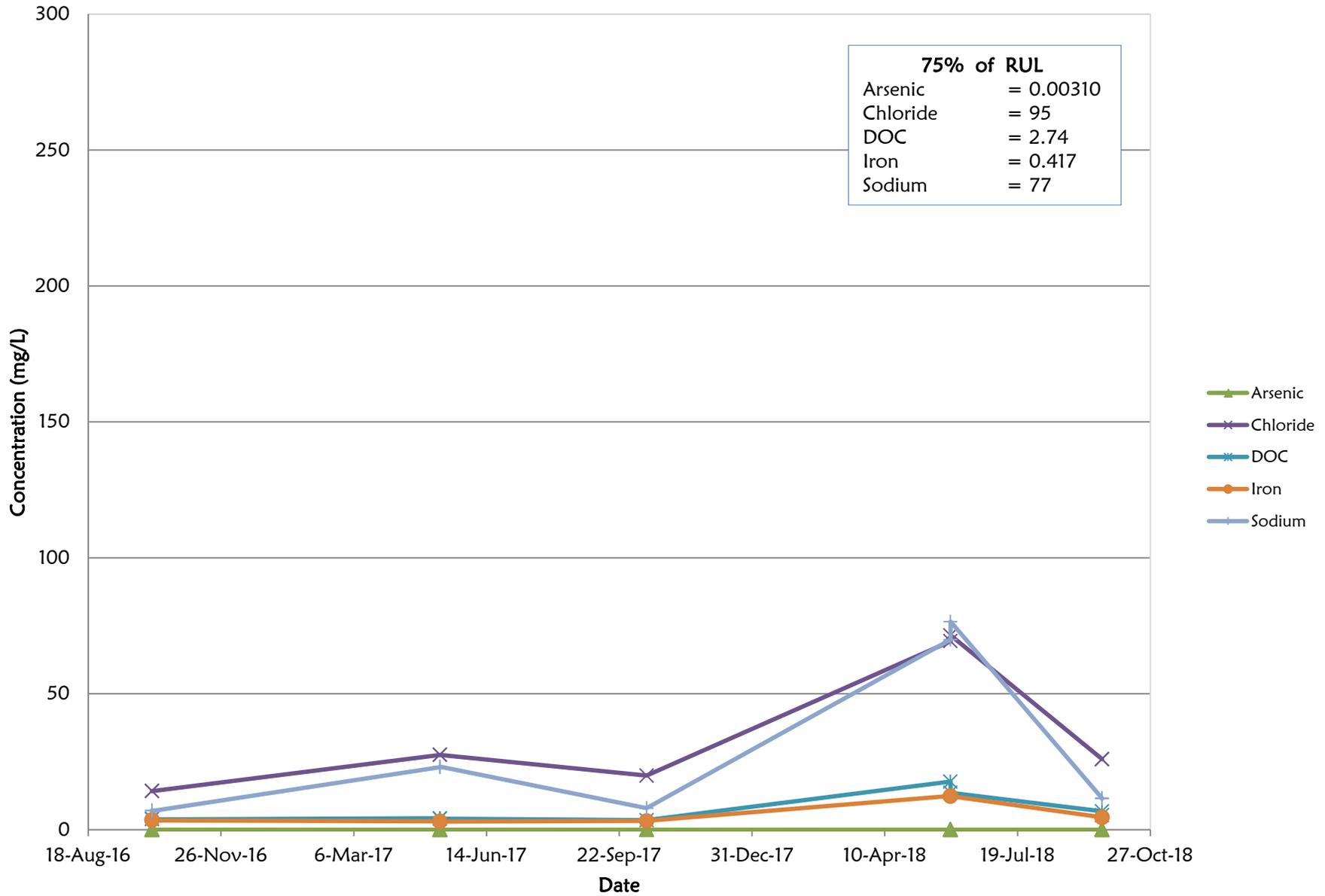
MW5- Down-gradient- Southwest



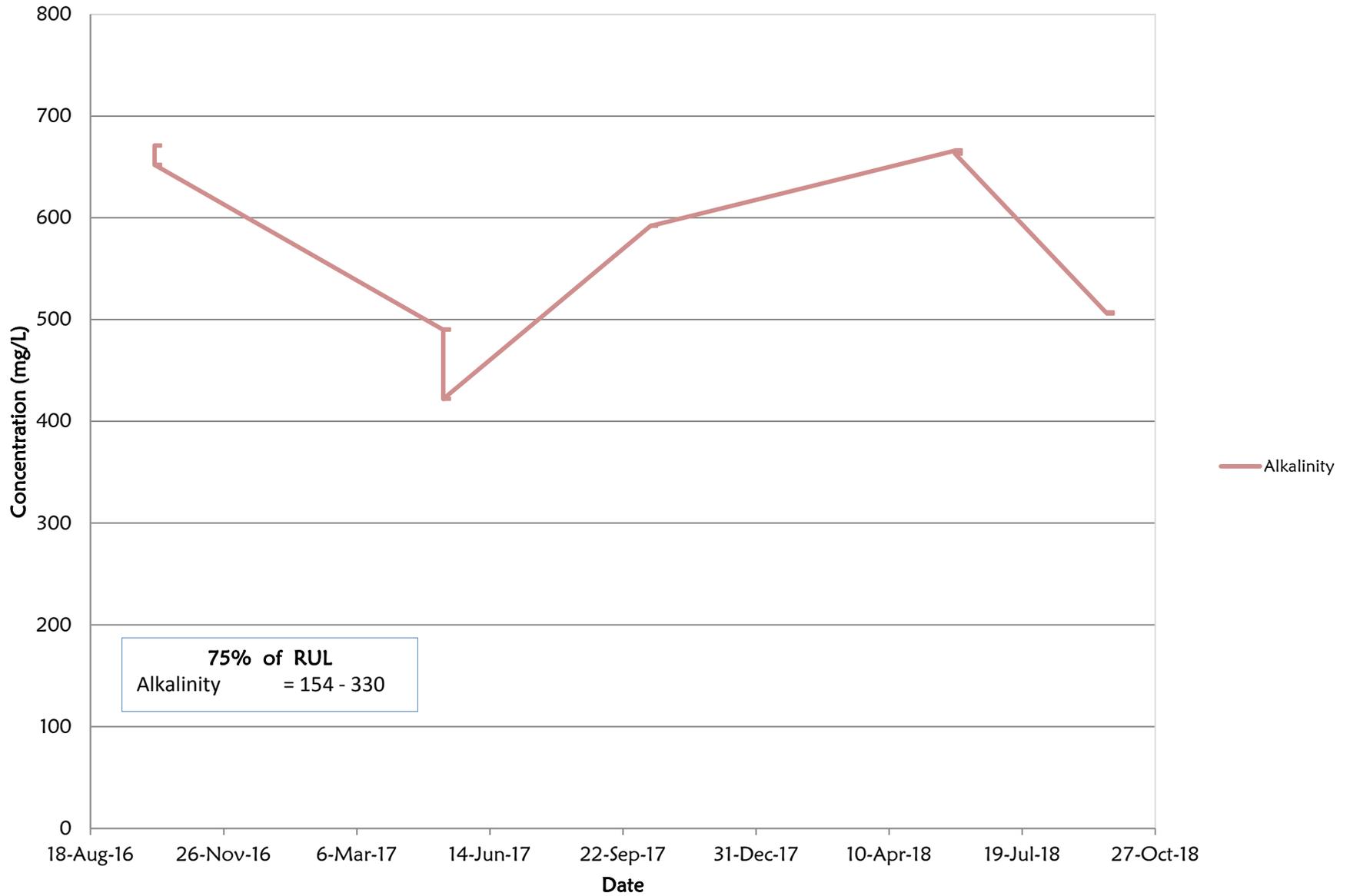
MW5- Down-gradient- Southwest



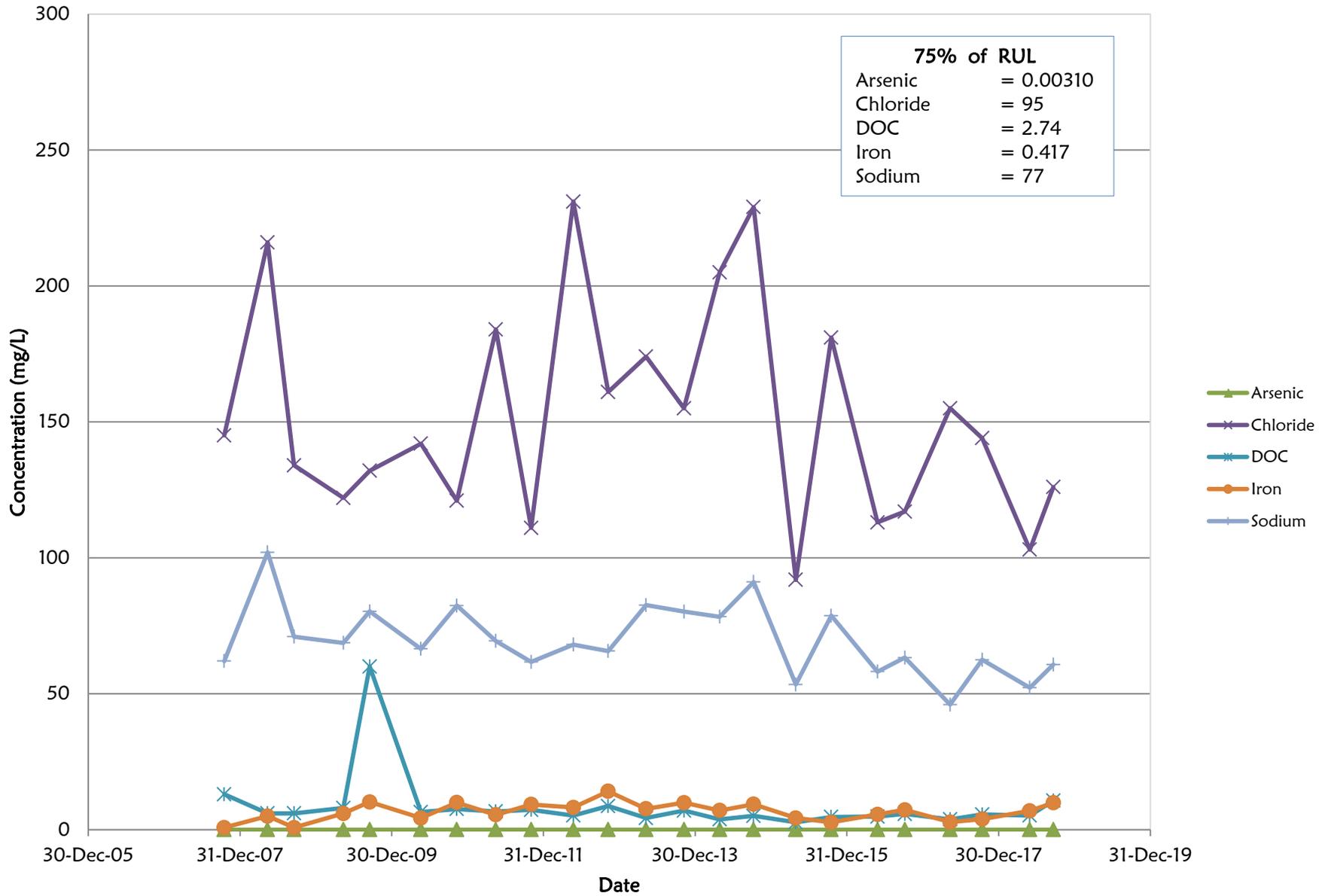
MW5-R- Down-gradient- Southwest



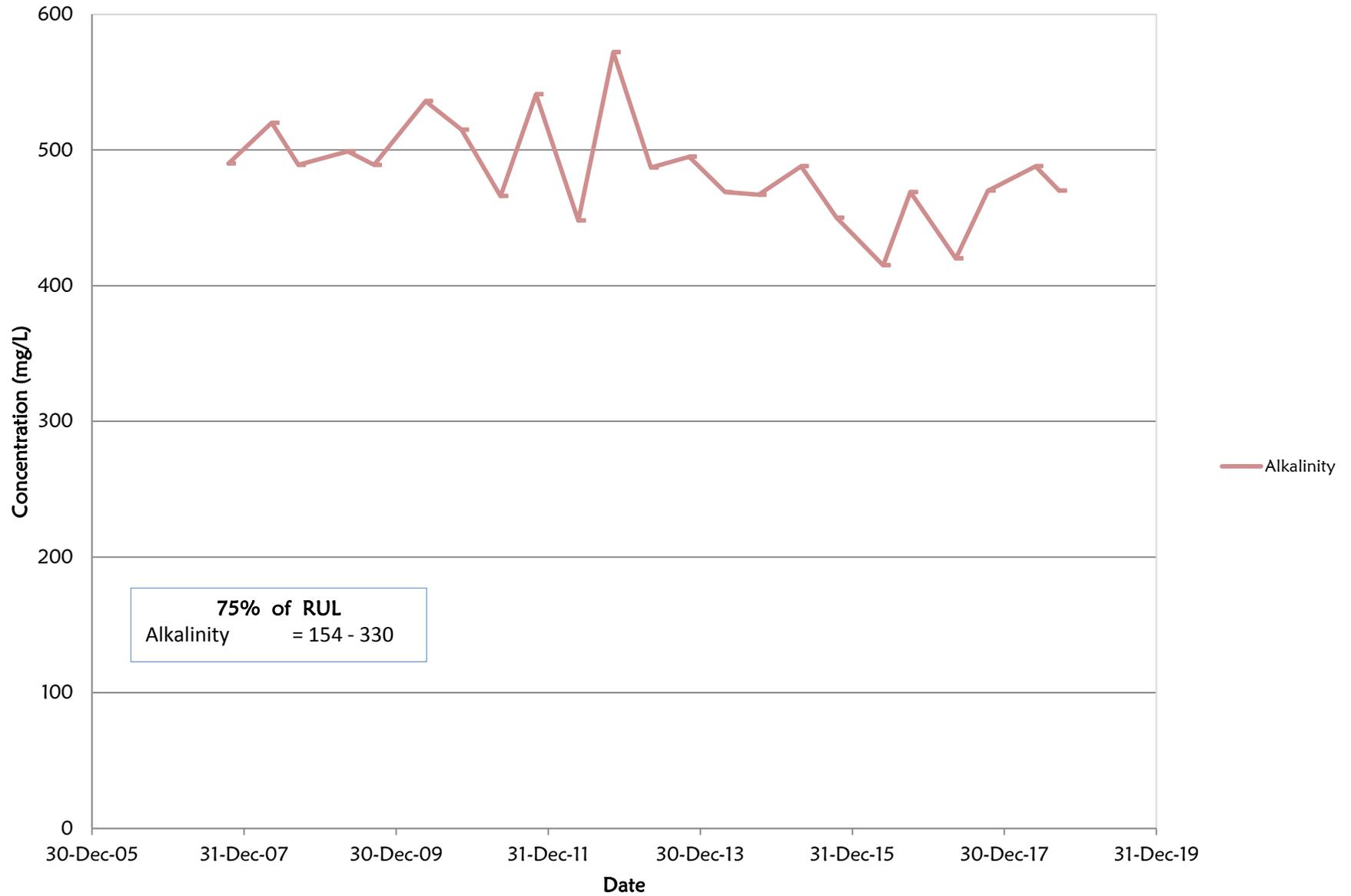
MW5-R- Down-gradient- Southwest



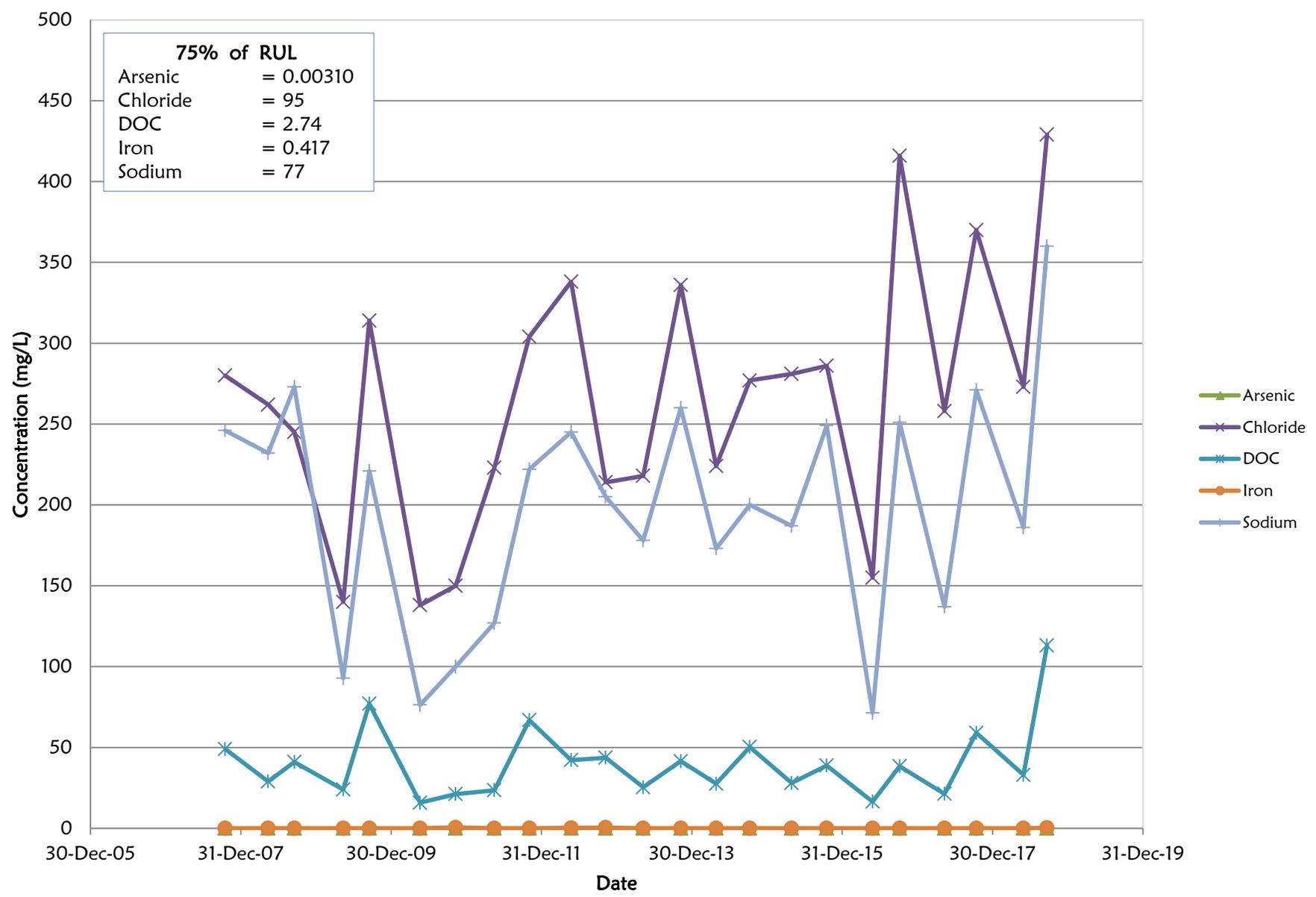
MW6- Down-gradient – South



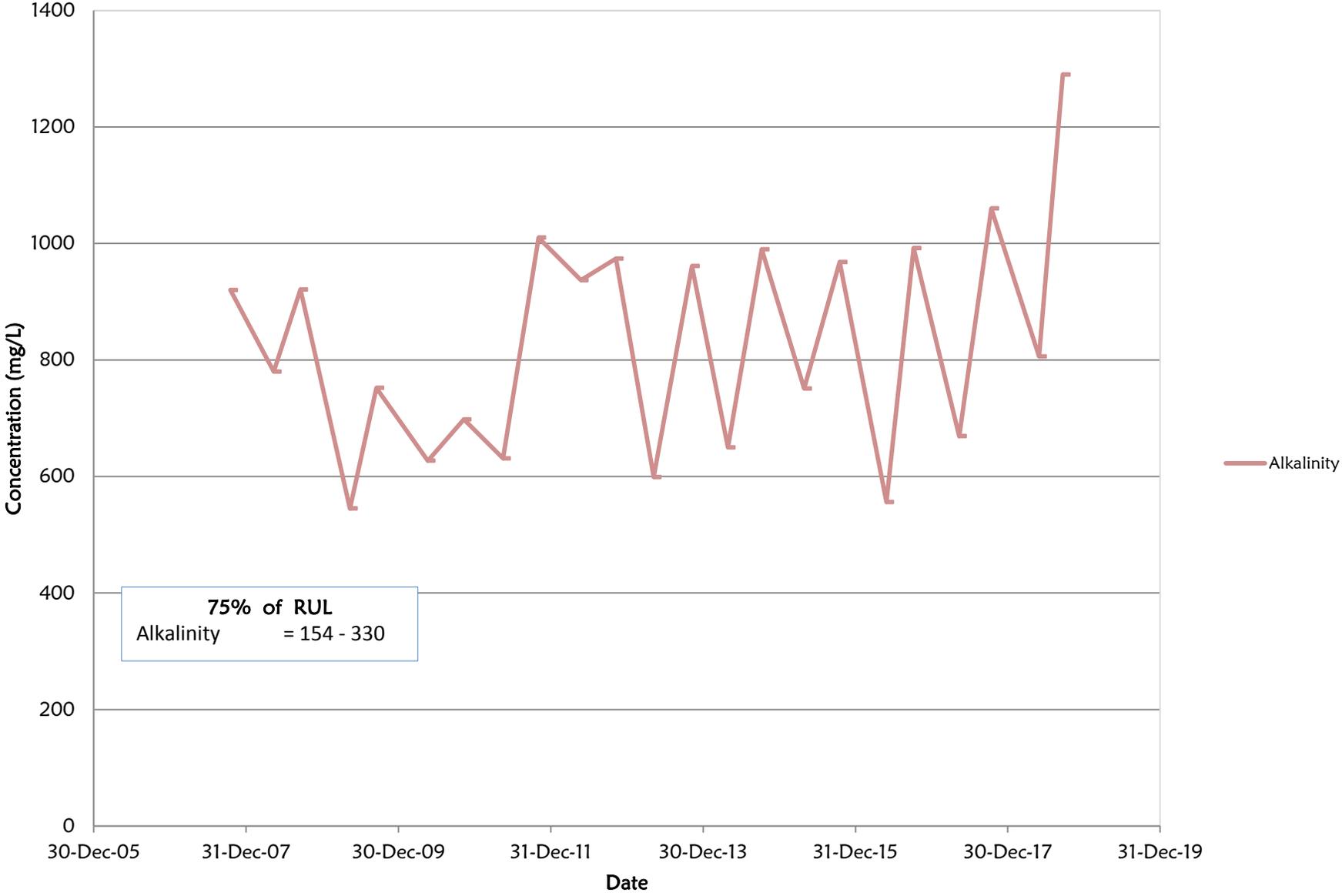
MW6- Down-gradient – South



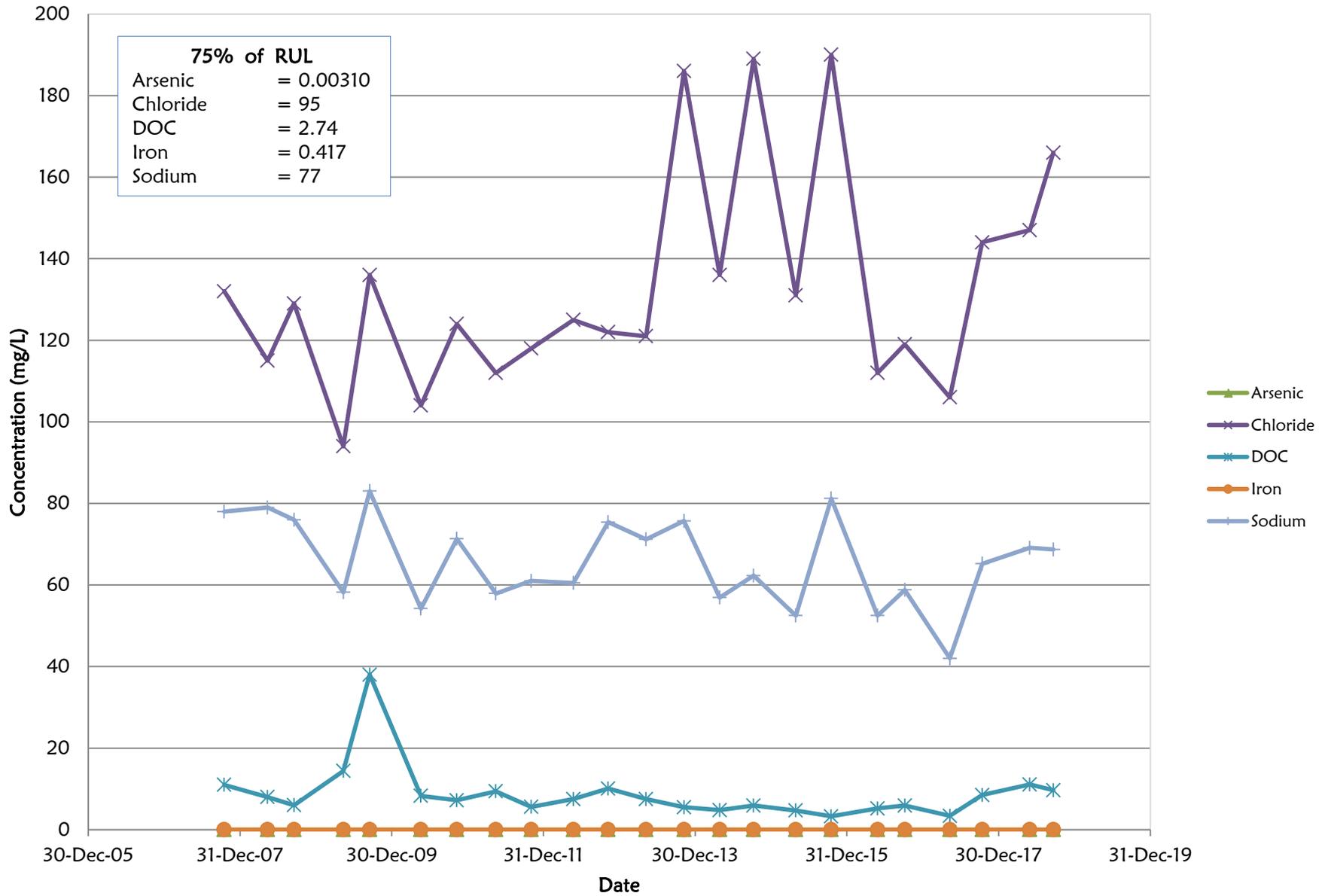
MW7- Down-gradient - East



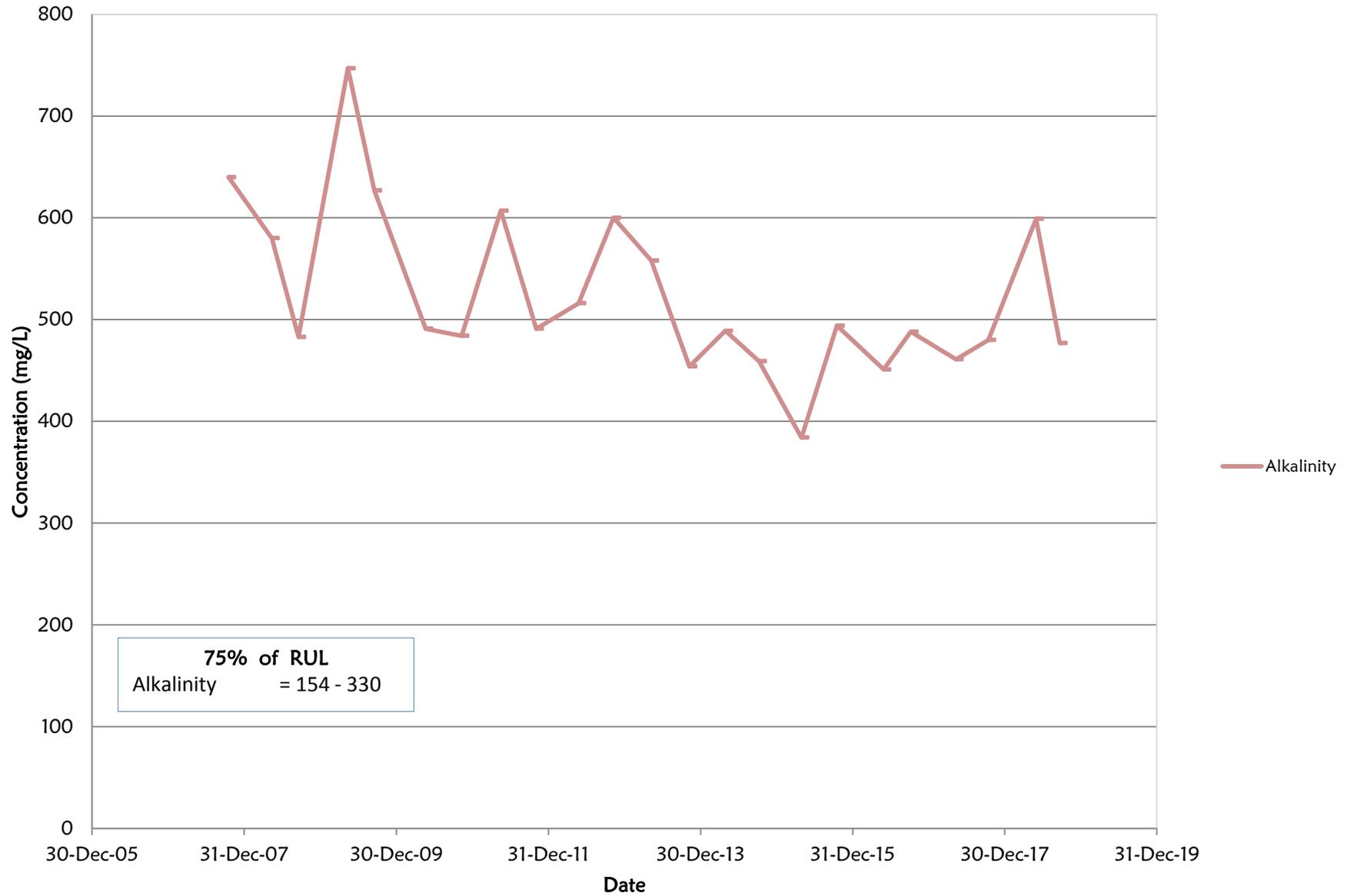
MW7- Down-gradient - East



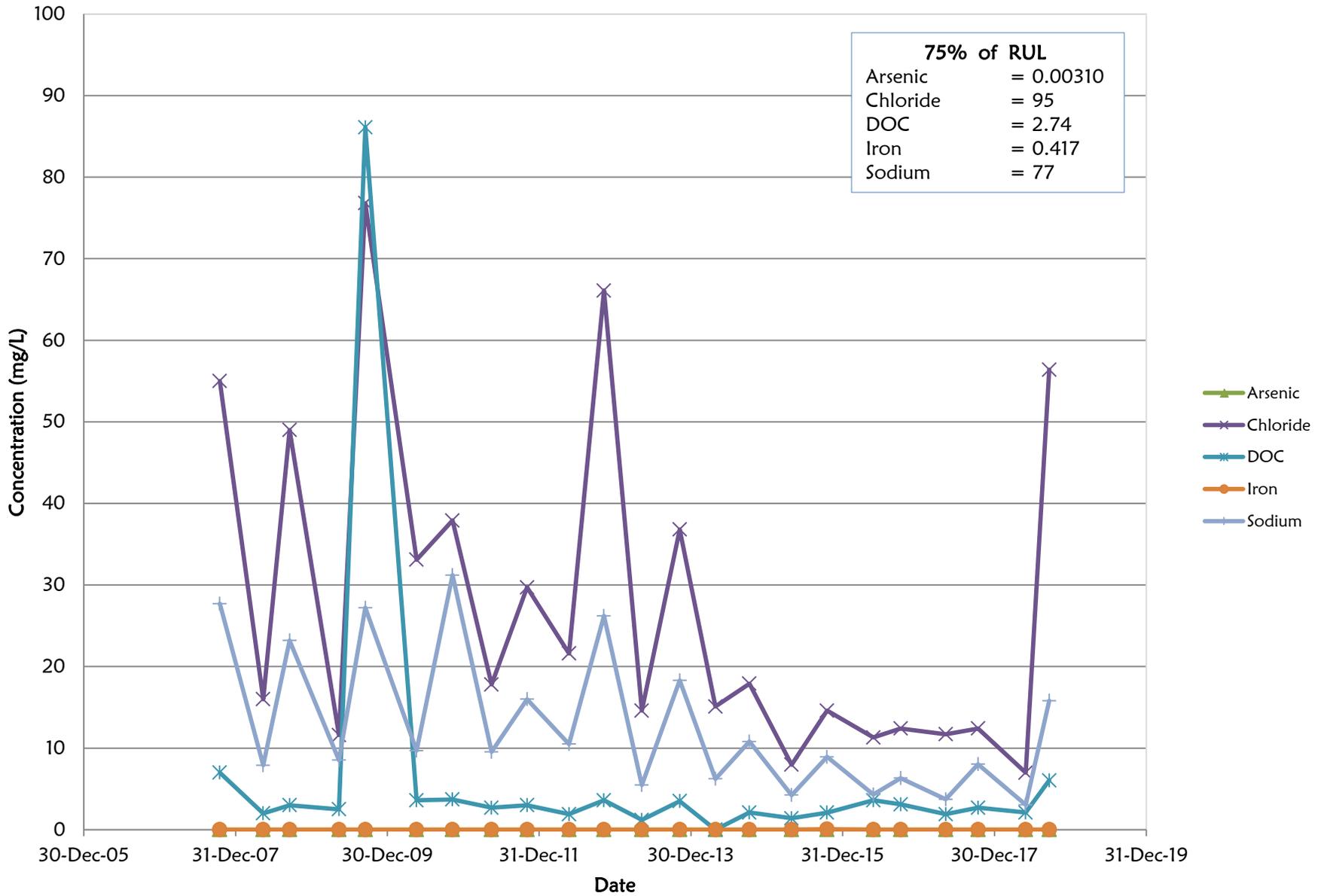
MW8- Down-gradient – East



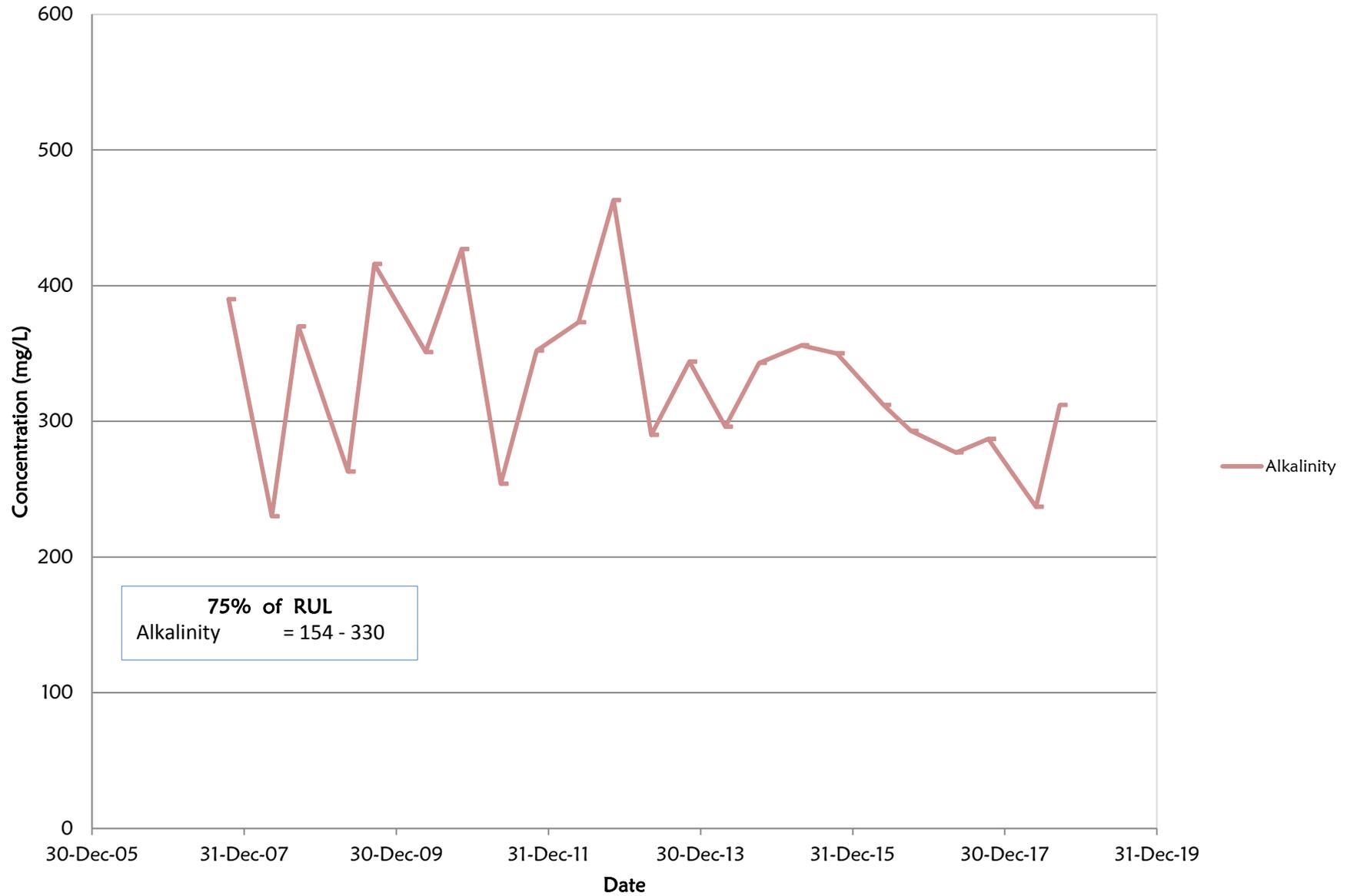
MW8- Down-gradient – East



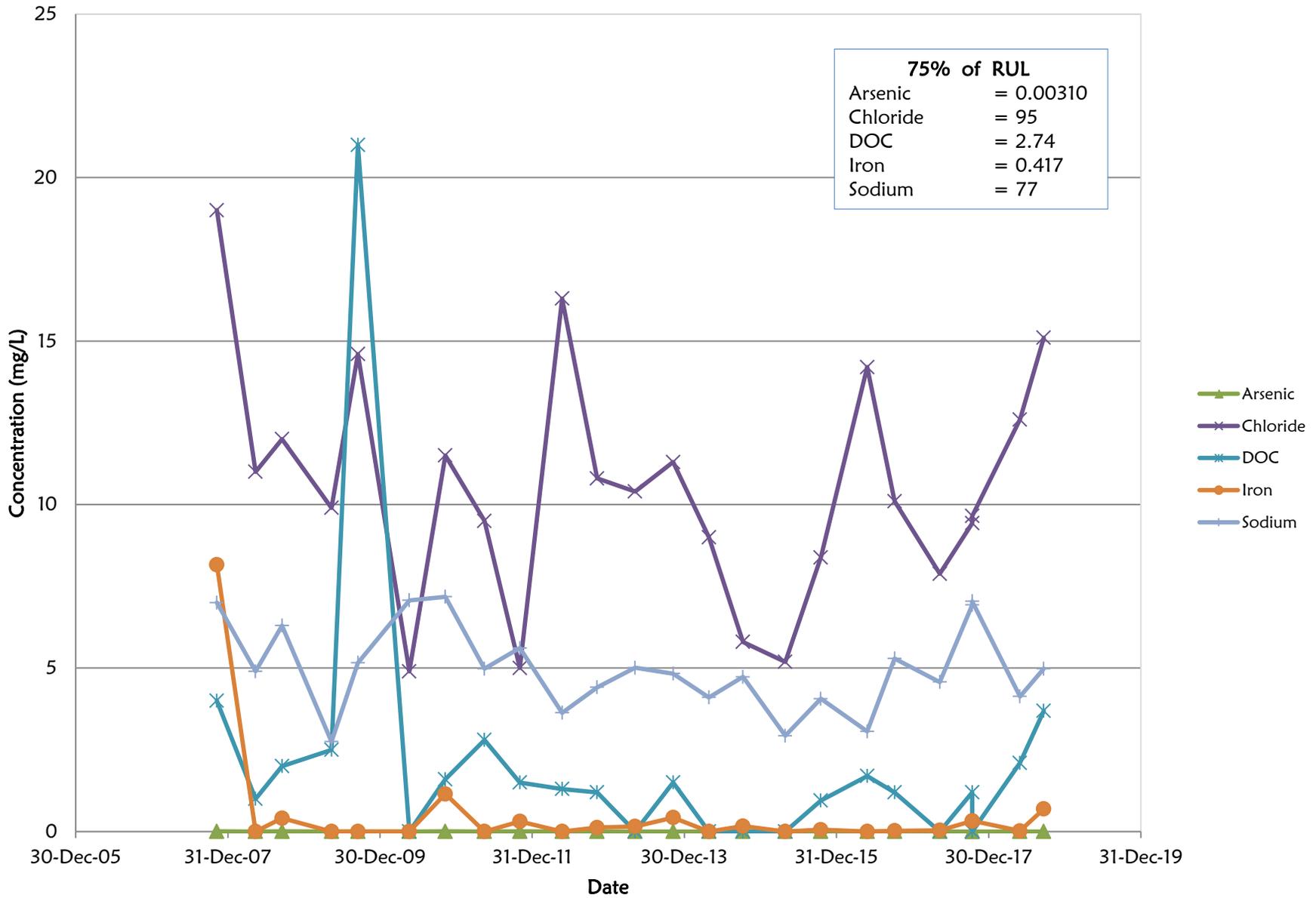
MW9- Down-gradient – South



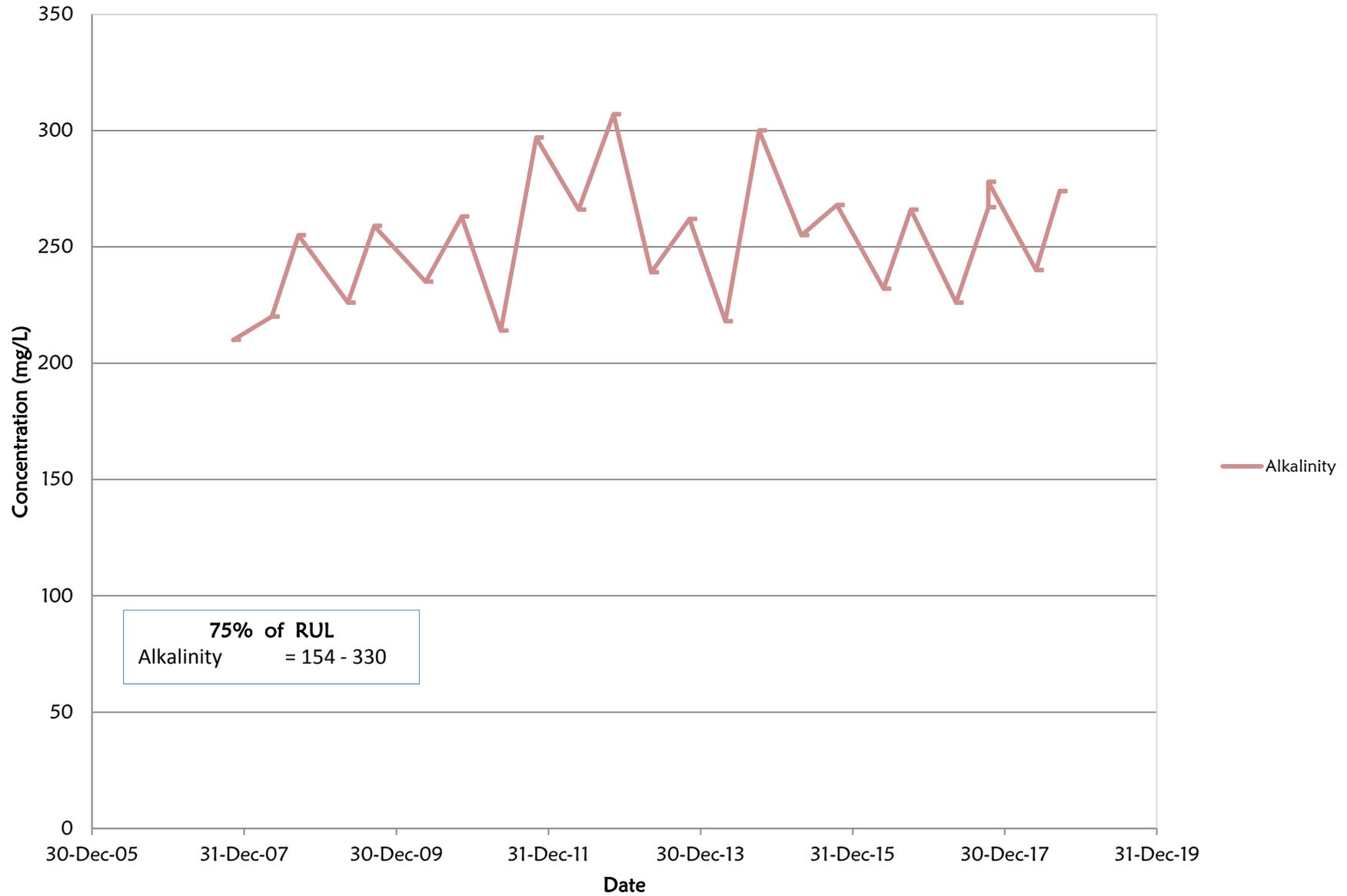
MW9- Down-gradient – South



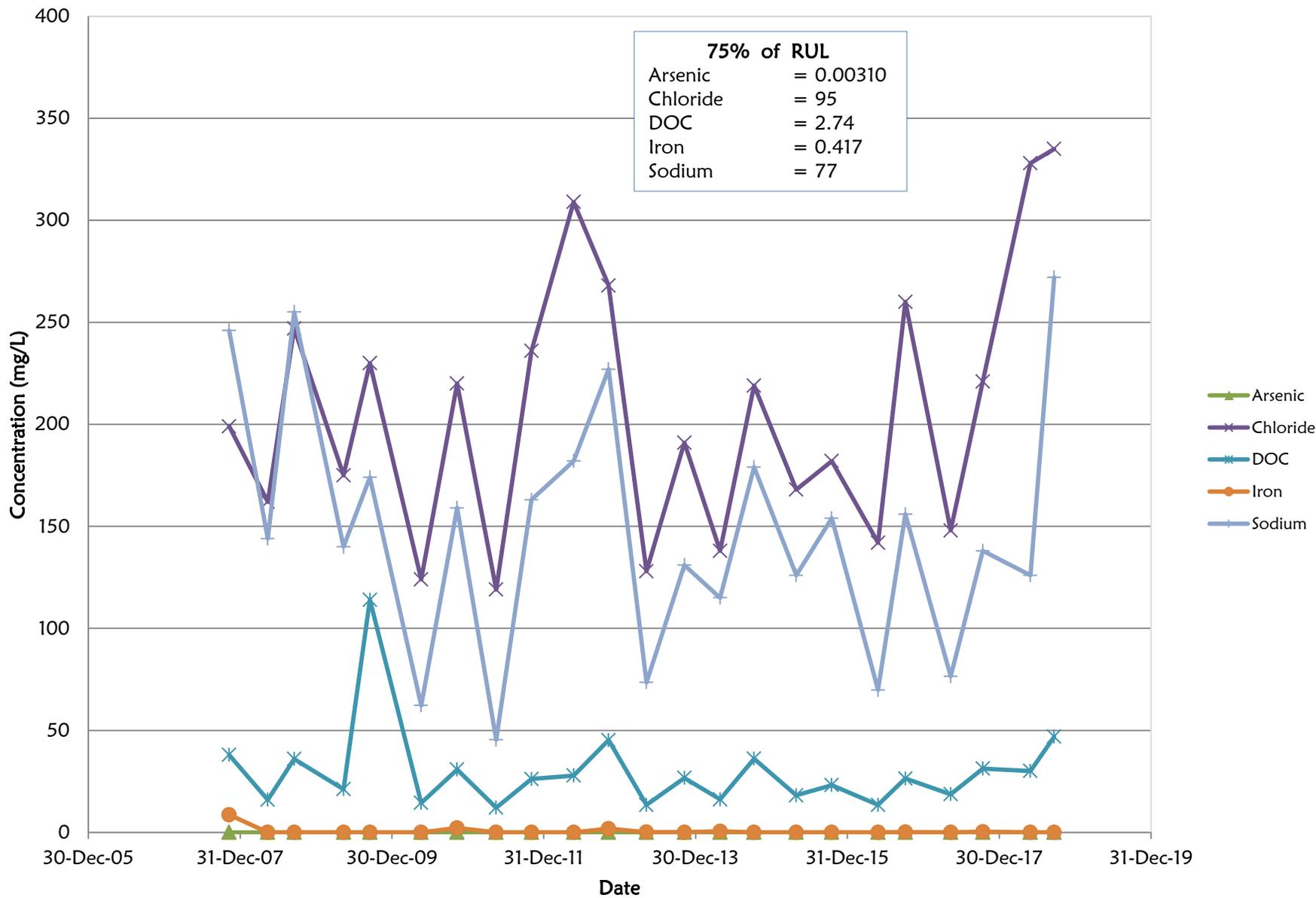
MW10- Down-gradient – West, off-site



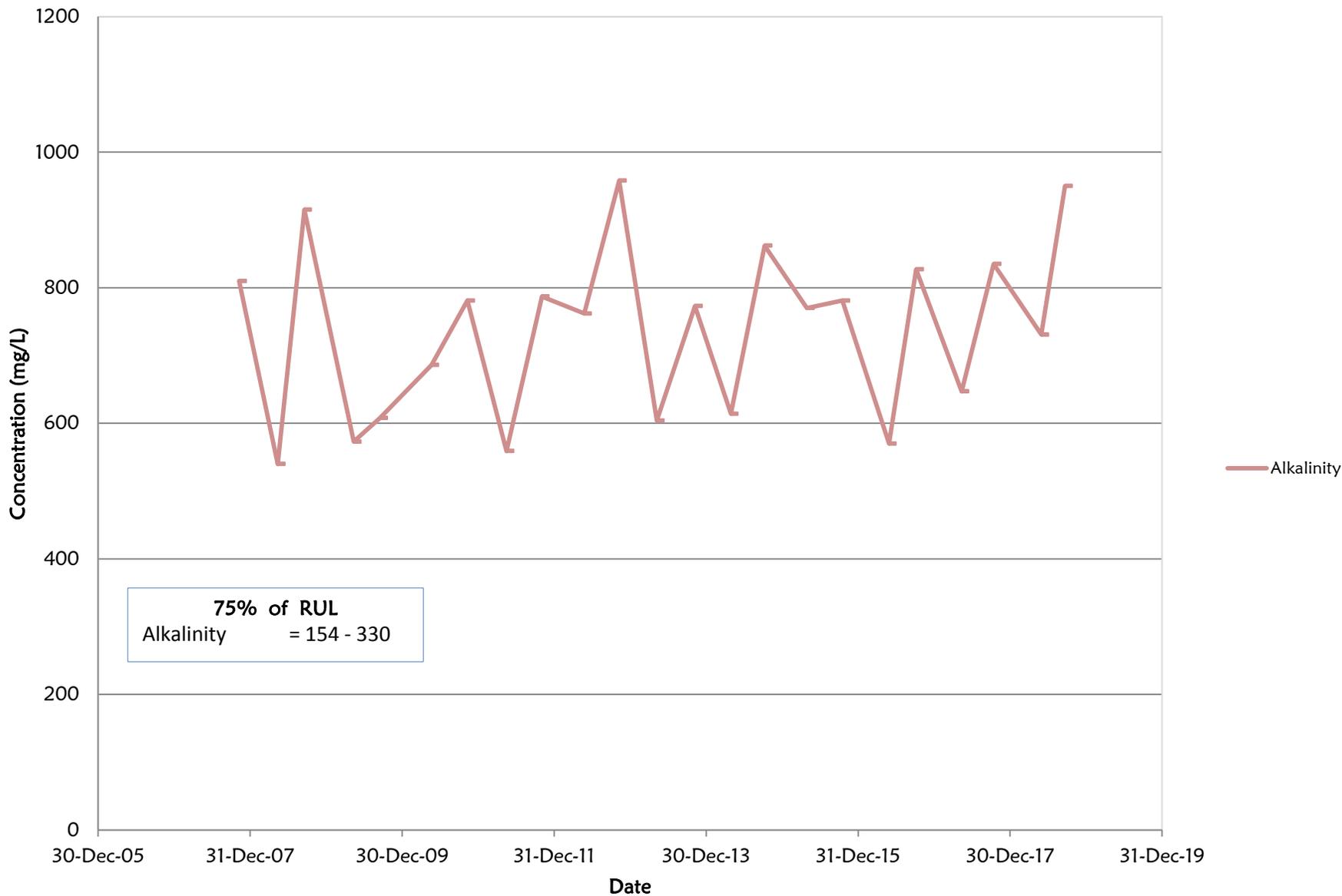
MW10- Down-gradient – West, off-site



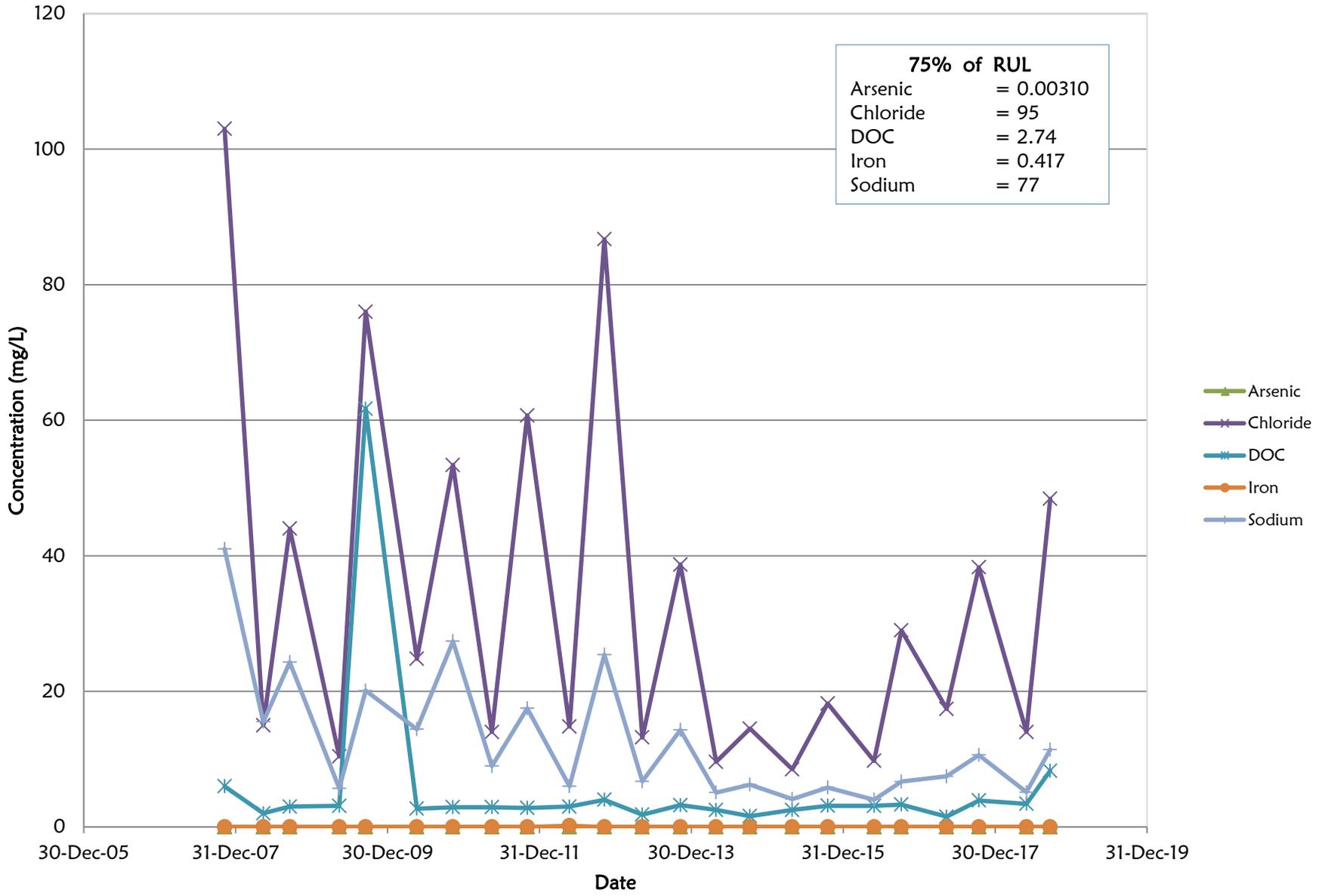
MW11- Down-gradient – East, off-site



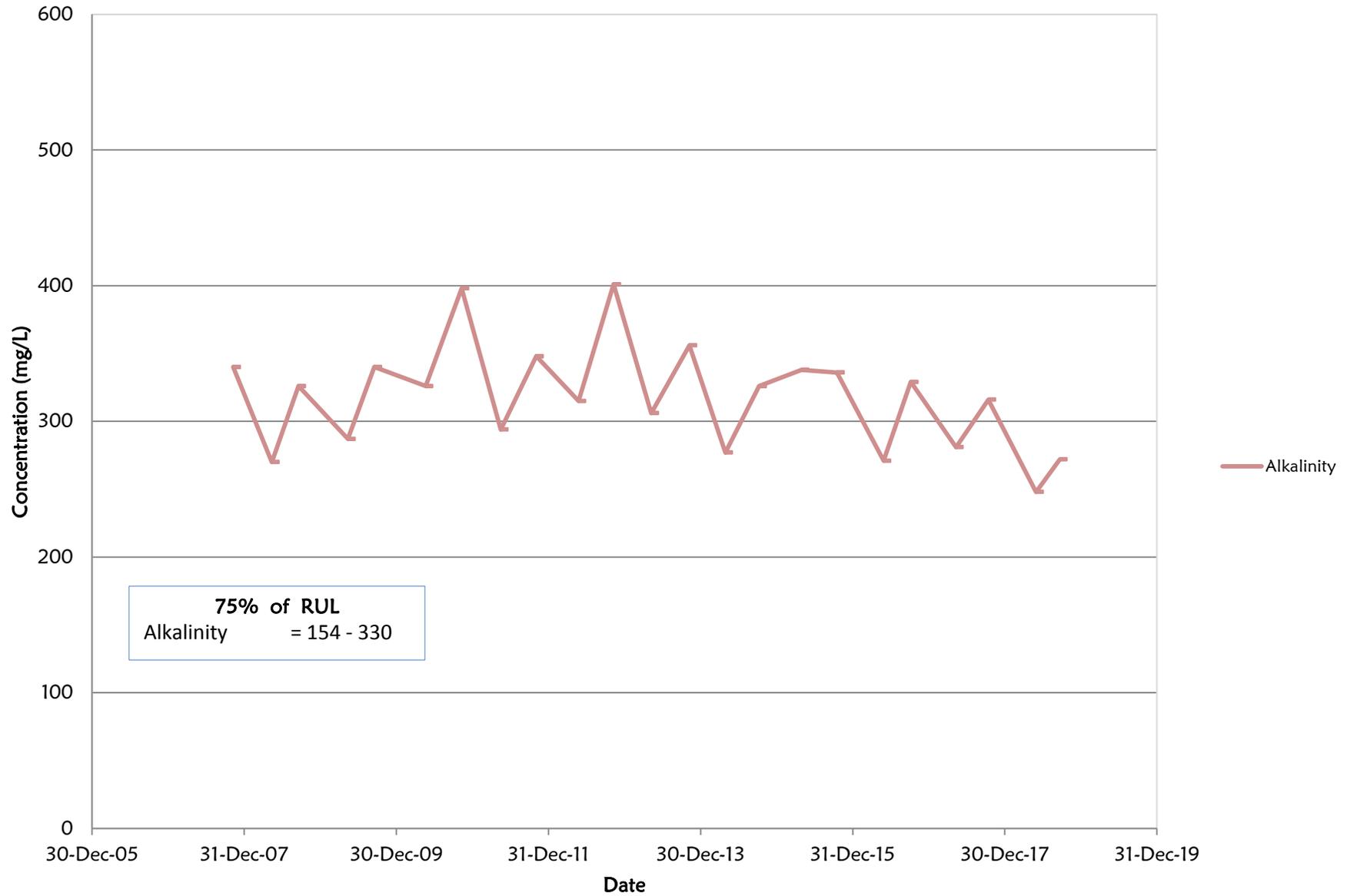
MW11- Down-gradient – East, off-site



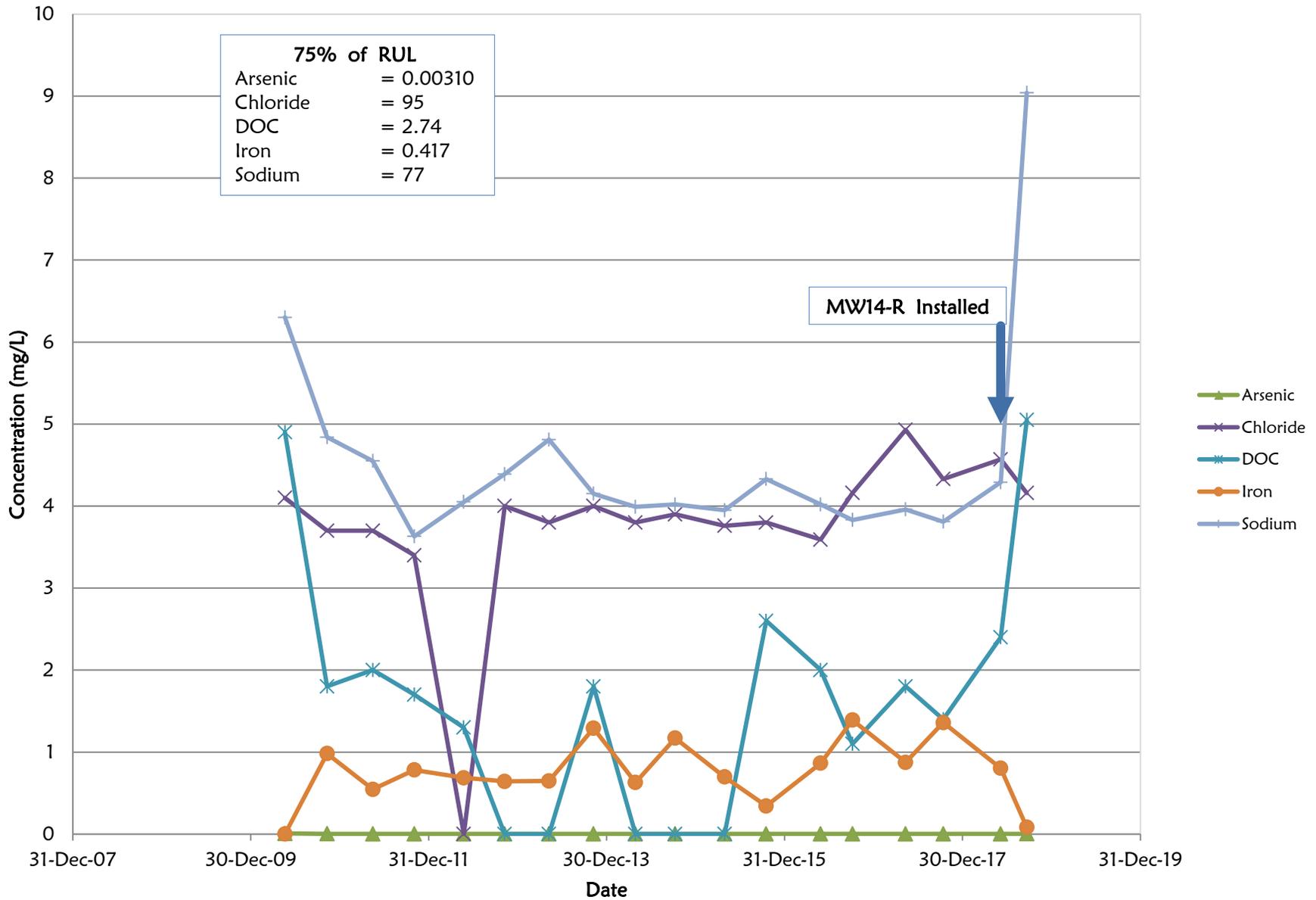
MW12- Down-gradient – East



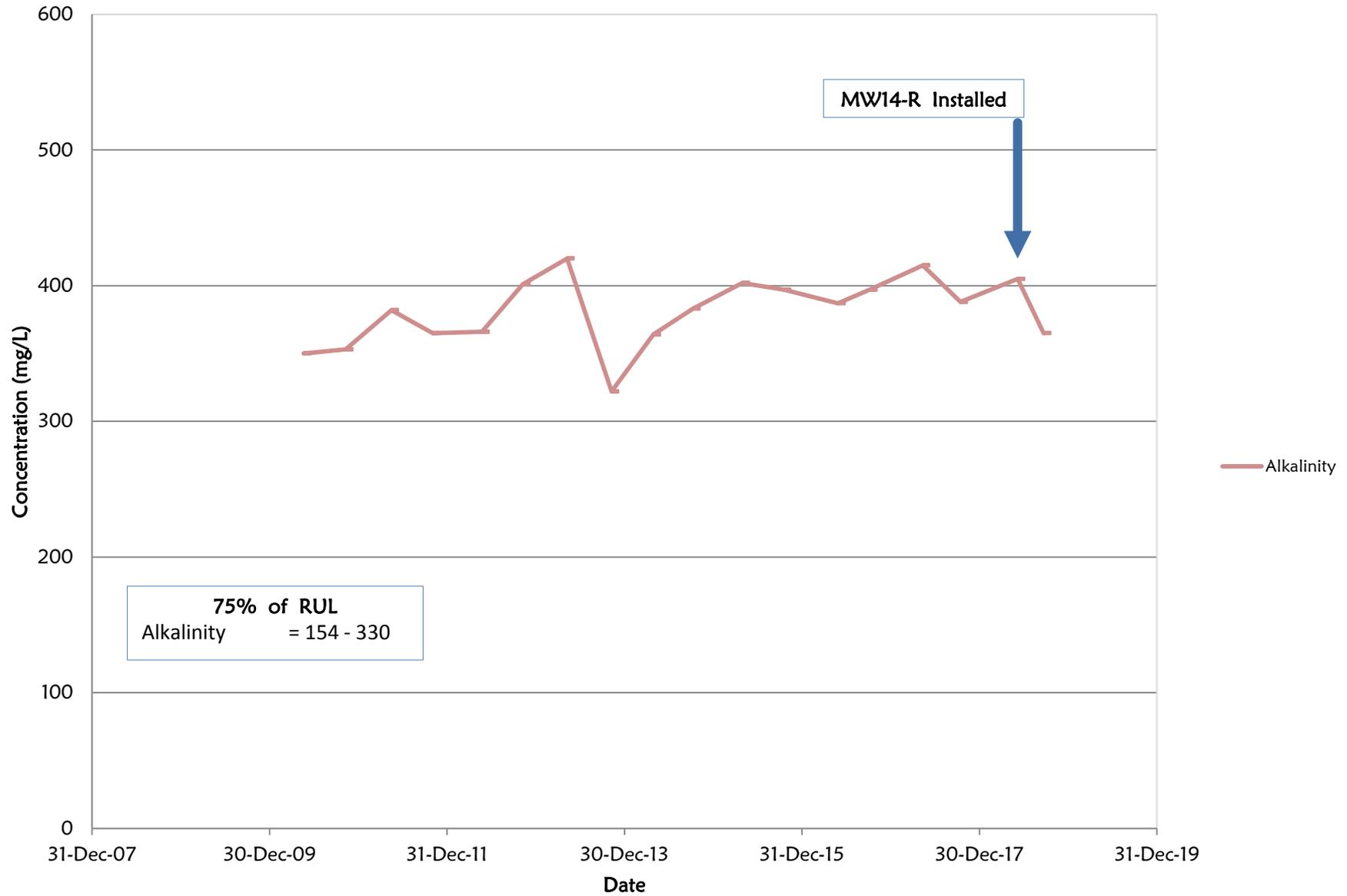
MW12- Down-gradient – East



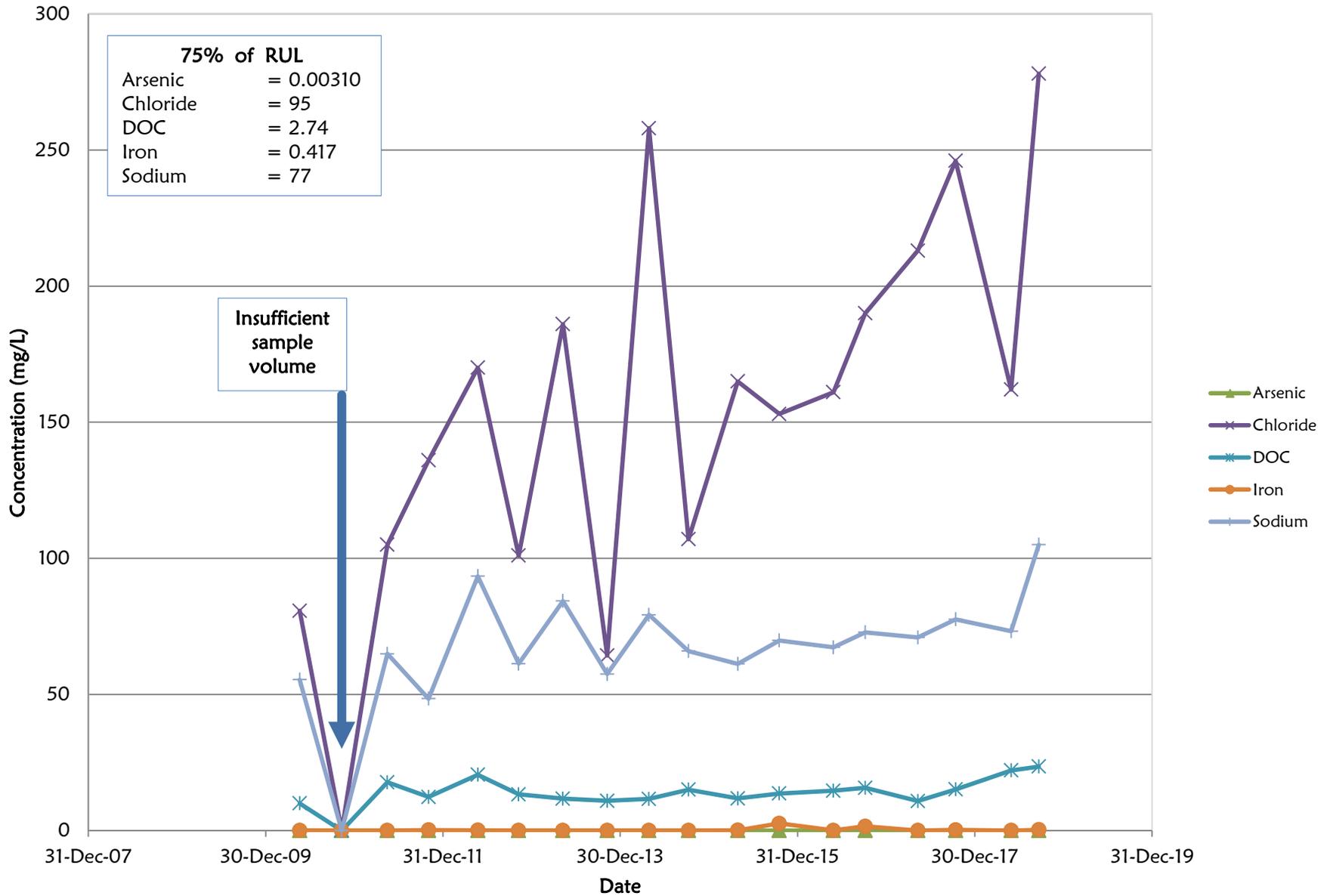
MW14 & MW14-R : Background Well



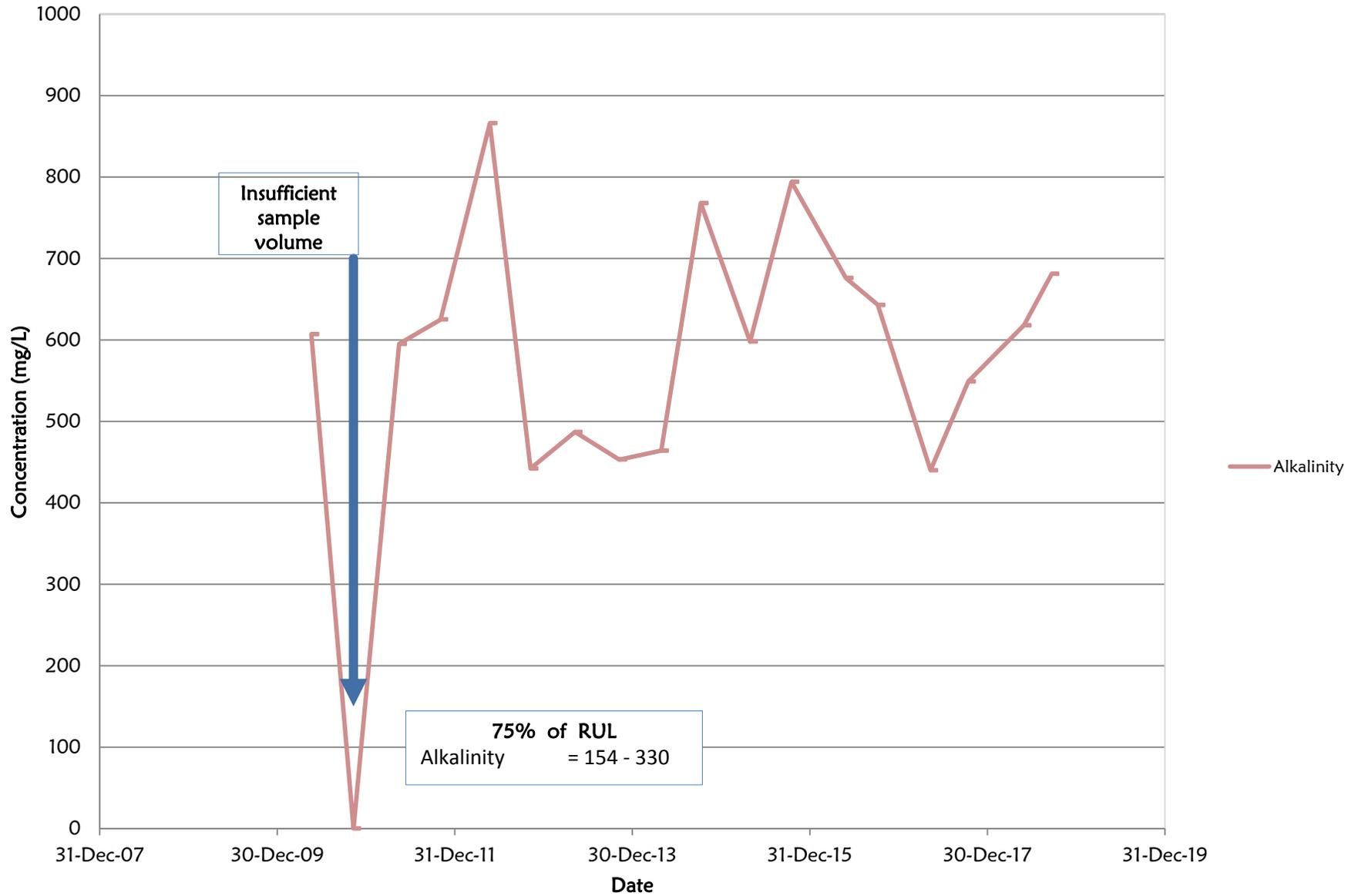
MW14 & MW14-R : Background Well



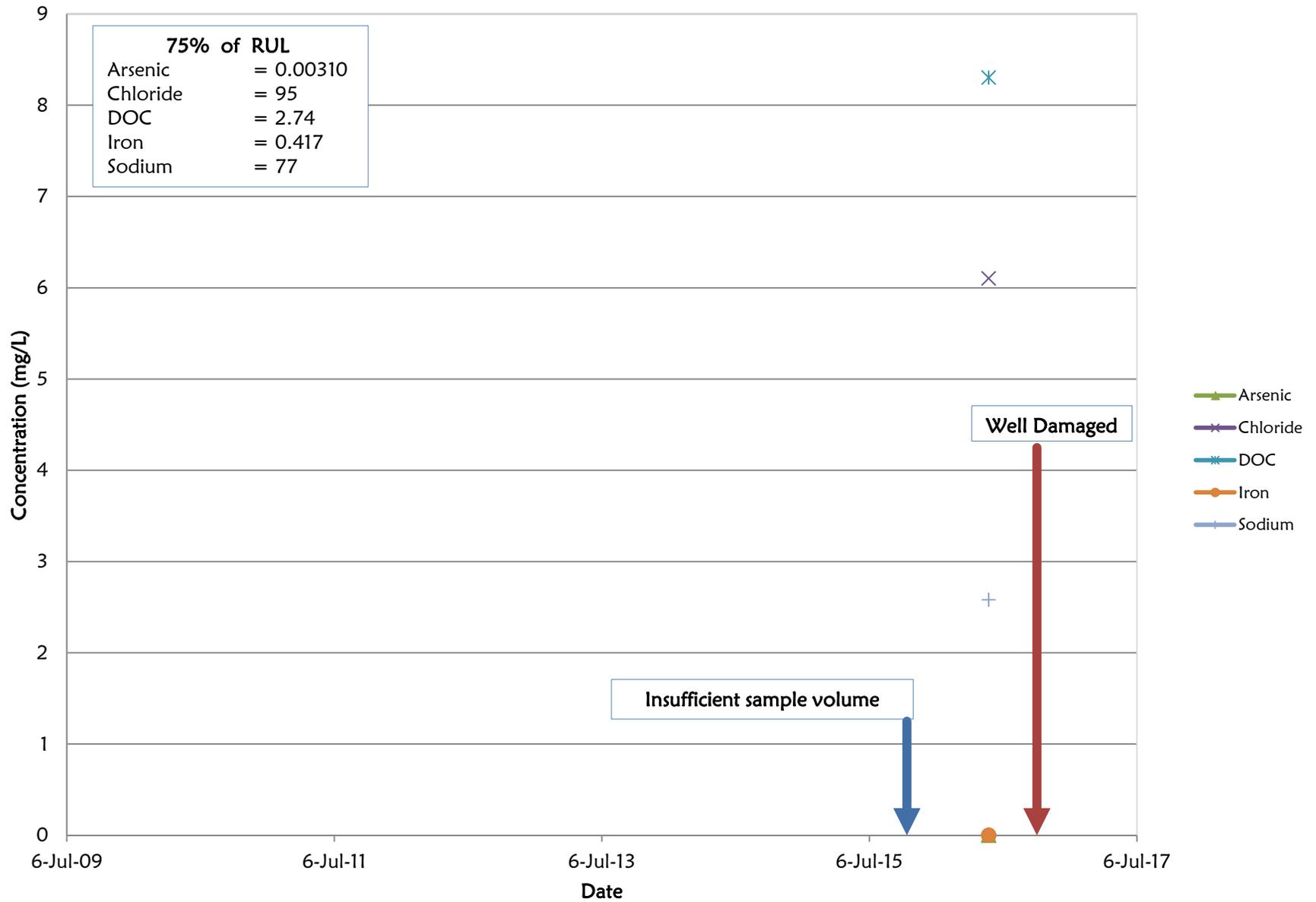
MW15- Downgradient - East Off-Site



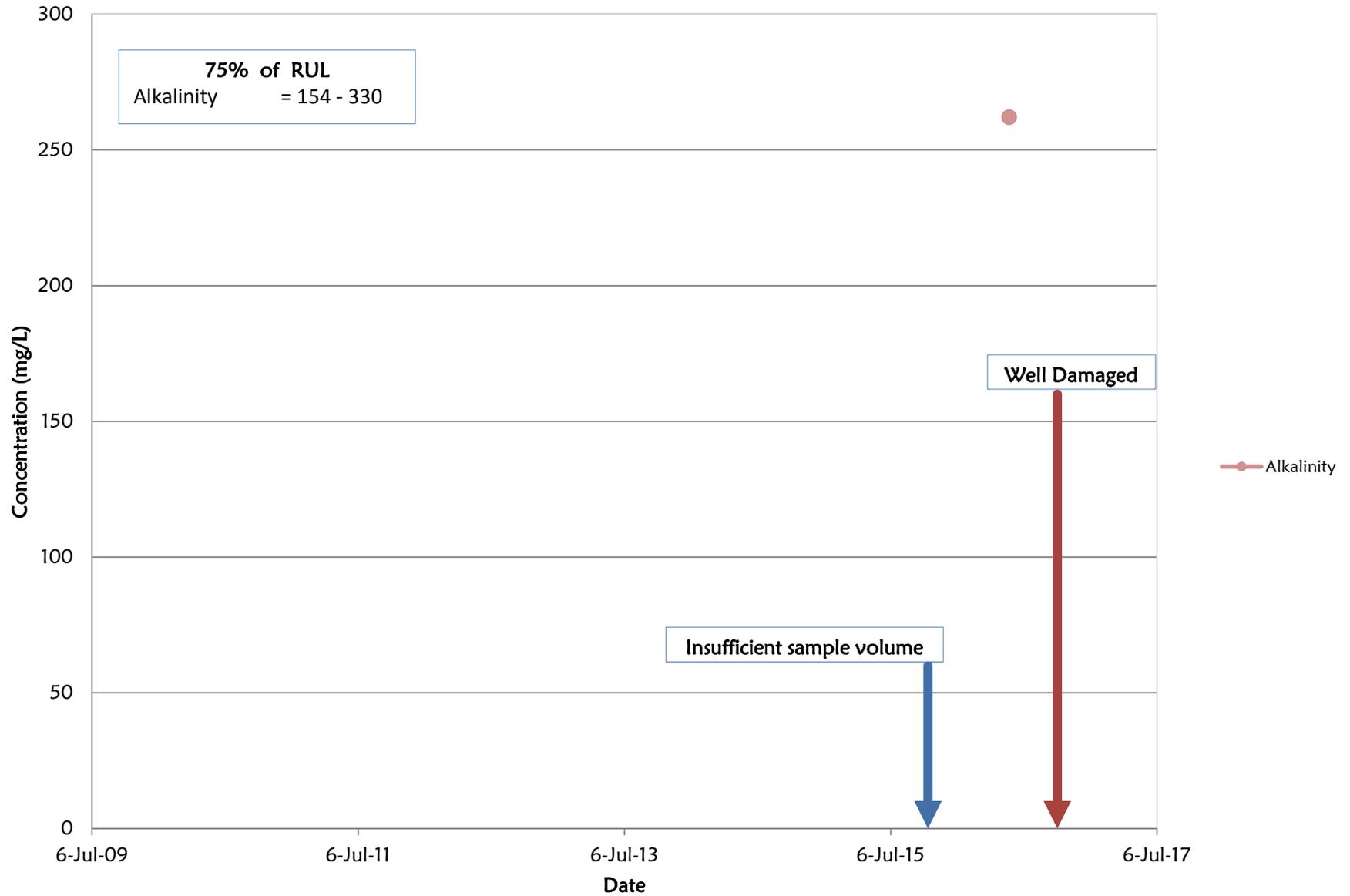
MW15- Downgradient - East Off-Site



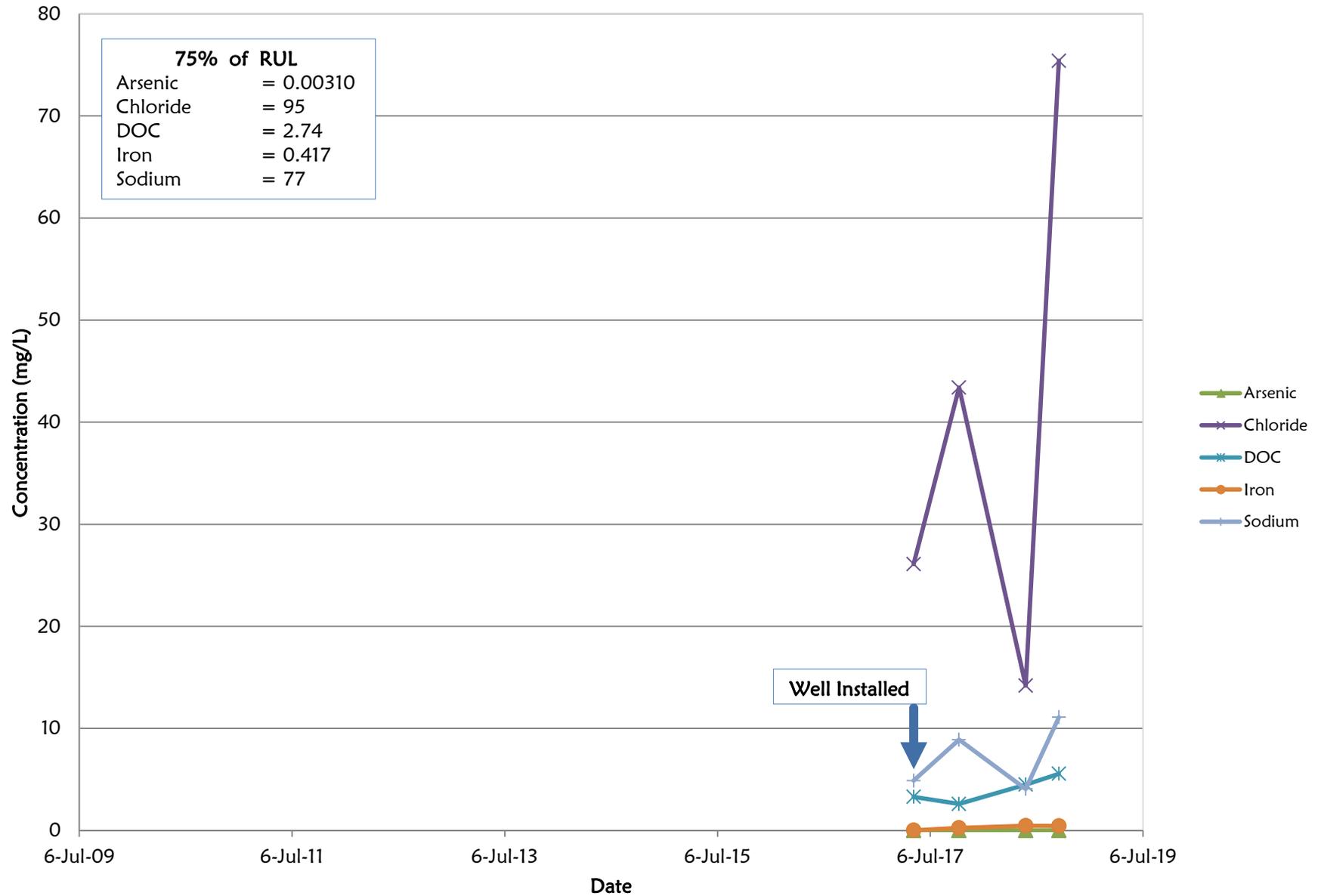
MW19- Downgradient - East Off-Site



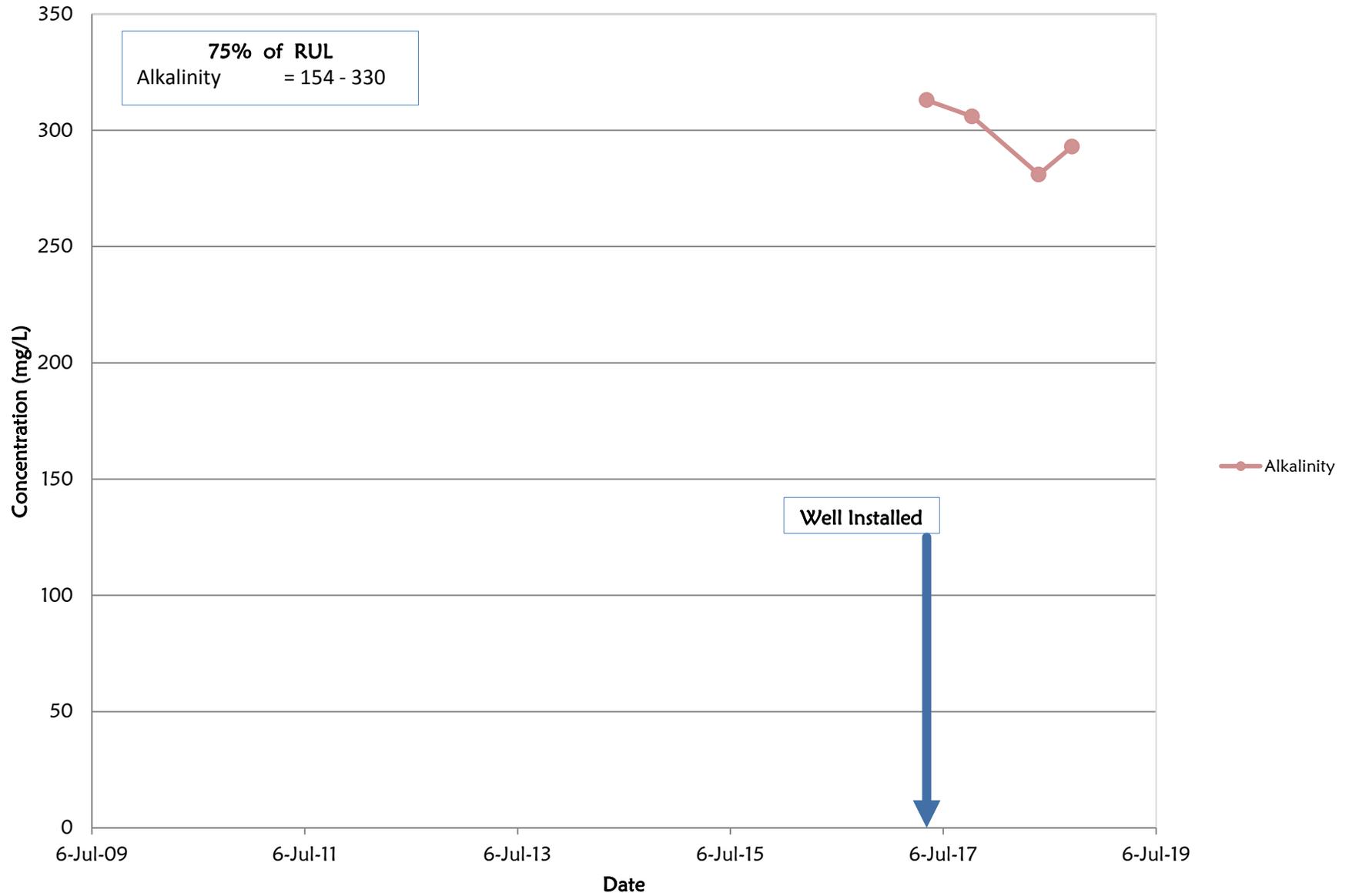
MW19- Downgradient - East Off-Site



MW19-R - Downgradient - East Off-Site



MW19-R - Downgradient - East Off-Site



APPENDIX G

Landfill Inspection Forms



LANDFILL INSPECTION AND MAINTENANCE RECORD
Municipality of West Elgin Landfill Site

(To be completed twice annually during the regular landfill monitoring events)

INSPECTED BY (Print): Dana Kavanagh

DATE: 2018/05/29

TITLE: Environmental Field Technician

TIME: 16:00

Note:

The check list is intended as an aid only. Reference is made to Provisional C of A A051101 for complete listing of terms and conditions by which the landfill may be operated. This check list is intended to be completed by the Inspector and maintained along with any other relevant documentation required (notes, photos etc.)

CHECK THE FOLLOWING CATEGORIES

- (√) Satisfactory
- (X) Requires Remediation (attach description and action plan and record completion)
- (N/A) Not-applicable

() 1. **Successful Completion of Previously Noted Action Items**

All items identified as requiring remediation on the previous check list have been properly completed and documented.

Description of Item & Possible Action	Completion of Action (Include Date)
MWS needs replacing	
MWD casing loose - Re-cement or replace	

(√) 2. **Landfill Site Layout & Site Operations**

Entrance sign is posted prominently and clearly states the following:

- Owner's name
- Operator's name
- Provisional Certificate of Approval No.
- Type of Waste Accepted
- The hours of operation
- Contact telephone number to call with complaints or in the event of an emergency

(√) Landfill limit is still clearly staked to delineate area suitable for waste placement (cement blocks in place).

(✓)

Buffer zone of 30 m is maintained between fill area and adjoining property boundary

(✓)

Ensure that disposal of waste is in compliance with the phased development approach as per the "Hydrogeological Investigation and Design and Operations Report" Figures 10 & 11 (WESA, 2006).

(✓)

Recyclable materials properly separated and each area properly identified. Ensure that areas are kept in a neat and tidy manner. Check compliance with site layout plan from the "Hydrogeological Investigation and Design and Operations Report" Figure 12.

(✓)

All storage containers/ bins used to store waste and/ or recyclables are maintained in good condition to prevent leakage.

Any action required for site layout & operations? () YES () NO

If yes, please specify: _____

3. **Active Face Operations and Landfill Cover**

(X)

Active face operations kept to a maximum of 10 m wide with the height of the active face being the shorter of 1.5 m or the distance to the final waste contour.

()

Daily cover shall be placed over the entire working face with a minimum thickness of 150 mm of soil cover or an approved thickness of alternative cover material at the end of every operating week. *did not check.*

(✓)

Intermediate cover shall be placed in areas where landfilling has been temporarily discontinued for six months or more. A minimum thickness of 300 mm of soil cover or an approved thickness of alternative cover material shall be placed.

()

Any final cover that is placed consists of 600 mm of compacted clay (low permeable barrier) and 150 mm of topsoil, seeded with an appropriate grass mixture. *did not check.*

Any action required for active face operations/ landfill cover? () YES () NO

If yes, please specify: Keep active face within specified parameters

4. **Nuisance Controls**

(✓)

There is no evidence of airborne dust, odour, noise or other airborne materials resulting from the landfill operation.

(✓)

There is no litter around the property, including the fenceline, wooded areas, and any surface water bodies on the property.

(✓)

There is no evidence of vector or vermin at the landfill that require control using a licensed exterminator.

Any action required for nuisance controls? () YES (X) NO
If yes, please specify: _____

(X) 5. **Site Security**

Security of the site is maintained to ensure authorized personnel only are allowed access to the site.

Action required for site security? () YES (X) NO
If yes, please specify: _____

(X) 6. **Groundwater Monitoring Wells**

The groundwater monitoring wells are in good repair and encased in locked protective casings.

There are no monitoring wells that have been destroyed or deemed inoperable for sampling (i.e. cannot be sampled for more than one regular sampling event).

All monitoring wells are accessible (note: road conditions, vegetation and general site maintenance).

Any action required for groundwater monitoring wells? () YES (X) NO
If yes, please specify: _____

7. **Summary of Action Items Required**

Description of Item	Potential Action
MW14 needs replacing	Redrilling already scheduled

INSPECTOR SIGNATURE: David Narasimhan DATE: 2018/05/29

MUNICIPALITY OF WEST ELGIN SIGNATURE: _____ DATE: _____
(acknowledgement of receipt)

LANDFILL OPERATOR SIGNATURE: Lee Stanell DATE: June 7, 2018
(acknowledgement of receipt)

LANDFILL INSPECTION AND MAINTENANCE RECORD
Municipality of West Elgin Landfill Site

(To be completed twice annually during the regular landfill monitoring events)

INSPECTED BY (Print): Dana Kavanagh
 TITLE: Environmental

DATE: 2018/09/20
 TIME: _____

Note:
 The check list is intended as an aid only. Reference is made to Provisional C of A A051101 for complete listing of terms and conditions by which the landfill may be operated. This check list is intended to be completed by the inspector and maintained along with any other relevant documentation required (notes, photos etc.)

CHECK THE FOLLOWING CATEGORIES

- (v) Satisfactory
- (X) Requires Remediation (attach description and action plan and record completion)
- (N/A) Not-applicable

1. **Successful Completion of Previously Noted Action Items**

All items identified as requiring remediation on the previous check list have been properly completed and documented.

Description of Item & Possible Action	Completion of Action (Include Date)
MW14 needs replacing	June 5 2018 - well redilled

2. **Landfill Site Layout & Site Operations**

Entrance sign is posted prominently and clearly states the following:

- Owner's name
- Operator's name
- Provisional Certificate of Approval No.
- Type of Waste Accepted
- The hours of operation
- Contact telephone number to call with complaints or in the event of an emergency

Landfill limit is still clearly staked to delineate area suitable for waste placement (cement blocks in place).

3

Buffer zone of 30 m is maintained between fill area and adjoining property boundary

3

Ensure that disposal of waste is in compliance with the phased development approach as per the "Hydrogeological Investigation and Design and Operations Report" Figures 10 & 11 (WESA, 2006).

3

Recyclable materials properly separated and each area properly identified. Ensure that areas are kept in a neat and tidy manner. Check compliance with site layout plan from the "Hydrogeological Investigation and Design and Operations Report" Figure 12.

3

All storage containers/ bins used to store waste and/ or recyclables are maintained in good condition to prevent leakage.

Any action required for site layout & operations? () YES () NO

If yes, please specify: _____

3. **Active Face Operations and Landfill Cover**

3

Active face operations kept to a maximum of 10 m wide with the height of the active face being the shorter of 1.5 m or the distance to the final waste contour.

3

Daily cover shall be placed over the entire working face with a minimum thickness of 150 mm of soil cover or an approved thickness of alternative cover material at the end of every operating week.

3

Intermediate cover shall be placed in areas where landfilling has been temporarily discontinued for six months or more. A minimum thickness of 300 mm of soil cover or an approved thickness of alternative cover material shall be placed.

3

Any final cover that is placed consists of 600 mm of compacted clay (low permeable barrier) and 150 mm of topsoil, seeded with an appropriate grass mixture.

Any action required for active face operations/ landfill cover? () YES () NO

If yes, please specify: _____

4. **Nuisance Controls**

()

There is no evidence of airborne dust, odour, noise or other airborne materials resulting from the landfill operation. *Burning wood waste*

3

There is no litter around the property, including the fenceline, wooded areas, and any surface water bodies on the property.

3

There is no evidence of vector or vermin at the landfill that require control using a licensed exterminator.

Any action required for nuisance controls? () YES (X) NO
If yes, please specify: _____

(X) 5. **Site Security**

Security of the site is maintained to ensure authorized personnel only are allowed access to the site.

Action required for site security? () YES () NO
If yes, please specify: _____

6. **Groundwater Monitoring Wells**

(X) The groundwater monitoring wells are in good repair and encased in locked protective casings.

(X) There are no monitoring wells that have been destroyed or deemed inoperable for sampling (i.e. cannot be sampled for more than one regular sampling event).

(X) All monitoring wells are accessible (note: road conditions, vegetation and general site maintenance).

Any action required for groundwater monitoring wells? (X) YES () NO
If yes, please specify: Clear brush around MW19-R,
MW1

↳ tripping hazards covered by grass/bushes

7. **Summary of Action Items Required**

Description of Item	Potential Action
Fire pit - ensure following ECA	
MW 7, MW19 - Blumetric no stake	
MW1 - clear concrete in vegetation	

INSPECTOR SIGNATURE: Dana Harman DATE: 2018/09/25

MUNICIPALITY OF WEST ELGIN SIGNATURE: Lee Stanell DATE: 2018/09/25
(acknowledgement of receipt)

LANDFILL OPERATOR SIGNATURE: Lee Stanell DATE: 2018/09/25
(acknowledgement of receipt)