

## REGIONAL MUNICIPALITY OF DURHAM

WHITBY, ONTARIO

### **DURHAM YORK ENERGY CENTRE: 2017 ANNUAL GROUNDWATER AND SURFACE WATER MONITORING REPORT**

RWDI #1604066, 8001

April 27, 2018

#### **SUBMITTED TO**

**Mr. Gioseph Anello, M.Eng., P.Eng.,  
PMP**

Manager of Waste Planning and  
Technical Services  
Gioseph.Anello@durham.ca

**Regional Municipality of Durham  
Works Department**

605 Rossland Road East  
P.O. Box 623  
Whitby, Ontario L1N 6A3

T: 905.668.7711 | ext. 3445

#### **SUBMITTED BY**

**Philippe Janisse, B.Sc., P.Geo.**

Project Manager | Sr. Geoscience  
Specialist

Philippe.Janisse@rwdi.com | ext. 2617

**Brent Langille, B.Sc., P.Geo.**

Senior Consultant | Principal

Brent.Langille@rwdi.com | ext. 2618

**RWDI AIR Inc.**

**Consulting Engineers & Scientists**

600 Southgate Drive  
Guelph, Ontario N1G 4P6

T: 519.823.1311



Mr. Gioseph Anello, M.Eng., P.Eng., PMP  
Manager of Waste Planning and Technical Services  
Regional Municipality of Durham  
Works Department  
605 Rossland Road East  
P.O. Box 623  
Whitby, ON L1N 6A3

**RE: 2017 Annual Groundwater and Surface Water Monitoring Report  
Durham York Energy Centre  
RFP-528-2016  
RWDI Reference No. 1604066, 8001**

Dear Mr. Anello,

RWDI AIR Inc. (RWDI) is pleased to provide this 2017 Annual Groundwater and Surface Water Monitoring Report for the Durham York Energy Centre (DYEC).

The 2017 Annual Groundwater and Surface Water Monitoring Report provides details of the monitoring program completed in 2017 for DYEC and an interpretation of the 2017 monitoring data, including our conclusions and recommendations. Relevant 2017 and historical technical data are appended.

In November 2010, the Ministry of the Environment (MOE) issued the Technical Guidance Document entitled "*Monitoring and Reporting for Waste Disposal Sites, Groundwater and Surface Water*" (MOE, 2010). Appended to this report is a completed Monitoring and Screening Checklist from the above Technical Guidance Document, which provides certification of the Competent Environmental Practitioner (CEP). The Monitoring and Screening Checklist is provided in **Appendix F**.

We trust that this 2017 Annual Groundwater and Surface Water Monitoring Report for DYEC provides sufficient information for your requirements. Should there be any questions or comments, please contact us.

Yours very truly,

**RWDI**

A handwritten signature in blue ink, appearing to read 'Brent J. Langille', is written over a light blue horizontal line.

Brent J. Langille, B.Sc., P.Geo.  
Senior Consultant | Principal

Attach.



## EXECUTIVE SUMMARY

The Regional Municipality of Durham (Region) and The Regional Municipality of York own the Durham York Energy Centre (DYEC), which is located in the Municipality of Clarington, Ontario. DYEC is located at municipal address 1835 Energy Dr. in Courtice, Ontario (hereinafter “the Site”).

DYEC is a thermal treatment energy from waste facility and is approved to process up to 140,000 tonnes of solid, non-hazardous, municipal waste per year. Covanta operates DYEC, which began operation in February 2015 when the first load of waste was received.

Operating requirements for DYEC are governed by the Ministry of Environment and Climate Change (MOECC) Environmental Assessment (EA) Notice of Approval (File No. 04-EA-02-08) (hereinafter “EA Approval”) and the Multi-Media Environmental Compliance Approval (ECA) Number 7306-8FDKNX, issued on June 28, 2011, with amendments to March 14, 2016 (Notice No. 5) (hereinafter “ECA”).

The EA Approval, ECA, and the MOECC approved Groundwater and Surface Water Monitoring Plan (prepared by Stantec Consulting Ltd., 2011) outline the groundwater and surface water monitoring and reporting requirements for DYEC. This 2017 Annual Groundwater and Surface Water Monitoring Report has been prepared in accordance with Condition 20.8 of the EA Approval, Condition 15 of the ECA and the Groundwater and Surface Water Monitoring Plan to provide details of the monitoring program completed in 2017.

With MOECC approval, via letter dated May 17, 2016, the routine surface water monitoring program (i.e., placement and monitoring of sondes in Tooley Creek) for DYEC has been suspended for at least three (3) years, beginning in 2016, due to construction activities for the Highway 401/Courtice Road interchange. As such, the routine surface water monitoring program for DYEC was not required to be completed in 2017.

Based on the findings presented in this report, the following conclusions are provided.

Based on the 2017 groundwater elevations, the shallow and deeper groundwater flow direction at the Site was interpreted to be toward the southwest, with minor flow alterations as a result of the influences from the trunk sewer.

- For the groundwater sampling program completed for DYEC in 2017, quality assurance and quality control (QA/QC) measures indicated that the detected constituent concentrations were accurate and reflected actual conditions at the time of sample collection.
- Based on the 2017 groundwater elevations, the shallow and deeper groundwater flow direction at the Site was interpreted to be toward the southwest, with minor flow alterations as a result of the influences from the trunk sewer.



- The concentrations of salt related constituents chloride and sodium within upgradient monitoring well MW2B have increased since 2014. The concentrations of chloride and sodium within crossgradient monitoring well MW1 and internal assessment monitoring well MW5B have increased since 2015. The beginning of the increasing trend of chloride and sodium concentrations within MW1, MW2B, and MW5B coincides with the approximate time of construction of Energy Dr. north and west of the Site, as well as the on-Site roadways and parking lot. As such, the increasing concentrations of salt related constituents are attributed to the application of deicing salt during the winter season to Energy Dr., Osborne Rd., and/or the on-Site roadways/parking lot. It is noted that the 2017 and historical concentrations of chloride and sodium within the groundwater at MW1, MW2B, and MW5B have satisfied their respective ODWS criterion.
- Within downgradient monitoring well MW4, the concentrations of the salt related constituents chloride, sodium, calcium, magnesium, and potassium, respectively, were generally stable since monitoring began at this monitoring well until distinctly increasing in November 2016. For the salt related constituents, only chloride and sodium have an ODWS, which were satisfied at MW4 until November 2017 when the concentration of chloride (682mg/L) was greater than its respective ODWS criterion (250 mg/L). However, the detected salt related constituent concentrations at the aforementioned monitoring well locations are attributed to the application of deicing salt to the nearby off-Site roadway to the Courtice WPCP and/or the downgradient migration of chloride from areas closer to Energy Dr. and Osborne Rd. It is noted that, at the internal assessment and downgradient monitoring locations MW5 and MW3, respectively, which are in closer proximity to the DYEC facility than MW4, the concentrations of the salt related constituents have been consistently less than the elevated concentrations detected within MW4. As such, there is no indication that the noted concentrations of the salt related constituents detected within MW4 have migrated downgradient within the shallow groundwater as a result of DYEC waste treatment operations.
- It is noted that elevated chloride concentrations, as well as the concentrations of the other salt related constituents of sodium, calcium, potassium and magnesium, are commonly elevated in groundwater where a monitoring well is situated in close proximity to roads that receive brine or salt for dust control or deicing. As such, the noted salt related constituent effects at the aforementioned monitoring wells are expected to fluctuate and/or increase several hundred mg/L over time with continued deicing activities along roadways and within parking lots at/near DYEC. As only salt related constituents show elevated concentrations compared to concentrations for metal constituents within the groundwater, no action is required to address the noted concentrations for the salt related constituents.
- The groundwater analytical results for the Site have consistently satisfied their respective ODWS since monitoring began at each monitoring well, with the exception of the deicing salt influence of the noted chloride concentration at MW4 during November 2017. The groundwater analytical results suggest that DYEC waste treatment operations have not had an adverse effect on groundwater quality at the Site.
- With MOECC approval, the routine surface water monitoring program (i.e., placement and monitoring of sondes in Tooley Creek) for DYEC has been suspended for at least three (3) years, beginning in 2016. As such, the routine surface water monitoring program for DYEC outlined in the Groundwater and Surface Water Monitoring Plan was not required to be completed in 2017.



Based on the findings of the 2017 monitoring program, the following recommendations are provided for your consideration.

- Groundwater monitoring at the Site should continue in 2018, in accordance with MOECC approved Groundwater and Surface Water Monitoring Plan. No deviations from the groundwater monitoring program are recommended.
- The routine surface water monitoring program for the Site (i.e., placement and monitoring of sondes in Tooley Creek) should not be completed in 2018 as the MOECC has approved the suspension of the program for at least three (3) years, beginning in 2016.
- The concentrations of salt related constituents chloride, sodium, calcium, magnesium, and potassium within the groundwater at monitoring wells should continue to be evaluated on an ongoing basis to verify that the concentrations of these constituents continue to be assessed to be effects of roadway and parking lot deicing practices, and are not attributable to DYEC waste treatment operations.



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# 1 INTRODUCTION

The Regional Municipality of Durham (Region) and The Regional Municipality of York own the Durham York Energy Centre (DYEC), which is located in the Municipality of Clarington, Ontario. DYEC is a thermal treatment energy from waste facility and is operated by Covanta.

DYEC began operation in February 2015 when the first load of waste was received. DYEC is approved to process up to 140,000 tonnes of solid, non-hazardous, municipal waste per year.

Operating requirements for DYEC are governed by the Ministry of Environment and Climate Change (MOECC) Environmental Assessment (EA) Notice of Approval (File No. 04-EA-02-08) (hereinafter “EA Approval”) and the Environmental Compliance Approval (ECA) Number 7306-8FDKNX, issued on June 28, 2011, with amendments to March 14, 2016 (Notice No. 5) (hereinafter “ECA”). The EA Approval, as well as the ECA and its supporting documents, are posted on the DYEC’s website and can be accessed at the following link: [www.durhamyorkwaste.ca](http://www.durhamyorkwaste.ca). The DYEC Surface Water Monitoring Program Change Request Letter (April 29, 2016), as well as the MOECC Approval Letter (May 17, 2016) are provided in **Appendix A-1, Appendix A**.

The EA Approval, ECA, and the MOECC approved Groundwater and Surface Water Monitoring Plan outline the groundwater and surface water monitoring and reporting requirements for DYEC. This 2017 Annual Groundwater and Surface Water Monitoring Report has been prepared in accordance with Condition 20.8 of the EA Approval and Condition 15 of the ECA to provide details of the monitoring program completed in 2017.

The groundwater and surface water monitoring programs for DYEC are outlined in the *Durham-York Energy Centre Groundwater and Surface Water Monitoring Plan*, dated September 14, 2011, and prepared by Stantec Consulting Ltd. The Groundwater and Surface Water Monitoring Plan was prepared in accordance with Condition 20 of the EA Approval and Condition 7(14) of the ECA.

**RWDI AIR Inc.** (RWDI) was retained by the Region to complete the groundwater monitoring and the 2017 Annual Groundwater and Surface Water Monitoring Report for DYEC. This report is organized in consideration of historical reporting frameworks, including but not limited to, site geologic details, to maintain a level of consistency and provide a familiarity to reviewers whereby historical reports can be easily referenced to this report.



## **1.1 Location**

DYEC is located at municipal address 1835 Energy Dr. in Courtice, Ontario. The Site is situated in the southwest corner of the Energy Dr. and Osborne Rd. intersection, southeast of the Courtice Rd. interchange of Highway 401. The area of the Site is approximately 12.1 hectares.

A Site Location Map that identifies the location of the Site and surrounding area features is provided in **Figure 1**. A Site Plan that identifies detailed information of the Site, such as monitoring locations, is provided in **Figure 2**.

## **1.2 Monitoring and Reporting Program Objectives and Requirements**

### **1.2.1 Groundwater Monitoring Objective**

The principal objectives of the 2017 monitoring and reporting programs for DYEC are as noted below.

- To evaluate groundwater and surface water quality at and nearby the Site and assess the potential for impacts to nearby water resources as a result of DYEC operations.
- To determine whether remedial actions are required in consideration of monitoring findings.
- To assess the adequacy of the existing monitoring program with respect to evaluating the potential for impacts at nearby water resources.
- To provide a report presenting the findings of the monitoring program to the Region, whereby the report will be provided to the MOECC and posted on the DYEC website ([www.durhamyorkwaste.ca](http://www.durhamyorkwaste.ca)).

The primary aspects of the environmental monitoring and reporting programs are data collection, analysis, and interpretation. This 2017 Annual Groundwater and Surface Water Monitoring Report documents the data collected as part of the 2017 monitoring program and the 2017 data was interpreted in consideration of historical data. In accordance with the Groundwater and Surface Water Monitoring Plan, groundwater results from 2017 were compared to the Ontario Drinking Water Standards (ODWS).

Unprocessed waste is stored indoors in a sealed concrete pit, set 5.5 metres below grade, which does not allow leachate from the waste to come into contact with groundwater. Ash is transported to a dedicated storage building with concrete floors using fully enclosed conveyors, and subsequently removed for off-Site disposal. The primary means by which groundwater could potentially become affected would be through an upset condition at the facility. The primary purpose of the groundwater monitoring program is to provide an early warning if a potential effect was to occur (Stantec, 2011).



## **1.2.2 Surface Water Monitoring Objective**

DYEC is a Zero Process Water Discharge Facility (Stantec, 2011). DYEC is designed such that there will be no discharge of water from inside the facility buildings other than sanitary sewer discharges from the washrooms. Stormwater drainage from outdoor surfaces, such as rooftops, driveways, and landscaped areas, are collected in two stormwater management ponds (SWMPs). Discharge from the on-site SWMPs is conveyed westward via an existing swale within the CN Rail right-of-way prior to discharging into a small tributary of Tooley Creek approximately 700 metres southwest of the Site. The primary purpose of the surface water monitoring program is to monitor the effectiveness of stormwater management controls in mitigating adverse impacts to Tooley Creek receiving waters (Stantec, 2011).

### *1.2.2.1 Changes to the Surface Water Monitoring Plan*

In a letter to the MOECC dated April 29, 2016, the Regional Municipalities of Durham and York (Regions) requested a change to the Groundwater and Surface Water Monitoring Plan for DYEC. The surface water monitoring program outlined in the Groundwater and Surface Water Monitoring Plan outlines that sondes are required to be placed in Tooley Creek upstream and downstream of the drainage swale that receives stormwater flow from DYEC in order to monitor select parameters. The section of Tooley Creek where the sondes are placed was scheduled for realignment beginning early 2016 as part of construction by the Ministry of Transportation to improve the Highway 401/Courtice Road interchange. The construction activity and creek re-alignment is anticipated to cause significant disruption and prevent the placement of the sondes in the creek for up to three (3) years. As such, the Regions requested that the requirement to place the sondes in Tooley Creek be suspended until the interchange construction activities are completed (at least three years). In a letter response dated May 17, 2016, from the MOECC to the Regions, the MOECC approved the suspension of the sondes placement and monitoring until such time as the interchange construction activities are completed. The MOECC noted that surface water monitoring completed to-date has indicated that DYEC is not having an adverse effect on Tooley Creek. It is noted that remedial activities in accordance with the Monitoring Plan are still required to be completed for surface water, if required. A copy of the letters from the Regions and the MOECC are provided in **Appendix A-1, Appendix A**.

## **1.3 Assumptions and Limitations**

WSP Canada Inc, (WSP) completed the required groundwater sampling for DYEC prior to 2017. The relevant historical data (field and laboratory) were provided to RWDI by the Region, as provided to the Region by WSP. The relevant environmental monitoring data provided by WSP has been relied upon by RWDI for the purposes of preparing this 2017 Annual Groundwater and Surface Water Monitoring Report. RWDI has assumed that the information provided was factual and accurate as presented.



## 2 PHYSICAL SETTING

### 2.1 Geology and Hydrogeology

The Site is located in the physiographic region defined as the Iroquois Plain (Chapman and Putnam, 1984). In the vicinity of the Site, the Iroquois Plain is comprised of silty lacustrine deposits and tills. Mapping by the Ontario Geological Survey indicates that the Site is underlain by Newmarket Till, which is described as a dense till comprised of clayey silt and sand till (Stantec, 2011). The layer of Newmarket Till is estimated to be between 20 and 25 metres in depth. The Newmarket Till is underlain by an approximately 5 metres thick layer of intertill sediment, including both Thorncliffe and Scarborough formations, which is underlain by Whitby shale bedrock (Stantec, 2011).

As part of a geotechnical investigation completed by Jacques Whitford at the Site in 2008, 17 boreholes were advanced (Stantec, 2011). The boreholes were advanced to depths ranging from 5 to 12 metres below ground surface (BGS). The subsurface stratigraphy encountered at the boreholes generally included topsoil up to approximately 0.6 metres in depth, which was underlain by dense to very dense silty sand. Bedrock was not encountered during the advancement of the boreholes. As part of a geotechnical investigation conducted on the adjacent Courtice WPCP property, which is located approximately 75 metres southwest of the Site, bedrock was encountered during borehole drilling at a depth of approximately 16 metres (Stantec, 2011).

Generally, ground surface elevations in the area of the Site gradually decrease from northeast to southwest toward Lake Ontario, which is located approximately 450 metres south of the Site. In the vicinity of the Site, ground surface elevations generally range from approximately 95 metres above sea level (ASL) to 102 metres ASL.

Regionally, shallow groundwater flow in the vicinity of the Site is anticipated to reflect surface topography and generally flow in a northeast to southwest direction towards Lake Ontario. Shallow groundwater flow may be influenced by local features, including but not limited to, Tooley Creek and its tributaries, surface water ponds and ditches, and underground utilities. Deep groundwater flow in the vicinity of the Site is anticipated to reflect bedrock topography and also flow in a southerly direction toward Lake Ontario.

### 2.2 Surface Water Features

The Site is located within the Tooley Creek watershed and is located in the Central Lake Ontario Conservation Authority (CLOCA) jurisdiction. On-Site surface water features include SWMPs in the southwest (West SWMP) and southeast (East SWMP) corners of the Site. The nearest natural surface water body to the Site is a tributary of Tooley Creek, located approximately 150 metres northwest of the Site. At its nearest point, Tooley Creek is located approximately 700 metres southwest of the Site. The Tooley Creek watershed has an approximate length of 5 kilometres from its headwaters near Highway 2 to its discharge point at Lake Ontario (Stantec, 2011). Lake Ontario is located approximately 450 metres south of the Site.



## 3 DESCRIPTION OF MONITORING PROGRAM

The 2017 groundwater and surface water monitoring program for DYEC included groundwater monitoring only. As noted in **Section 1.2.2.1**, the surface water monitoring program for DYEC (i.e., placement and monitoring of sondes in Tooley Creek) has been suspended for at least three (3) years, beginning in 2016. The groundwater monitoring program generally consists of the measurement of groundwater levels and the collection of groundwater samples for the relevant monitoring locations. The required monitoring locations, sampling frequency, and parameters of analysis are outlined in the Groundwater and Surface Water Monitoring Plan. Monitoring locations for the Site are shown in **Figure 2**.

### 3.1 Monitoring Locations

#### 3.1.1 Groundwater

A total of eight (8) groundwater monitoring wells are installed at five (5) monitoring locations at the Site. Construction details for the monitoring wells are presented in **Table B-1, Appendix B**, as well as in the borehole logs provided in **Appendix B**. The locations for the monitoring wells are shown in **Figure 2**.

Two (2) monitoring wells, one (1) shallow and one (1) deep, are installed at different depths at locations MW2, MW3, and MW5. The shallow well is designated with the postscript "B" (e.g., MW2B) and the deeper well is designated with the postscript "A" (e.g., MW1A). It is noted that monitoring wells MW3A/B were decommissioned in September 2013 due to infrastructure construction activities in the area. MW3A/B were replaced in March 2014 in a nearby location and designated as MW3A-R and MW3B-R, respectively.

As discussed in **Section 4.2**, the groundwater elevations have changed as a result of the influence on the groundwater flow due to the presence of the trunk sewer installed to the west of the Site. As a result of the groundwater flow pattern change, the following summary is provided that details the monitoring wells' current assigned positions (e.g., downgradient) with respect to the DYEC facility.

- MW1 is located within the northeast corner of the Site and is crossgradient of DYEC.
- MW2A/B are located within the northwest corner of the Site and are upgradient of DYEC.
- MW3A-R/B-R are located within the southwest corner of the Site and are downgradient of DYEC.
- MW4 is located within the southeast corner of the Site and is downgradient of DYEC.
- MW5A/B are located within the central area of the Site and are internal assessment monitoring wells for DYEC.



Historically, groundwater monitoring location MW1 was noted to be upgradient of DYEC, and groundwater monitoring location MW5 was considered downgradient of the DYEC. As a result of the trunk sewer installation, which required the relocation of groundwater monitoring location MW3, the aforementioned groundwater monitoring locations MW1 and MW5 are now interpreted as presented above.

## **3.2 Monitoring Frequency**

### **3.2.1 Groundwater**

The Groundwater and Surface Water Monitoring Plan requires that groundwater monitoring events are completed once in each the spring, summer and fall seasons for DYEC. In 2017, the monitoring events were completed between April 11 and 13, between August 3 and 9, and between November 17 and 21. Each monitoring event included the measurement of groundwater levels and collection of groundwater samples at the relevant monitoring locations.

As discussed further in **Section 3.4**, the groundwater sample collection procedure for each monitoring well was initiated on the first day of each monitoring event in 2017. If discontinuous flow was observed while purging groundwater from a monitoring well (i.e., monitoring well goes “dry” during the purging procedure), sample collection was only completed after a period of recovery (next day at a minimum).

## **3.3 Field and Laboratory Parameters and Analysis**

### **3.3.1 Groundwater**

In 2017, the field parameters temperature, pH, electrical conductivity (EC), and turbidity were analyzed and recorded at the time of sample collection for each monitoring well and event.

Collected groundwater samples were submitted to AGAT Laboratories (AGAT) in Mississauga, Ontario, which is a Canadian Association for Laboratory Accreditation (CALA) certified environmental laboratory, for analysis of the required parameters noted in the summary below. The required parameters for laboratory analysis are outlined in the Groundwater and Surface Water Monitoring Plan.

<b>Parameter Group</b>	<b>Parameters</b>
<b>Major Anions</b>	Carbonate, Bicarbonate, Chloride, Sulphate
<b>Major Cations</b>	Calcium, Magnesium, Potassium, Sodium
<b>Metals</b>	Boron, Cadmium, Cobalt, Lead, Mercury



## 3.4 Monitoring and Sampling Procedures

### 3.4.1 Groundwater

#### 3.4.1.1 Groundwater Level Measurements

Groundwater levels were manually measured at the accessible monitoring wells at the Site during each monitoring event. The liquid levels for each monitoring well were measured using an electric contact meter with an accuracy of 10 mm. The meter was decontaminated between monitoring wells with an anionic detergent and rinsed with distilled water to mitigate the potential for cross-contamination between sampling/monitoring points.

The groundwater levels measured in 2017 and historically are presented in **Table C-1, Appendix C**, and plotted in **Figures C-1 to C-3, Appendix C**. Shallow groundwater flow contours are shown in **Figure 2**.

#### 3.4.1.2 Groundwater Sampling

Groundwater samples were collected using dedicated inertial-lift pumps and tubing. Prior to monitoring well purging, the static groundwater level was measured and the groundwater volume within the well casing was calculated. The monitoring well was then purged with the dedicated inertial-lift pump until three (3) volumes were removed, or until a discontinuous flow of groundwater was observed.

The monitoring wells were each purged on the first day of each monitoring event in 2017. Sampling was completed after the removal of three (3) static volumes of groundwater or following a period of recovery (next day at a minimum, where monitoring wells go dry following the purge event) after producing discontinuous flow. It is noted that for select monitoring wells and events in 2017, where purging produced discontinuous flow (i.e. monitoring well went 'dry'), multiple days of recovery were required such that sufficient groundwater volume was available for sample collection. At the time of sample collection, field indicator parameters temperature, pH, EC, and turbidity were recorded onto dedicated field forms. The 2017 groundwater field analytical results are presented in **Table D-1, Appendix D**.

The groundwater samples were collected directly into bottles provided by the laboratory. Groundwater sample aliquots collected for metals analysis were filtered in the field using 45 micrometre in-line disposable filters.

Collected samples were submitted to AGAT for analysis. The 2017 groundwater analytical results are presented in **Table D-2, Appendix D**. It is noted that the dates presented in **Tables D-1 and D-2, Appendix D**, represent the actual date of sample collection for the relevant monitoring well. Laboratory Certificates of Analysis are provided in **Appendix E**.



### **3.5 Sample Management**

Groundwater samples collected at DYEC in August 2017 were submitted under successive Chains of Custody, along with other groundwater samples that originated from other Region of Durham projects. As such, the laboratory proceeded with QA/QC procedures based on the overall list of parameters identified under the successive Chains of Custody. For simplicity of reporting purposes, the laboratory Certificates of Analysis for the samples submitted under the above-mentioned successive Chains of Custody were separated to only show the analytical results for the relevant project, including the DYEC samples. As such, for the August 2017 groundwater samples, only the analytical results for the DYEC samples are presented. However, as the QA/QC procedures are completed based on a batch of samples, including any requested analysis under a Chain of Custody, or successive Chains of Custody, the QA/QC results presented in the August 2017 Certificates of Analysis for DYEC includes each parameter requested under the successive Chains of Custody and not only those for the DYEC samples.

For the groundwater samples collected at DYEC in April 2017, a note was included on the Chain of Custody, which suggested the laboratory was to filter the relevant sample aliquots for metals analysis. This indication that the groundwater samples were not filtered in the field was a clerical error during the completion of the hand-written Chain of Custody as part of the batch submission where other project sites' metals samples are not field-filtered. The bottles utilized to store the relevant groundwater sample aliquots for metals analysis contained the appropriate preservatives and field-filtering for these sample aliquots occurred for each groundwater sampling event in 2017. Thus, the metals analysis for the groundwater at the monitoring well locations for DYEC were accurate and sampled and analyzed in accordance with the Groundwater and Surface Water Monitoring Plan for DYEC in 2017.

The sample labelled MW5001 collected during the August 2017 monitoring event was a field-prepared duplicate sample collected from monitoring well MW2A. The sample MW5001 was shipped and received by the laboratory, but was inadvertently not listed on the Chain of Custody. The laboratory identified the inadvertent clerical error and contacted RWDI for clarification. RWDI confirmed with the laboratory that sample MW5001 was in fact a duplicate groundwater sample collected from a monitoring well at DYEC and required to be analyzed for the same parameter list as its original sample MW2A.

In summary, the use of the chain of custody process, accompanied with the laboratory/consultant review of these forms and subsequent clarification communications, enabled the 2017 groundwater samples to be managed and assessed per the required procedures for the approved DYEC monitoring program.



### 3.6 Quality Assurance and Quality Control for Sampling and Analysis

In accordance with the Groundwater and Surface Water Monitoring Plan, for each groundwater monitoring event completed in 2017 one (1) field duplicate sample was collected during the sample collection procedure for a select monitoring well as a QA/QC measure.

The field duplicate samples and their respective original sample collected in 2017 are presented in the summary below.

Monitoring Event	Duplicate Sample ID	Original Sample ID
<b>April 11, 2017</b>	MW8001	MW2A
<b>August 3, 2017</b>	MW5001	MW2A
<b>November 21, 2017</b>	GW DUP 1	MW2A

## 4 MONITORING RESULTS AND EVALUATION

### 4.1 Quality Assurance and Quality Control

QA/QC measures for the groundwater monitoring program completed for DYEC in 2017 included field-prepared duplicate samples, laboratory duplicates, laboratory spiked samples, as well as percent recovery of analysis and data review.

The laboratory analyzed several control samples to verify that their analytical equipment was functioning properly and reporting results accurately at the time of analysis for the samples collected at the Site. The control samples had an expected target value, which was compared against pre-determined data quality objectives. For the laboratory control samples, the results were within acceptable laboratory data quality criteria.

For the field-prepared duplicate samples, the analytical results for the required parameters of analysis were evaluated for the relative percent difference (RPD) of parameter concentrations using the USEPA National Functional Guidelines (US EPA 540-R-10-011) as a general QA/QC RPD screening mechanism. The RPD screening mechanism is such that for concentrations greater than five (5) times the laboratory reportable detection limit (RDL), a concentration difference of less than or equal to 20% is deemed acceptable.



For concentrations less than or equal to five (5) times the RDL, a concentration difference of equal to or less than the RDL is deemed acceptable. Where a calculated RPD is outside of the tolerance of the general QA/QC RPD screening mechanism, the results for the required parameters of analysis are evaluated against the applicable performance standards for sample duplicates noted in Tables 5.1 to 5.15 of the MOECC's Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act, dated March 8, 2004, and amended July 1, 2011. For the results found to be outside of the tolerance of each QA/QC evaluation, a laboratory data quality review (DQR) of the results is requested such that the concentrations are accurate as presented and are within acceptable laboratory data quality criteria.

#### **4.1.1 Groundwater QA/QC**

For each of the 2017 monitoring events, QA/QC evaluations were completed for the analytical results of the original samples and their respective duplicate samples, as outlined in Section 3.5. The analytical results of the original and duplicate samples collected for each monitoring event satisfied the criteria of the QA/QC evaluations. Thus, the results of the duplicate analysis indicated that the concentrations for the original samples are accurate as presented and acceptable for interpretive purposes.

In summary, acceptable QA/QC data for the field-prepared duplicate samples, laboratory duplicates, laboratory spiked samples, as well as percent recovery of analysis indicated that the detected constituent concentrations were accurate and reflected actual conditions at the time of sample collection.

## **4.2 Groundwater Levels and Flow**

Groundwater levels have been measured in the groundwater monitoring wells at the Site since December 2011. The 2017 and historical groundwater level data are summarized in **Table C-1, Appendix C**. Hydrographs of the groundwater elevations at the Site are plotted in **Figures C-1 to C-3, Appendix C**. Monitoring well locations are shown in **Figure 2**. It is noted that, for the purposes of comparing groundwater levels and evaluating the groundwater flow direction at the Site, the top of each monitoring well riser pipe has been surveyed to an assumed Site datum.

The groundwater elevations measured at the Site have remained generally consistent since monitoring began at each monitoring well, with exceptions noted below for monitoring wells MW1 and MW4. Overall, the groundwater elevations for each monitoring well have been generally stable or have fluctuated, with no consistent increasing or decreasing trend over-time. The fluctuating groundwater elevations are attributed to prolonged periods of precipitation (e.g., elevation increase in April due to a wet spring season) or lower than normal precipitation (e.g., elevation decrease in August due to a dry summer season). It is noted that in 2016, the groundwater elevation measured in August and November at each monitoring well decreased slightly relative to the respective recent historical elevations. Based on the April 2017 groundwater levels, the groundwater elevation for each monitoring well had recovered and was consistent with recent historical elevations prior to August 2016. Thus, the decreases in groundwater elevation observed in August and November 2016 is attributed to lower than normal precipitation over the summer and fall seasons of 2016.



At crossgradient monitoring well MW1, the groundwater elevation decreased more than 5 metres between the July 2013 and April 2014 monitoring events. This decrease is attributed to the presence of a trunk sewer to the west of the Site, where the groundwater preferentially flows towards the more porous backfill material used around the trunk sewer (i.e., behaves like a French Drain). Between April 2014 and April 2015, following the installation of the trunk sewer, the groundwater elevation at MW1 recovered by approximately 2.6 metres. Since April 2015, the groundwater elevation at MW1 has generally fluctuated with no consistent increasing or decreasing trend over-time.

At downgradient monitoring well MW4, the groundwater elevation decreased by approximately 2 metres between the March and November 2012 monitoring events. This decrease is attributed to the construction of the East SWMP during the aforementioned period. The groundwater elevation at MW4 since November 2012 has remained similar to, but slightly higher than, the base elevation of the East SWMP (WSP, 2016).

Based on the 2017 groundwater elevations, the shallow groundwater flow direction at the Site was interpreted to be toward the southwest. Contour mapping of the shallow groundwater elevations and the interpreted groundwater flow direction, based on the April 2017 groundwater elevations, is presented in **Figure 2**. The interpreted groundwater flow regime presented in **Figure 2** is consistent with results from August and November 2017 and with results from previous years. The deep groundwater monitoring network at the Site is not sufficient to map groundwater contours across the Site, however, the deeper groundwater flow direction at the Site in 2017 was also interpreted to be toward the southwest.

Each of the monitoring wells at the Site are positioned in overburden. For the nested groundwater monitoring wells at the Site, the deep monitoring wells (MW2A, MW3A-R, and MW5A) have midpoint screen elevations approximately 2.6 to 3.1 metres deeper than the midpoint screen elevations of their respective shallow monitoring well counterpart in the overburden. For the nested monitoring well locations, the vertical hydraulic gradients were calculated for the 2017 and historical data. The calculated vertical hydraulic gradients are presented in **Table C-2, Appendix C**. The hydraulic gradients calculated for the 2017 groundwater elevations were generally consistent with historical results. In 2017, downward gradients were observed between the shallow and deep monitoring wells at MW2 in April, August, and November, as well as at MW3 in April and August. The vertical gradients in 2017 ranged between 0.02 metres per metre in an upward direction at MW5 in August and 0.37 metres per metre in a downward direction at MW2 and MW3 in April. Groundwater movement through the overburden at the Site has historically been generally downward at MW2 and MW3 with occasional upward gradients. At MW5, the vertical hydraulic gradient has historically been even (i.e., 0.0 metres per metre) and fluctuates between slight upward and downward gradients.



## 4.3 Groundwater Quality

The 2017 groundwater field analytical results are tabulated in **Table D-1, Appendix D**. The 2017 and historical groundwater laboratory analytical results are tabulated in **Table D-2, Appendix D**. Laboratory Certificates of Analysis are provided in **Appendix E**.

### 4.3.1 Concentration Trends

Concentration vs. time plots for chloride, sodium, sulphate, calcium, magnesium, potassium, boron, and bicarbonate are presented in **Figures D-1 to D-8, Appendix D**, respectively. As shown in **Figures D-1 to D-8**, the concentrations of each relevant parameter have remained generally stable or have fluctuated since monitoring began at each monitoring well, with exceptions noted below.

- As shown in **Figure D-1 and D-2**, the concentrations of salt related constituents chloride and sodium, respectively, within upgradient monitoring well MW2B have generally increased since 2014. The concentrations of chloride and sodium within crossgradient monitoring well MW1 and internal assessment monitoring well MW5B have also generally increased since 2015. The beginning of the increasing trend of chloride and sodium concentrations within MW1, MW2B, and MW5B coincides with the approximate time of construction of Energy Dr. north and west of the Site, as well as the on-Site roadways and parking lot. As such, the increasing concentrations of salt related constituents are attributed to the application of deicing salt during the winter season to Energy Dr., Osborne Rd., and/or the on-Site roadways/parking lot. It is noted that the 2017 and historical concentrations of chloride and sodium within the groundwater at MW1, MW2B, and MW5B have satisfied their respective ODWS criteria.
- As shown in **Figure D-1, D-2, D-4, D-5, and D-6**, within downgradient monitoring well MW4, the concentrations of the salt related constituents chloride, sodium, calcium, magnesium, and potassium, respectively, were generally stable since monitoring began at this monitoring well until distinctly increasing in November 2016. For the salt related constituents, only chloride and sodium have an ODWS, which were satisfied at MW4 until November 2017 when the concentration of chloride (682 mg/L) was greater than its respective ODWS criterion (250 mg/L). However, the detected salt related constituent concentrations at MW4 are attributed to the application of deicing salt to the nearby off-Site roadway to the Courtice WPCP and/or the downgradient migration of chloride from areas closer to Energy Dr. and Osborne Rd. It is noted that, at the internal assessment and downgradient monitoring locations MW5 and MW3, respectively, which are in closer proximity to the DYEC facility than MW4, the concentrations of the salt related constituents have been consistently less than the elevated concentrations detected within MW4. As such, there is no indication that the noted concentrations of the salt related constituents detected within MW4 have migrated downgradient within the shallow groundwater as a result of DYEC waste treatment operations.



- It is noted that elevated chloride concentrations, as well as the concentrations of the other salt related constituents of sodium, calcium, potassium and magnesium, are commonly elevated in groundwater where a monitoring well is situated near roads that receive brine or salt for dust control or deicing. As such, the noted salt related constituent effects at the aforementioned monitoring wells are expected to fluctuate and/or increase several hundred mg/L over time with continued deicing activities along roadways and within parking lots at/near DYEC. As only salt related constituents show elevated concentrations compared to concentrations for metal constituents within the groundwater, no action is required to address the noted concentrations for the salt related constituents.

In summary, since groundwater monitoring began at the Site in 2011, concentrations of most required parameters of analysis in the shallow and deep groundwater monitoring wells have generally fluctuated or been stable with no apparent increasing or decreasing trend, exclusive of those trends outlined above. The concentrations of the salt related constituents chloride, sodium, calcium, magnesium, and potassium detected within groundwater, each cross-gradient and downgradient of DYEC, are not attributable to DYEC waste treatment operations, but are the result of the application of deicing salt to Energy Dr., Osborne Rd., the nearby off-Site roadway to the Courtice WPCP, and/or the on-Site roadways/parking lot. It is expected that over time, the concentrations of the aforementioned salt related constituents will continue to fluctuate and/or increase with the continued practice of roadway and parking lot deicing. As only salt related constituents show elevated concentrations compared to concentrations for metal constituents within the groundwater, no action is required to address the noted concentrations for the salt related constituents.

#### **4.4 Regulatory Criteria**

In accordance with the Groundwater and Surface Water Monitoring Plan for DYEC, groundwater quality at the Site is required to be evaluated by comparing the groundwater quality data to the respective criteria provided in the *Technical Support Document for Ontario Drinking Water, Standards, Objectives, and Guidelines* (MOE, 2006). These standards are collectively referred to as the Ontario Drinking Water Standards (ODWS). For the required parameters of analysis, their respective ODWS are presented in **Table D-2, Appendix D**.

It is noted that the aesthetic objective for sodium is 200 mg/L. However, as indicated in the ODWS (MOE, 2006), the local Medical Officer of Health should be notified when the sodium concentration (in drinking water) exceeds 20 mg/L so that this information may be communicated to local physicians for their use in notifying patients on sodium restricted diets. Groundwater is not used as a drinking water source at or downgradient of DYEC thus, the aesthetic objective of 200 mg/L for sodium is utilized to assess the overall groundwater quality.



For the 2017 monitoring events, the groundwater analytical results for the required parameters of analysis satisfied their respective ODWS, with one (1) exception. The November 2017 concentration of chloride (682 mg/L) within monitoring well MW4 was greater than the respective ODWS (250 mg/L). The concentration of chloride was generally stable since monitoring began at this monitoring well and satisfied the respective ODWS until November 2017, when the concentration distinctly increased. As discussed in **Section 4.3**, based on the interpreted groundwater flow direction and the analytical results for chloride at downgradient monitoring wells in closer proximity to the DYEC facility, there is no indication that the November 2017 concentration of chloride within MW4 migrated downgradient within the shallow groundwater as a result of DYEC waste treatment operations. The November 2017 concentration of chloride detected at MW4 is attributed to the application of deicing salt. Thus, no corrective action(s) are required to address the noted chloride concentration.

The historical groundwater analytical results for the Site consistently have satisfied their respective ODWS since monitoring began at each monitoring well. For the required parameters of analysis, there are not any trends of concern that would suggest an impending exceedance of an ODWS within the downgradient groundwater quality at the Site as a result of DYEC waste treatment operations.

Based on a review of 2017 and historical groundwater analytical results for the Site, the data suggests that DYEC waste treatment operations have not had an adverse effect on groundwater quality at the Site. As discussed, the increased concentration of chloride at monitoring well MW4 in November 2017 is not consistent with historical results and is attributed to the application of deicing salt. The concentration of chloride at MW4 should continue to be monitored during subsequent monitoring events to assess the repeatability of the November 2017 result and evaluate the concentration trend over time.

## 5 CONTINGENCY MEASURES

In accordance with Condition 17 of the EA Approval, a Spill Contingency and Emergency Response Plan has been developed for the Site. The Spill Contingency and Emergency Response Plan documents remedial actions that are required in the event of a spill or upset condition (Stantec, 2011). It is the understanding of RWDI that a spill or upset condition requiring remedial action did not occur at the Site in 2017



## 6 2018 MONITORING PROGRAM

The proposed 2018 monitoring program considers the findings of this report and the MOECC approved Groundwater and Surface Water Monitoring Plan for the Site. Details of the monitoring programs for the Site, including analytes, are summarized in **Section 3** of this report. The groundwater monitoring locations for the Site are shown in **Figure 2**.

As discussed, with MOECC approval, the routine surface water monitoring program for DYEC (i.e., placement and monitoring of sondes in Tooley Creek) has been suspended for at least three (3) years, beginning in 2016. As such, the routine surface water monitoring program for DYEC outlined in the Groundwater and Surface Water Monitoring Plan is not required to be completed in 2018.

An annual monitoring report that details the findings of the 2018 monitoring period will be prepared and submitted to the MOECC by April 30, 2019. The annual report should be prepared in consideration of historical report submissions while acknowledging the purpose and objectives of the monitoring program, which are summarized in **Section 1.2** of this report.

## 7 CONCLUSIONS

Based on the findings presented in this report, the following conclusions are provided.

- Based on the 2017 groundwater elevations, the shallow and deeper groundwater flow direction at the Site was interpreted to be toward the southwest, with minor flow alterations as a result of the influences from the trunk sewer.
- For the groundwater sampling program completed for DYEC in 2017, QA/QC measures indicated that the detected constituent concentrations were accurate and reflected actual conditions at the time of sample collection.
- The concentrations of salt related constituents chloride and sodium within upgradient monitoring well MW2B have increased since 2014. The concentrations of chloride and sodium within crossgradient monitoring well MW1 and internal assessment monitoring well MW5B have also increased since 2015. The beginning of the increasing trend of chloride and sodium concentrations within MW1, MW2B, and MW5B coincides with the approximate time of construction of Energy Dr. north and west of the Site, as well as the on-Site roadways and parking lot. As such, the increasing concentrations of salt related constituents are attributed to the application of deicing salt during the winter season to Energy Dr., Osborne Rd., and/or the on-Site roadways/parking lot. It is noted that the 2017 and historical concentrations of chloride and sodium within the groundwater at MW1, MW2B, and MW5B have satisfied their respective ODWS criterion.



- Within downgradient monitoring well MW4, the concentrations of the salt related constituents chloride, sodium, calcium, magnesium, and potassium, respectively, were generally stable since monitoring began at this monitoring well until distinctly increasing in November 2016. For the salt related constituents, only chloride and sodium have an ODWS, which were satisfied at MW4 until November 2017 when the concentration of chloride (682mg/L) was greater than its respective ODWS criterion (250 mg/L). However, the detected salt related constituent concentrations at the aforementioned monitoring well locations attributed to the application of deicing salt to the nearby off-Site roadway to the Courtice WPCP and/or the downgradient migration of chloride from areas closer to Energy Dr. and Osborne Rd. or from the East SWMP. It is noted that, at the internal assessment and downgradient monitoring locations MW5 and MW3, respectively, which are in closer proximity to the DYEC facility than MW4, the concentrations of the salt related constituents have been consistently less than the elevated concentrations detected within MW4. As such, there is no indication that the noted concentrations of the salt related constituents detected within MW4 have migrated downgradient within the shallow groundwater as a result of DYEC waste treatment operations.
- It is noted that elevated chloride concentrations, as well as the concentrations of the other salt related constituents of sodium, calcium, potassium and magnesium, are commonly elevated in groundwater where a monitoring well is situated in close proximity to roads that receive brine or salt for dust control or deicing. As such, the noted salt related constituent effects at the aforementioned monitoring wells are expected to fluctuate and/or increase several hundred mg/L over time with continued deicing activities along roadways and within parking lots at/near DYEC. As only salt related constituents show elevated concentrations compared to concentrations for metal constituents within the groundwater, no action is required to address the noted concentrations for the salt related.
- The groundwater analytical results for the Site have consistently satisfied their respective ODWS since monitoring began at each monitoring well, with the exception of the deicing salt influence of the noted chloride concentration at MW4 during November 2017. The groundwater analytical results suggest that DYEC waste treatment operations have not had an adverse effect on groundwater quality at the Site.
- With MOECC approval, the routine surface water monitoring program (i.e., placement and monitoring of sondes in Tooley Creek) for DYEC has been suspended for at least three (3) years, beginning in 2016. As such, the routine surface water monitoring program for DYEC outlined in the Groundwater and Surface Water Monitoring Plan was not required to be completed in 2017.



## 8 RECOMMENDATIONS

Based on the findings of the 2017 monitoring program, the following recommendations are provided for your consideration.

- Groundwater monitoring at the Site should continue in 2018, in accordance with MOECC approved Groundwater and Surface Water Monitoring Plan. No deviations from the groundwater monitoring program are recommended.
- The routine surface water monitoring program for the Site (i.e., placement and monitoring of sondes in Tooley Creek) should not be completed in 2018 as the MOECC has approved the suspension of the program for at least three (3) years, beginning in 2016.
- The concentrations of salt related constituents chloride, sodium, calcium, magnesium, and potassium within the groundwater at monitoring wells should continue to be evaluated on an ongoing basis to verify that the concentrations of these constituents continue to be assessed to be effects of roadway and parking lot deicing practices, and are not attributable to DYEC waste treatment operations.

## 9 STUDY LIMITATIONS AND USE OF REPORT

This report was prepared using scientific principles and professional judgment in assessing available facts and presenting subjective interpretations. The professional judgments presented within this document are based on available facts within the limits of the existing information, budgeted scope of work, and schedule. It is RWDI's intent that the professional judgment and interpretive conclusions be utilized as guidance and not be necessarily construed as a firm course of action, unless explicitly stated otherwise. We make no warranties, expressed or implied, including without limitation, or warranties as to merchantability or fitness of the property for a particular purpose. The information presented in this report is not to be construed as legal advice.

RWDI relied on information obtained from Site representatives, independent sources, and other historical documentation as referenced in this report. The accuracy and completeness of third party sources was not verified. It is noted that regulatory guidelines, standards, and related documents as they may be referenced in this report are subject to interpretation and may change over time.

This report was prepared for the exclusive use of the Regional Municipality of Durham and the Ministry of the Environment and Climate Change. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibility of such third parties. RWDI accepts no responsibility for damages, if any, suffered by any third party as result of decisions made or actions based on this report.



## 10 CLOSURE

We trust that this 2017 Annual Groundwater and Surface Water Monitoring Report, prepared in accordance with Condition 20.8 of the Environmental Assessment Notice of Approval and Condition 15 of the Environmental Compliance Approval Number 7306-8FDKNX for the Durham York Energy Centre in the Municipality of Clarington, Ontario, is satisfactory for your requirements. Should there be any questions or comments, please contact us.

Yours very truly,

**RWDI**

Report Prepared By:

A blue ink signature of Brent J. Langille, consisting of a stylized 'B' followed by several horizontal strokes.

Brent J. Langille, B.Sc., P.Geo.  
Senior Consultant | Principal

A blue ink signature of Andy de Jong, written in a cursive style.

Andy de Jong, M.A.Sc., P.Eng.  
Senior Engineer

A black ink signature of Philippe E. Janisse, written in a cursive style.

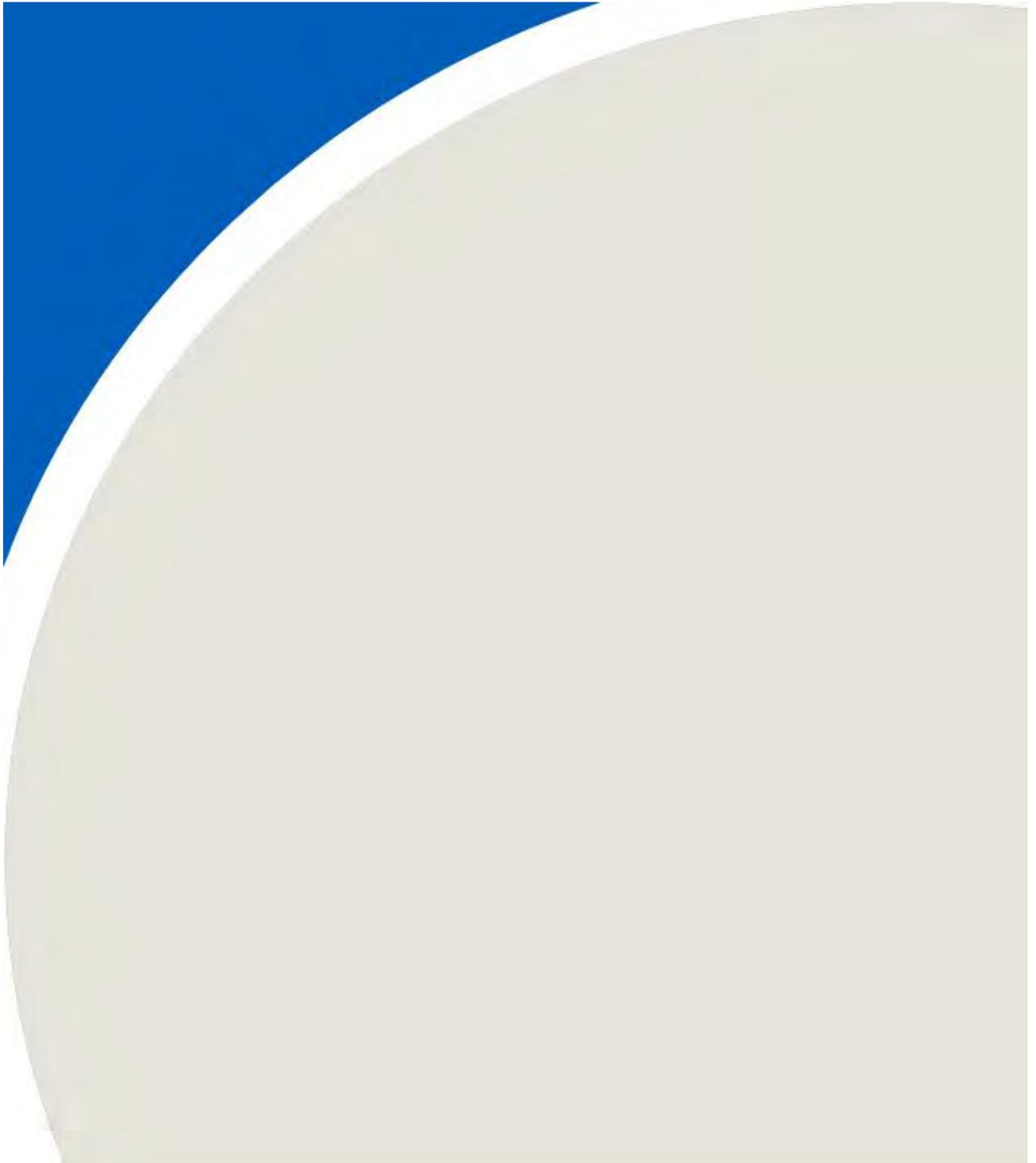
Philippe E. Janisse, B.Sc., P.Geo.  
Project Manager | Sr. Geoscience Specialist

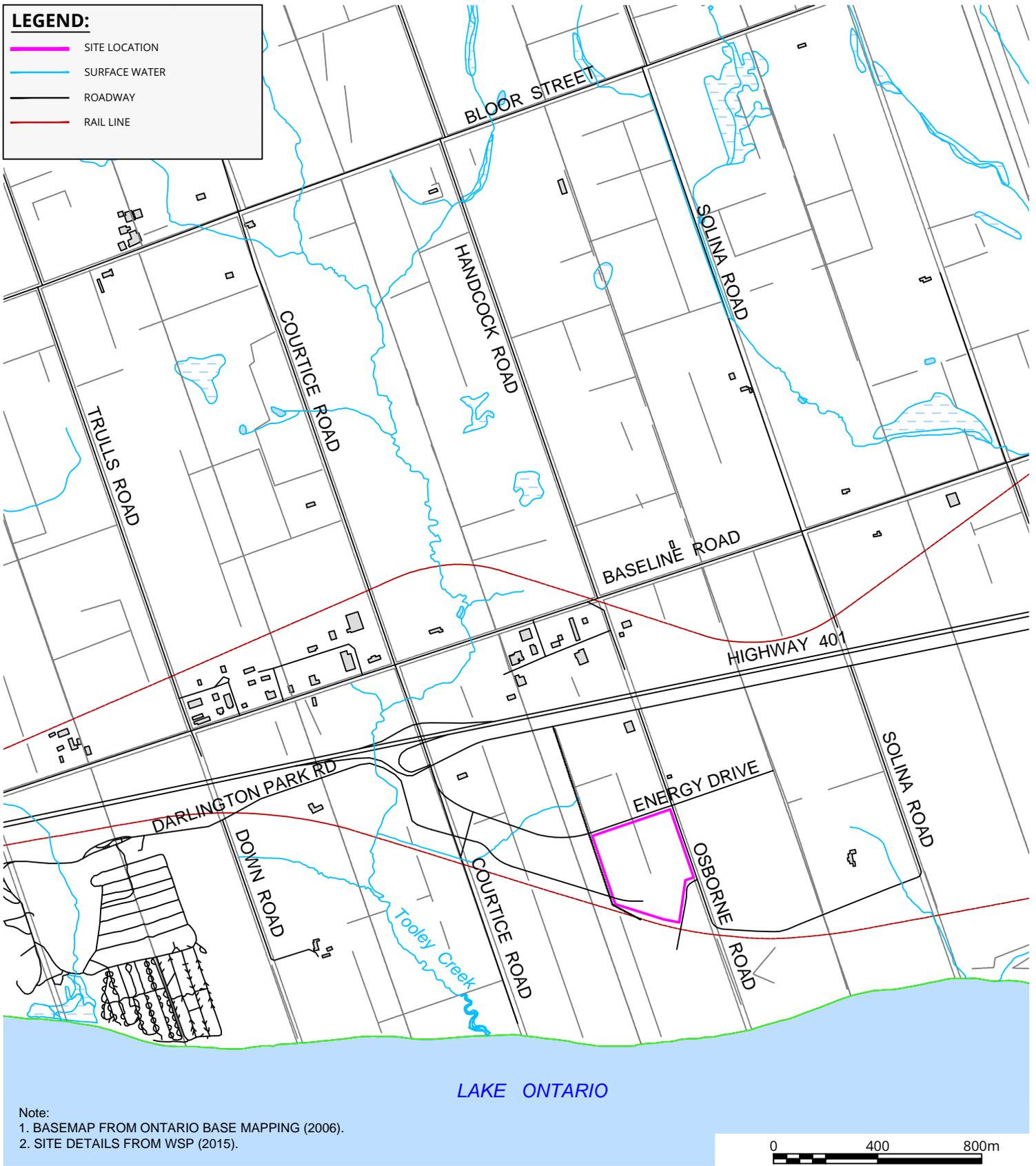


## 11 REFERENCES

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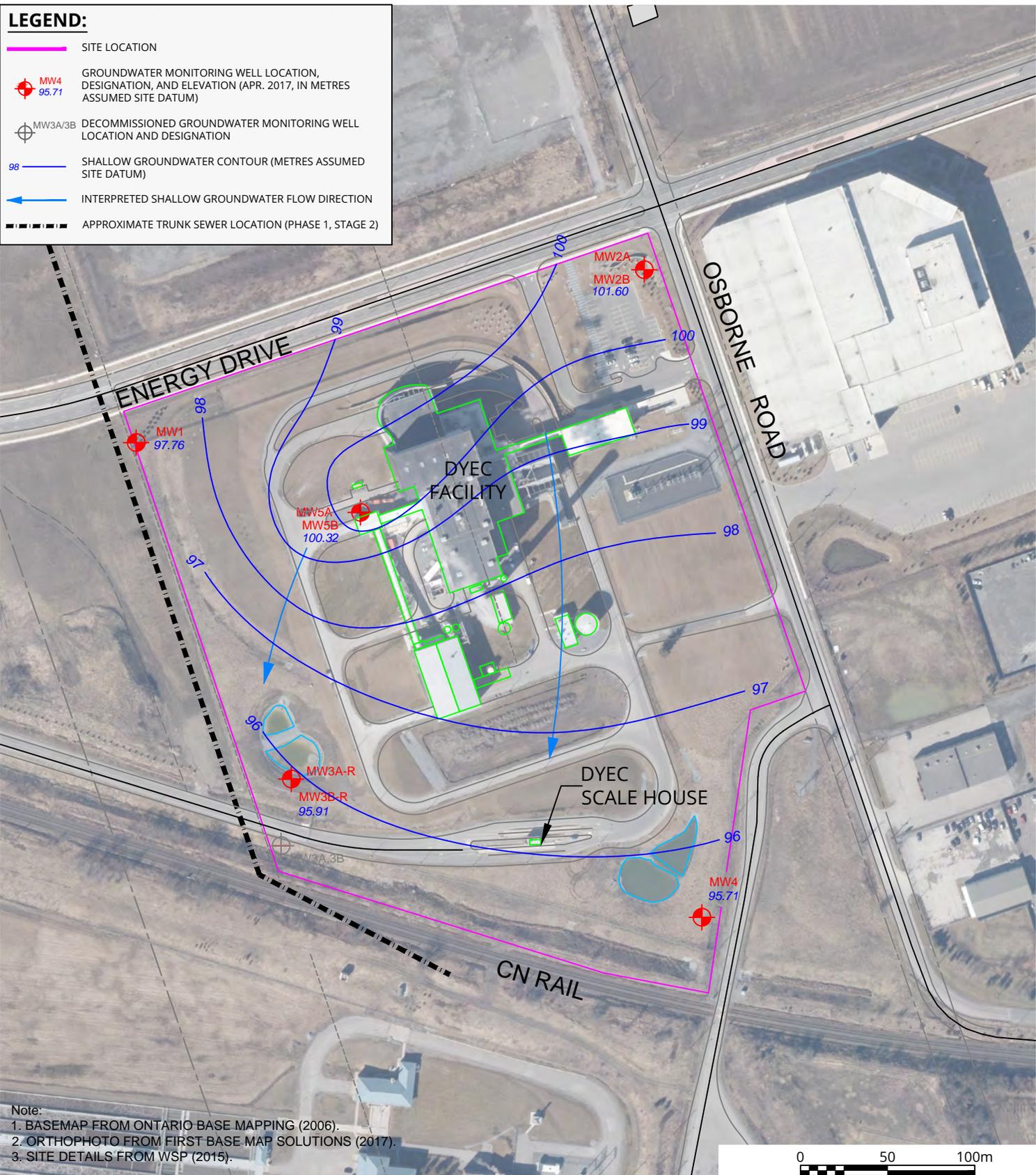
## FIGURES





Note:  
 1. BASEMAP FROM ONTARIO BASE MAPPING (2006).  
 2. SITE DETAILS FROM WSP (2015).

<b>SITE LOCATION MAP</b> DURHAM YORK ENERGY CENTRE 2017 ANNUAL GROUNDWATER AND SURFACE WATER MONITORING REPORT  THE REGIONAL MUNICIPALITY OF DURHAM	True North 	Drawn by: SSL Figure: 1	
		Approx. Scale: 1:20,000	
		Date Revised: Jan. 5, 2018	
Project # 1604066		DATE PLOTTED: January 8, 2018	



**SITE PLAN**  
**DURHAM YORK ENERGY CENTRE**  
 2017 ANNUAL GROUNDWATER AND SURFACE WATER MONITORING REPORT

THE REGIONAL MUNICIPALITY OF DURHAM

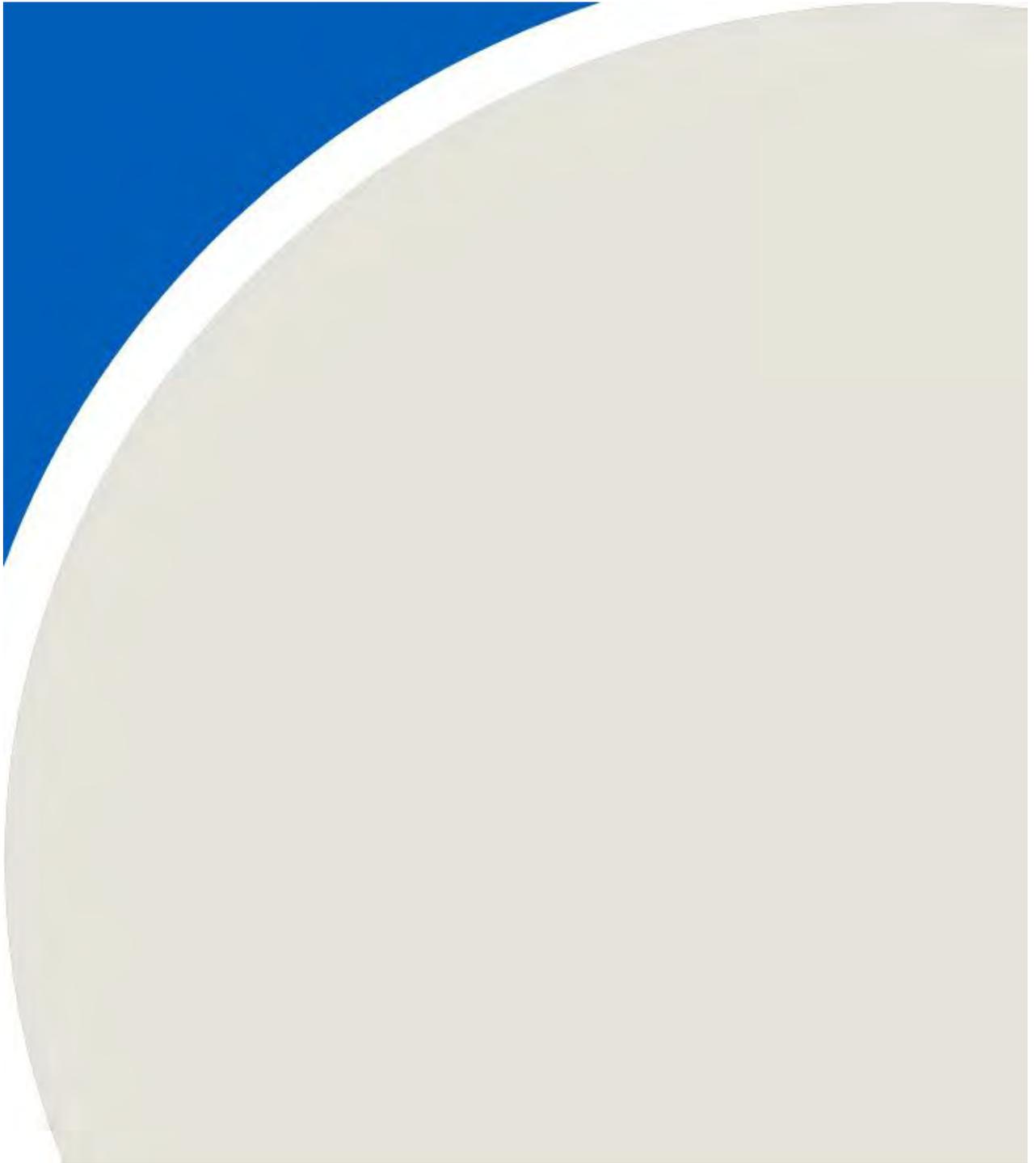


Project # 1604066

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Approx. Scale: 1:3,000	
Date Revised: Jan. 8, 2018	



## APPENDIX A



Ministry  
of the Environment  
and Climate Change  
Central Region Office  
5775 Yonge Street  
8<sup>th</sup> Floor  
North York ON M2M 4J1  
Tel.: 416 326-6700  
Fax: 416-325-6345

Ministère  
de l'Environnement et de l'Action  
en matière de changement climatique  
Région Central  
5775, rue Yonge  
8<sup>ème</sup> étage  
North York (Ontario) M2M 4J1  
Tél: (416) 326-6700  
Télé: (416) 326-6345



May 17, 2016

Mirka Januszkiewicz, P. Eng  
Director, Waste Management  
The Regional Municipality of Durham  
605 Rossland Road East  
Whitby ON L1N 6A3

Laura McDowell, P.Eng  
Director, Environmental Promotion and Protection  
The Regional Municipality of York  
17250 Yonge Street  
Newmarket ON L3Y 6Z1

Dear Ms. Januszkiewicz and Ms. McDowell,

**RE: Durham York Energy Centre (DYEC)  
Requested change to Surface Water Monitoring Program**

In your letter dated April 29, 2016, the Regional Municipalities of Durham and York (Regions) requested that the requirement in the DYEC Groundwater and Surface Water Monitoring Plan to place continuous surface water monitoring equipment (sondes) in Tooley Creek be suspended until Hwy 401/Courtice Road interchange construction is completed.

Ministry staff have confirmed with the Ministry of Transportation that the section of Tooley Creek where the sondes are placed each spring will be significantly disturbed (re-aligned) and access will be restricted for at least 3 years during the interchange construction. The construction will prevent the placement of the sondes and affect the reliability of any surface water monitoring in the creek downstream of the construction.

The ministry's review of surface water monitoring results, to date, indicates that the DYEC is not having an adverse effect on Tooley Creek. The remaining monitoring, inspection and spill contingency and emergency response requirements for the facility will continue to ensure that the potential for any off-site impact to surface water is controlled.

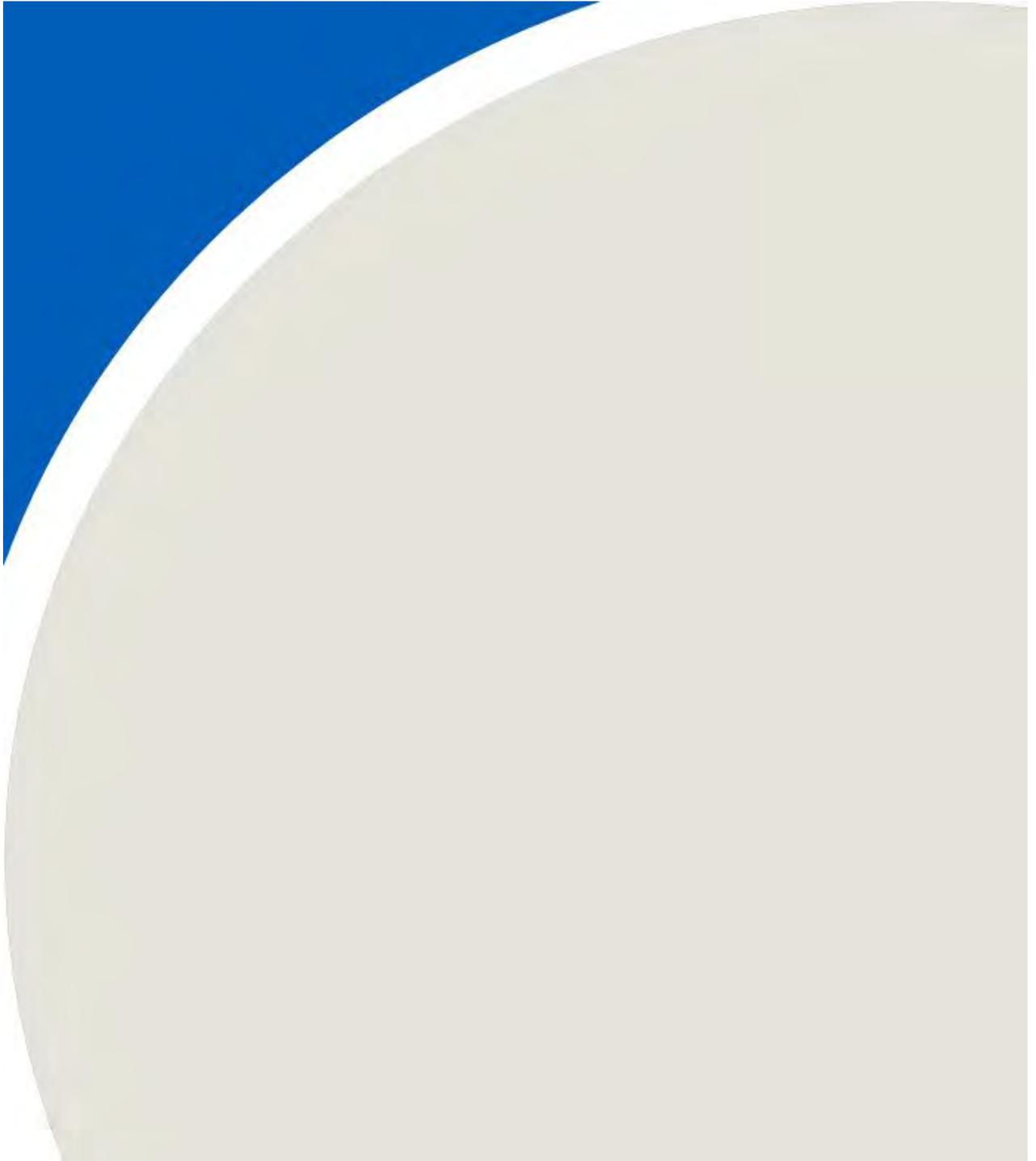
In accordance with Condition 20.5 of the Notice to Proceed with the Undertaking and Condition 7(14) of the Environmental Compliance Approval, I am granting your request to suspend the placement of the sondes in Tooley Creek until such time as the interchange construction activities are completed.

Sincerely,

Dolly Goyette  
Director, Central Region  
Ministry of the Environment and Climate Change

- c. Ross Lashbrook, Manager, Technical Support Section, Central Region MOECC  
Celeste Dugas, Manager, York Durham District Office  
Sandra Thomas, Issues Project Coordinator, York Durham District Office

## APPENDIX B



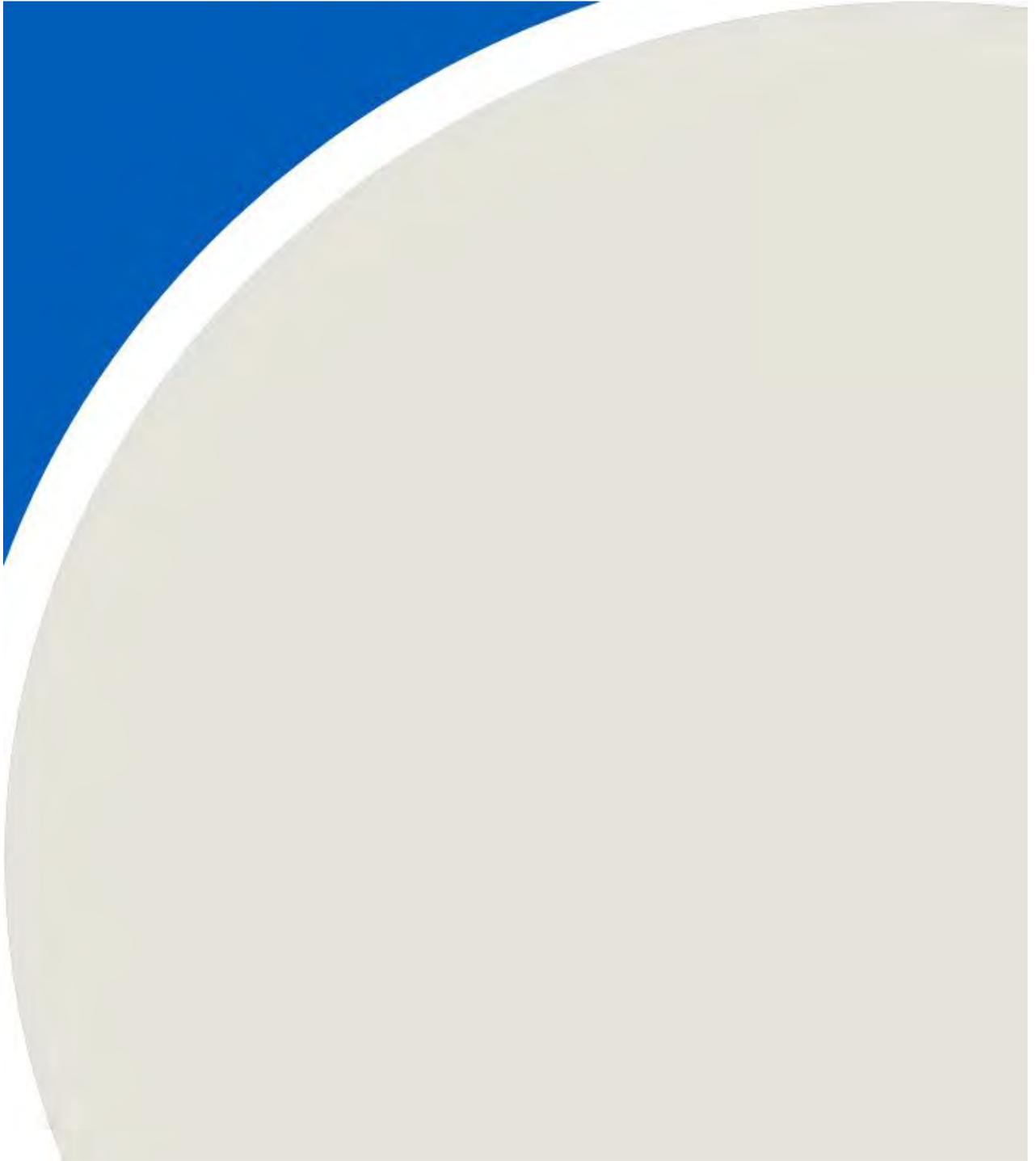
## Table B-1 - Monitoring Well Construction Detail Summary

Durham York Energy Centre - 2017 Monitoring Program  
 Regional Municipality of Durham  
 Project No. 1604066

Monitoring Well ID	Monitor Type	Monitor Diameter	Measuring Point Elevation	Ground Surface Elevation	Monitor Stick-Up	Screen Interval		Filter Pack Interval		Bentonite Seal Interval		Surface Seal Interval			
		(mm)	(mSD)	(mSD)	(m)	(mSD)	(mSD)	(mSD)	(mSD)	(mSD)	(mSD)	(mSD)	(mSD)		
MW1	Standpipe	51	102.32	101.29	1.03	95.19	-	93.67	95.50	-	93.67	101.29	-	95.50	-
MW2A	Piezometer	51	103.03	102.01	1.02	94.39	-	92.87	94.69	-	92.82	102.01	-	94.69	-
MW2B	Standpipe	51	103.08	102.01	1.07	97.46	-	95.94	97.77	-	95.94	102.01	-	97.77	-
MW3A	Piezometer	51	96.22	95.17	1.05	87.63	-	86.10	87.93	-	86.10	93.95	-	87.93	95.17 - 93.95
MW3A-R	Piezometer	51	99.16	98.36	1.05	90.74	-	89.22	91.35	-	89.22	98.36	-	91.35	-
MW3B	Standpipe	51	96.31	95.28	1.03	90.76	-	89.23	91.06	-	89.23	95.28	-	91.06	-
MW3B-R	Standpipe	51	99.11	98.31	1.03	93.81	-	91.86	94.06	-	91.86	98.31	-	94.06	-
MW4	Standpipe	51	98.27	97.17	1.10	95.25	-	93.72	95.55	-	93.72	97.17	-	95.55	-
MW5A	Piezometer	51	102.79	101.96	1.05	94.81	-	93.36	95.16	-	93.36	101.96	-	95.16	-
MW5B	Standpipe	51	102.75	101.97	1.03	97.47	-	95.97	97.77	-	95.87	101.97	-	97.77	-

- Notes:** 1) mSD denotes metres Site Datum.  
 2) Monitoring Point denotes the top of the monitor riser pipe (i.e., top-of-pipe [T.O.P.]).  
 3) Blank denotes data not available.

## APPENDIX C



## Table C-1 - Groundwater Elevations

Durham York Energy Centre - 2017 Monitoring Program

Regional Municipality of Durham

Project No. 1604066

Monitor ID	Groundwater Elevations											
	MW1		MW2A		MW2B		MW3A		MW3A-R		MW3B	
Measuring Point Elevation	102.32		103.03		103.08		96.22		99.16		96.31	
Units	mBTOP	mSD	mBTOP	mSD	mBTOP	mSD	mBTOP	mSD	mBTOP	mSD	mBTOP	mSD
28-Dec-11		100.62		100.18		99.98		<b>89.20</b>				94.50
14-Mar-12		100.58		100.53		100.75		94.34				94.51
21-Jun-12		99.76		100.06		100.22		94.26				94.11
5-Nov-12		100.47		100.24		101.00		94.56				94.91
22-Mar-13		100.50		100.22		100.79		94.50				94.59
12-Jul-13		100.01		100.07		100.42		94.94				94.14
9-Sep-13								94.33				94.22
26-Nov-13		97.72		100.01		100.41						
9-Apr-14		94.34		100.22		101.46				<b>93.52</b>		
18-Jun-14										95.07		
11-Aug-14		95.96		99.98		100.64				94.98		
29-Oct-14		96.09		99.99		100.56				95.12		
16-Apr-15		96.96		100.17		101.24				95.12		
10-Aug-15		95.84		100.05		101.74				95.06		
9-Nov-15		96.93		100.11		100.91				95.15		
29-Apr-16	4.86	97.46	2.85	100.18	2.42	100.66			4.40	94.76		
10-Aug-16	8.42	93.90	3.84	99.19	3.69	99.39			4.92	94.24		
23-Nov-16	Dry (< 8.60)		4.06	98.97	4.14	98.94			5.17	93.99		
11-Apr-17	4.56	97.76	2.58	100.45	1.48	101.60			4.30	94.86		
3-Aug-17	5.80	96.52	2.96	100.07	2.57	100.51			4.44	94.72		
17-Nov-17	6.55	95.77	3.17	99.86	2.19	100.89			4.59	94.57		

### Notes:

- 1) mSD denotes metres Site Datum.
- 2) mBTOP denotes metres below top-of-pipe.
- 3) Bold denotes that water level elevation is assumed to be anomalous (anomalous data are not plotted in the relevant hydrographs).
- 4) Blank denotes data not available.
- 5) The measuring point elevations noted within this table for MW3A-R and MW3B-R do not match the respective top of pipe [T.O.P.] elevations noted within Table B-1 (Monitor Construction Details) and thus, the calculated groundwater elevations for these monitoring wells should be interpreted with caution.

## Table C-1 - Groundwater Elevations

Durham York Energy Centre - 2017 Monitoring Program

Regional Municipality of Durham

Project No. 1604066

Monitor ID	Groundwater Elevations							
	MW3B-R		MW4		MW5A		MW5B	
Measuring Point Elevation	99.11		98.27		102.75		102.79	
Units	mBTOP	mSD	mBTOP	mSD	mBTOP	mSD	mBTOP	mSD
28-Dec-11				97.17				
14-Mar-12				97.18				
21-Jun-12				96.51				
5-Nov-12				95.39				
22-Mar-13				95.44				
12-Jul-13				95.32				
9-Sep-13								
26-Nov-13				95.30				
9-Apr-14		<b>92.40</b>		95.26		100.18		100.58
18-Jun-14		95.34				100.27		100.26
11-Aug-14		95.04		94.83		100.13		100.12
29-Oct-14		95.31		95.19		100.10		100.08
16-Apr-15		95.79		95.72		100.17		100.36
10-Aug-15		95.45		94.89		100.16		100.16
9-Nov-15		95.57		95.50		100.25		100.25
29-Apr-16	3.68	95.43	2.55	95.72	2.39	100.36	2.47	100.32
10-Aug-16	4.70	94.41	4.19	94.08	2.94	99.81	2.85	99.94
23-Nov-16	4.88	94.23	3.92	94.35	3.17	99.58	3.67	99.12
11-Apr-17	3.20	95.91	2.56	95.71	2.23	100.52	2.30	100.49
3-Aug-17	3.81	95.30	3.43	94.84	2.38	100.37	2.47	100.32
17-Nov-17	4.84	94.27	3.22	95.05	2.63	100.12	2.68	100.11

### Notes:

- 1) mSD denotes metres Site Datum.
- 2) mBTOP denotes metres below top-of-pipe.
- 3) Bold denotes that water level elevation is assumed to be anomalous (anomalous data are not plotted in the relevant hydrographs).
- 4) Blank denotes data not available.
- 5) The measuring point elevations noted within this table for MW3A-R and MW3B-R do not match the respective top of pipe [T.O.P.] elevations noted within Table B-1 (Monitor Construction Details) and thus, the calculated groundwater elevations for these monitoring wells should be interpreted with caution.

## Table C-2 - Hydraulic Gradients

Durham York Energy Centre - 2017 Monitoring Program

Regional Municipality of Durham

Project No. 1604066

Monitoring Well	MW2B	MW2A	Hydraulic Gradient (m/m)	MW3B	MW3A	Hydraulic Gradient (m/m)	MW3B-R	MW3A-R	Hydraulic Gradient (m/m)	MW5B	MW5A	Hydraulic Gradient (m/m)
Measuring Point Elevation (mSD)	103.08	103.03		96.31	96.22		99.11	99.16		102.79	102.75	
Top of Screen (mSD)	97.46	94.39		90.76	87.63		93.81	90.74		97.47	94.81	
Bottom of Screen (mSD)	95.94	92.87		89.23	86.10		91.86	89.22		95.97	93.36	
Screen Midpoint (mSD)	96.70	93.63	90.00	86.87	92.84	89.98	96.72	94.09				
Date	Water Levels (mSD)		Water Levels (mSD)		Water Levels (mSD)		Water Levels (mSD)					
28-Dec-11	99.98	100.18	-0.07	94.50								
14-Mar-12	100.75	100.53	0.07	94.51	94.34	0.05						
21-Jun-12	100.22	100.06	0.05	94.11	94.26	-0.05						
5-Nov-12	101.00	100.24	0.25	94.91	94.56	0.11						
22-Mar-13	100.79	100.22	0.19	94.59	94.50	0.03						
12-Jul-13	100.42	100.07	0.11	94.14	94.94	-0.26						
9-Sep-13				94.22	94.33	-0.04						
26-Nov-13	100.41	100.01	0.13									
9-Apr-14	101.46	100.22	0.40							100.58	100.18	0.15
18-Jun-14							95.34	95.07	0.09	100.26	100.27	0.00
11-Aug-14	100.64	99.98	0.21				95.04	94.98	0.02	100.12	100.13	0.00
29-Oct-14	100.56	99.99	0.19				95.31	95.12	0.07	100.08	100.10	-0.01
16-Apr-15	101.24	100.17	0.35				95.79	95.12	0.23	100.36	100.17	0.07
10-Aug-15	101.74	100.05	0.55				95.45	95.06	0.14	100.16	100.16	0.00
9-Nov-15	100.91	100.11	0.26				95.57	95.15	0.15	100.25	100.25	0.00
29-Apr-16	100.66	100.18	0.16				95.43	94.76	0.23	100.32	100.36	-0.02
10-Aug-16	99.39	99.19	0.07				94.41	94.24	0.06	99.94	99.81	0.05
23-Nov-16	98.94	98.97	-0.01				94.23	93.99	0.08	99.12	99.58	-0.17
11-Apr-17	101.60	100.45	0.37				95.91	94.86	0.37	100.49	100.52	-0.01
3-Aug-17	100.51	100.07	0.14				95.30	94.72	0.20	100.32	100.37	-0.02
17-Nov-17	100.89	99.86	0.34				94.27	94.57	-0.11	100.11	100.12	0.00

**Notes:** 1) mSD denotes metres Site Datum.

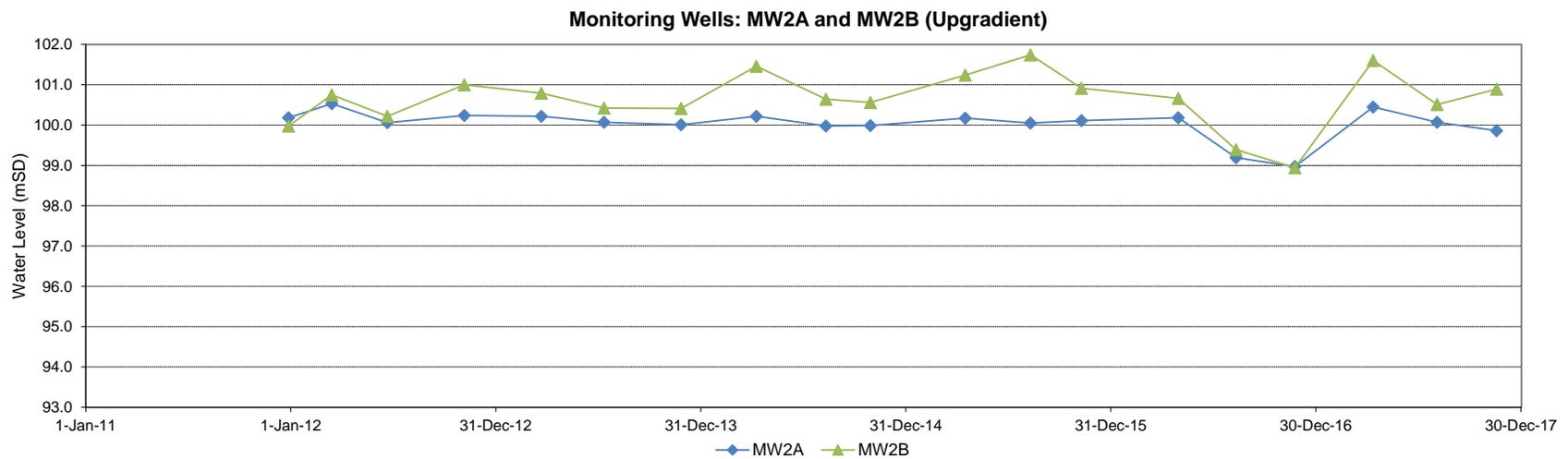
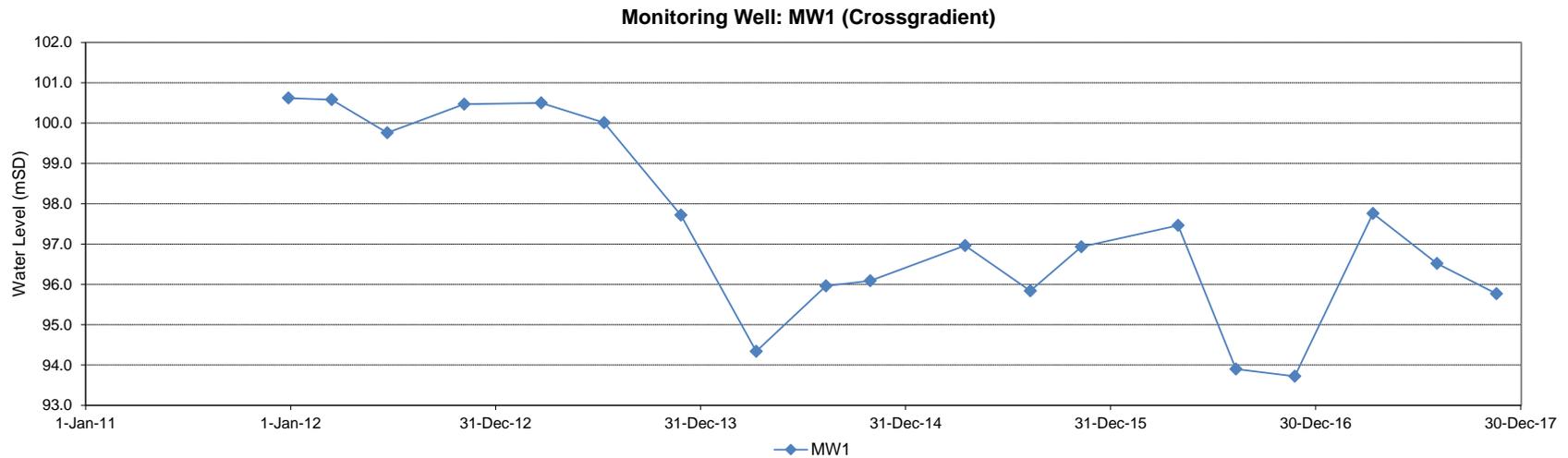
2) Bold denotes that the water level is above the top of the well screen (i.e., the well screen is fully submerged).

3) The hydraulic gradient is calculated as the difference in water level elevation between the shallow and deep monitoring wells, divided by the difference in the screen midpoint elevation. Where a water level within the well screen, the difference between the water level and bottom of the well screen is used to calculate the screen midpoint.

4) A positive hydraulic gradient indicates downward groundwater movement, while a negative hydraulic gradient indicates upward groundwater movement.

5) MW3A and MW3B were decommissioned in September 2013 and replaced in March 2014 as MW3A-R and MW3B-R, respectively.

6) Blank denotes data not available.



**NOTES:**

1. Unfilled markers denote that the monitoring well was dry at the time of the monitoring event (i.e., groundwater level was below the total depth of the monitor).

**GROUNDWATER HYDROGRAPHS**

**2017 ANNUAL MONITORING REPORT**

REGIONAL MUNICIPALITY OF DURHAM  
Durham-York Energy Centre

FIGURE NUMBER PROJECT NUMBER

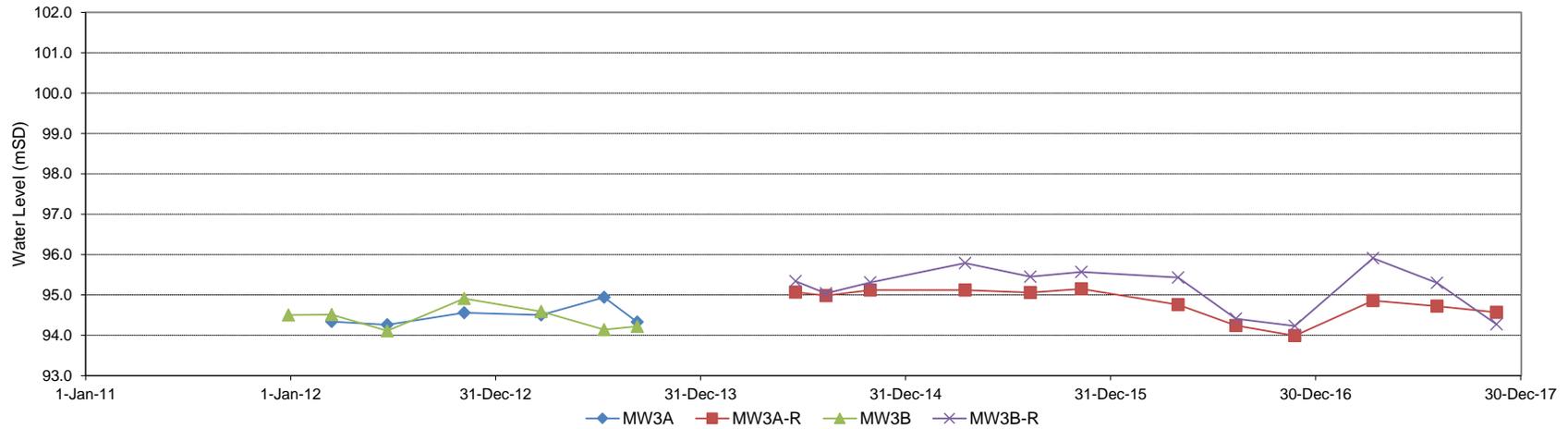
C-1 1604066

APPROX. SCALE DATE REVISED

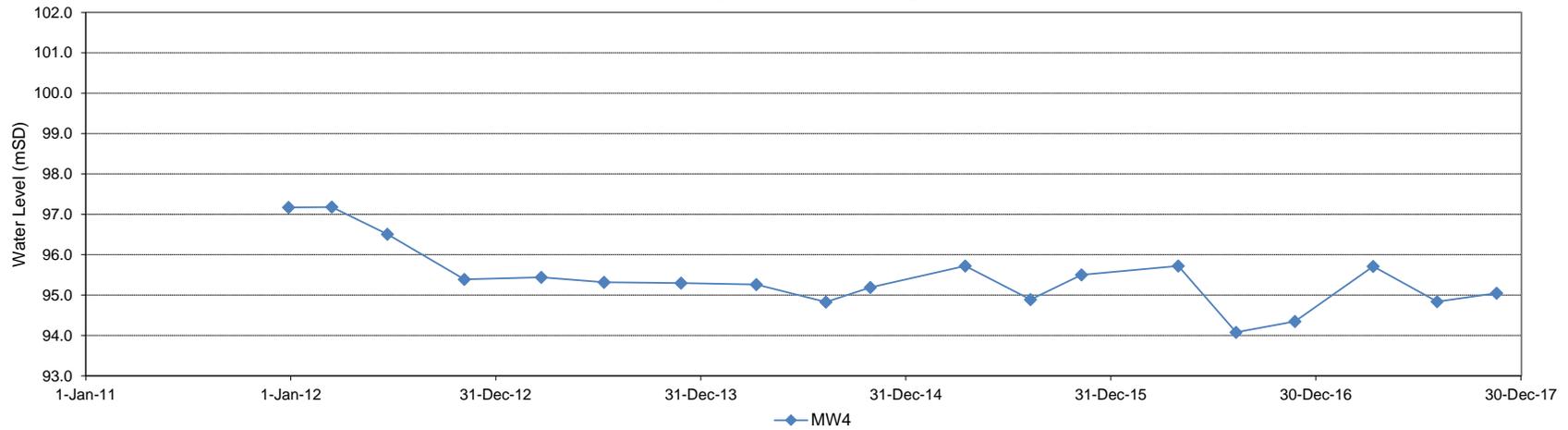
NTS 05/01/2017



**Monitoring Wells: MW3A and MW3B (Downgradient)**



**Monitoring Well: MW4 (Downgradient)**



**NOTES:**

1. Unfilled markers denote that the monitoring well was dry at the time of the monitoring event (i.e., groundwater level was below the total depth of the monitor).

**GROUNDWATER HYDROGRAPHS**

**2017 ANNUAL MONITORING REPORT**

REGIONAL MUNICIPALITY OF DURHAM  
Durham-York Energy Centre

FIGURE NUMBER PROJECT NUMBER

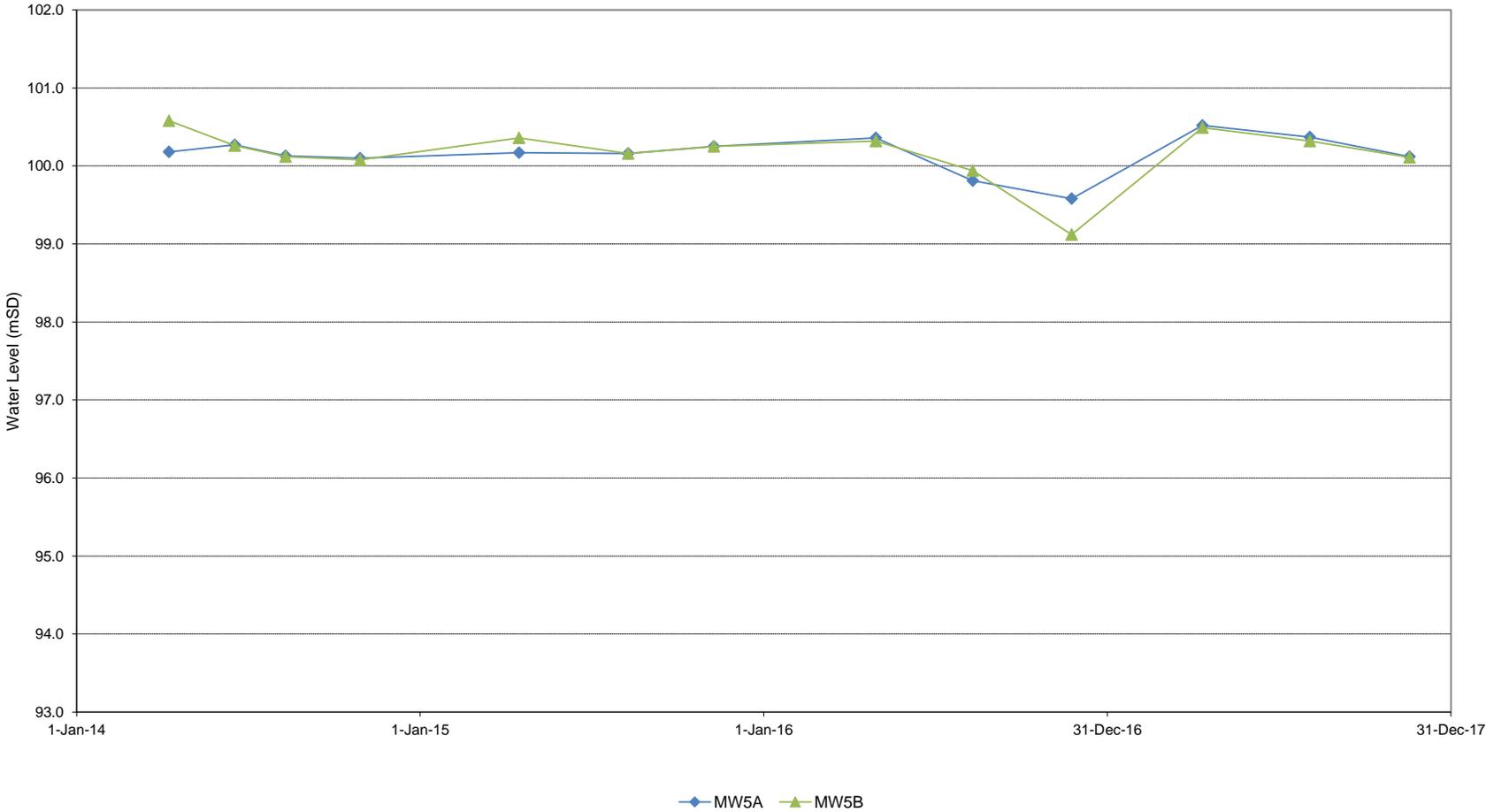
C-2 1604066

APPROX. SCALE DATE REVISED

NTS 05/01/2017



**Monitoring Wells: MW5A and MW5B (Internal Assessment Wells)**



**NOTES:**

1. Unfilled markers denote that the monitoring well was dry at the time of the monitoring event (i.e., groundwater level was below the total depth of the monitor).

**GROUNDWATER HYDROGRAPHS**

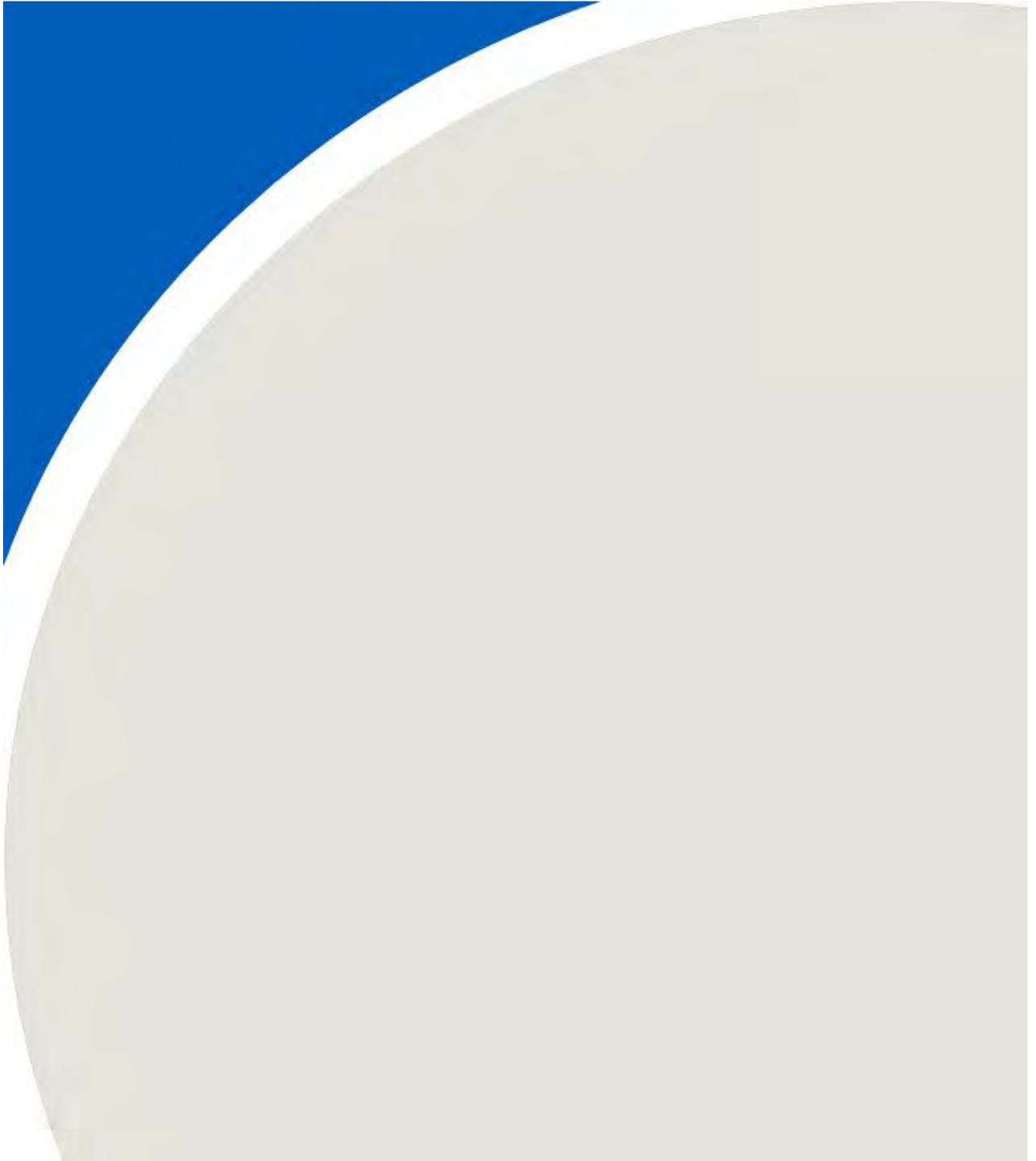
**2017 ANNUAL MONITORING REPORT**

*REGIONAL MUNICIPALITY OF DURHAM  
Durham-York Energy Centre*

FIGURE NUMBER	PROJECT NUMBER
<b>C-3</b>	<b>1604066</b>
APPROX. SCALE	DATE REVISED
<b>NTS</b>	<b>05/01/2017</b>



## APPENDIX D



# Table D-1 - Groundwater Field Analytical Results

Durham York Energy Centre - 2017 Monitoring Program

Regional Municipality of Durham

Project No. 1604066

Monitor ID	Monitoring Event	Temperature	pH	Conductivity	Turbidity
		°C	pH units	µS/cm	NTU
MW1	12-Apr-17	7.8	7.92	772	586
	3-Aug-17	16.5	7.85	830	587
	21-Nov-17	10.9	8.27	940	123
MW2A	11-Apr-17	12.4	8.70	338	227
	3-Aug-17	14.5	8.47	410	393
	21-Nov-17	10.3	8.65	450	526
MW2B	11-Apr-17	13.3	8.33	710	>1000
	3-Aug-17	18.6	7.90	960	>1000
	21-Nov-17	10.6	8.23	1010	43
MW3A-R	13-Apr-17	6.6	8.68	306	894
	3-Aug-17	15.5	8.22	378	
	21-Nov-17	10.1	8.68	400	69
MW3B-R	11-Apr-17	13.7	8.31	515	>1000
	3-Aug-17	17.0	8.12	612	
	21-Nov-17	10.8	8.28	700	69
MW4	11-Apr-17	9.4	7.96	909	>1000
	3-Aug-17	17.2	7.68	1120	337
	17-Nov-17	8.6	8.03	2660	466
MW5A	11-Apr-17	11.0	8.53	376	>1000
	3-Aug-17	15.6	8.37	430	>1000
	21-Nov-17	10.8	8.55	480	37
MW5B	11-Apr-17	10.9	8.24	650	>1000
	3-Aug-17	17.9	8.21	760	>1000
	21-Nov-17	11.5	8.31	800	56

**Notes:**

- 1) µS/cm denotes micro-Siemens per centimetre.
- 2) NTU denotes Nephelometric Turbidity Units.
- 3) Blank denotes data not available.

## Table D-2 - Groundwater Laboratory Analytical Results

Durham York Energy Centre - 2017 Monitoring Program  
Regional Municipality of Durham  
Project No. 1604066

Parameter	Unit	ODWS	MW1	MW1	MW1	MW1	MW1	MW1	MW1	MW1	MW1	MW1	MW1	MW1
			28-Dec-11	14-Mar-12	21-Jun-12	5-Nov-12	22-Mar-13	12-Jul-13	26-Nov-13	9-Apr-14	11-Aug-14	29-Oct-14	16-Apr-15	10-Aug-15
<b>Bicarbonate</b>	mg/L		240	244	243	214	226	228	241	223	262	244	229	238
<b>Carbonate</b>	mg/L		<5	<5	<5	6.00	<5	<5	<5	<5	<5	<5	<5	<5
<b>Chloride</b>	mg/L	250 (AO)	14.9	15.0	13.5	15.3	14.8	14.6	13.4	13.5	15.0	15.3	19.9	20.5
<b>Sulphate</b>	mg/L	500 (AO)	152	153	131	147	127	129	132	227	151	150	158	143
<b>Calcium</b>	mg/L		83	69	68	74	74	65	66	91	70	69	68	68
<b>Magnesium</b>	mg/L		46	44	46	50	53	46	44	62	50	48	46	46
<b>Sodium</b>	mg/L	200 (AO)	10.3	8.3	8.1	8.5	10.2	8.6	10.0	9.6	13.4	13.0	21.1	20.2
<b>Potassium</b>	mg/L		3.0	3.0	3.1	3.6	3.3	2.7	3.0	4.3	3.8	3.7	3.2	2.9
<b>Boron</b>	mg/L	5 (IMAC)	0.02	0.02	0.01	0.02	0.01	0.02	0.02	0.01	0.01	0.02	0.01	0.02
<b>Cadmium</b>	mg/L	0.005 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002
<b>Cobalt</b>	mg/L		0.002	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
<b>Lead</b>	mg/L	0.01 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
<b>Mercury</b>	mg/L	0.001 (MAC)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

Parameter	Unit	ODWS	MW1	MW1	MW1	MW1	MW1	MW1	MW1
			9-Nov-15	29-Apr-16	10-Aug-16	23-Nov-16	11-Apr-17	4-Aug-17	21-Nov-17
<b>Bicarbonate</b>	mg/L		243	235	INS	INS	257	246	248
<b>Carbonate</b>	mg/L		8.00	<5			<5	<5	<5
<b>Chloride</b>	mg/L	250 (AO)	19.0	24.4			26.0	21.1	22.7
<b>Sulphate</b>	mg/L	500 (AO)	139	154			184	160	166
<b>Calcium</b>	mg/L		69	71			77	68	72
<b>Magnesium</b>	mg/L		48	49			54	49	52
<b>Sodium</b>	mg/L	200 (AO)	17.0	20.3			21.2	18.9	17.1
<b>Potassium</b>	mg/L		3.2	3.0			3.5	3.2	3.2
<b>Boron</b>	mg/L	5 (IMAC)	0.02	0.01			0.01	0.02	0.02
<b>Cadmium</b>	mg/L	0.005 (MAC)	<0.001	<0.001			<0.002	<0.001	<0.002
<b>Cobalt</b>	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001		
<b>Lead</b>	mg/L	0.01 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002		
<b>Mercury</b>	mg/L	0.001 (MAC)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		

### Notes:

- 1) ODWS denotes Ontario Drinking Water Standards, Objectives and Guidelines, Ontario Ministry of the Environment, as revised June 2006.
- 2) OG = Operational Guideline; AO = Aesthetic Objective; MAC = Maximum Acceptable Concentration; and IMAC = Interim Maximum Acceptable Concentration.
- 3) < denotes analyte concentration is below the laboratory reportable detection limit (RDL) or the method reporting limit (MRL).
- 4) Bold and Shaded denotes exceedance of the ODWS.
- 5) mg/L denotes milligrams per litre.
- 6) INS denotes insufficient volume available for sample collection.
- 7) Blank denotes data not available.

## Table D-2 - Groundwater Laboratory Analytical Results

Durham York Energy Centre - 2017 Monitoring Program  
 Regional Municipality of Durham  
 Project No. 1604066

Parameter	Unit	ODWS	MW2A	MW2A	MW2A	MW2A	MW2A	MW2A	MW2A	MW2A	MW2A	MW2A	MW2A	MW2A
			28-Dec-11	14-Mar-12	21-Jun-12	5-Nov-12	22-Mar-13	12-Jul-13	26-Nov-13	9-Apr-14	11-Aug-14	29-Oct-14	16-Apr-15	10-Aug-15
<b>Bicarbonate</b>	mg/L		221	215	195	168	188	190	206	185	180	188	198	194
<b>Carbonate</b>	mg/L		<5	<5	<5	7.00	<5	<5	<5	<5	<5	<5	<5	<5
<b>Chloride</b>	mg/L	250 (AO)	4.7	3.2	1.8	4.0	1.9	2.7	2.5	3.3	4.5	4.5	6.1	5.1
<b>Sulphate</b>	mg/L	500 (AO)	73	46	21	29	16	19	22	25	28	26	34	27
<b>Calcium</b>	mg/L		48	27	18	20	18	15	17	16	17	15	18	17
<b>Magnesium</b>	mg/L		32	31	32	36	38	32	31	34	30	31	32	32
<b>Sodium</b>	mg/L	200 (AO)	23.5	16.8	14.6	17.3	17.6	15.2	18.7	24.7	25.9	25.2	29.5	28.1
<b>Potassium</b>	mg/L		2.3	2.2	1.6	1.8	1.8	1.3	1.5	1.5	1.4	1.3	1.5	1.6
<b>Boron</b>	mg/L	5 (IMAC)	0.09	0.08	0.09	0.10	0.10	0.11	0.10	0.11	0.11	0.12	0.11	0.11
<b>Cadmium</b>	mg/L	0.005 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002
<b>Cobalt</b>	mg/L		0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
<b>Lead</b>	mg/L	0.01 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
<b>Mercury</b>	mg/L	0.001 (MAC)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

Parameter	Unit	ODWS	MW2A	MW2A	MW2A	MW2A	MW2A	MW2A	MW2A
			9-Nov-15	29-Apr-16	10-Aug-16	23-Nov-16	11-Apr-17	4-Aug-17	21-Nov-17
<b>Bicarbonate</b>	mg/L		202	217	193	192	197	195	198
<b>Carbonate</b>	mg/L		<5	<5	<5	<5	<5	<5	<5
<b>Chloride</b>	mg/L	250 (AO)	4.0	4.5	4.5	3.5	2.7	2.5	2.4
<b>Sulphate</b>	mg/L	500 (AO)	23	30	28	24	17	16	16
<b>Calcium</b>	mg/L		15	13	15	15	13	12	12
<b>Magnesium</b>	mg/L		33	30	32	31	33	32	32
<b>Sodium</b>	mg/L	200 (AO)	28.2	28.5	28.7	22.1	18.8	18.0	16.9
<b>Potassium</b>	mg/L		1.3	1.2	1.3	1.2	1.1	1.1	0.98
<b>Boron</b>	mg/L	5 (IMAC)	0.10	0.10	0.11	0.11	0.11	0.10	0.09
<b>Cadmium</b>	mg/L	0.005 (MAC)	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.002
<b>Cobalt</b>	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
<b>Lead</b>	mg/L	0.01 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
<b>Mercury</b>	mg/L	0.001 (MAC)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

### Notes:

- 1) ODWS denotes Ontario Drinking Water Standards, Objectives and Guidelines, Ontario Ministry of the Environment, as revised June 2006.
- 2) OG = Operational Guideline; AO = Aesthetic Objective; MAC = Maximum Acceptable Concentration; and IMAC = Interim Maximum Acceptable Concentration.
- 3) < denotes analyte concentration is below the laboratory reportable detection limit (RDL) or the method reporting limit (MRL).
- 4) Bold and Shaded denotes exceedance of the ODWS.
- 5) mg/L denotes milligrams per litre.
- 6) INS denotes insufficient volume available for sample collection.
- 7) Blank denotes data not available.

## Table D-2 - Groundwater Laboratory Analytical Results

Durham York Energy Centre - 2017 Monitoring Program  
Regional Municipality of Durham  
Project No. 1604066

Parameter	Unit	ODWS	MW2B	MW2B	MW2B	MW2B	MW2B	MW2B	MW2B	MW2B	MW2B	MW2B	MW2B	MW2B
			28-Dec-11	14-Mar-12	21-Jun-12	5-Nov-12	22-Mar-13	12-Jul-13	26-Nov-13	9-Apr-14	11-Aug-14	29-Oct-14	16-Apr-15	10-Aug-15
<b>Bicarbonate</b>	mg/L		235	244	252	220	242	241	248	224	236	238	240	225
<b>Carbonate</b>	mg/L		<5	<5	<5	8.00	<5	<5	<5	<5	<5	<5	<5	<5
<b>Chloride</b>	mg/L	250 (AO)	13.5	11.7	11.8	12.6	14.2	15.2	14.3	22.6	45.4	59.9	71.3	66.3
<b>Sulphate</b>	mg/L	500 (AO)	99	120	94	99	85	82	77	84	78	80	96	80
<b>Calcium</b>	mg/L		59	50	46	48	46	41	39	44	45	46	49	48
<b>Magnesium</b>	mg/L		35	42	44	50	55	47	44	52	52	53	55	55
<b>Sodium</b>	mg/L	200 (AO)	29.1	24.0	20.7	20.4	21.9	18.5	19.3	22.5	22.5	24.5	26.5	27.7
<b>Potassium</b>	mg/L		1.1	1.7	1.8	2.2	2.2	1.8	2.0	2.0	2.0	2.0	2.0	2.0
<b>Boron</b>	mg/L	5 (IMAC)	0.08	0.08	0.08	0.09	0.08	0.09	0.08	0.08	0.08	0.08	0.07	0.07
<b>Cadmium</b>	mg/L	0.005 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002
<b>Cobalt</b>	mg/L		0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
<b>Lead</b>	mg/L	0.01 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
<b>Mercury</b>	mg/L	0.001 (MAC)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

Parameter	Unit	ODWS	MW2B	MW2B	MW2B	MW2B	MW2B	MW2B	MW2B
			9-Nov-15	29-Apr-16	10-Aug-16	23-Nov-16	11-Apr-17	4-Aug-17	21-Nov-17
<b>Bicarbonate</b>	mg/L		258	250	233	243	247	258	251
<b>Carbonate</b>	mg/L		<5	<5	<5	<5	<5	<5	<5
<b>Chloride</b>	mg/L	250 (AO)	67.0	76.4	78.5	70.5	77.4	106	132
<b>Sulphate</b>	mg/L	500 (AO)	75	85	83	81	84	80	74
<b>Calcium</b>	mg/L		48	50	50	46	48	51	52
<b>Magnesium</b>	mg/L		57	58	59	56	59	62	63
<b>Sodium</b>	mg/L	200 (AO)	30.9	29.4	29.4	26.2	28.7	34.5	34.9
<b>Potassium</b>	mg/L		2.1	2.3	2.2	2.1	2.1	2.2	2.3
<b>Boron</b>	mg/L	5 (IMAC)	0.07	0.07	0.08	0.09	0.08	0.08	0.07
<b>Cadmium</b>	mg/L	0.005 (MAC)	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.002
<b>Cobalt</b>	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
<b>Lead</b>	mg/L	0.01 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
<b>Mercury</b>	mg/L	0.001 (MAC)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

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- 4) Bold and Shaded denotes exceedance of the ODWS.
- 5) mg/L denotes milligrams per litre.
- 6) INS denotes insufficient volume available for sample collection.
- 7) Blank denotes data not available.

## Table D-2 - Groundwater Laboratory Analytical Results

Durham York Energy Centre - 2017 Monitoring Program  
Regional Municipality of Durham  
Project No. 1604066

Parameter	Unit	ODWS	MW3A	MW3A	MW3A	MW3A	MW3A	MW3A	MW3A	MW3A-R	MW3A-R	MW3A-R	MW3A-R	MW3A-R
			28-Dec-11	14-Mar-12	21-Jun-12	5-Nov-12	22-Mar-13	12-Jul-13	9-Sep-13	18-Jun-14	11-Aug-14	29-Oct-14	16-Apr-15	10-Aug-15
<b>Bicarbonate</b>	mg/L		181	153	147	130	124	121	151	134	120	123	147	126
<b>Carbonate</b>	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
<b>Chloride</b>	mg/L	250 (AO)	22.7	24.6	24.4	26.3	25.1	23.8	26.2	7.5	6.5	6.2	7.7	6.5
<b>Sulphate</b>	mg/L	500 (AO)	125	79	51	44	29	23	20	27	21	21	27	26
<b>Calcium</b>	mg/L		77	44	34	28	26	23	24	22	19	16	18	21
<b>Magnesium</b>	mg/L		12	10	9	9	9	7	7	9	9	9	11	12
<b>Sodium</b>	mg/L	200 (AO)	47.5	45.3	43.0	46.0	49.6	40.8	44.7	35.1	35.7	34.5	39.2	37.9
<b>Potassium</b>	mg/L		1.8	1.8	1.3	1.9	1.3	1.1	2.9	2.3	2.1	1.4	1.5	1.7
<b>Boron</b>	mg/L	5 (IMAC)	0.13	0.16	0.17	0.18	0.18	0.17	0.17	0.13	0.14	0.16	0.15	0.14
<b>Cadmium</b>	mg/L	0.005 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002
<b>Cobalt</b>	mg/L		0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
<b>Lead</b>	mg/L	0.01 (MAC)	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
<b>Mercury</b>	mg/L	0.001 (MAC)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

Parameter	Unit	ODWS	MW3A-R	MW3A-R	MW3A-R	MW3A-R	MW3A-R	MW3A-R	MW3A-R
			9-Nov-15	29-Apr-16	10-Aug-16	23-Nov-16	13-Apr-17	9-Aug-17	21-Nov-17
<b>Bicarbonate</b>	mg/L		137	152	141	140	154	157	157
<b>Carbonate</b>	mg/L		<5	<5	<5	<5	<5	<5	<5
<b>Chloride</b>	mg/L	250 (AO)	6.2	6.3	6.4	5.9	5.7	6.9	5.9
<b>Sulphate</b>	mg/L	500 (AO)	22	21	19	17	20	26	22
<b>Calcium</b>	mg/L		18	20	17	16	20	17	19
<b>Magnesium</b>	mg/L		10	11	11	10	11	10	11
<b>Sodium</b>	mg/L	200 (AO)	40.0	38.5	38.1	36.8	37.0	40.8	38.4
<b>Potassium</b>	mg/L		1.4	1.7	1.3	1.3	1.5	1.3	1.1
<b>Boron</b>	mg/L	5 (IMAC)	0.12	0.13	0.16	0.15	0.15	0.15	0.13
<b>Cadmium</b>	mg/L	0.005 (MAC)	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002
<b>Cobalt</b>	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
<b>Lead</b>	mg/L	0.01 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
<b>Mercury</b>	mg/L	0.001 (MAC)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

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## Table D-2 - Groundwater Laboratory Analytical Results

Durham York Energy Centre - 2017 Monitoring Program  
 Regional Municipality of Durham  
 Project No. 1604066

Parameter	Unit	ODWS	MW3B	MW3B	MW3B	MW3B	MW3B	MW3B	MW3B	MW3B-R	MW3B-R	MW3B-R	MW3B-R	MW3B-R
			28-Dec-11	14-Mar-12	21-Jun-12	5-Nov-12	22-Mar-13	12-Jul-13	9-Sep-13	18-Jun-14	11-Aug-14	29-Oct-14	16-Apr-15	10-Aug-15
Bicarbonate	mg/L		247	212	211	186	213	202	235	198	209	203	215	200
Carbonate	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloride	mg/L	250 (AO)	10.8	10.2	10.7	12.5	15.6	13.9	18.8	15.4	12.3	10.7	11.6	10.3
Sulphate	mg/L	500 (AO)	102	59	52	46	34	40	43	103	89	86	96	83
Calcium	mg/L		78	50	48	49	56	47	61	58	47	48	52	52
Magnesium	mg/L		22	20	20	22	26	21	25	31	29	29	31	32
Sodium	mg/L	200 (AO)	35.5	25.5	25.7	26.2	26.4	24.1	27.1	25.1	23.8	23.9	25.7	26.6
Potassium	mg/L		2.0	1.4	1.6	2.0	1.6	1.4	2.4	5.9	4.6	4.0	3.4	3.2
Boron	mg/L	5 (IMAC)	0.07	0.08	0.09	0.09	0.07	0.10	0.08	0.12	0.10	0.12	0.10	0.09
Cadmium	mg/L	0.005 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002
Cobalt	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Lead	mg/L	0.01 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Mercury	mg/L	0.001 (MAC)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

Parameter	Unit	ODWS	MW3B-R	MW3B-R	MW3B-R	MW3B-R	MW3B-R	MW3B-R	MW3B-R
			9-Nov-15	29-Apr-16	10-Aug-16	23-Nov-16	11-Apr-17	9-Aug-17	21-Nov-17
Bicarbonate	mg/L		235	222	221	220	223	231	252
Carbonate	mg/L		<5	<5	<5	<5	<5	<5	<5
Chloride	mg/L	250 (AO)	9.2	8.7	9.0	8.8	8.8	13.1	10.9
Sulphate	mg/L	500 (AO)	79	80	76	71	77	95	81
Calcium	mg/L		51	49	50	47	47	49	48
Magnesium	mg/L		32	31	31	30	31	32	33
Sodium	mg/L	200 (AO)	28.9	25.7	25.4	25.0	25.8	29.6	29.0
Potassium	mg/L		3.3	3.0	2.8	2.8	2.7	2.7	2.7
Boron	mg/L	5 (IMAC)	0.08	0.08	0.09	0.10	0.08	0.12	0.09
Cadmium	mg/L	0.005 (MAC)	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002
Cobalt	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Lead	mg/L	0.01 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Mercury	mg/L	0.001 (MAC)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

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- 5) mg/L denotes milligrams per litre.
- 6) INS denotes insufficient volume available for sample collection.
- 7) Blank denotes data not available.

## Table D-2 - Groundwater Laboratory Analytical Results

Durham York Energy Centre - 2017 Monitoring Program  
Regional Municipality of Durham  
Project No. 1604066

Parameter	Unit	ODWS	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW4
			28-Dec-11	14-Mar-12	21-Jun-12	5-Nov-12	22-Mar-13	12-Jul-13	26-Nov-13	9-Apr-14	11-Aug-14	29-Oct-14	16-Apr-15	10-Aug-15
<b>Bicarbonate</b>	mg/L		300	430	506	346	330	448	496	301	353	300	539	482
<b>Carbonate</b>	mg/L		<5	<5	<5	8.0	<5	<5	<5	<5	<5	<5	<5	<5
<b>Chloride</b>	mg/L	250 (AO)	12.3	14.5	7.1	12.0	8.2	7.5	6.8	8.6	8.5	12.2	7.0	7.6
<b>Sulphate</b>	mg/L	500 (AO)	51	48	48	61	39	63	63	24	32	32	78	59
<b>Calcium</b>	mg/L		43	36	43	46	42	45	39	29	32	31	39	46
<b>Magnesium</b>	mg/L		52	73	88	68	69	84	84	55	62	54	103	102
<b>Sodium</b>	mg/L	200 (AO)	22.0	25.5	28.0	23.1	23.7	28.6	35.8	22.2	25.5	22.0	40.0	36.6
<b>Potassium</b>	mg/L		4.4	2.5	2.7	6.1	2.8	3.6	3.6	2.3	2.7	2.6	2.7	3.4
<b>Boron</b>	mg/L	5 (IMAC)	0.06	0.06	0.07	0.06	0.04	0.06	0.07	0.04	0.05	0.05	0.07	0.07
<b>Cadmium</b>	mg/L	0.005 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002
<b>Cobalt</b>	mg/L		0.002	<0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
<b>Lead</b>	mg/L	0.01 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
<b>Mercury</b>	mg/L	0.001 (MAC)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

Parameter	Unit	ODWS	MW4	MW4	MW4	MW4	MW4	MW4	MW4
			9-Nov-15	29-Apr-16	10-Aug-16	23-Nov-16	11-Apr-17	4-Aug-17	17-Nov-17
<b>Bicarbonate</b>	mg/L		574	590	425	337	503	563	289
<b>Carbonate</b>	mg/L		<5	15.0	<5	<5	31.00	<5	<5
<b>Chloride</b>	mg/L	250 (AO)	8.7	6.6	28.3	141	11.5	11.2	682
<b>Sulphate</b>	mg/L	500 (AO)	72	66	63	36	77	75	33
<b>Calcium</b>	mg/L		44	41	37	42	40	39	83
<b>Magnesium</b>	mg/L		106	114	89	87	108	105	165
<b>Sodium</b>	mg/L	200 (AO)	47.6	37.4	31.4	35.2	34.3	34.6	127
<b>Potassium</b>	mg/L		3.7	3.2	3.2	3.4	3.1	3.4	5.0
<b>Boron</b>	mg/L	5 (IMAC)	0.08	0.06	0.07	0.06	0.05	0.07	0.05
<b>Cadmium</b>	mg/L	0.005 (MAC)	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.002
<b>Cobalt</b>	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
<b>Lead</b>	mg/L	0.01 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
<b>Mercury</b>	mg/L	0.001 (MAC)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

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## Table D-2 - Groundwater Laboratory Analytical Results

Durham York Energy Centre - 2017 Monitoring Program

Regional Municipality of Durham

Project No. 1604066

Parameter	Unit	ODWS	MW5A	MW5A	MW5A	MW5A	MW5A	MW5A	MW5A	MW5A	MW5A	MW5A	MW5A	MW5A
			18-Jun-14	11-Aug-14	29-Oct-14	16-Apr-15	10-Aug-15	9-Nov-15	29-Apr-16	10-Aug-16	23-Nov-16	11-Apr-17	4-Aug-17	21-Nov-17
<b>Bicarbonate</b>	mg/L		207	199	183	200	198	215	215	200	203	217	218	234
<b>Carbonate</b>	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	6.0	<5	<5	<5
<b>Chloride</b>	mg/L	250 (AO)	5.3	3.9	3.2	2.8	2.7	2.2	1.9	2.0	2.2	1.7	1.6	1.5
<b>Sulphate</b>	mg/L	500 (AO)	16.9	11.0	5.6	9.4	7.6	6.9	9.1	7.7	9.9	16.8	9.2	10.0
<b>Calcium</b>	mg/L		25	19	17	20	21	17	25	18	17	21	17	16
<b>Magnesium</b>	mg/L		35	32	31	33	35	35	35	35	35	38	36	37
<b>Sodium</b>	mg/L	200 (AO)	12.2	11.2	11.4	11.9	11.7	12.9	11.8	11.5	11.4	11.9	10.2	10.1
<b>Potassium</b>	mg/L		3.8	2.9	2.8	2.5	2.4	2.4	2.8	2.2	2.1	2.3	1.8	1.6
<b>Boron</b>	mg/L	5 (IMAC)	0.05	0.05	0.05	0.04	0.04	0.03	0.03	0.04	0.04	0.03	0.03	0.03
<b>Cadmium</b>	mg/L	0.005 (MAC)	<0.002	<0.002	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.002
<b>Cobalt</b>	mg/L		<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
<b>Lead</b>	mg/L	0.01 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
<b>Mercury</b>	mg/L	0.001 (MAC)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

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## Table D-2 - Groundwater Laboratory Analytical Results

Durham York Energy Centre - 2017 Monitoring Program

Regional Municipality of Durham

Project No. 1604066

Parameter	Unit	ODWS	MW5B	MW5B	MW5B	MW5B	MW5B	MW5B	MW5B	MW5B	MW5B	MW5B	MW5B	MW5B
			18-Jun-14	11-Aug-14	29-Oct-14	16-Apr-15	10-Aug-15	9-Nov-15	29-Apr-16	10-Aug-16	23-Nov-16	11-Apr-17	4-Aug-17	21-Nov-17
<b>Bicarbonate</b>	mg/L		240	247	234	247	229	274	266	263	262	258	255	258
<b>Carbonate</b>	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	6.0	<5	<5	<5
<b>Chloride</b>	mg/L	250 (AO)	5.9	5.0	4.8	8.0	10.1	12.9	14.0	17.8	34.9	42.5	35.0	34.4
<b>Sulphate</b>	mg/L	500 (AO)	96	91	96	107	103	99	111	104	95	100	91	82
<b>Calcium</b>	mg/L		41	34	36	39	47	39	44	40	40	41	36	33
<b>Magnesium</b>	mg/L		57	52	53	55	60	59	61	60	61	67	61	60
<b>Sodium</b>	mg/L	200 (AO)	10.2	10.1	10.2	12.2	13.0	16.6	14.9	15.6	19.1	17.2	14.9	15.5
<b>Potassium</b>	mg/L		4.4	3.8	3.5	3.0	3.3	3.3	3.2	3.0	3.1	2.7	2.5	2.4
<b>Boron</b>	mg/L	5 (IMAC)	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.05	0.04	0.04	0.04
<b>Cadmium</b>	mg/L	0.005 (MAC)	<0.002	<0.002	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.002
<b>Cobalt</b>	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
<b>Lead</b>	mg/L	0.01 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
<b>Mercury</b>	mg/L	0.001 (MAC)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

### Notes:

- 1) ODWS denotes Ontario Drinking Water Standards, Objectives and Guidelines, Ontario Ministry of the Environment, as revised June 2006.
- 2) OG = Operational Guideline; AO = Aesthetic Objective; MAC = Maximum Acceptable Concentration; and IMAC = Interim Maximum Acceptable Concentration.
- 3) < denotes analyte concentration is below the laboratory reportable detection limit (RDL) or the method reporting limit (MRL).
- 4) Bold and Shaded denotes exceedance of the ODWS.
- 5) mg/L denotes milligrams per litre.
- 6) INS denotes insufficient volume available for sample collection.
- 7) Blank denotes data not available.

## Table D-2 - Groundwater Laboratory Chemical Results

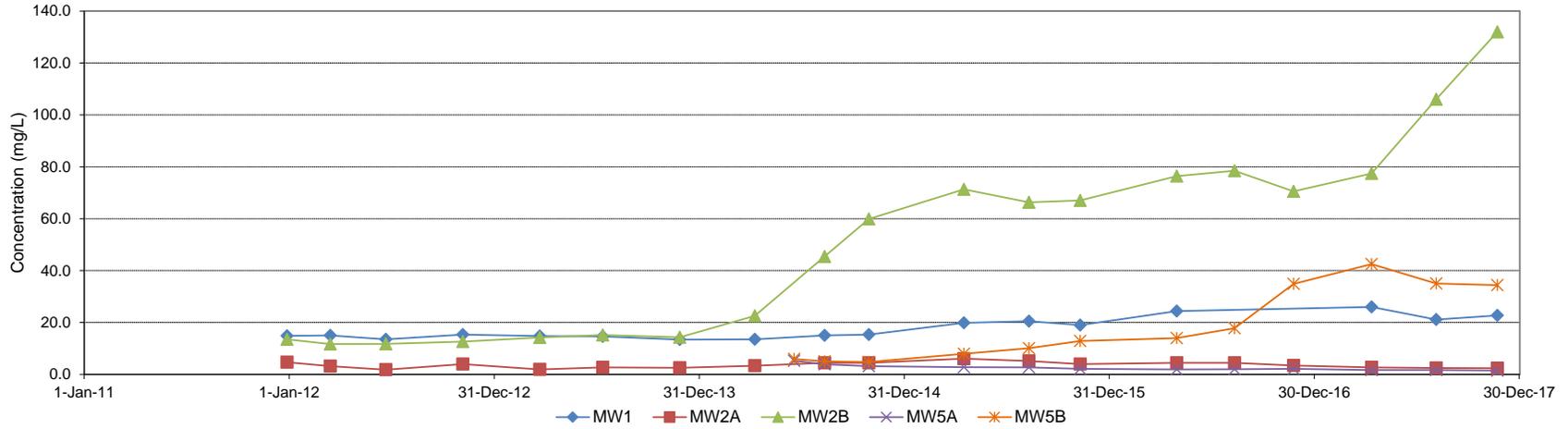
Durham-York Energy Centre - 2017 Monitoring Program  
 Regional Municipality of Durham  
 Project No. 1604066

Parameter	Unit	ODWS	Duplicate						
			MW2A	MW2A	MW2A	MW2A	MW2A	MW2B	MW2A
			29-Apr-16	10-Aug-16	23-Nov-16	11-Apr-17	11-Apr-17	4-Aug-17	21-Nov-17
<b>Bicarbonate</b>	mg/L		213	190	187	197	199	195	199
<b>Carbonate</b>	mg/L		<5	<5	<5	<5	<5	<5	<5
<b>Chloride</b>	mg/L	250 (AO)	5.1	3.8	3.2	2.7	2.7	2.6	2.4
<b>Sulphate</b>	mg/L	500 (AO)	30	24	23	17	18	16	16
<b>Calcium</b>	mg/L		13	15	14	13	14	12	12
<b>Magnesium</b>	mg/L		30	33	31	33	34	32	32
<b>Sodium</b>	mg/L	200 (AO)	27.9	25.1	21.4	18.8	19.9	18.1	16.8
<b>Potassium</b>	mg/L		1.24	1.39	1.18	1.05	1.17	1.04	1.04
<b>Boron</b>	mg/L	5 (IMAC)	0.10	0.12	0.12	0.11	0.11	0.10	0.09
<b>Cadmium</b>	mg/L	0.005 (MAC)	<0.001	<0.001	<0.001	<0.002	<0.002	<0.001	<0.002
<b>Cobalt</b>	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
<b>Lead</b>	mg/L	0.01 (MAC)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
<b>Mercury</b>	mg/L	0.001 (MAC)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

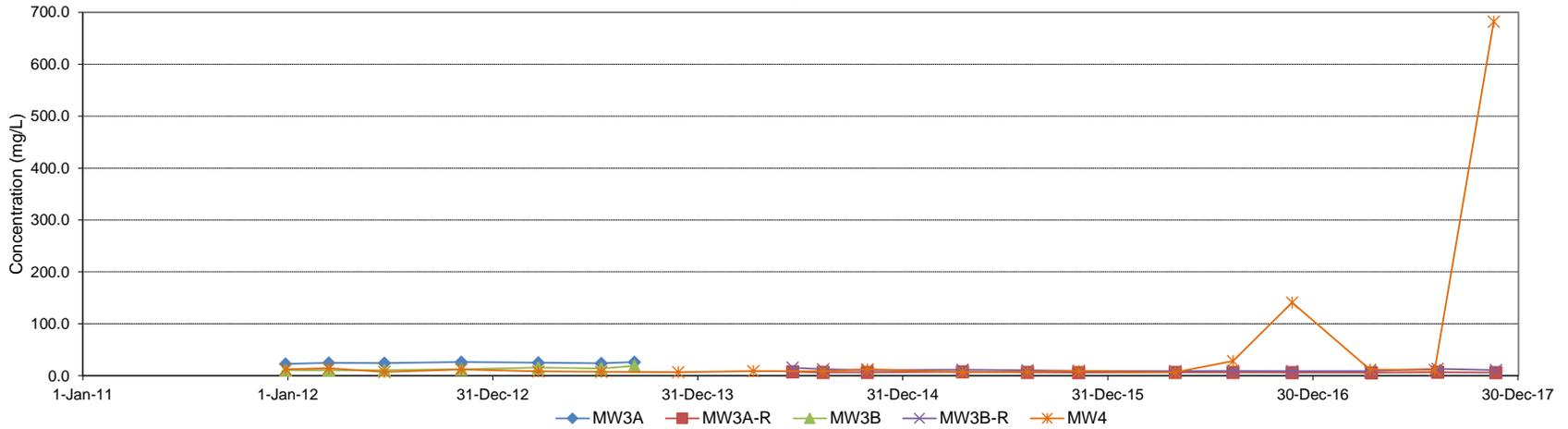
**Notes:**

- 1) ODWS denotes Ontario Drinking Water Standards, Objectives and Guidelines, Ontario Ministry of the Environment, as revised June 2006.
- 2) OG = Operational Guideline; AO = Aesthetic Objective; MAC = Maximum Acceptable Concentration; and IMAC = Interim Maximum Acceptable Concentration.
- 3) < denotes analyte concentration is below the laboratory reportable detection limit (RDL) or the method reporting limit (MRL).
- 4) Bold and Shaded denotes exceedance of the ODWS.
- 5) mg/L denotes milligrams per litre.
- 6) INS denotes insufficient volume available for sample collection.
- 7) Blank denotes data not available.

**Monitoring Locations: MW1 (Crossgradient), MW2 (Upgradient), and MW5 (Internal Assessment)**



**Downgradient Monitoring Locations: MW3 and MW4**



**NOTES:**

1. mg/L denotes milligrams per litre.

**CONCENTRATION VS. TIME PLOT  
CHLORIDE**

**2017 ANNUAL MONITORING REPORT**

*REGIONAL MUNICIPALITY OF DURHAM  
Durham-York Energy Centre*

FIGURE NUMBER

**D-1**

APPROX. SCALE

**NTS**

PROJECT NUMBER

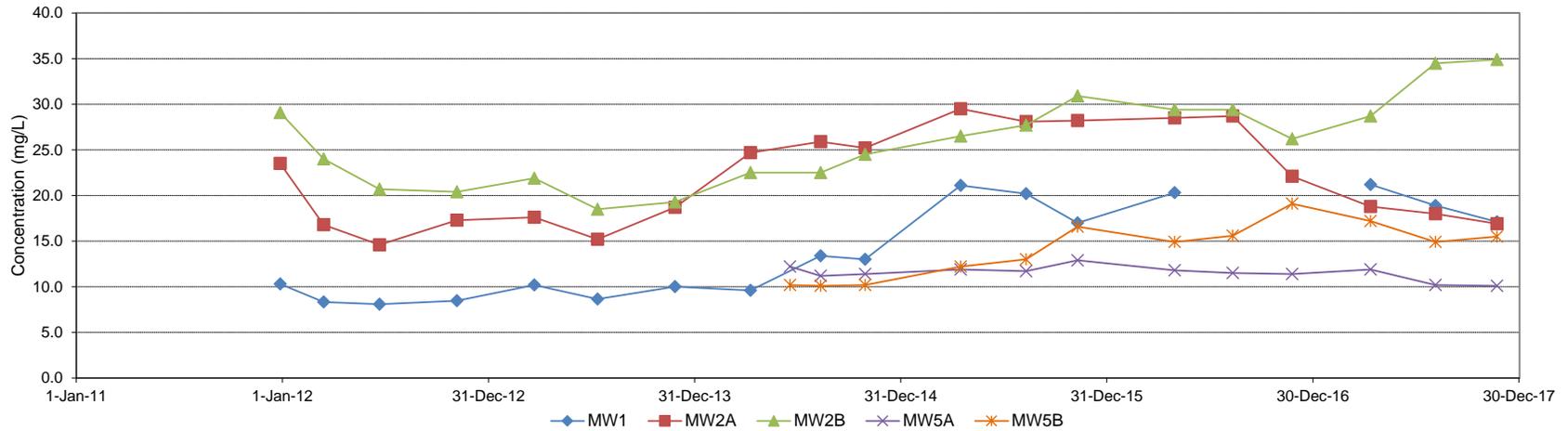
**1604066**

DATE REVISED

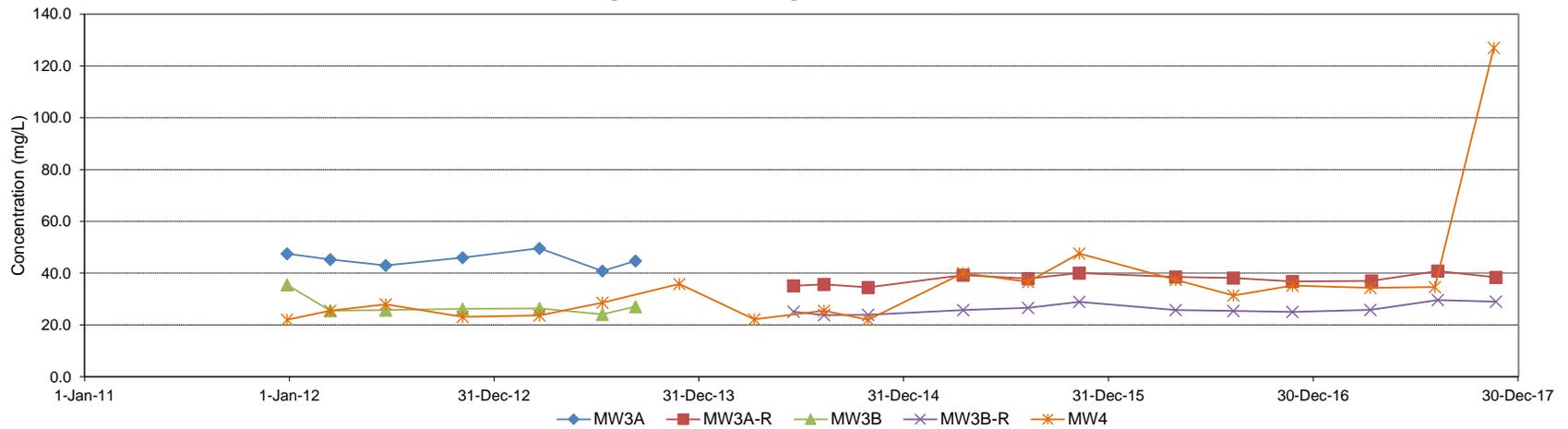
**01/08/2018**



**Monitoring Locations: MW1 (Crossgradient), MW2 (Upgradient), and MW5 (Internal Assessment)**



**Downgradient Monitoring Locations: MW3 and MW4**



**NOTES:**

1. mg/L denotes milligrams per litre.

**CONCENTRATION VS. TIME PLOT  
SODIUM**

**2017 ANNUAL MONITORING REPORT**

*REGIONAL MUNICIPALITY OF DURHAM  
Durham-York Energy Centre*

FIGURE NUMBER

**D-2**

APPROX. SCALE

**NTS**

PROJECT NUMBER

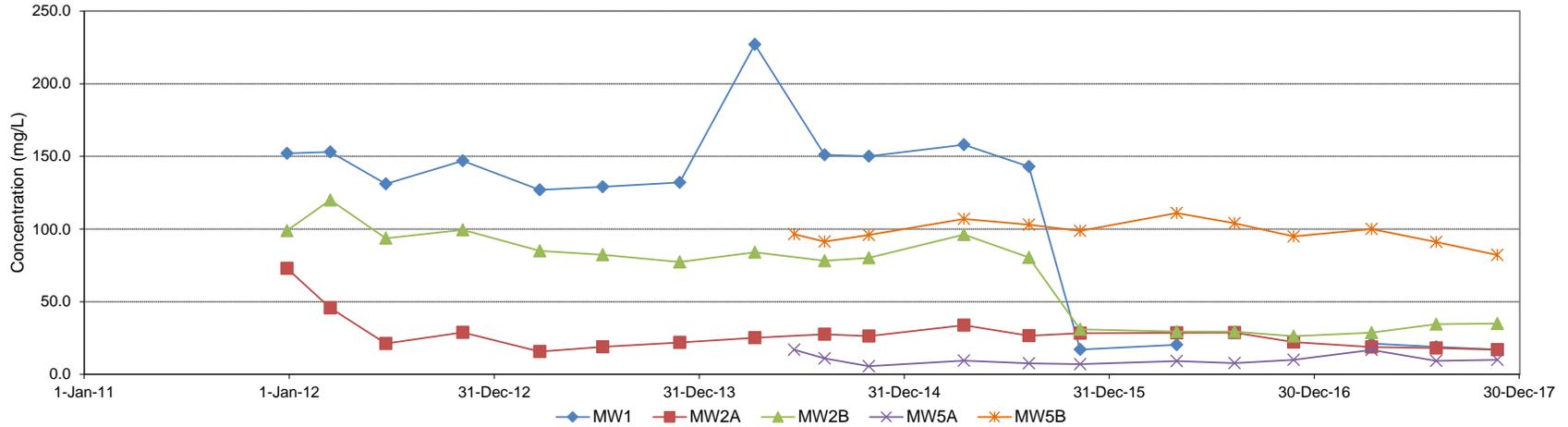
**1604066**

DATE REVISED

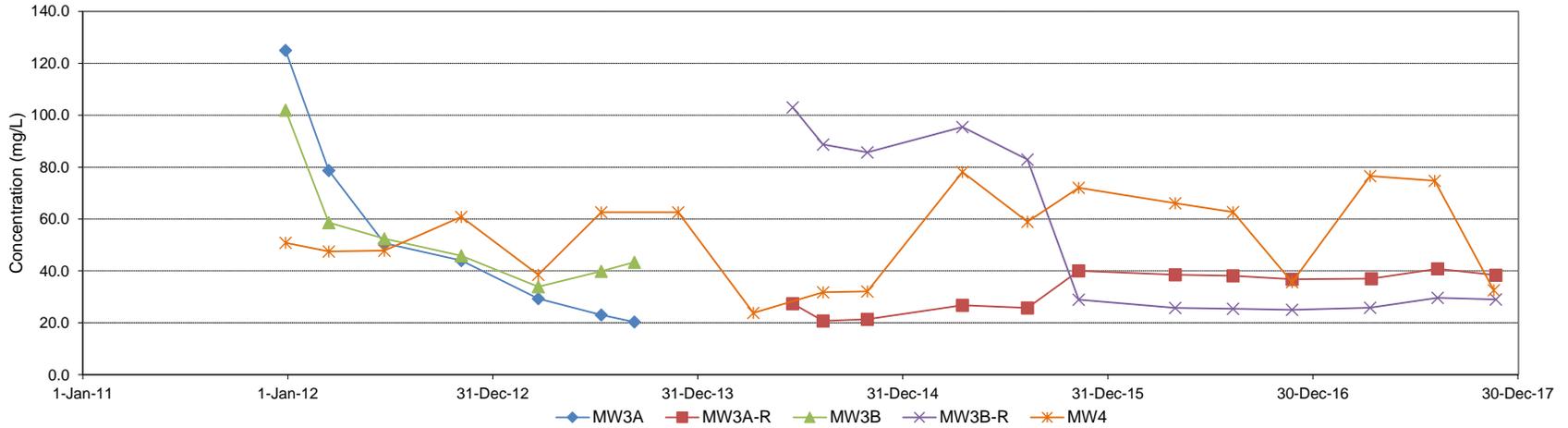
**01/08/2018**



**Monitoring Locations: MW1 (Crossgradient), MW2 (Upgradient), and MW5 (Internal Assessment)**



**Downgradient Monitoring Locations: MW3 and MW4**



**NOTES:**

1. mg/L denotes milligrams per litre.

**CONCENTRATION VS. TIME PLOT  
SULPHATE**

**2017 ANNUAL MONITORING REPORT**

*REGIONAL MUNICIPALITY OF DURHAM  
Durham-York Energy Centre*

FIGURE NUMBER

**D-3**

APPROX. SCALE

**NTS**

PROJECT NUMBER

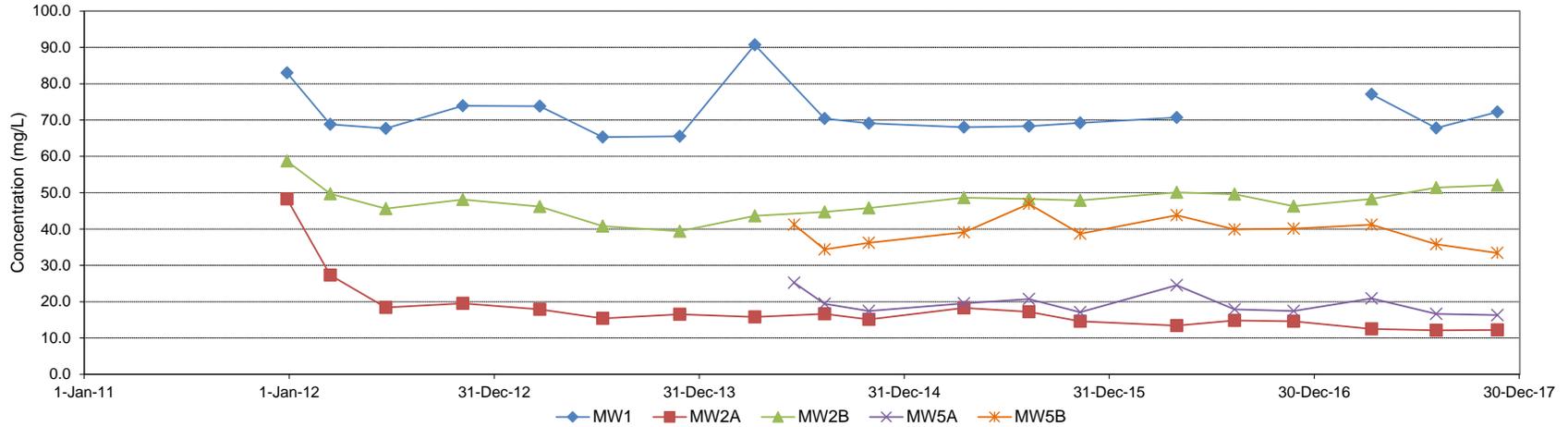
**1604066**

DATE REVISED

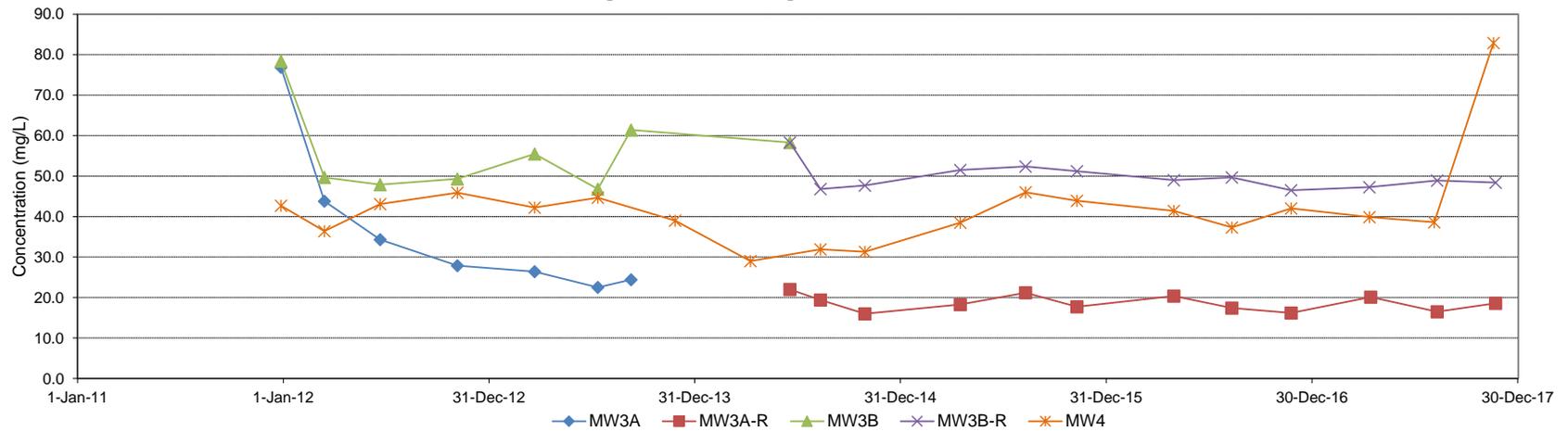
**01/08/2018**



**Monitoring Locations: MW1 (Crossgradient), MW2 (Upgradient), and MW5 (Internal Assessment)**



**Downgradient Monitoring Locations: MW3 and MW4**



**NOTES:**

1. mg/L denotes milligrams per litre.

**CONCENTRATION VS. TIME PLOT  
CALCIUM**

**2017 ANNUAL MONITORING REPORT**

*REGIONAL MUNICIPALITY OF DURHAM  
Durham-York Energy Centre*

FIGURE NUMBER

**D-4**

APPROX. SCALE

**NTS**

PROJECT NUMBER

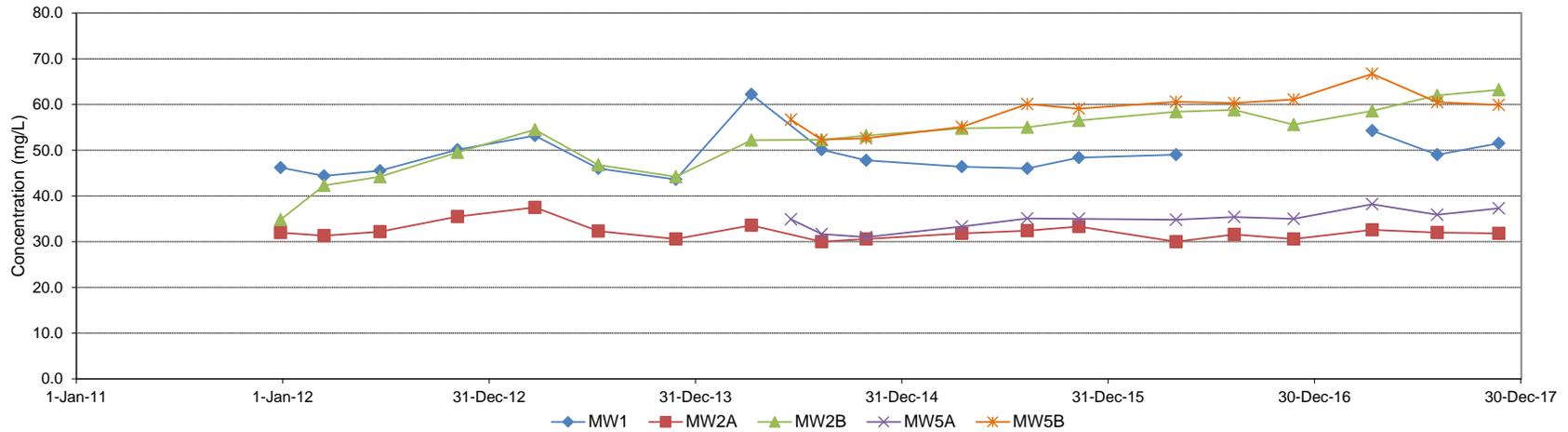
**1604066**

DATE REVISED

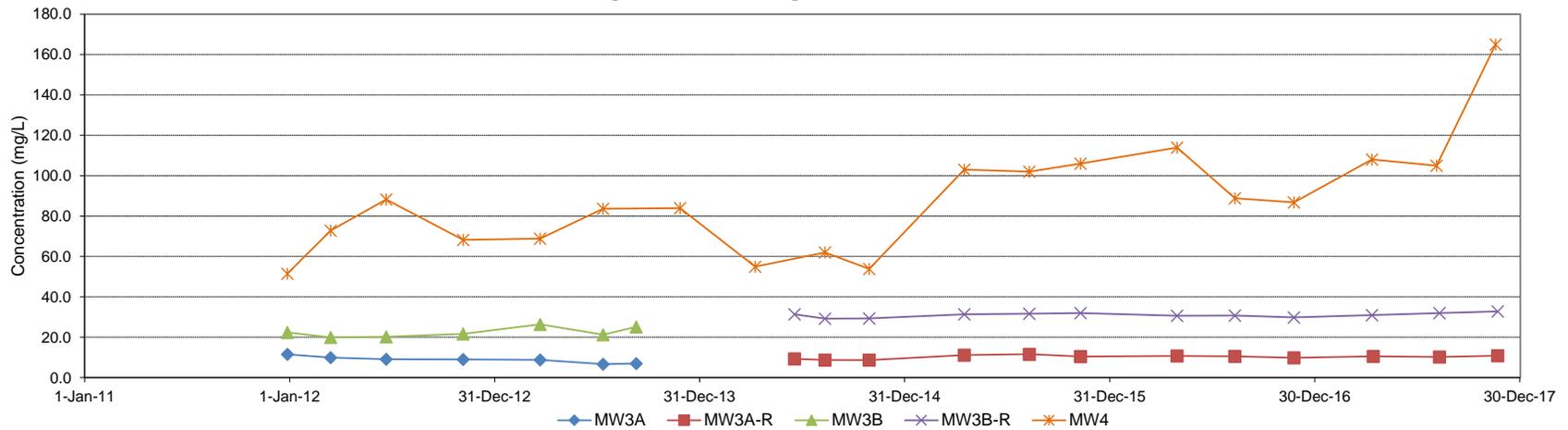
**01/08/2018**



Monitoring Locations: MW1 (Crossgradient), MW2 (Upgradient), and MW5 (Internal Assessment)



Downgradient Monitoring Locations: MW3 and MW4



NOTES:

1. mg/L denotes milligrams per litre.

**CONCENTRATION VS. TIME PLOT  
MAGNESIUM**

2017 ANNUAL MONITORING REPORT

REGIONAL MUNICIPALITY OF DURHAM  
Durham-York Energy Centre

FIGURE NUMBER

D-5

APPROX. SCALE

NTS

PROJECT NUMBER

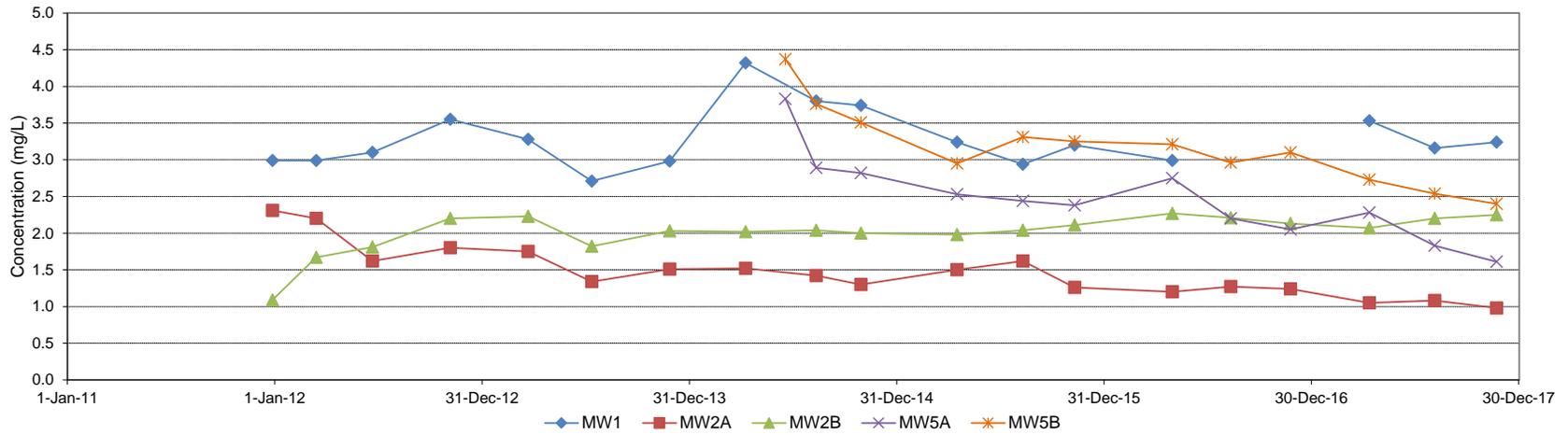
1604066

DATE REVISED

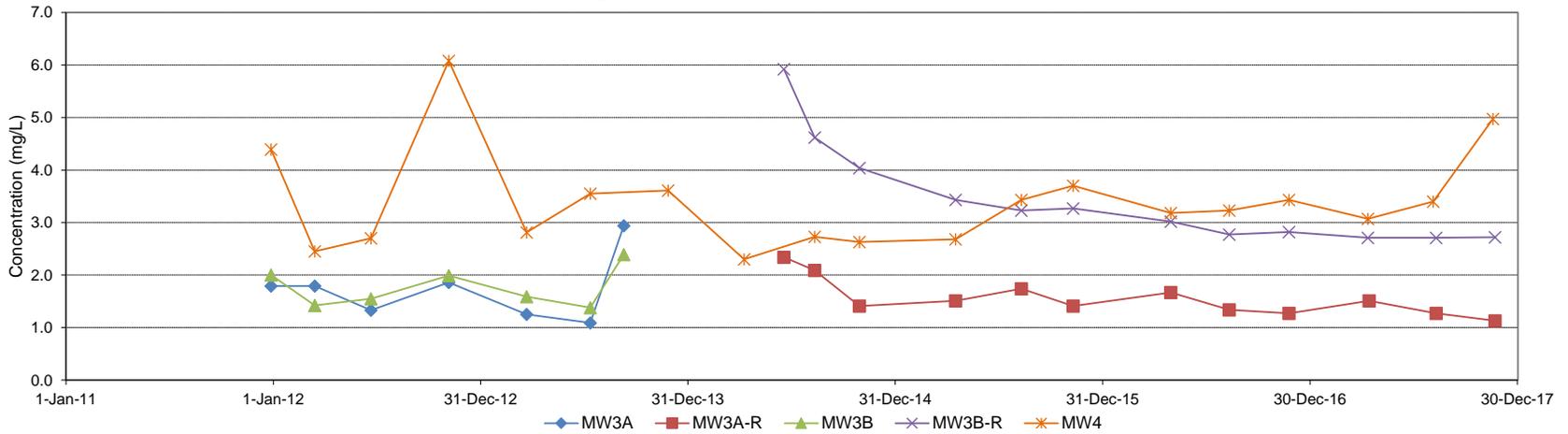
01/08/2018



**Monitoring Locations: MW1 (Crossgradient), MW2 (Upgradient), and MW5 (Internal Assessment)**



**Downgradient Monitoring Locations: MW3 and MW4**



**NOTES:**

1. mg/L denotes milligrams per litre.

**CONCENTRATION VS. TIME PLOT  
POTASSIUM**

**2017 ANNUAL MONITORING REPORT**

*REGIONAL MUNICIPALITY OF DURHAM  
Durham-York Energy Centre*

FIGURE NUMBER

**D-6**

APPROX. SCALE

**NTS**

PROJECT NUMBER

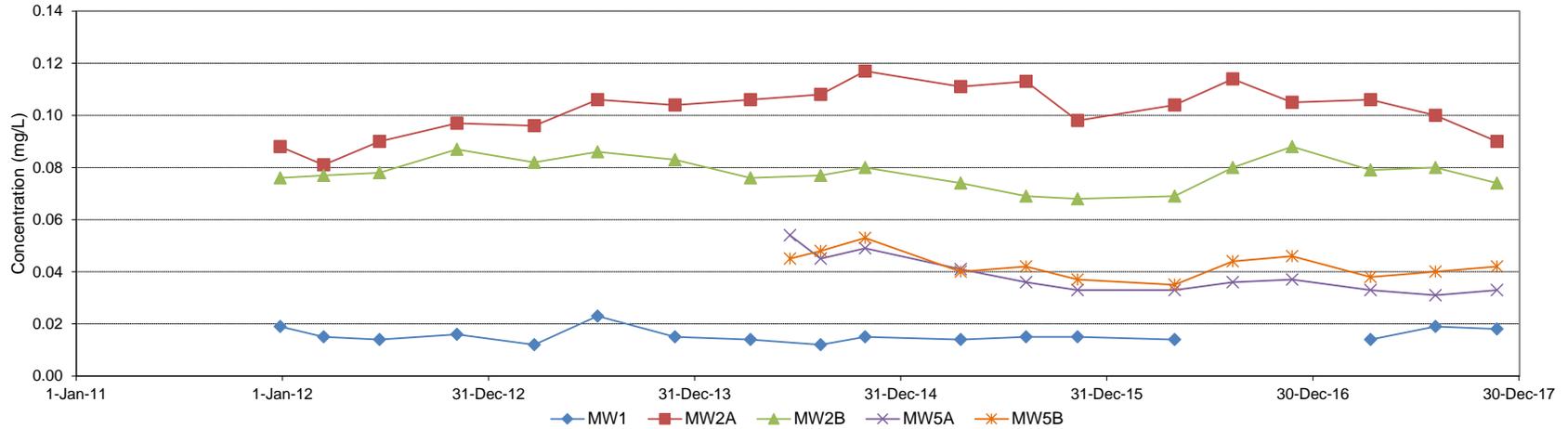
**1604066**

DATE REVISED

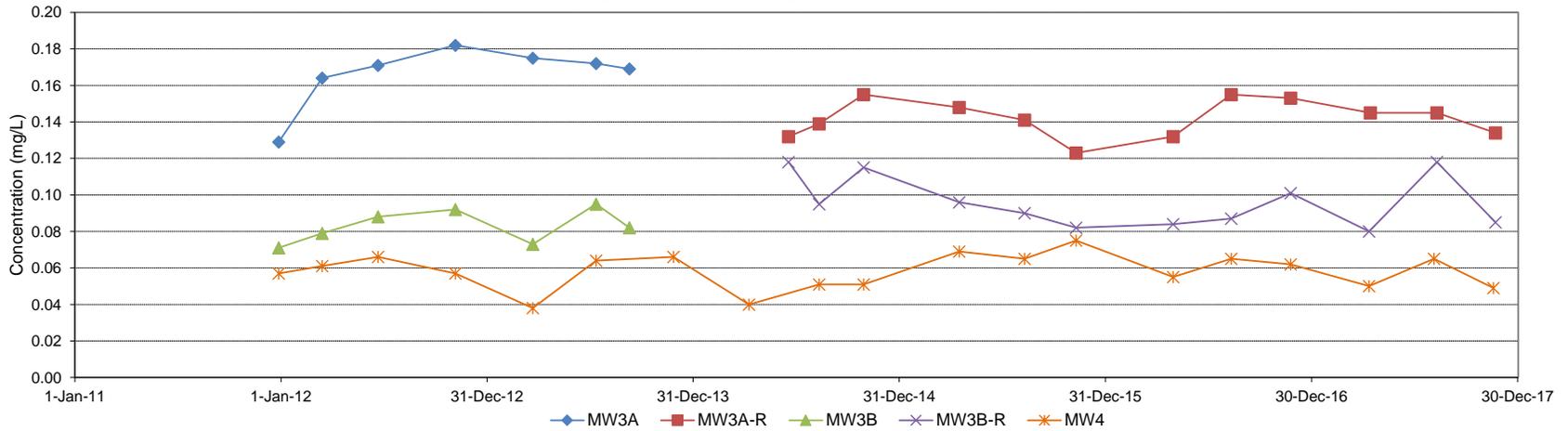
**01/08/2018**



**Monitoring Locations: MW1 (Crossgradient), MW2 (Upgradient), and MW5 (Internal Assessment)**



**Downgradient Monitoring Locations: MW3 and MW4**



**NOTES:**

1. mg/L denotes milligrams per litre.

**CONCENTRATION VS. TIME PLOT  
BORON**

**2017 ANNUAL MONITORING REPORT**

*REGIONAL MUNICIPALITY OF DURHAM  
Durham-York Energy Centre*

FIGURE NUMBER

**D-7**

APPROX. SCALE

**NTS**

PROJECT NUMBER

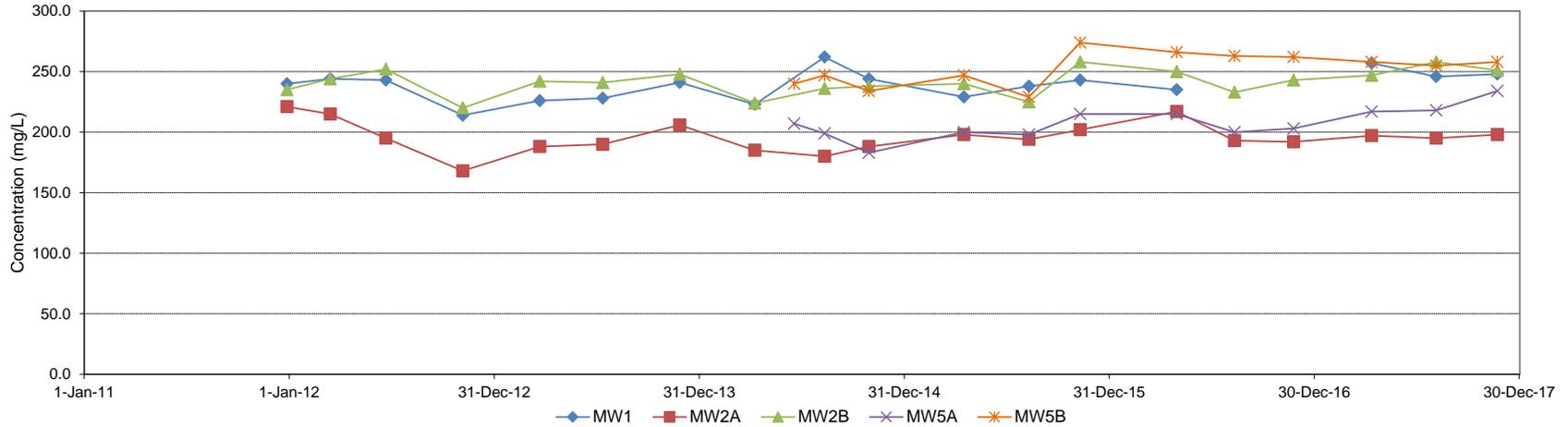
**1604066**

DATE REVISED

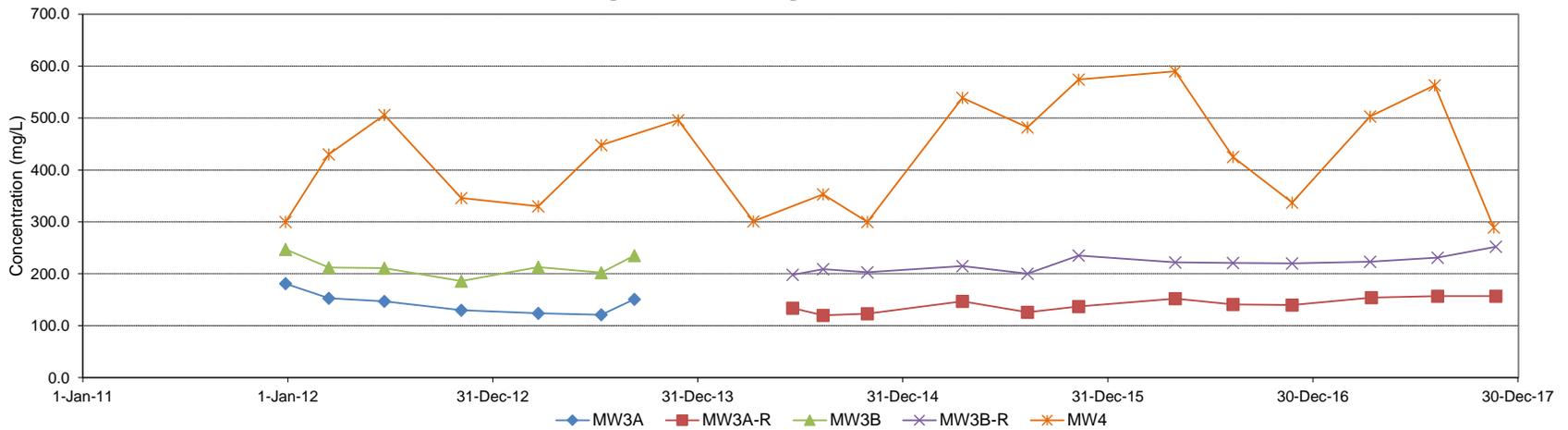
**01/08/2018**



**Monitoring Locations: MW1 (Crossgradient), MW2 (Upgradient), and MW5 (Internal Assessment)**



**Downgradient Monitoring Locations: MW3 and MW4**



**NOTES:**

1. mg/L denotes milligrams per litre.

**CONCENTRATION VS. TIME PLOT  
BICARBONATE**

**2017 ANNUAL MONITORING REPORT**

*REGIONAL MUNICIPALITY OF DURHAM  
Durham-York Energy Centre*

FIGURE NUMBER

**D-8**

APPROX. SCALE

**NTS**

PROJECT NUMBER

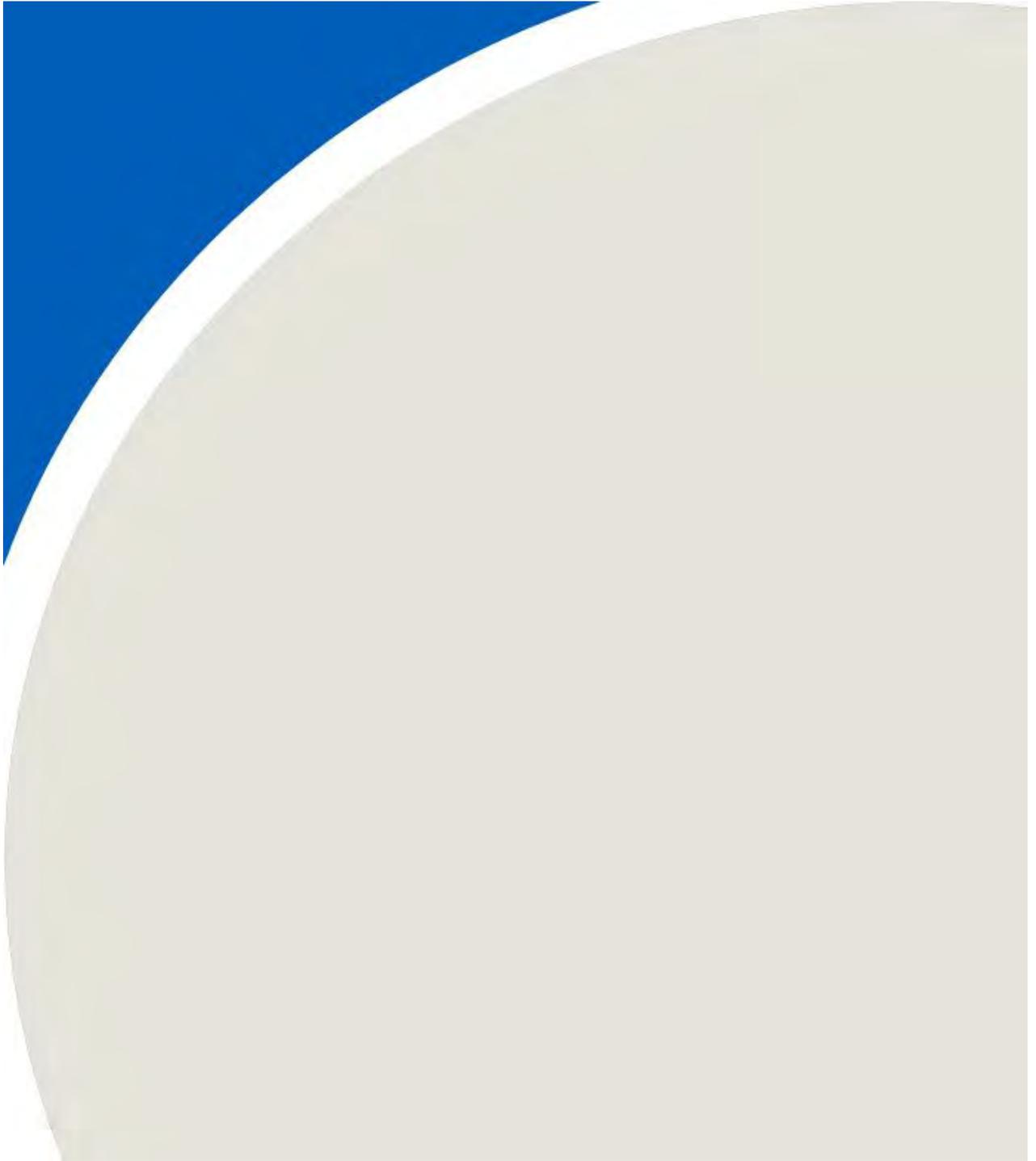
**1604066**

DATE REVISED

**01/08/2018**



## APPENDIX E



**CLIENT NAME: RWDI  
650 WOODLAWN ROAD WEST  
GUELPH, ON N1K1B8  
(519) 823-1311**

**ATTENTION TO: Andy DeJong**

**PROJECT: 1604066.8001**

**AGAT WORK ORDER: 17T205888**

**WATER ANALYSIS REVIEWED BY: Mike Muneswar, BSc (Chem), Senior Inorganic Analyst**

**DATE REPORTED: Apr 27, 2017**

**PAGES (INCLUDING COVER): 8**

**VERSION\*: 1**

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

\*NOTES

**All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.**



## Certificate of Analysis

AGAT WORK ORDER: 17T205888

PROJECT: 1604066.8001

5835 COOPERS AVENUE  
 MISSISSAUGA, ONTARIO  
 CANADA L4Z 1Y2  
 TEL (905)712-5100  
 FAX (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: RWDI

ATTENTION TO: Andy DeJong

SAMPLING SITE:

SAMPLED BY:

### Durham - Groundwater - Group F Parameters

DATE RECEIVED: 2017-04-13

DATE REPORTED: 2017-04-20

Parameter	Unit	SAMPLE DESCRIPTION:		MW1	MW2A	MW2B	MW3B-R	MW4			
		SAMPLE TYPE:		Water	Water	Water	Water	Water			
		DATE SAMPLED:		2017-04-11	2017-04-11	2017-04-11	2017-04-11	2017-04-11			
		G / S	RDL	8318676	RDL	8318677	RDL	8318680	8318683	RDL	8318686
Bicarbonate (as CaCO3)	mg/L		5	257	5	197	5	247	223	5	503
Carbonate (as CaCO3)	mg/L		5	<5	5	<5	5	<5	<5	5	31
Chloride	mg/L	250	0.50	26.0	0.10	2.71	0.20	77.4	8.75	0.50	11.5
Sulphate	mg/L	500	0.50	184	0.10	17.3	0.20	84.2	77.0	0.50	76.6
Calcium	mg/L		0.05	77.1	0.05	12.5	0.05	48.3	47.3	0.05	39.9
Magnesium	mg/L		0.05	54.3	0.05	32.6	0.05	58.6	31.0	0.05	108
Sodium	mg/L	20 (200)	0.05	<b>21.2</b>	0.05	18.8	0.05	<b>28.7</b>	<b>25.8</b>	0.05	<b>34.3</b>
Potassium	mg/L		0.05	3.53	0.05	1.05	0.05	2.07	2.71	0.05	3.07
Boron	mg/L	5	0.010	0.014	0.010	0.106	0.010	0.079	0.080	0.010	0.050
Cadmium	mg/L	0.005	0.002	<0.002	0.002	<0.002	0.002	<0.002	<0.002	0.002	<0.002
Cobalt	mg/L		0.001	<0.001	0.001	<0.001	0.001	<0.001	<0.001	0.001	<0.001
Lead	mg/L	0.01	0.002	<0.002	0.002	<0.002	0.002	<0.002	<0.002	0.002	<0.002
Mercury	mg/L	0.001	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	<0.0001	0.0001	<0.0001

Certified By:



# Certificate of Analysis

AGAT WORK ORDER: 17T205888

PROJECT: 1604066.8001

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
FAX (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: RWDI

ATTENTION TO: Andy DeJong

SAMPLING SITE:

SAMPLED BY:

## Durham - Groundwater - Group F Parameters

DATE RECEIVED: 2017-04-13

DATE REPORTED: 2017-04-20

Parameter	Unit	SAMPLE DESCRIPTION:		MW5A	MW5B	MW8001	MW3A-R		
		SAMPLE TYPE:		Water	Water	Water	Water		
		DATE SAMPLED:		2017-04-11	2017-04-11	2017-04-11	2017-04-13		
		G / S	RDL	8318689	RDL	8318692	RDL	8318695	8318698
Bicarbonate (as CaCO <sub>3</sub> )	mg/L		5	217	5	258	5	199	154
Carbonate (as CaCO <sub>3</sub> )	mg/L		5	<5	5	<5	5	<5	<5
Chloride	mg/L	250	0.10	1.65	0.20	42.5	0.10	2.73	5.71
Sulphate	mg/L	500	0.10	16.8	0.20	100	0.10	17.6	20.2
Calcium	mg/L		0.05	20.9	0.05	41.2	0.05	13.9	20.1
Magnesium	mg/L		0.05	38.2	0.05	66.7	0.05	34.0	10.5
Sodium	mg/L	20 (200)	0.05	11.9	0.05	17.2	0.05	19.9	<b>37.0</b>
Potassium	mg/L		0.05	2.28	0.05	2.73	0.05	1.17	1.51
Boron	mg/L	5	0.010	0.033	0.010	0.038	0.010	0.105	0.145
Cadmium	mg/L	0.005	0.002	<0.002	0.002	<0.002	0.002	<0.002	<0.002
Cobalt	mg/L		0.001	<0.001	0.001	<0.001	0.001	<0.001	<0.001
Lead	mg/L	0.01	0.002	<0.002	0.002	<0.002	0.002	<0.002	<0.002
Mercury	mg/L	0.001	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	<0.0001

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O.Reg.169/03(mg/L)

**8318676-8318698** Elevated RDLs indicate the degree of sample dilutions prior to analysis in order to keep the analytes within the calibration range of the instruments and to reduce matrix interferences.

Certified By:





## Guideline Violation

AGAT WORK ORDER: 17T205888

PROJECT: 1604066.8001

5835 COOPERS AVENUE  
 MISSISSAUGA, ONTARIO  
 CANADA L4Z 1Y2  
 TEL (905)712-5100  
 FAX (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: RWDI

ATTENTION TO: Andy DeJong

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
8318676	MW1	O.Reg.169/03(mg/L)	Durham - Groundwater - Group F Parameters	Sodium	mg/L	20 (200)	21.2
8318680	MW2B	O.Reg.169/03(mg/L)	Durham - Groundwater - Group F Parameters	Sodium	mg/L	20 (200)	28.7
8318683	MW3B-R	O.Reg.169/03(mg/L)	Durham - Groundwater - Group F Parameters	Sodium	mg/L	20 (200)	25.8
8318686	MW4	O.Reg.169/03(mg/L)	Durham - Groundwater - Group F Parameters	Sodium	mg/L	20 (200)	34.3
8318698	MW3A-R	O.Reg.169/03(mg/L)	Durham - Groundwater - Group F Parameters	Sodium	mg/L	20 (200)	37.0

## Quality Assurance

CLIENT NAME: RWDI  
 PROJECT: 1604066.8001  
 SAMPLING SITE:

AGAT WORK ORDER: 17T205888  
 ATTENTION TO: Andy DeJong  
 SAMPLED BY:

Water Analysis															
RPT Date:			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE		MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

**Durham - Groundwater - Group F Parameters**

Bicarbonate (as CaCO <sub>3</sub> )	8318686	8318686	503	536	6.4%	< 5	NA	80%	120%	NA			NA		
Carbonate (as CaCO <sub>3</sub> )	8318686	8318686	31	<5	NA	< 5	NA	80%	120%	NA			NA		
Chloride	8318676	8318676	26.0	25.9	0.4%	< 0.10	94%	90%	110%	103%	90%	110%	103%	80%	120%
Sulphate	8318676	8318676	184	184	0.0%	< 0.10	101%	90%	110%	104%	90%	110%	106%	80%	120%
Calcium	8318677	8318677	12.5	12.6	0.8%	< 0.05	98%	90%	110%	99%	90%	110%	99%	70%	130%
Magnesium	8318677	8318677	32.6	33.0	1.2%	< 0.05	97%	90%	110%	97%	90%	110%	100%	70%	130%
Sodium	8318677	8318677	18.8	19.1	1.6%	< 0.05	96%	90%	110%	95%	90%	110%	95%	70%	130%
Potassium	8318677	8318677	1.05	1.11	5.6%	< 0.05	97%	90%	110%	96%	90%	110%	98%	70%	130%
Boron	8318676	8318676	0.014	0.014	NA	< 0.010	100%	90%	110%	100%	80%	120%	98%	70%	130%
Cadmium	8318676	8318676	< 0.002	<0.002	NA	< 0.002	100%	90%	110%	97%	80%	120%	115%	70%	130%
Cobalt	8318676	8318676	< 0.001	<0.001	NA	< 0.001	95%	90%	110%	99%	80%	120%	100%	70%	130%
Lead	8318676	8318676	< 0.002	<0.002	NA	< 0.002	97%	90%	110%	99%	80%	120%	103%	70%	130%
Mercury	8318676	8318676	< 0.0001	<0.0001	NA	< 0.0001	99%	90%	110%	100%	90%	110%	97%	80%	120%

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By: \_\_\_\_\_



## Method Summary

CLIENT NAME: RWDI  
 PROJECT: 1604066.8001  
 SAMPLING SITE:

AGAT WORK ORDER: 17T205888  
 ATTENTION TO: Andy DeJong  
 SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
<b>Water Analysis</b>			
Bicarbonate (as CaCO <sub>3</sub> )	INOR-93-6000	SM 2320 B	PC TITRATE
Carbonate (as CaCO <sub>3</sub> )	INOR-93-6000	SM 2320 B	PC TITRATE
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Boron	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Mercury	MET-93-6100	EPA SW-846 7470 & 245.1	CVAAS



# AGAT Laboratories

5835 Coopers Avenue  
Mississauga, Ontario L4Z 1Y2  
Ph: 905.712.5100 Fax: 905.712.5122  
webearth.agatlabs.com

## Laboratory Use Only

Work Order #: 17T 205888  
Cooler Quantity: \_\_\_\_\_  
Arrival Temperatures: see attached  
Custody Seal Intact:  Yes  No  N/A  
Notes: \_\_\_\_\_

## Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

### Report Information:

Company: RWD1  
Contact: ANDREW DE JONG  
Address: 600 SOUTHGATE DR.  
GUELPH, ONTARIO N1G 4P6  
Phone: 519-823-1311 Fax: 519-823-1316  
Reports to be sent to:  
1. Email: AGCA@RWD1.COM  
2. Email: DDM@RWD1.COM

### Regulatory Requirements:

No Regulatory Requirement  
(Please check all applicable boxes)  
 Regulation 153/04  Sewer Use  Regulation 558  
Table: Indicate One  Sanitary  CCME  
 Ind/Com  Storm  Prov. Water Quality Objectives (PWQO)  
 Res/Park  Agriculture  Other  
 Agriculture  Other  
Soil Texture (Check One) Region: Indicate One  
 Coarse  MISA 60WS  
 Fine  MISA

### Turnaround Time (TAT) Required:

Regular TAT  5 to 7 Business Days  
Rush TAT (Rush Surcharges Apply)  
 3 Business Days  2 Business Days  Next Business Day  
OR Date Required (Rush Surcharges May Apply): \_\_\_\_\_

### Project Information:

Project: 1601066-8001  
Site Location: DURHAM YORK ENERGY CENTRE  
Sampled By: DDM/MT  
AGAT Quote #: 565-2012 PO: \_\_\_\_\_

### Is this submission for a Record of Site Condition?

Yes  No

### Report Guideline on Certificate of Analysis

Yes  No

Please provide prior notification for rush TAT  
\*TAT is exclusive of weekends and statutory holidays

For 'Same Day' analysis, please contact your AGAT CPM

### Invoice Information:

Bill To Same: Yes  No   
Company: REGION OF DURHAM  
Contact: \_\_\_\_\_  
Address: \_\_\_\_\_  
Email: \_\_\_\_\_

### Sample Matrix Legend

B Biota  
GW Ground Water  
O Oil  
P Paint  
S Soil  
SD Sediment  
SW Surface Water

Field Filtered - Metals - Hg, CYI

O, Reg 153	
Metals and Inorganics	<input type="checkbox"/> All Metals <input type="checkbox"/> 153 Metals (excl. Hydrides) <input type="checkbox"/> Hydride Metals <input type="checkbox"/> 153 Metals (incl. Hydrides)
ORPs:	<input type="checkbox"/> B-HWS <input type="checkbox"/> Cr <input type="checkbox"/> CN <input type="checkbox"/> Cr* <input type="checkbox"/> EC <input type="checkbox"/> FOC <input type="checkbox"/> Hg <input type="checkbox"/> pH <input type="checkbox"/> SAR
Full Metals Scan	
Regulatory/Custom Metals	
Nutrients:	<input type="checkbox"/> TP <input type="checkbox"/> NH <sub>3</sub> <input type="checkbox"/> TKN <input type="checkbox"/> NO <sub>2</sub> <input type="checkbox"/> NO <sub>3</sub> <input type="checkbox"/> NO <sub>2</sub> +NO <sub>3</sub>
Volatiles:	<input type="checkbox"/> VOC <input type="checkbox"/> BTEX <input type="checkbox"/> THM
CCME Fractions 1 to 4	
ABNS	
PAHs	
PCBs:	<input type="checkbox"/> Total <input type="checkbox"/> Aroclors
Organochlorine Pesticides	
TCLP:	<input type="checkbox"/> M&I <input type="checkbox"/> VOCs <input type="checkbox"/> ABNS <input type="checkbox"/> B(a)P <input type="checkbox"/> PCBs
Sewer Use	
	<u>GROUND WATER SAMPLING-F</u>

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Y / N
MW 1	11-APR-17			GW	LAB TO FILTER AND PRESERVE METALS AND DOC ALIQUOTS	
MW 2A						
MW 2B						
MW 3B-R						
MW 4						
MW 5A						
MW 5B						
MW 8001						
MW 3A-R	13-APR-17					

Samples Relinquished By (Print Name and Sign): <u>DDM</u> <u>[Signature]</u>	Date: <u>13-APR-17</u>	Time:	Samples Received By (Print Name and Sign): <u>Sima J</u>	Date: <u>17/04/18</u>	Time: <u>4:05</u>
Samples Relinquished By (Print Name and Sign):	Date:	Time:	Samples Received By (Print Name and Sign):	Date:	Time:
Samples Relinquished By (Print Name and Sign):	Date:	Time:	Samples Received By (Print Name and Sign):	Date:	Time:

Page 1 of 1

Nº: T 049275

CLIENT NAME: RWDI  
4510 RHONES DR, UNITE 520  
WINDSOR, ON N8W5K5  
(519) 823-1311

ATTENTION TO: PHILIPPE JANISSE

PROJECT: 1604066, 8001

AGAT WORK ORDER: 17T245929

TRACE ORGANICS REVIEWED BY: Gulhan Yalamova, Report Reviewer

WATER ANALYSIS REVIEWED BY: Mike Muneswar, BSc (Chem), Senior Inorganic Analyst

DATE REPORTED: Aug 23, 2017

PAGES (INCLUDING COVER): 11

VERSION\*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

\*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.



## Certificate of Analysis

AGAT WORK ORDER: 17T245929

PROJECT: 1604066, 8001

5835 COOPERS AVENUE  
 MISSISSAUGA, ONTARIO  
 CANADA L4Z 1Y2  
 TEL (905)712-5100  
 FAX (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: RWDI

SAMPLING SITE:

ATTENTION TO: PHILIPPE JANISSE

SAMPLED BY: ODM/MT

### Durham - Groundwater - Group F Parameters

DATE RECEIVED: 2017-08-05

DATE REPORTED: 2017-08-23

Parameter	Unit	SAMPLE DESCRIPTION: MW2A		MW2B		MW1		MW4		
		SAMPLE TYPE: Water		Water		Water		Water		
		DATE SAMPLED: 2017-08-04		2017-08-04		2017-08-04		2017-08-04		
		G / S	RDL	RDL	RDL	RDL	RDL	RDL	RDL	
Bicarbonate (as CaCO3)	mg/L		5	195	5	258	5	246	5	563
Carbonate (as CaCO3)	mg/L		5	<5	5	<5	5	<5	5	<5
Chloride	mg/L	0.10	2.51	0.50	106	0.20	21.1	0.50	11.2	
Sulphate	mg/L	0.10	15.7	0.50	80.4	0.20	160	0.50	74.7	
Calcium	mg/L	0.05	12.1	0.05	51.4	0.05	67.8	0.10	38.6	
Magnesium	mg/L	0.05	32.0	0.05	62.0	0.05	49.0	0.10	105	
Sodium	mg/L	0.05	18.0	0.05	34.5	0.05	18.9	0.10	34.6	
Potassium	mg/L	0.05	1.08	0.05	2.20	0.05	3.16	0.10	3.40	
Boron	mg/L	0.010	0.100	0.010	0.080	0.010	0.019	0.010	0.065	
Cadmium	mg/L		0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001
Cobalt	mg/L		0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001
Lead	mg/L		0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002
Mercury	mg/L		0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001

Certified By:



## Quality Assurance

CLIENT NAME: RWDI  
 PROJECT: 1604066, 8001  
 SAMPLING SITE:

AGAT WORK ORDER: 17T245929  
 ATTENTION TO: PHILIPPE JANISSE  
 SAMPLED BY: ODM/MT

Water Analysis															
RPT Date: Aug 23, 2017			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE		MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Durham - Groundwater - Group B Parameters															
BOD (5)	8622518		<5	<5	NA	< 5	103%	75%	125%	NA			NA		
Electrical Conductivity	8630623		59	58	1.7%	< 2	101%	80%	120%	NA			NA		
pH	8630623		7.40	7.51	1.5%	NA	100%	90%	110%	NA			NA		
Total Solids	8623013	8623013	845	841	0.5%	< 10	NA	80%	120%	NA			NA		
Total Dissolved Solids	8623318		412	418	1.4%	< 20	98%	80%	120%	NA			NA		
Total Suspended Solids	8623013	8623013	264	269	1.9%	< 10	98%	80%	120%	NA			NA		
Alkalinity (as CaCO3)	8630623		29	27	7.1%	< 5	99%	80%	120%	NA			NA		
Fluoride	8623095	8623095	<0.25	<0.25	NA	< 0.05	101%	90%	110%	94%	90%	110%	98%	80%	120%
Chloride	8623095	8623095	106	106	0.0%	< 0.10	94%	90%	110%	108%	90%	110%	109%	80%	120%
Bromide	8623095	8623095	<0.25	<0.25	NA	< 0.05	107%	90%	110%	103%	90%	110%	93%	80%	120%
Nitrate as N	8623095	8623095	<0.25	<0.25	NA	< 0.05	98%	90%	110%	107%	90%	110%	106%	80%	120%
Nitrite as N	8623095	8623095	<0.25	<0.25	NA	< 0.05	NA	90%	110%	99%	90%	110%	94%	80%	120%
Sulphate	8623095	8623095	80.4	80.7	0.4%	< 0.10	98%	90%	110%	106%	90%	110%	106%	80%	120%
Phosphate as P	8623095	8623095	<0.50	<0.50	NA	< 0.10	102%	90%	110%	103%	90%	110%	105%	80%	120%
Total Phosphorus	8633595		0.44	0.44	0.0%	< 0.05	99%	90%	110%	104%	90%	110%	100%	80%	120%
Ammonia as N	8620228		0.29	0.28	3.5%	< 0.02	95%	90%	110%	101%	90%	110%	95%	80%	120%
Chemical Oxygen Demand	8633595		16	15	NA	< 5	106%	90%	110%	96%	90%	110%	96%	70%	130%
Dissolved Organic Carbon	8623013	8623013	26.8	28.5	6.1%	< 0.5	97%	90%	110%	104%	90%	110%	106%	80%	120%
Phenols	8623013	8623013	< 0.001	<0.001	NA	< 0.001	102%	90%	110%	100%	90%	110%	101%	80%	120%
Total Kjeldahl Nitrogen	8626222		0.15	0.14	NA	< 0.10	98%	80%	120%	99%	80%	120%	99%	70%	130%
Colour	8623013	8623013	102	105	2.9%	< 5	107%	90%	110%	NA			NA		
Turbidity	8623013	8623013	247	249	0.8%	< 0.5	99%	90%	110%	NA			NA		
Calcium	8623057	8623057	66.7	67.1	0.6%	< 0.05	100%	90%	110%	100%	90%	110%	99%	70%	130%
Magnesium	8623057	8623057	29.6	29.9	1.0%	< 0.05	100%	90%	110%	100%	90%	110%	97%	70%	130%
Sodium	8623057	8623057	33.0	32.9	0.3%	< 0.05	100%	90%	110%	100%	90%	110%	99%	70%	130%
Potassium	8623057	8623057	8.39	8.54	1.8%	< 0.05	99%	90%	110%	100%	90%	110%	100%	70%	130%
Aluminum	8623013	8623013	0.027	0.024	11.8%	< 0.004	110%	90%	110%	109%	80%	120%	112%	70%	130%
Antimony	8623013	8623013	< 0.006	<0.006	NA	< 0.006	100%	90%	110%	101%	80%	120%	106%	70%	130%
Arsenic	8623013	8623013	< 0.003	<0.003	NA	< 0.003	99%	90%	110%	104%	80%	120%	112%	70%	130%
Barium	8623013	8623013	0.207	0.203	2.0%	< 0.002	100%	90%	110%	102%	80%	120%	98%	70%	130%
Boron	8623013	8623013	0.397	0.392	1.3%	< 0.010	100%	90%	110%	104%	80%	120%	108%	70%	130%
Cadmium	8623013	8623013	< 0.002	<0.002	NA	< 0.002	103%	90%	110%	106%	80%	120%	109%	70%	130%
Chromium	8623013	8623013	< 0.003	<0.003	NA	< 0.003	104%	90%	110%	107%	80%	120%	118%	70%	130%
Cobalt	8623013	8623013	0.001	0.001	NA	< 0.001	101%	90%	110%	108%	80%	120%	108%	70%	130%
Copper	8623013	8623013	< 0.003	<0.003	NA	< 0.003	102%	90%	110%	105%	80%	120%	102%	70%	130%
Iron	8623013	8623013	0.241	0.239	0.8%	< 0.010	110%	90%	110%	105%	80%	120%	111%	70%	130%
Lead	8623013	8623013	< 0.002	<0.002	NA	< 0.002	103%	90%	110%	110%	80%	120%	104%	70%	130%
Manganese	8623013	8623013	0.084	0.083	1.2%	< 0.002	108%	90%	110%	107%	80%	120%	108%	70%	130%
Molybdenum	8623013	8623013	< 0.001	<0.001	NA	< 0.001	101%	90%	110%	99%	80%	120%	105%	70%	130%

## Quality Assurance

CLIENT NAME: RWDI  
 PROJECT: 1604066, 8001  
 SAMPLING SITE:

AGAT WORK ORDER: 17T245929  
 ATTENTION TO: PHILIPPE JANISSE  
 SAMPLED BY: ODM/MT

### Water Analysis (Continued)

RPT Date: Aug 23, 2017			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits		
								Lower	Upper		Lower	Upper		Lower	Upper	
Nickel	8623013	8623013	0.015	0.014	NA	< 0.003	103%	90%	110%	110%	80%	120%	106%	70%	130%	
Selenium	8623013	8623013	0.006	0.006	NA	< 0.004	102%	90%	110%	104%	80%	120%	115%	70%	130%	
Zinc	8623013	8623013	< 0.005	< 0.005	NA	< 0.005	106%	90%	110%	108%	80%	120%	114%	70%	130%	

Comments: NA signifies Not Applicable.  
 Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By: \_\_\_\_\_



## Method Summary

CLIENT NAME: RWDI  
 PROJECT: 1604066, 8001  
 SAMPLING SITE:

AGAT WORK ORDER: 17T245929  
 ATTENTION TO: PHILIPPE JANISSE  
 SAMPLED BY: ODM/MT

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
BOD (5)	INOR-93-6006	SM 5210 B	DO METER
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
Electrical Conductivity (calculated)		SM 1030 E	CALCULATION
pH	INOR-93-6000	SM 4500-H+ B	PC TITRATE
Langelier Index		SM 2330B	CALCULATION
Total Solids	INOR-93-6028	SM 2540 B	BALANCE
Total Dissolved Solids	INOR-93-6028	SM 2540 C	BALANCE
Total Dissolved Solids (calculated)		SM 1030 E	CALCULATION
Total Suspended Solids	INOR-93-6028	SM 2540 D	BALANCE
Total Hardness (as CaCO <sub>3</sub> )	MET-93-6105	EPA SW-846 6010C & 200.7 & SM 2340 B	ICP/OES
Alkalinity (as CaCO <sub>3</sub> )	INOR-93-6000	SM 2320 B	PC TITRATE
Fluoride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Bromide	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Phosphate as P	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Total Phosphorus	INOR-93-6057	QuikChem 10-115-01-3-A & SM 4500-P I	LACHAT FIA
Ammonia as N	INOR-93-6059	QuikChem 10-107-06-1-J & SM 4500 NH <sub>3</sub> -F	LACHAT FIA
Chemical Oxygen Demand	INOR-93-6042	SM 5220 D	SPECTROPHOTOMETER
Dissolved Organic Carbon	INOR-93-6049	EPA 415.1 & SM 5310 B	SHIMADZU CARBON ANALYZER
Phenols	INOR-93-6050	MOE ROPHEN-E 3179 & SM 5530 D	TECHNICON AUTO ANALYZER
Total Kjeldahl Nitrogen	INOR-93-6048	QuikChem 10-107-06-2-I & SM 4500-Norg D	LACHAT FIA
Colour	INOR-93-6046	SM 2120 B	SPECTROPHOTOMETER
Turbidity	INOR-93-6044	SM 2130 B	NEPHELOMETER
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Aluminum	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Antimony	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Arsenic	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Barium	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Boron	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Chromium	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Copper	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Iron	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Manganese	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Molybdenum	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Nickel	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Selenium	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Zinc	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS

## Method Summary

CLIENT NAME: RWDI  
PROJECT: 1604066, 8001  
SAMPLING SITE:

AGAT WORK ORDER: 17T245929  
ATTENTION TO: PHILIPPE JANISSE  
SAMPLED BY:ODM/MT

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Anion Sum		SM 1030 E	CALCULATION
Cation Sum		SM 1030 E	CALCULATION
% Difference/ Ion Balance		SM 1030 E	CALCULATION
Bicarbonate (as CaCO <sub>3</sub> )	INOR-93-6000	SM 2320 B	PC TITRATE
Carbonate (as CaCO <sub>3</sub> )	INOR-93-6000	SM 2320 B	PC TITRATE
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Mercury	MET-93-6100	EPA SW 846 7470 & 245.1	CVAAS



# AGAT Laboratories

5835 Coopers Avenue  
Mississauga, Ontario L4Z 1Y2  
Ph: 905.712.5100 Fax: 905.712.5122  
webearth.agatlabs.com

### Laboratory Use Only

Work Order #: 17T245929  
Cooler Quantity: 4 BIK  
Arrival Temperatures: 5.0, 5.1, 5.2, 5.3  
Custody Seal Intact:  Yes  No  N/A  
Notes:

## Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

### Report Information:

Company: RW01  
Contact: PHIL JANISSE  
Address: 5510 RHODES DR  
WINDSOR, ON N6L 5K5  
Phone: 519-823-1311 FAX:  
Reports to be sent to:  
1. Email: PHILIPPE.JANISSE@RW01.COM  
2. Email: AGD@RW01.COM

### Regulatory Requirements:

No Regulatory Requirement  
(Please check all applicable boxes)  
 Regulation 153/04  Sewer Use  Regulation 558  
 Ind/Com  Sanitary  CCME  
 Res/Park  Storm  Prov. Water Quality Objectives (PWQO)  
 Agriculture  Other ODWS  
Soil Texture (Check One) Region Indicate One  
 Coarse  MISA  
 Fine

### Project Information:

Project: 160666, 5001, 8001  
Site Location: 5510 RHODES DR, WINDSOR, ON  
Sampled By: DDM/ML  
AGAT Quote #: 565-2012 PO:

### Is this submission for a Record of Site Condition?

Yes  No

### Report Guideline on Certificate of Analysis

Yes  No

### Turnaround Time (TAT) Required:

Regular TAT  5 to 7 Business Days  
Rush TAT (Rush Surcharges Apply)  
 3 Business Days  2 Business Days  Next Business Day  
OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT  
\*TAT is exclusive of weekends and statutory holidays

For 'Same Day' analysis, please contact your AGAT CPM

### Invoice Information:

Bill To Same: Yes  No   
Company: REGION OF DURHAM  
Contact:  
Address:  
Email:

### Sample Matrix Legend

B Biota  
GW Ground Water  
O Oil  
P Paint  
S Soil  
SD Sediment  
SW Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Y / N	Field Filtered - Metals, Hg, CrVI	Metals and Inorganics	Regulation / Custom Metals	Nutrients	Volatiles	CCME Fractions 1 to 4	ABNs	PAHs	PCBs:	Organochlorine Pesticides	TCLP:	Sewer Use
<del>12-1</del>	<del>1</del>					<del>N</del>		<input type="checkbox"/> All Metals <input type="checkbox"/> 153 Metals (excl. hydrides)		<input type="checkbox"/> TP <input type="checkbox"/> NH <sub>3</sub> <input type="checkbox"/> TKN	<input type="checkbox"/> VOC <input type="checkbox"/> BTEX <input type="checkbox"/> THM				<input type="checkbox"/> M&I <input type="checkbox"/> VOCs <input type="checkbox"/> ABNs <input type="checkbox"/> B(a)P <input type="checkbox"/> PCBs			
13-1	1-AUG-17	AM	9	GW		N		<input type="checkbox"/> Hydride Metals <input type="checkbox"/> 153 Metals (incl. Hydrides)		<input type="checkbox"/> NO <sub>3</sub> <input type="checkbox"/> NO <sub>2</sub> <input type="checkbox"/> NO <sub>x</sub> +NO <sub>2</sub>								
14-2	1-AUG-17	AM	9			N		ORPs: <input type="checkbox"/> B-HWS <input type="checkbox"/> Cl <sup>-</sup> <input type="checkbox"/> CN <sup>-</sup>		<input type="checkbox"/> Cr <sup>6+</sup> <input type="checkbox"/> EC <input type="checkbox"/> FOC <input type="checkbox"/> Hg								
MW 7D-09	3-AUG-17	AM	12			N		<input type="checkbox"/> pH <input type="checkbox"/> SAR										
MW 2A		AM	3			N		Full Metals Scan										
MW 2B		AM	1			N		Regulation / Custom Metals										
MW 1		PM				N												
MW 4						N												
MW 5A						N												
MW 5B						N												

Samples Relinquished By (Print Name and Sign): <u>DDM [Signature]</u>	Date: <u>1-AUG-17</u>	Time: <u>6:30 PM</u>	Samples Received By (Print Name and Sign): <u>Neil Ramnathign [Signature]</u>	Date: <u>Aug 4, 17</u>	Time: <u>6:35 PM</u>
Samples Relinquished By (Print Name and Sign):	Date:	Time:	Samples Received By (Print Name and Sign):	Date:	Time:
Samples Relinquished By (Print Name and Sign):	Date:	Time:	Samples Received By (Print Name and Sign):	Date:	Time:

Page 1 of 1  
No: **T 055741**

CLIENT NAME: RWDI  
4510 RHONES DR, UNITE 520  
WINDSOR, ON N8W5K5  
(519) 823-1311

ATTENTION TO: PHILIPPE JANISSE

PROJECT: 1604066.8001

AGAT WORK ORDER: 17T247224

TRACE ORGANICS REVIEWED BY: Gulhan Yalamova, Report Reviewer

WATER ANALYSIS REVIEWED BY: Mike Muneswar, BSc (Chem), Senior Inorganic Analyst

DATE REPORTED: Aug 28, 2017

PAGES (INCLUDING COVER): 12

VERSION\*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

\*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.



## Quality Assurance

CLIENT NAME: RWDI  
 PROJECT: 1604066.8001  
 SAMPLING SITE:

AGAT WORK ORDER: 17T247224  
 ATTENTION TO: PHILIPPE JANISSE  
 SAMPLED BY:

### Water Analysis

RPT Date: Aug 28, 2017			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE		MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Durham - Groundwater - Group B Parameters															
BOD (5)	8625052	8625052	50	53	5.8%	< 5	102%	75%	125%	NA			NA		
Electrical Conductivity	8624984	8624984	1550	1550	0.0%	< 2	108%	80%	120%	NA			NA		
pH	8624984	8624984	7.89	7.81	1.0%	NA	100%	90%	110%	NA			NA		
Total Solids	8624984	8624984	15800	16800	6.1%	< 10	NA	80%	120%	NA			NA		
Total Dissolved Solids	8625097	8625097	242	238	1.7%	< 20	98%	80%	120%	NA			NA		
Total Suspended Solids	8624984	8624984	14700	15800	7.2%	< 10	100%	80%	120%	NA			NA		
Alkalinity (as CaCO3)	8624984	8624984	944	947	0.3%	< 5	96%	80%	120%	NA			NA		
Fluoride	8625126	8625126	< 0.25	<0.25	NA	< 0.05	105%	90%	110%	101%	90%	110%	106%	80%	120%
Chloride	8625126	8625126	5.06	4.91	3.0%	< 0.10	103%	90%	110%	107%	90%	110%	114%	80%	120%
Bromide	8625126	8625126	< 0.25	<0.25	NA	< 0.05	109%	90%	110%	104%	90%	110%	117%	80%	120%
Nitrate as N	8625126	8625126	< 0.25	<0.25	NA	< 0.05	94%	90%	110%	100%	90%	110%	119%	80%	120%
Nitrite as N	8625126	8625126	< 0.25	<0.25	NA	< 0.05	NA	90%	110%	101%	90%	110%	111%	80%	120%
Sulphate	8625126	8625126	31.8	30.5	4.2%	< 0.10	102%	90%	110%	105%	90%	110%	118%	80%	120%
Phosphate as P	8625126	8625126	< 0.50	<0.50	NA	< 0.10	99%	90%	110%	102%	90%	110%	111%	80%	120%
Total Phosphorus	8625344	8625344	0.13	0.12	NA	< 0.05	104%	90%	110%	106%	90%	110%	104%	80%	120%
Ammonia as N	8625287	8625287	15.8	15.8	0.0%	< 0.02	99%	90%	110%	96%	90%	110%	98%	80%	120%
Chemical Oxygen Demand	8625344	8625344	18	17	NA	< 5	98%	90%	110%	101%	90%	110%	95%	70%	130%
Dissolved Organic Carbon	8624984	8624984	12.5	12.4	0.8%	< 0.5	97%	90%	110%	96%	90%	110%	97%	80%	120%
Phenols	8624984	8624984	< 0.001	<0.001	NA	< 0.001	102%	90%	110%	100%	90%	110%	98%	80%	120%
Total Kjeldahl Nitrogen	8625154	8625154	< 0.10	< 0.10	NA	< 0.10	99%	80%	120%	96%	80%	120%	96%	70%	130%
Colour	8625173	8625173	< 5	< 5	NA	< 5	106%	90%	110%	NA			NA		
Turbidity	8624984	8624984	2160	2210	2.3%	< 0.5	108%	90%	110%	NA			NA		
Calcium	8625068	8625068	102	101	1.0%	< 0.05	101%	90%	110%	101%	90%	110%	97%	70%	130%
Magnesium	8625068	8625068	25.0	24.9	0.4%	< 0.05	100%	90%	110%	101%	90%	110%	97%	70%	130%
Sodium	8625068	8625068	5.08	5.00	1.6%	< 0.05	101%	90%	110%	101%	90%	110%	99%	70%	130%
Potassium	8625068	8625068	1.52	1.48	2.7%	< 0.05	100%	90%	110%	101%	90%	110%	100%	70%	130%
Aluminum	8624984	8624984	0.005	0.005	NA	< 0.004	100%	90%	110%	109%	80%	120%	102%	70%	130%
Antimony	8624984	8624984	< 0.006	<0.006	NA	< 0.006	104%	90%	110%	108%	80%	120%	106%	70%	130%
Arsenic	8624984	8624984	< 0.003	<0.003	NA	< 0.003	97%	90%	110%	98%	80%	120%	107%	70%	130%
Barium	8624984	8624984	0.422	0.414	1.9%	< 0.002	100%	90%	110%	105%	80%	120%	98%	70%	130%
Boron	8624984	8624984	0.312	0.341	8.9%	< 0.010	104%	90%	110%	101%	80%	120%	92%	70%	130%
Cadmium	8624984	8624984	< 0.002	<0.002	NA	< 0.002	102%	90%	110%	108%	80%	120%	105%	70%	130%
Chromium	8624984	8624984	< 0.003	<0.003	NA	< 0.003	101%	90%	110%	107%	80%	120%	101%	70%	130%
Cobalt	8624984	8624984	< 0.001	<0.001	NA	< 0.001	93%	90%	110%	100%	80%	120%	93%	70%	130%
Copper	8624984	8624984	< 0.003	<0.003	NA	< 0.003	95%	90%	110%	101%	80%	120%	88%	70%	130%
Iron	8624984	8624984	< 0.010	<0.010	NA	< 0.010	97%	90%	110%	107%	80%	120%	99%	70%	130%
Lead	8624984	8624984	< 0.002	<0.002	NA	< 0.002	104%	90%	110%	110%	80%	120%	101%	70%	130%
Manganese	8624984	8624984	0.058	0.058	0.0%	< 0.002	95%	90%	110%	102%	80%	120%	101%	70%	130%
Molybdenum	8624984	8624984	< 0.001	<0.001	NA	< 0.001	97%	90%	110%	96%	80%	120%	105%	70%	130%

## Quality Assurance

CLIENT NAME: RWDI  
 PROJECT: 1604066.8001  
 SAMPLING SITE:

AGAT WORK ORDER: 17T247224  
 ATTENTION TO: PHILIPPE JANISSE  
 SAMPLED BY:

### Water Analysis (Continued)

RPT Date: Aug 28, 2017			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits		
								Lower	Upper		Lower	Upper		Lower	Upper	
Nickel	8624984	8624984	< 0.003	<0.003	NA	< 0.003	95%	90%	110%	102%	80%	120%	91%	70%	130%	
Selenium	8624984	8624984	< 0.004	<0.004	NA	< 0.004	100%	90%	110%	100%	80%	120%	114%	70%	130%	
Zinc	8624984	8624984	0.013	0.013	NA	< 0.005	96%	90%	110%	102%	80%	120%	87%	70%	130%	
Durham - Groundwater - Group F Parameters																
Bicarbonate (as CaCO3)	8624984	8624984	944	947	0.3%	< 5	NA	80%	120%	NA				NA		
Carbonate (as CaCO3)	8624984	8624984	< 5	<5	NA	< 5	NA	80%	120%	NA				NA		
Chloride	8625126	8625126	5.06	4.91	3.0%	< 0.10	103%	90%	110%	107%	90%	110%	114%	80%	120%	
Sulphate	8625126	8625126	31.8	30.5	4.2%	< 0.10	102%	90%	110%	105%	90%	110%	118%	80%	120%	
Calcium	8625394	8625394	44.0	43.5	1.1%	< 0.05	101%	90%	110%	101%	90%	110%	96%	70%	130%	
Magnesium	8625394	8625394	13.9	13.8	0.7%	< 0.05	100%	90%	110%	101%	90%	110%	95%	70%	130%	
Sodium	8625394	8625394	53.2	52.8	0.8%	< 0.05	101%	90%	110%	101%	90%	110%	94%	70%	130%	
Potassium	8625394	8625394	1.68	1.64	2.4%	< 0.05	99%	90%	110%	100%	90%	110%	98%	70%	130%	
Boron	8625357	8625357	0.777	0.821	5.5%	< 0.010	101%	90%	110%	101%	80%	120%	99%	70%	130%	
Cadmium	8625357	8625357	< 0.002	<0.002	NA	< 0.002	101%	90%	110%	107%	80%	120%	104%	70%	130%	
Cobalt	8625357	8625357	< 0.001	<0.001	NA	< 0.001	95%	90%	110%	100%	80%	120%	98%	70%	130%	
Mercury	8624586		<0.0001	<0.0001	NA	< 0.0001	104%	90%	110%	100%	90%	110%	93%	80%	120%	

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By: \_\_\_\_\_



## Method Summary

CLIENT NAME: RWDI  
 PROJECT: 1604066.8001  
 SAMPLING SITE:

AGAT WORK ORDER: 17T247224  
 ATTENTION TO: PHILIPPE JANISSE  
 SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
BOD (5)	INOR-93-6006	SM 5210 B	DO METER
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
Electrical Conductivity (calculated)		SM 1030 E	CALCULATION
pH	INOR-93-6000	SM 4500-H+ B	PC TITRATE
Total Solids	INOR-93-6028	SM 2540 B	BALANCE
Total Dissolved Solids	INOR-93-6028	SM 2540 C	BALANCE
Total Dissolved Solids (calculated)		SM 1030 E	CALCULATION
Total Suspended Solids	INOR-93-6028	SM 2540 D	BALANCE
Total Hardness (as CaCO <sub>3</sub> )	MET-93-6105	EPA SW-846 6010C & 200.7 & SM 2340 B	ICP/OES
Alkalinity (as CaCO <sub>3</sub> )	INOR-93-6000	SM 2320 B	PC TITRATE
Fluoride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Bromide	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Phosphate as P	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Total Phosphorus	INOR-93-6057	QuikChem 10-115-01-3-A & SM 4500-P I	LACHAT FIA
Ammonia as N	INOR-93-6059	QuikChem 10-107-06-1-J & SM 4500 NH <sub>3</sub> -F	LACHAT FIA
Chemical Oxygen Demand	INOR-93-6042	SM 5220 D	SPECTROPHOTOMETER
Dissolved Organic Carbon	INOR-93-6049	EPA 415.1 & SM 5310 B	SHIMADZU CARBON ANALYZER
Phenols	INOR-93-6050	MOE ROPHEN-E 3179 & SM 5530 D	TECHNICON AUTO ANALYZER
Total Kjeldahl Nitrogen	INOR-93-6048	QuikChem 10-107-06-2-I & SM 4500-Norg D	LACHAT FIA
Colour	INOR-93-6046	SM 2120 B	SPECTROPHOTOMETER
Turbidity	INOR-93-6044	SM 2130 B	NEPHELOMETER
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Aluminum	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Antimony	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Arsenic	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Barium	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Boron	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Chromium	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Copper	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Iron	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Manganese	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Molybdenum	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Nickel	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Selenium	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Zinc	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
% Difference/ Ion Balance		SM 1030 E	CALCULATION

## Method Summary

CLIENT NAME: RWDI  
 PROJECT: 1604066.8001  
 SAMPLING SITE:

AGAT WORK ORDER: 17T247224  
 ATTENTION TO: PHILIPPE JANISSE  
 SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Bicarbonate (as CaCO <sub>3</sub> )	INOR-93-6000	SM 2320 B	PC TITRATE
Carbonate (as CaCO <sub>3</sub> )	INOR-93-6000	SM 2320 B	PC TITRATE
Mercury	MET-93-6100	EPA SW-846 7470 & 245.1	CVAAS



# AGAT Laboratories

5 Black Cooks  
Turbidity

5835 Coopers Avenue  
Mississauga, Ontario L4Z 1Y2  
Ph 905.712.5100 Fax: 905.712.5122  
web@earth.agatlabs.com

## Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

### Laboratory Use Only

Work Order #: 17T247224

Cooler Quantity: \_\_\_\_\_

Arrival Temperatures: \_\_\_\_\_

Custody Seal Intact:  Yes  No  N/A

Notes: \_\_\_\_\_

### Report Information:

Company: RW01  
 Contact: PHIL JANISSE  
 Address: 4510 RHODES DR N8W5K7  
WINDSOR, ON  
 Phone: 519-823-1311 Fax: \_\_\_\_\_  
 Reports to be sent to:  
 1. Email: PHILIPPE.JANISSE@RW01.COM  
 2. Email: AGD@RW01.COM

### Regulatory Requirements:

No Regulatory Requirement  
 (Please check all applicable boxes)

Regulation 153/04  Sewer Use  Regulation 558

Table \_\_\_\_\_  
 Ind/Com  Sanitary  CCME  
 Res/Park  Storm  Prov. Water Quality Objectives (PWQO)  
 Agriculture  Other  ODWS  
 Soil Texture (Check One) \_\_\_\_\_ Region \_\_\_\_\_  
 Coarse  MISA  Fine  Indicate One

### Turnaround Time (TAT) Required:

Regular TAT  5 to 7 Business Days  
 Rush TAT (Rush Surcharges Apply)  
 3 Business Days  2 Business Days  Next Business Day  
 OR Date Required (Rush Surcharges May Apply): \_\_\_\_\_

### Project Information:

Project: 1604066-5001 9001  
 Site Location: BLOCC, OSHTWA  
 Sampled By: DOM / MT  
 AGAT Quote #: 565-2012 PO: \_\_\_\_\_  
 Please note: If quotation number is not provided, client will be billed full price for analysis.

### Is this submission for a Record of Site Condition?

Yes  No

### Report Guideline on Certificate of Analysis

Yes  No

Please provide prior notification for rush TAT  
 \*TAT is exclusive of weekends and statutory holidays

For 'Same Day' analysis, please contact your AGAT CPM

### Invoice Information:

Bill To Same: Yes  No   
 Company: REGLOW OF DIRTAM  
 Contact: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Email: \_\_\_\_\_

### Sample Matrix Legend

B Biota  
 GW Ground Water  
 O Oil  
 P Paint  
 S Soil  
 SD Sediment  
 SW Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Y/N	Field Filtered - Metals, Hg, CrVI	0. Reg 153	Metals and Inorganics	Full Metals Scan	Regulation/Custom Metals	Nutrients: TP NH <sub>3</sub> TKN NO <sub>3</sub> NO <sub>2</sub> NO <sub>3</sub> +NO <sub>2</sub>	Volatiles: VOC BTEX THM	CCME Fractions 1 to 4	ABNS	PAHS	PCBs: Total Aroclors	Organochlorine Pesticides	TCLP: M&I VOCs ABNS B(a)P PCBs	Sewer Use
MW7S-09	8-AUG-17	AM	12	GW	REG 153/04 TABLE 3	N														
MW2-09		AM	12		INSTEAD OF ODWS															
6		PM	7																	
16																				
12																				
9-I																				
9-II																				
11																				
21																				
MW26-08																				
MW25-08	9-AUG-17																			

Samples Relinquished By (Print Name and Sign): <u>DOM</u>	Date: <u>9-AUG-17</u>	Time: -	Samples Received By (Print Name and Sign): <u>Neha</u>	Date: <u>Aug/9/17</u>	Time: <u>640pm</u>
Samples Relinquished By (Print Name and Sign):	Date:	Time:	Samples Received By (Print Name and Sign):	Date:	Time:

Page 1 of 2  
 No: **T 057152**



CLIENT NAME: RWDI  
4510 RHONES DR, UNITE 520  
WINDSOR, ON N8W5K5  
(519) 823-1311

ATTENTION TO: PHILIPPE JANISSE

PROJECT: 1604066 5001 8001

AGAT WORK ORDER: 17T245929

TRACE ORGANICS REVIEWED BY: Gulhan Yalamova, Report Reviewer

WATER ANALYSIS REVIEWED BY: Mike Muneswar, BSc (Chem), Senior Inorganic Analyst

DATE REPORTED: Aug 23, 2017

PAGES (INCLUDING COVER): 10

VERSION\*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

\*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

# Certificate of Analysis

AGAT WORK ORDER: 17T245929

PROJECT: 1604066 5001 8001

 5835 COOPERS AVENUE  
 MISSISSAUGA, ONTARIO  
 CANADA L4Z 1Y2  
 TEL (905)712-5100  
 FAX (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: RWDI

ATTENTION TO: PHILIPPE JANISSE

SAMPLING SITE:

SAMPLED BY: ODM/MT

## Durham - Groundwater - Group F Parameters

DATE RECEIVED: 2017-08-05

DATE REPORTED: 2017-08-23

		SAMPLE DESCRIPTION: MW5001	
		SAMPLE TYPE: Water	
		DATE SAMPLED: 2017-08-04	
Parameter	Unit	G / S	RDL
			8623110
Bicarbonate (as CaCO <sub>3</sub> )	mg/L	5	195
Carbonate (as CaCO <sub>3</sub> )	mg/L	5	<5
Chloride	mg/L	0.10	2.62
Sulphate	mg/L	0.10	15.7
Calcium	mg/L	0.05	11.8
Magnesium	mg/L	0.05	32.1
Sodium	mg/L	0.05	18.1
Potassium	mg/L	0.05	1.04
Boron	mg/L	0.010	0.096
Cadmium	mg/L	0.001	<0.001
Cobalt	mg/L	0.001	<0.001
Lead	mg/L	0.002	<0.002
Mercury	mg/L	0.0001	<0.0001

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8623110 Elevated RDLs indicate the degree of sample dilutions prior to analysis in order to keep the analytes within the calibration range of the instruments and to reduce matrix interferences.

Certified By:



## Quality Assurance

CLIENT NAME: RWDI  
 PROJECT: 1604066 5001 8001  
 SAMPLING SITE:

AGAT WORK ORDER: 17T245929  
 ATTENTION TO: PHILIPPE JANISSE  
 SAMPLED BY: ODM/MT

Water Analysis															
RPT Date: Aug 23, 2017			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE		MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Durham - Groundwater - Group B Parameters															
BOD (5)	8622518		<5	<5	NA	< 5	103%	75%	125%	NA			NA		
Electrical Conductivity	8630623		59	58	1.7%	< 2	101%	80%	120%	NA			NA		
pH	8630623		7.40	7.51	1.5%	NA	100%	90%	110%	NA			NA		
Total Solids	8623013	8623013	845	841	0.5%	< 10	NA	80%	120%	NA			NA		
Total Dissolved Solids	8623318		412	418	1.4%	< 20	98%	80%	120%	NA			NA		
Total Suspended Solids	8623013	8623013	264	269	1.9%	< 10	98%	80%	120%	NA			NA		
Alkalinity (as CaCO3)	8630623		29	27	7.1%	< 5	99%	80%	120%	NA			NA		
Fluoride	8623095	8623095	<0.25	<0.25	NA	< 0.05	101%	90%	110%	94%	90%	110%	98%	80%	120%
Chloride	8623095	8623095	106	106	0.0%	< 0.10	94%	90%	110%	108%	90%	110%	109%	80%	120%
Bromide	8623095	8623095	<0.25	<0.25	NA	< 0.05	107%	90%	110%	103%	90%	110%	93%	80%	120%
Nitrate as N	8623095	8623095	<0.25	<0.25	NA	< 0.05	98%	90%	110%	107%	90%	110%	106%	80%	120%
Nitrite as N	8623095	8623095	<0.25	<0.25	NA	< 0.05	NA	90%	110%	99%	90%	110%	94%	80%	120%
Sulphate	8623095	8623095	80.4	80.7	0.4%	< 0.10	98%	90%	110%	106%	90%	110%	106%	80%	120%
Phosphate as P	8623095	8623095	<0.50	<0.50	NA	< 0.10	102%	90%	110%	103%	90%	110%	105%	80%	120%
Total Phosphorus	8633595		0.44	0.44	0.0%	< 0.05	99%	90%	110%	104%	90%	110%	100%	80%	120%
Ammonia as N	8620228		0.29	0.28	3.5%	< 0.02	95%	90%	110%	101%	90%	110%	95%	80%	120%
Chemical Oxygen Demand	8633595		16	15	NA	< 5	106%	90%	110%	96%	90%	110%	96%	70%	130%
Dissolved Organic Carbon	8623013	8623013	26.8	28.5	6.1%	< 0.5	97%	90%	110%	104%	90%	110%	106%	80%	120%
Phenols	8623013	8623013	< 0.001	<0.001	NA	< 0.001	102%	90%	110%	100%	90%	110%	101%	80%	120%
Total Kjeldahl Nitrogen	8626222		0.15	0.14	NA	< 0.10	98%	80%	120%	99%	80%	120%	99%	70%	130%
Colour	8623013	8623013	102	105	2.9%	< 5	107%	90%	110%	NA			NA		
Turbidity	8623013	8623013	247	249	0.8%	< 0.5	99%	90%	110%	NA			NA		
Calcium	8623057	8623057	66.7	67.1	0.6%	< 0.05	100%	90%	110%	100%	90%	110%	99%	70%	130%
Magnesium	8623057	8623057	29.6	29.9	1.0%	< 0.05	100%	90%	110%	100%	90%	110%	97%	70%	130%
Sodium	8623057	8623057	33.0	32.9	0.3%	< 0.05	100%	90%	110%	100%	90%	110%	99%	70%	130%
Potassium	8623057	8623057	8.39	8.54	1.8%	< 0.05	99%	90%	110%	100%	90%	110%	100%	70%	130%
Aluminum	8623013	8623013	0.027	0.024	11.8%	< 0.004	110%	90%	110%	109%	80%	120%	112%	70%	130%
Antimony	8623013	8623013	< 0.006	<0.006	NA	< 0.006	100%	90%	110%	101%	80%	120%	106%	70%	130%
Arsenic	8623013	8623013	< 0.003	<0.003	NA	< 0.003	99%	90%	110%	104%	80%	120%	112%	70%	130%
Barium	8623013	8623013	0.207	0.203	2.0%	< 0.002	100%	90%	110%	102%	80%	120%	98%	70%	130%
Boron	8623013	8623013	0.397	0.392	1.3%	< 0.010	100%	90%	110%	104%	80%	120%	108%	70%	130%
Cadmium	8623013	8623013	< 0.002	<0.002	NA	< 0.002	103%	90%	110%	106%	80%	120%	109%	70%	130%
Chromium	8623013	8623013	< 0.003	<0.003	NA	< 0.003	104%	90%	110%	107%	80%	120%	118%	70%	130%
Cobalt	8623013	8623013	0.001	0.001	NA	< 0.001	101%	90%	110%	108%	80%	120%	108%	70%	130%
Copper	8623013	8623013	< 0.003	<0.003	NA	< 0.003	102%	90%	110%	105%	80%	120%	102%	70%	130%
Iron	8623013	8623013	0.241	0.239	0.8%	< 0.010	110%	90%	110%	105%	80%	120%	111%	70%	130%
Lead	8623013	8623013	< 0.002	<0.002	NA	< 0.002	103%	90%	110%	110%	80%	120%	104%	70%	130%
Manganese	8623013	8623013	0.084	0.083	1.2%	< 0.002	108%	90%	110%	107%	80%	120%	108%	70%	130%
Molybdenum	8623013	8623013	< 0.001	<0.001	NA	< 0.001	101%	90%	110%	99%	80%	120%	105%	70%	130%

## Quality Assurance

CLIENT NAME: RWDI  
 PROJECT: 1604066 5001 8001  
 SAMPLING SITE:

AGAT WORK ORDER: 17T245929  
 ATTENTION TO: PHILIPPE JANISSE  
 SAMPLED BY: ODM/MT

### Water Analysis (Continued)

RPT Date: Aug 23, 2017			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits		
								Lower	Upper		Lower	Upper		Lower	Upper	
Nickel	8623013	8623013	0.015	0.014	NA	< 0.003	103%	90%	110%	110%	80%	120%	106%	70%	130%	
Selenium	8623013	8623013	0.006	0.006	NA	< 0.004	102%	90%	110%	104%	80%	120%	115%	70%	130%	
Zinc	8623013	8623013	< 0.005	< 0.005	NA	< 0.005	106%	90%	110%	108%	80%	120%	114%	70%	130%	

Comments: NA signifies Not Applicable.  
 Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

  
 Certified By: \_\_\_\_\_

## Method Summary

CLIENT NAME: RWDI  
 PROJECT: 1604066 5001 8001  
 SAMPLING SITE:

AGAT WORK ORDER: 17T245929  
 ATTENTION TO: PHILIPPE JANISSE  
 SAMPLED BY: ODM/MT

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
BOD (5)	INOR-93-6006	SM 5210 B	DO METER
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
Electrical Conductivity (calculated)		SM 1030 E	CALCULATION
pH	INOR-93-6000	SM 4500-H+ B	PC TITRATE
Langelier Index		SM 2330B	CALCULATION
Total Solids	INOR-93-6028	SM 2540 B	BALANCE
Total Dissolved Solids	INOR-93-6028	SM 2540 C	BALANCE
Total Dissolved Solids (calculated)		SM 1030 E	CALCULATION
Total Suspended Solids	INOR-93-6028	SM 2540 D	BALANCE
Total Hardness (as CaCO <sub>3</sub> )	MET-93-6105	EPA SW-846 6010C & 200.7 & SM 2340 B	ICP/OES
Alkalinity (as CaCO <sub>3</sub> )	INOR-93-6000	SM 2320 B	PC TITRATE
Fluoride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Bromide	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Phosphate as P	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Total Phosphorus	INOR-93-6057	QuikChem 10-115-01-3-A & SM 4500-P I	LACHAT FIA
Ammonia as N	INOR-93-6059	QuikChem 10-107-06-1-J & SM 4500 NH <sub>3</sub> -F	LACHAT FIA
Chemical Oxygen Demand	INOR-93-6042	SM 5220 D	SPECTROPHOTOMETER
Dissolved Organic Carbon	INOR-93-6049	EPA 415.1 & SM 5310 B	SHIMADZU CARBON ANALYZER
Phenols	INOR-93-6050	MOE ROPHEN-E 3179 & SM 5530 D	TECHNICON AUTO ANALYZER
Total Kjeldahl Nitrogen	INOR-93-6048	QuikChem 10-107-06-2-I & SM 4500-Norg D	LACHAT FIA
Colour	INOR-93-6046	SM 2120 B	SPECTROPHOTOMETER
Turbidity	INOR-93-6044	SM 2130 B	NEPHELOMETER
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Aluminum	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Antimony	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Arsenic	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Barium	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Boron	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Chromium	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Copper	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Iron	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Manganese	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Molybdenum	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Nickel	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Selenium	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Zinc	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS

## Method Summary

CLIENT NAME: RWDI  
 PROJECT: 1604066 5001 8001  
 SAMPLING SITE:

AGAT WORK ORDER: 17T245929  
 ATTENTION TO: PHILIPPE JANISSE  
 SAMPLED BY: ODM/MT

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Anion Sum		SM 1030 E	CALCULATION
Cation Sum		SM 1030 E	CALCULATION
% Difference/ Ion Balance		SM 1030 E	CALCULATION
Bicarbonate (as CaCO <sub>3</sub> )	INOR-93-6000	SM 2320 B	PC TITRATE
Carbonate (as CaCO <sub>3</sub> )	INOR-93-6000	SM 2320 B	PC TITRATE
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Mercury	MET-93-6100	EPA SW 846 7470 & 245.1	CVAAS



# AGAT Laboratories

5835 Coopers Avenue  
Mississauga, Ontario L4Z 1Y2  
Ph: 905.712.5100 Fax: 905.712.5122  
webearth.agatlabs.com

### Laboratory Use Only

Work Order #: 17T245929  
Cooler Quantity: 4 BIK  
Arrival Temperatures: 5.0, 5.1, 5.2, 5.3  
Custody Seal Intact:  Yes  No  N/A  
Notes:

## Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

### Report Information:

Company: RW01  
Contact: PHIL JANISSE  
Address: 5110 RHODES DR  
WINDSOR, ON N6L 5K5  
Phone: 519-823-1311 FAX:  
Reports to be sent to:  
1. Email: PHILIPPE.JANISSE@RW01.COM  
2. Email: AGD@RW01.COM

### Regulatory Requirements:

No Regulatory Requirement  
(Please check all applicable boxes)  
 Regulation 153/04  Sewer Use  Regulation 558  
 Ind/Com  Sanitary  CCME  
 Res/Park  Storm  Prov. Water Quality Objectives (PWQO)  
 Agriculture  Other ODWS  
Soil Texture (Check One) Region Indicate One  
 Coarse  MISA  
 Fine

### Project Information:

Project: 160606, 5001, 8001  
Site Location: STATION WHITBY  
Sampled By: DDM/ML  
AGAT Quote #: 565-2012 PO:

### Is this submission for a Record of Site Condition?

Yes  No

### Report Guideline on Certificate of Analysis

Yes  No

### Turnaround Time (TAT) Required:

Regular TAT  5 to 7 Business Days  
Rush TAT (Rush Surcharges Apply)  
 3 Business Days  2 Business Days  Next Business Day  
OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT  
\*TAT is exclusive of weekends and statutory holidays

For 'Same Day' analysis, please contact your AGAT CPM

### Invoice Information:

Bill To Same: Yes  No   
Company: REGION OF DURHAM  
Contact:  
Address:  
Email:

### Sample Matrix Legend

B Biota  
GW Ground Water  
O Oil  
P Paint  
S Soil  
SD Sediment  
SW Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Y/N	Field Filtered - Metals, Hg, CrVI	Metals and Inorganics	Regulation/Custom Metals	Nutrients	Volatiles	CCME Fractions 1 to 4	ABNs	PAHs	PCBs	Organochlorine Pesticides	TCLP	Sewer Use	
<del>12-1</del>	<del>1</del>					<del>N</del>		<input type="checkbox"/> All Metals <input type="checkbox"/> 153 Metals (excl. hydrides) <input type="checkbox"/> Hydride Metals <input type="checkbox"/> 153 Metals (incl. Hydrides) ORPs: <input type="checkbox"/> B-HWS <input type="checkbox"/> Cl- <input type="checkbox"/> CN- <input type="checkbox"/> Cr* <input type="checkbox"/> EC <input type="checkbox"/> FOC <input type="checkbox"/> Hg <input type="checkbox"/> pH <input type="checkbox"/> SAR Full Metals Scan		<input type="checkbox"/> TP <input type="checkbox"/> NH <sub>3</sub> <input type="checkbox"/> TKN <input type="checkbox"/> NO <sub>3</sub> <input type="checkbox"/> NO <sub>2</sub> <input type="checkbox"/> NO <sub>x</sub> +NO <sub>2</sub>	<input type="checkbox"/> VOC <input type="checkbox"/> BTEX <input type="checkbox"/> THM								
13-1	1-AUG-17	AM	9	GW		N													
14-2	1-AUG-17	AM	9			N													
MW7D-09	3-AUG-17	AM	12			N													
MW 2A		AM	3			N													
MW 2B		AM	1			N													
MW 1		PM				N													
MW 4						N													
MW 5A						N													
MW 5B						N													

Samples Relinquished By (Print Name and Sign): <u>DDM [Signature]</u>	Date: <u>1-AUG-17</u>	Time: <u>6:30 PM</u>	Samples Received By (Print Name and Sign): <u>Neil Ramnath [Signature]</u>	Date: <u>Aug 4, 17</u>	Time: <u>6:35 PM</u>
Samples Relinquished By (Print Name and Sign):	Date:	Time:	Samples Received By (Print Name and Sign):	Date:	Time:
Samples Relinquished By (Print Name and Sign):	Date:	Time:	Samples Received By (Print Name and Sign):	Date:	Time:

Page 1 of 1  
No: **T 055741**

CLIENT NAME: RWDI  
605 ROSSLAND ROAD EAST, PO BOX 710  
WHITBY, ON L1N0A9  
(905) 668-7711

ATTENTION TO: PHILIPPE JANISSE

PROJECT: 1604066.8001

AGAT WORK ORDER: 17T286683

WATER ANALYSIS REVIEWED BY: Yris Verastegui, Report Reviewer

DATE REPORTED: Dec 27, 2017

PAGES (INCLUDING COVER): 7

VERSION\*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

\*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.



## Certificate of Analysis

AGAT WORK ORDER: 17T286683

PROJECT: 1604066.8001

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
FAX (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: RWDI

SAMPLING SITE:

ATTENTION TO: PHILIPPE JANISSE

SAMPLED BY: Sonia Lee

### Durham - Groundwater - Group F Parameters

DATE RECEIVED: 2017-11-22

DATE REPORTED: 2017-12-27

Parameter	Unit	SAMPLE DESCRIPTION:		MW1	MW2A	MW2B	MW3A - R			
		SAMPLE TYPE:		Water	Water	Water	Water			
		DATE SAMPLED:		2017-11-21	2017-11-21	2017-11-21	2017-11-21			
		G / S	RDL	8925099	RDL	8925118	RDL	8925121	RDL	8925124
Bicarbonate (as CaCO3)	mg/L		5	248	5	198	5	251	5	157
Carbonate (as CaCO3)	mg/L		5	<5	5	<5	5	<5	5	<5
Chloride	mg/L		0.50	22.7	0.10	2.36	0.50	132	0.10	5.90
Sulphate	mg/L		0.50	166	0.10	15.7	0.50	74.0	0.10	21.9
Calcium	mg/L		0.05	72.2	0.05	12.2	0.05	52.1	0.05	18.6
Magnesium	mg/L		0.05	51.5	0.05	31.8	0.05	63.2	0.05	10.8
Sodium	mg/L	20	0.05	17.1	0.05	16.9	0.05	34.9	0.05	38.4
Potassium	mg/L		0.05	3.24	0.05	0.98	0.05	2.25	0.05	1.13
Boron	mg/L	5	0.010	0.018	0.010	0.090	0.010	0.074	0.010	0.134
Cadmium	mg/L	0.005	0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002
Cobalt	mg/L		0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001
Lead	mg/L	0.01	0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002
Mercury	mg/L	0.001	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001

Certified By:

*Jris Veraástequi*

# Certificate of Analysis

AGAT WORK ORDER: 17T286683

PROJECT: 1604066.8001

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
FAX (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: RWDI

SAMPLING SITE:

ATTENTION TO: PHILIPPE JANISSE

SAMPLED BY: Sonia Lee

## Durham - Groundwater - Group F Parameters

DATE RECEIVED: 2017-11-22

DATE REPORTED: 2017-12-27

Parameter	Unit	SAMPLE DESCRIPTION: MW3B - R		MW5A		MW5B		GW DUP 1		
		SAMPLE TYPE: Water		Water		Water		Water		
		DATE SAMPLED: 2017-11-21		2017-11-21		2017-11-21		2017-11-21		
		G / S	RDL	8925132	RDL	8925136	RDL	8925137	RDL	8925139
Bicarbonate (as CaCO <sub>3</sub> )	mg/L		5	252	5	234	5	258	5	199
Carbonate (as CaCO <sub>3</sub> )	mg/L		5	<5	5	<5	5	<5	5	<5
Chloride	mg/L		0.50	10.9	0.10	1.48	0.50	34.4	0.10	2.36
Sulphate	mg/L		0.50	81.0	0.10	9.97	0.50	82.1	0.10	15.7
Calcium	mg/L		0.05	48.4	0.05	16.3	0.05	33.4	0.05	12.3
Magnesium	mg/L		0.05	32.8	0.05	37.3	0.05	59.9	0.05	32.3
Sodium	mg/L	20	0.05	29.0	0.05	10.1	0.05	15.5	0.05	16.8
Potassium	mg/L		0.05	2.72	0.05	1.61	0.05	2.40	0.05	1.04
Boron	mg/L	5	0.010	0.085	0.010	0.033	0.010	0.042	0.010	0.090
Cadmium	mg/L	0.005	0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002
Cobalt	mg/L		0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001
Lead	mg/L	0.01	0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002
Mercury	mg/L	0.001	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Ontario Drinking Water Quality Standards. Na value is derived from O. Reg. 248  
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8925099 Elevated RDLs indicate the degree of sample dilutions prior to the analysis to keep analytes within the calibration range, reduce matrix interference and/or to avoid contaminating the instrument.

8925121 Elevated RDLs indicate the degree of sample dilutions prior to the analysis to keep analytes within the calibration range, reduce matrix interference and/or to avoid contaminating the instrument.

8925132 Elevated RDLs indicate the degree of sample dilutions prior to the analysis to keep analytes within the calibration range, reduce matrix interference and/or to avoid contaminating the instrument.

8925137 Elevated RDLs indicate the degree of sample dilutions prior to the analysis to keep analytes within the calibration range, reduce matrix interference and/or to avoid contaminating the instrument.

Certified By:

*Jris Veraestegui*



# Guideline Violation

AGAT WORK ORDER: 17T286683

PROJECT: 1604066.8001

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
FAX (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: RWDI

ATTENTION TO: PHILIPPE JANISSE

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
8925121	MW2B	O.Reg.169/03(mg/L)	Durham - Groundwater - Group F Parameters	Sodium	mg/L	20	34.9
8925124	MW3A - R	O.Reg.169/03(mg/L)	Durham - Groundwater - Group F Parameters	Sodium	mg/L	20	38.4
8925132	MW3B - R	O.Reg.169/03(mg/L)	Durham - Groundwater - Group F Parameters	Sodium	mg/L	20	29.0

## Quality Assurance

CLIENT NAME: RWDI  
 PROJECT: 1604066.8001  
 SAMPLING SITE:

AGAT WORK ORDER: 17T286683  
 ATTENTION TO: PHILIPPE JANISSE  
 SAMPLED BY: Sonia Lee

Water Analysis															
RPT Date: Dec 27, 2017			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE		MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

**Durham - Groundwater - Group F Parameters**

Bicarbonate (as CaCO3)	8933992		398	404	1.5%	< 5	NA	80%	120%	NA			NA		
Carbonate (as CaCO3)	8933992		<5	<5	NA	< 5	NA	80%	120%	NA			NA		
Chloride	8925137	8925137	34.4	34.5	0.3%	< 0.10	90%	90%	110%	104%	90%	110%	105%	80%	120%
Sulphate	8925137	8925137	82.1	82.3	0.2%	< 0.10	96%	90%	110%	101%	90%	110%	99%	80%	120%
Calcium	8924899		105	105	0.0%	< 0.05	100%	90%	110%	100%	90%	110%	124%	70%	130%
Magnesium	8924899		34.2	34.0	0.6%	< 0.05	102%	90%	110%	101%	90%	110%	123%	70%	130%
Sodium	8924899		17.9	17.9	0.0%	< 0.05	99%	90%	110%	98%	90%	110%	119%	70%	130%
Potassium	8924899		3.53	3.55	0.6%	< 0.05	98%	90%	110%	98%	90%	110%	118%	70%	130%
Boron	8925099	8925099	0.018	0.018	NA	< 0.010	101%	90%	110%	101%	80%	120%	85%	70%	130%
Cadmium	8925099	8925099	<0.002	<0.002	NA	< 0.002	100%	90%	110%	101%	80%	120%	101%	70%	130%
Cobalt	8925099	8925099	<0.001	<0.001	NA	< 0.001	95%	90%	110%	95%	80%	120%	92%	70%	130%
Lead	8925099	8925099	<0.002	<0.002	NA	< 0.002	99%	90%	110%	101%	80%	120%	97%	70%	130%
Mercury	8925099	8925099	<0.0001	<0.0001	NA	< 0.0001	103%	90%	110%	102%	90%	110%	96%	80%	120%

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL

Certified By: \_\_\_\_\_

*Jris Verastegui*

## Method Summary

 CLIENT NAME: RWDI  
 PROJECT: 1604066.8001  
 SAMPLING SITE:

 AGAT WORK ORDER: 17T286683  
 ATTENTION TO: PHILIPPE JANISSE  
 SAMPLED BY: Sonia Lee

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Bicarbonate (as CaCO <sub>3</sub> )	INOR-93-6000	SM 2320 B	PC TITRATE
Carbonate (as CaCO <sub>3</sub> )	INOR-93-6000	SM 2320 B	PC TITRATE
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Boron	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Mercury	MET-93-6100	EPA SW-846 7470 & 245.1	CVAAS



CLIENT NAME: RWDI  
4510 RHONES DR, UNITE 520  
WINDSOR, ON N8W5K5  
(519) 823-1311

ATTENTION TO: PHILIPPE JANISSE

PROJECT: 1604066, 8001

AGAT WORK ORDER: 17T287182

WATER ANALYSIS REVIEWED BY: Yris Verastegui, Report Reviewer

DATE REPORTED: Nov 29, 2017

PAGES (INCLUDING COVER): 6

VERSION\*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

\*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.



## Certificate of Analysis

AGAT WORK ORDER: 17T287182

PROJECT: 1604066, 8001

5835 COOPERS AVENUE  
 MISSISSAUGA, ONTARIO  
 CANADA L4Z 1Y2  
 TEL (905)712-5100  
 FAX (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: RWDI

ATTENTION TO: PHILIPPE JANISSE

SAMPLING SITE:

SAMPLED BY:

### Durham - Groundwater - Group F Parameters

DATE RECEIVED: 2017-11-17

DATE REPORTED: 2017-11-28

		SAMPLE DESCRIPTION:		MW4
		SAMPLE TYPE:		Water
		DATE SAMPLED:		2017-11-17
Parameter	Unit	G / S	RDL	8927386
Bicarbonate (as CaCO3)	mg/L		5	289
Carbonate (as CaCO3)	mg/L		5	<5
Chloride	mg/L		1.0	682
Sulphate	mg/L		1.0	32.6
Calcium	mg/L		0.25	82.9
Magnesium	mg/L		0.25	165
Sodium	mg/L	20	0.25	127
Potassium	mg/L		0.25	4.97
Boron	mg/L	5	0.010	0.049
Cadmium	mg/L	0.005	0.002	<0.002
Cobalt	mg/L		0.001	<0.001
Lead	mg/L	0.01	0.002	<0.002
Mercury	mg/L	0.001	0.0001	<0.0001

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O.Reg.169/03(mg/L)  
 Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.  
 8927386 Elevated RDLs indicate the degree of sample dilutions prior to the analysis to keep analytes within the calibration range, reduce matrix interference and/or to avoid contaminating the instrument.

Certified By:

*Jris Veraístequi*



# Guideline Violation

AGAT WORK ORDER: 17T287182

PROJECT: 1604066, 8001

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
FAX (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: RWDI

ATTENTION TO: PHILIPPE JANISSE

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
8927386	MW4	O.Reg.169/03(mg/L)	Durham - Groundwater - Group F Parameters	Sodium	mg/L	20	127

## Quality Assurance

CLIENT NAME: RWDI  
 PROJECT: 1604066, 8001  
 SAMPLING SITE:

AGAT WORK ORDER: 17T287182  
 ATTENTION TO: PHILIPPE JANISSE  
 SAMPLED BY:

Water Analysis																
RPT Date:			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits		
								Lower	Upper		Lower	Upper		Lower	Upper	

Durham - Groundwater - Group F Parameters															
Bicarbonate (as CaCO3)	8925059		218	218	0.0%	< 5	NA	80%	120%						
Carbonate (as CaCO3)	8925059		<5	<5	NA	< 5	NA	80%	120%						
Chloride	8936464		74.7	74.7	0.0%	< 0.10	100%	90%	110%	104%	90%	110%	110%	80%	120%
Sulphate	8936464		201	203	1.0%	< 0.10	99%	90%	110%	104%	90%	110%	106%	80%	120%
Calcium	8916727		95.3	95.7	0.4%	< 0.05	104%	90%	110%	105%	90%	110%	93%	70%	130%
Magnesium	8916727		21.5	21.4	0.5%	< 0.05	104%	90%	110%	105%	90%	110%	92%	70%	130%
Sodium	8916727		30.3	30.1	0.7%	< 0.05	108%	90%	110%	109%	90%	110%	94%	70%	130%
Potassium	8916727		2.34	2.27	3.0%	< 0.05	106%	90%	110%	108%	90%	110%	95%	70%	130%
Boron	8920792		0.015	0.016	NA	< 0.010	106%	90%	110%	100%	80%	120%	80%	70%	130%
Cadmium	8920792		<0.002	<0.002	NA	< 0.002	106%	90%	110%	108%	80%	120%	115%	70%	130%
Cobalt	8920792		<0.001	<0.001	NA	< 0.001	99%	90%	110%	98%	80%	120%	98%	70%	130%
Lead	8920792		<0.002	<0.002	NA	< 0.002	106%	90%	110%	107%	80%	120%	92%	70%	130%
Mercury	8913975		0.01	0.01	0.0%	< 0.0001	100%	90%	110%	98%	90%	110%	102%	80%	120%

Comments: NA signifies Not Applicable.  
 Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By: \_\_\_\_\_

*Yris Veraestegui*

## Method Summary

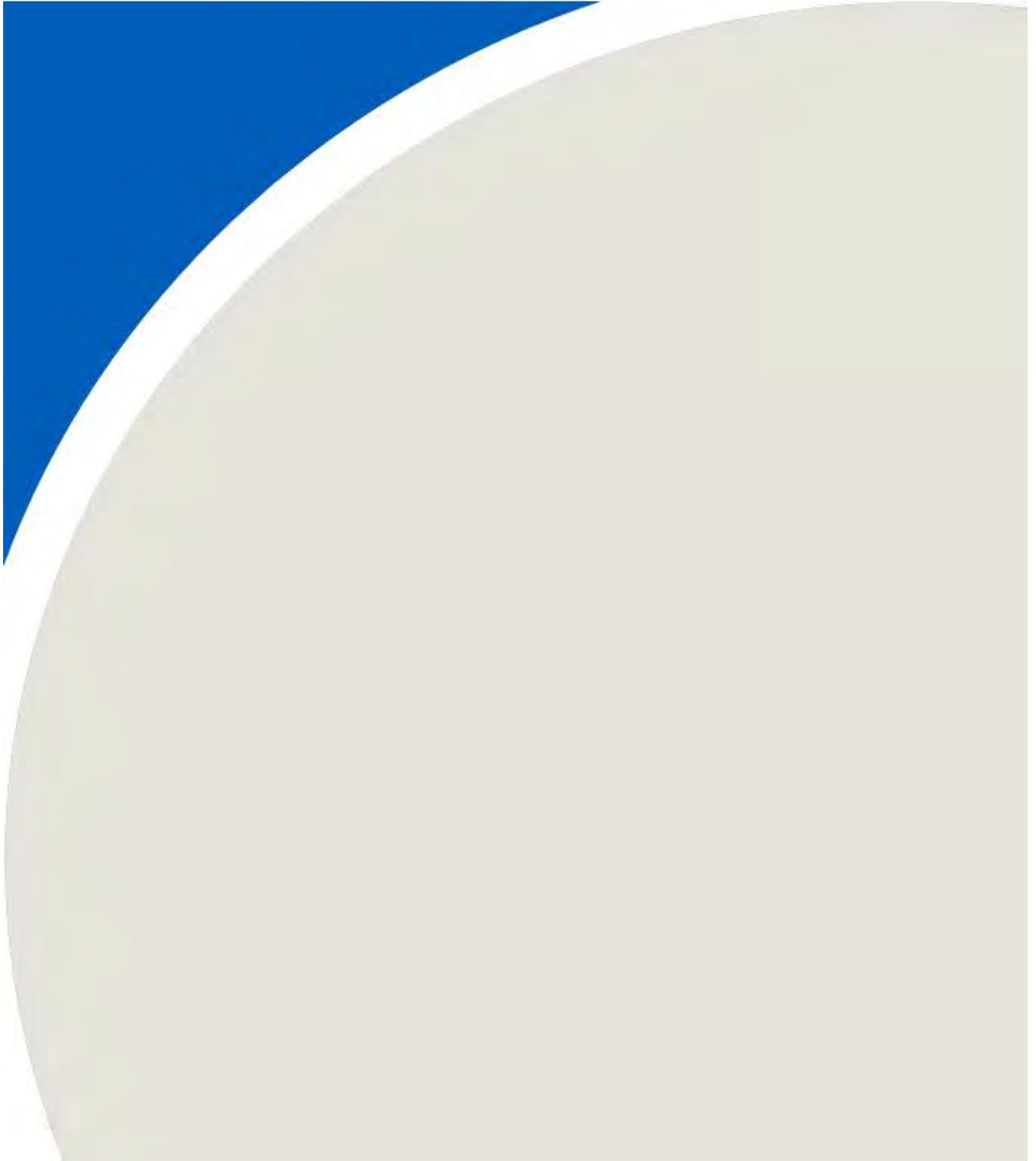
 CLIENT NAME: RWDI  
 PROJECT: 1604066, 8001  
 SAMPLING SITE:

 AGAT WORK ORDER: 17T287182  
 ATTENTION TO: PHILIPPE JANISSE  
 SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Bicarbonate (as CaCO <sub>3</sub> )	INOR-93-6000	SM 2320 B	PC TITRATE
Carbonate (as CaCO <sub>3</sub> )	INOR-93-6000	SM 2320 B	PC TITRATE
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Boron	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW 846 6020A & 200.8	ICP-MS
Mercury	MET-93-6100	EPA SW-846 7470 & 245.1	CVAAS



## APPENDIX F



## 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

<b>Monitoring Report and Site Information</b>	
<b>Waste Disposal Site Name</b>	Durham York Energy Centre
<b>Location (e.g. street address, lot, concession)</b>	1835 Energy Dr., Courtice, Ontario
<b>GPS Location (taken within the property boundary at front gate/ front entry)</b>	NAD 83: Zone 17, 680660E, 4860490N
<b>Municipality</b>	Municipality of Clarington
<b>Client and/or Site Owner</b>	Regional Municipalities of Durham and York
<b>Monitoring Period (Year)</b>	2017
This Monitoring Report is being submitted under the following:	
<b>Certificate of Approval No.:</b>	7306-8FDKNX
<b>Director's Order No.:</b>	
<b>Provincial Officer's Order No.:</b>	
<b>Other:</b>	

<b>Report Submission Frequency</b>	<input checked="" type="radio"/> <b>Annual</b> <input type="radio"/> <b>Other</b>	Specify (Type Here):
<b>The site is:</b>	<input checked="" type="radio"/> <b>Active</b> <input type="radio"/> <b>Inactive</b> <input type="radio"/> <b>Closed</b>	
<b>If closed, specify C of A, control or authorizing document closure date:</b>		
<b>Has the nature of the operations at the site changed during this monitoring period?</b>	<input type="radio"/> <b>Yes</b> <input checked="" type="radio"/> <b>No</b>	
<b>If yes, provide details:</b>	Type Here	
<b>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)</b>	<input type="radio"/> <b>Yes</b> <input checked="" type="radio"/> <b>No</b>	

## 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 <input type="radio"/> No</p>	
<p>2) All groundwater, leachate and WDS gas sampling and monitoring for the monitoring period being reported on was successfully completed as required by Certificate(s) of Approval or other relevant authorizing/control document(s):</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> No <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>3) a) Some or all groundwater, leachate and WDS gas sampling and monitoring requirements have been established or defined outside of a ministry C of A, authorizing, or control document.</p>	<p><input type="radio"/> Yes  <input checked="" type="radio"/> No  <input type="radio"/> Not Applicable</p>	
<p>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:</p>	<p><input type="radio"/> Yes  <input type="radio"/> No  <input checked="" type="radio"/> Not Applicable</p>	<p>If no, list exceptions below or attach additional information.</p>
<p><b>Groundwater Sampling Location</b></p>	<p><b>Description/Explanation for change (change in name or location, additions, deletions)</b></p>	<p><b>Date</b></p>
<p>4) All field work for groundwater investigations was done in accordance with standard operating procedures 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>	

## Sampling and Monitoring Program Results/WDS Conditions and Assessment:

<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 type="radio"/> Yes <input checked="" type="radio"/> No</p>	<p>Refer to Section 4.4 of the 2017 Annual Groundwater and Surface Water Monitoring Report for additional details. There was one ODWS exceedance in 2017 (chloride) at MW4, which is attributed to the application of deicing salt.</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 type="radio"/> Yes <input checked="" type="radio"/> No</p>	<p>Refer to Section 4.3 of the 2017 Annual Groundwater and Surface Water Monitoring Report for additional details. There were distinct increases in the concentration of salt related constituents (chloride, sodium, calcium, magnesium, and potassium) at MW4 in November 2017, which are attributed to the application of deicing salt.</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>i.</i> The site has developed stable leachate mound(s) and stable leachate plume geometry/concentrations; and</p> <p><i>ii.</i> Seasonal and annual water levels and water quality fluctuations are well understood.</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> No</p>	<p>Note which practice(s):</p>	<p><input type="checkbox"/> (a) <input checked="" type="checkbox"/> (b) <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 type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Not Applicable</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 Certificate of 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:

Select Date

## 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:

<b>Name:</b>	Brent Langille, B.Sc., P.Geo.		
<b>Seal:</b>	Add Image		
<b>Signature:</b>		<b>Date:</b>	
<b>CEP Contact Information:</b>	Brent Langille, B.Sc., P.Geo.		
<b>Company:</b>	RWDI AIR Inc.		
<b>Address:</b>	4510 Rhodes Drive, Unit 530, Windsor, ON N8W 5K5		
<b>Telephone No.:</b>	(519) 823-1311	Fax No. :	(519) 823-1316
<b>E-mail Address:</b>	Brent.Langille@rwdi.com		
<b>Co-signers for additional expertise provided:</b>			
<b>Signature:</b>		<b>Date:</b>	
<b>Signature:</b>		<b>Date:</b>	

## 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):

<b>Name (s)</b>	Tooley Creek and tributaries.
<b>Distance(s)</b>	The nearest natural surface water body to the Site is a tributary of Tooley Creek, located approximately 150 m northwest of the Site. At its nearest point, Tooley Creek is located approximately 700 m southwest of the Site.

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

### Sampling and Monitoring Program Status:

<b>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:</b>	<input type="radio"/> Yes <input checked="" type="radio"/> No	With MOECC approval, the routine surface water monitoring program (i.e., placement and monitoring of sondes in Tooley Creek) for the DYEC has been suspended for at least three (3) years, beginning in 2016, due to construction activities for the Highway 401/Courtice Road interchange. As such, the routine surface water monitoring program for the DYEC was not required to be completed in 2017.
<b>2) All surface water sampling for the monitoring period being reported was successfully completed in accordance with the Certificate(s) of Approval or relevant authorizing/control document(s) (if applicable):</b>	<input checked="" type="radio"/> Yes <input type="radio"/> No  <input type="radio"/> Not applicable (No C of A, authorizing / control document applies)	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

<p>3) a) Some or all surface water sampling and monitoring program requirements for the monitoring period have been established outside of a ministry C of A or authorizing/control document.</p>	<p><input type="radio"/> Yes  <input checked="" type="radio"/> No  <input type="radio"/> Not Applicable</p>	
<p>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:</p>	<p><input type="radio"/> Yes  <input type="radio"/> No  <input checked="" type="radio"/> Not Applicable</p>	<p>If no, specify below or provide details in an attachment.</p>
<p><b>Surface Water Sampling Location</b></p>	<p><b>Description/Explanation for change (change in name or location, additions, deletions)</b></p>	<p><b>Date</b></p>
<p>4) All field work for surface water investigations was done in accordance with standard operating procedures, 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  <input type="radio"/> No</p>	<p>Not applicable.</p>

## Sampling and Monitoring Program Results/WDS Conditions and Assessment:

<b>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):</b>	<input checked="" type="radio"/> <b>Yes</b> <input type="radio"/> <b>No</b>
--	--

**If no, list parameters that exceed criteria outlined above and the amount/percentage of the exceedance as per the table below 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. C of A limit, PWQO, background	e.g. X% above PWQO

<b>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)?</b>	<input checked="" type="radio"/> <b>Yes</b> <input type="radio"/> <b>No</b>	Not applicable.
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<p>7) <b>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.</b></p>	<p><input checked="" type="radio"/> <b>Yes</b></p> <p><input type="radio"/> <b>No</b></p>	<p>Not applicable.</p>
<p>8) <b>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)):</b></p>	<p><input checked="" type="radio"/> <b>Yes</b></p> <p><input type="radio"/> <b>No</b></p> <p><input type="radio"/> <b>Not Known</b></p> <p><input type="radio"/> <b>Not Applicable</b></p>	<p>Groundwater quality naturally exceeds select PWQOs. Please refer to the 2017 Annual Groundwater and Surface Water Monitoring Report.</p>
<p>9) <b>Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):</b></p>	<p><input type="radio"/> <b>Yes</b></p> <p><input checked="" type="radio"/> <b>No</b></p> <p><input type="radio"/> <b>Not Applicable</b></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 Certificate of 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>	

<b>CEP Signature</b>		
<b>Relevant Discipline</b>	Geology	
<b>Date:</b>		
<b>CEP Contact Information:</b>	Brent Langille, B.Sc., P.Geo.	
<b>Company:</b>	RWDI AIR Inc.	
<b>Address:</b>	4510 Rhodes Drive, Unit 530, Windsor, ON N8W 5K5	
<b>Telephone No.:</b>	(519) 823-1311	
<b>Fax No. :</b>	(519) 823-1316	
<b>E-mail Address:</b>	Brent.Langille@rwdi.com	
<b>Save As</b>		<b>Print Form</b>