February 2016

MCCARTHY QUARRY

McCarthy Quarry 2015 Annual Permit To Take Water Compliance Report

Submitted to:
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Barrie District Office
1203-54 Cedar Pointe Drive
Barrie, ON L4N 5R7

REPORT

Report Number: 1407634

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Golder Associates

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1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by QBJR/Coco Aggregates Inc. (Coco) to prepare the annual Permit To Take Water (PTTW) report for the McCarthy Quarry (the Site) located in the Township of Ramara, County of Simcoe (Figure 1). The annual report is a requirement of the PTTW No. 7818-9QJNL4 which expires December 31, 2019 (Appendix A). The PTTW for McCarthy Quarry authorizes pumping of up to 6,544,800 L/day with a maximum taking of 196,500,000 L/year over a maximum of 150 days per year. The disposal of water from the Site is governed by Environmental Compliance Approval (ECA) No. 4731-987KM8 under Section 20.2 of the Environmental Protection Act.

The property is located approximately six kilometres south-east of the Community of Brechin at Lot 1, Concession 1, Township of Ramara former Mara, Simcoe County (Figures 1 and 2). The area around the Site is primarily rural consisting of woodlots, pasture and scattered single-family homes. To the south and east along the Talbot River and Canal Lake are numerous seasonal and year round residences.

PTTW No. 7818-9QJNL4 directs Coco to regularly collect monitoring data of the Site water taking, groundwater levels in the on-Site monitoring wells and off-Site residential wells, groundwater quality in selected on-Site monitoring wells and off-Site residential wells and meteorological data from an on-Site meteorological station (Conditions 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7 and 4.10). Coco is also required to maintain a publically accessible site on the internet containing the required monitoring data and every report that has been required by the PTTW (Condition 4.13). Coco is also required to establish a Public Liaison Committee (PLC) that is to meet once every four months (Condition 4.14).

2.0 BACKGROUND INFORMATION

The following provides an overview of the area, including information on the surface water, geological and hydrogeological regime of the Site.

2.1 Geology

The quarry is located on a broad, arching, low relief upland area within a low relief clay and limestone plain typical of the physiography to the east of Lake Simcoe (Chapman & Putman, 1975). The elevation of the land in the area, 255 metres above sea level (masl), places the higher elevations on the property at the shoreline of the glacial Lake Algonquin. The original aggregate operation on this Site extracted gravel deposited on the shoreline of Lake Algonquin. To the south of the Site, the overburden thickens and older silt and clay materials are present over the bedrock. At elevations above 254 masl the land area was in an active erosional environment for approximately 700 years by Lake Algonquin which drained across this area and out the Kirkfield Outlet toward Lake Ontario. In this “washed zone” the surficial geological deposits consist of a patchwork of thin clayey-silt, sandy-silt to silty-sand glacial till, with occasional gravelly beach ridges. Below the level of Lake Algonquin, the pre-existing fine-grained glaciolacustrine and fine-grained till deposits, the land escaped shoreline erosion and in the Talbot River Valley the overburden thickness can reach ten’s of metres in thickness. On the Site, the overburden thickness ranges from 0.3 m to the north at OW9 to approximately 8 m at OW4 to the south.

Underlying the overburden are Middle Ordovician aged limestone of the Verulam, Bobcaygeon and Gull River Formations, which are part of the Simcoe Group. The Verulam Formation consists of thinly bedded limestone and shale or shaley limestone. The Verulam Formation is relatively thin at the Site (0 to 4 m in thickness).

The underlying Bobcaygeon Formation consists of thin to medium bedded limestone's ranging in thickness from approximately 31 m (OW6) to 40 m (OW9) within the area of investigation (Figures 3 and 4). Quarrying at the Site will be primarily in the Bobcaygeon Formation.

The Gull River Formation (approximately 16 m in thickness) will not be quarried at the Site. It consists of fine-grained limestone with minor interbeds of shale or shaley limestone. Beneath the Gill River Formation is the Shadow Lake Formation (estimated to be approximately 7 m thick), which consists of conglomerate sandstone and mudstone, and overlies the Precambrian Bedrock. The Shadow Lake Formation as well as the Precambrian Bedrock was encountered at OW8 and OW7.

2.2 Hydrogeological Setting

The overburden deposits in the area are thin and generally fine-grained. These deposits host numerous dug or bored wells in the area. Bored wells are often preferred by homeowners because of the fresh water that can be obtained. The wells are often vulnerable to the impact of surface activities and frequently filtration and Ultra Violet disinfection is added to domestic water supplies. In the Talbot River Valley there are buried granular deposits that provide sufficient groundwater for domestic use, through both dug and drilled wells.

Wells constructed in the bedrock aquifer most often obtain water supplies from the Gull River Formation. This bedrock, however, is known to contain sulfate minerals and the water often has a sulphurous odour. The deep bedrock wells may also contain salty water where wells intersect a sluggish groundwater flow system. Bedrock wells often produce sufficient water supplies for domestic use; however when wells are drilled deeper than 5 m to 10 m into the bedrock, the well yield is not often improved and the groundwater is prone to containing elevated levels of chloride and sulphur (MOE, 1990).

The Ministry of Environment and Climate Change (MOECC) water well database was reviewed to identify nearby water wells in the vicinity (<1,000 m) of the McCarthy Quarry. Nine wells were located within 1,000 m of McCarthy Quarry, seven of which are on Concession Road 1 and two of which are on the Mara-Eldon Boundary Road.

2.3 Quarry Dewatering

The handling of water will increase as the quarry area increases and the majority of the water removed from the Site will be precipitation and snow melt. Currently, the water taking on-Site is well below the permitted volume of 6,544,800 L/day at a maximum rate of 76 L/sec. Water is removed from the quarry sump at a rate of 35 L/sec and the water pumping ranges from 0 to 3,024,000 L/day (2,100 L/min) (Table 6).

Groundwater and precipitation entering the quarry is collected in a sump on the quarry floor. The sump is equipped with a 4-inch Grindex pump rated at 35 L/sec and is attached to a 4-inch (101 mm) diameter discharge line. The water is pumped from the quarry floor up the quarry face to a 4-inch (101 mm) diameter discharge pipeline that directs the water to a ditch that runs southward through the McCarthy property to the 14,000 m^3 settling pond. The water in the settling pond is discharged to the roadside ditches along Concession Road 1 with a Hickenbottom control structure. The water in the roadside ditch travels eastward along the north side of Concession Road 1 to a municipal drain and eventually to the Talbot River, which discharges to Lake Simcoe.

3.0 MONITORING RESULTS

Monitoring Condition 4.1: Water Level Monitoring of Sump

The quarry floor is approximately 15 metres below ground level (mbgl) or 240 masl and is permitted to be extracted to an elevation of 232 masl to an approximate depth of 27 mbgl.

The current quarry footprint is approximately 400 m by 100 m and the future extent of the quarry is shown in Figure 4. The extraction rate is dictated by market demand and the future size of the quarry is difficult to predict. However, the current extraction is approximately 150,000 m^3/year and at this rate of extraction, the footprint of the quarry would be 18 to 20 ha in ten years if a second lift is not started. If a second lift into the Bobcaygeon Formation is started, then the quarry footprint would be smaller.

Monitoring Condition 4.2: Local Climatic Conditions

The on-Site climate conditions are monitored with an RM Young tipping bucket precipitation gauge with a heater that is connected to the Solinst Rainlogger as well as an on-Site Barologger that measures temperature. Precipitation data was not collected from the weather station in 2015 and the 2015 on-Site weather data was supplemented with weather data from the nearby Environment Canada Barrie-Oro weather station. Figure 5 illustrates the precipitation and temperature data collected at the meteorological station for the 2015 monitoring period.

The on-Site meteorological data is used to evaluate fluctuations in the groundwater elevations throughout the monitoring period as well as to estimate how the water pumped from the quarry sump is actually surface water runoff.

Monitoring Condition 4.3, 4.4 and 4.5: Groundwater Elevations

Water level monitoring has been ongoing at the McCarthy Quarry since the early stages of quarry development commencing in 2002 and ongoing until 2010. Both on-Site observation wells and off-Site residential wells have been incorporated into the monitoring program in order to meet the requirements of Conditions 4.3, 4.4, 4.5 and 4.6. Pressure transducers are installed in select wells for daily monitoring of the groundwater elevation and monthly monitoring is completed with a manual water level meter. The monitoring wells and residential wells that are monitored are listed in Table 1.

Table 1: Groundwater Monitoring Locations

	Daily Monitoring	**Monthly Monitoring**
Monitoring Wells	OW4-1, OW4-2, OW5-1, OW6-1, OW6-2, OW9-1, OW9-2, Bored,CKL-1 and CKL-2	AM1b, AMx, TW1-1, OW4-1, OW4-2, OW5-1, OW5-2, OW5-3, OW6-1, OW6-2, OW6-3, OW7-1, OW7-2, OW7-3, OW8-1, OW8-2, OW8-3, OW9-1, OW9-2, Bored, CKL-1 and CKL-2
Residential Wells	DW3	DW3, DW1, DW2, DW4, DW5*, DW6*, DW7* and DW8*

*Monitored at least once every two months

The water level monitoring data for the 2015 monitoring period is presented in graphic form on Figures 6 to 10 and is listed in Table 2. The ongoing hydrographs can be found in Appendix B. The groundwater monitoring

locations are provided on Figures 1 and 2. With the exception of OW9-1 and OW8-3 (Figures 8 and 9, respectively) no declining trends were observed in the monitoring wells during the 2015 monitoring period. These three monitoring wells are in close proximity to the active quarry and it was noted during the PTTW renewal that these monitoring locations are being impacted by the ongoing dewatering activities at the Site. These monitoring locations allow for a zone of influence to be mapped out surrounding the quarry. Additionally, when looking at the historical ranges (Appendix B) the deeper Gull River and Precambrian monitors appear to be changing with time; however, these monitoring wells are much deeper than the quarry excavation and the variation is due to external forces.

Monitoring wells installed in the overburden materials are: Bored, OW5-1, AM1b and CKL-1. The following private off-Site residential wells are part of the monitoring program: DW1, DW2, DW4, DW5, DW6, DW7 and DW8. The location of these wells is shown in Figure 6. The fluctuations in the groundwater elevations at the overburden observation wells have been minimal since the beginning of the monitoring program in 2006 (Appendix B). During the 2015 monitoring program, the groundwater levels at the on-Site overburden monitoring wells have fluctuated as little as 0.30 m at CKL-1 and as much as 1.09 m at AM1b.

The water levels in the upper bedrock, Verulam Formation, are monitored at wells DW3, OW4-1, OW6-1, OW7-1, OW8-1, AMx and CKL-2 (Figure 7). Changes in the groundwater elevations in the on-Site Verulam Formation ranged from 0.87 m at OW6-1 to 2.01 m at OW8-1. AMx was monitored until April 2015; it was within the quarry extraction area and was removed as the quarry face advanced towards the south. A replacement monitoring well for AMx should be installed along the western property boundary between the quarry face and OW4 in 2016.

Water levels in the Bobcaygeon Formation are monitored at OW4-2, OW5-2, OW5-3, OW6-2, OW7-2, OW8-2, OW9-1, OW9-2 and TW1-1(Figure 8). Changes in the groundwater elevation in the Bobcaygeon Formation ranged from 0.90 m at OW4-2 to 2.76 m at TW1-1; however, the groundwater elevation changes were significantly greater at OW9-1 (lower by 6.50 m). The water level changes at OW9-1 appear to be related to quarrying. OW9 is approximately 10 m from the active quarry face now and was originally installed 230 m away from the quarry face. The water levels started to react to gravity drainage when the quarry face was at a distance of approximately 150 m from the well. This is consistent with observations of drawdown at other quarries in this rock type.

Water levels in the Gull River Formation are monitored at OW6-3, OW7-3 and OW8-3 (Figure 9). Changes in the groundwater elevation in the Gull River Formation ranged from 0.79 m at OW7-3 to 4.06 m at OW8-3.

The Precambrian bedrock monitoring well is TW1-2. Changes in the groundwater elevation in the Precambrian bedrock monitoring was 0.89 m at TW1-2.

The regional groundwater flow in the Upper Bobcaygeon Formation is generally towards Lake Simcoe in the southwest direction (Figure 2). The regional groundwater flow in the overburden material is most influenced by the topography in the area and the Talbot River and is general in the south-southeast direction (Figure 1).

Impact Assessment

The impact of development of the McCarthy Quarry as a result of dewatering is minimal. Drawdowns attributable to the quarrying operations have been observed at OW9 and AMx. OW9 was installed after

extraction had begun at the quarry; therefore there are no pre-extraction water level data; however water levels were stable until the quarry face was about 150 m from OW9.

OW9 is now currently approximately 50 m from the working face of the quarry and the water levels in the upper screen have declined approximately 15 m in response to the lowering of the groundwater table in the quarry footprint (Figure 8). Based on these observations, drawdown occurs in the shallow bedrock when the quarry face is closer than 150 m. The monitoring well AMx also showed signs of impact as the quarry face approached (Figure B-2).

Supporting this observation are water levels in upper bedrock observation wells OW4, OW6 and OW7 where the water levels are within their respective ranges, accounting for seasonal variation, and do not indicate impact from dewatering. It can be concluded from this that the impact area of quarry dewatering is restricted to less than 150 m from the quarry face. Off-Site impacts are not expected for several years as quarrying will be in the northern part of the Site. At the current extraction rate of approximately 2 ha per year, the quarry will expand to approximately 12 ha over the next five years or 20 ha over the next ten years, unless a deeper lift is developed, then the quarry footprint would be smaller.

The closest neighbour, McIntosh residence, is approximately 280 m from the closest the excavation could be to their water supply well. It is not expected that this well will be impacted during the life of the current PTTW renewal application. The on-Site observation wells (OW4 and OW6) will serve as sentinel wells for impacts at the McIntosh well.

Monitoring Condition 4.6 and 4.7: Groundwater Quality

Groundwater quality is analyzed on a semi-annual basis at both on-Site monitoring wells and off-Site residential wells. A summary of the parameters and locations are provided in Table 3.

The results from the water quality monitoring program from May 2015 and October 2015 can be found in Appendix C as well as in Tables 4 and 5. The water quality results have been compared to Ontario Drinking Water Standards (ODWS) and any exceedances have been highlighted.

The off-Site private residential wells have been tested since April 2013 and were tested in May and October of 2015 (Table 4). The water quality at DW1, DW2 and DW4 met the ODWS during the 2015 sampling events for the parameters tested with the exception of Total Dissolved Solids (TDS) at DW1, D2 and D3 (maximum of 964 mg/L at DW1 in May 2015) and Hardness ($CaCO_3$) at DW1, DW2 and DW3 (maximum of 590 mg/L at DW1 in May 2015).

At the on-Site monitoring wells, the water quality continues to represent the pre-quarry conditions (Table 5), which is representative of the overburden and bedrock conditions found in the Carden Plain. Azimuth (2008) interpreted the water quality signatures defined by the major ion chemistry at the McCarthy Quarry and found that the signatures represent groundwater that has been mineralized by host rocks as brackish waters.

Table 3: Groundwater Quality Requirements

	Monitoring Locations	Water Quality Parameters
Monitoring Wells	AM1b, AMx, TW1-1, Bored, OW4-1, OW4-2, OW5-1, OW5-2, OW5-3, OW6-2, OW7-1, OW7-2, OW8-1, OW8-2, OW9-1 and OW9-2	pH, Alkalinity, Bicarbonate, Fluoride, Chloride, Magnesium, Calcium, Sodium, Potassium, Ammonia, Sulphate, Nitrate, Nitrite, Phosphate, Phosphorous, Conductivity, DOC, Colour, TDS, Hardness
Residential Wells	DW3, DW1 and DW2	pH, Alkalinity (CaCO3), Bicarbonate, Conductivity, Fluoride, Chloride, Nitrate, Nitrite, Chromium, Tannins, Sulphate, Magnesium, Calcium, Sodium, Potassium, Ammonia (N), Phosphate, Phosphorous, Anion Sum, Cation Sum, DOC, Colour, Turbidity, Aluminium, Arsenic, Barium, Boron, Cadmium, Ion Ratio, % Difference, Copper, Iron, Lead, Manganese, Selenium, Zinc, Hardness (CaCO3), TDS (iron sum calc.), Langelier Index

Monitoring Condition 4.10 and 4.12 Water Taking Measurements and Reporting

The rate and volume of discharge from the quarry is measured on-Site by an inline flow meter in the discharge line from the quarry sump. The pump records are provided by McCarthy Quarry staff. The pump records for January 2015 to December 2015 are found in Table 6. The discharge rate between January 2015 and December 2015 was below the permitted rate of 4,545 L/min (76 L/sec).

As previously mentioned the dewatering equipment consists of a Grindex pump with a 4-inch discharge capable of pumping 35 L/sec. Estimating the precipitation proportion of the water taking can be done by assuming the moisture surplus is 500 mm/year and that the capture area for the excavation is 15 ha (the stripped area including the excavation). This volume of water is equal to 75,000,000 L and the total volume removed from January 1 to December 31, 2015 is 157,878,000 L, which results in a proportion of groundwater of 52%. The total volume of water removed is less than the maximum taking of 196,500,000 L/year; however, the pumping was completed for a total of 179 days in 2015, which exceeded the maximum of 150 days per year.

Condition 4.13 Publically-accessible Site

The water quality and quantity monitoring data that is required by the PTTW is available at:

www.cocoaggregates.com

To access the reports for the McCarthy Quarry click “Documents” on the homepage.

4.0 RECOMMENDATIONS

Golder recommends that the groundwater monitoring continue as outlined in the PTTW No. 7818-9QJNL4.

5.0 LIMITATIONS AND USE OF REPORT

The services performed as described in this report were conducted in a manner consistent with the level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

Any use which a third party makes this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

6.0 CLOSURE

We trust that this report meets your needs at the present time. If you have any questions or require clarification, please do not hesitate to contact the undersigned.

Report Signature Page

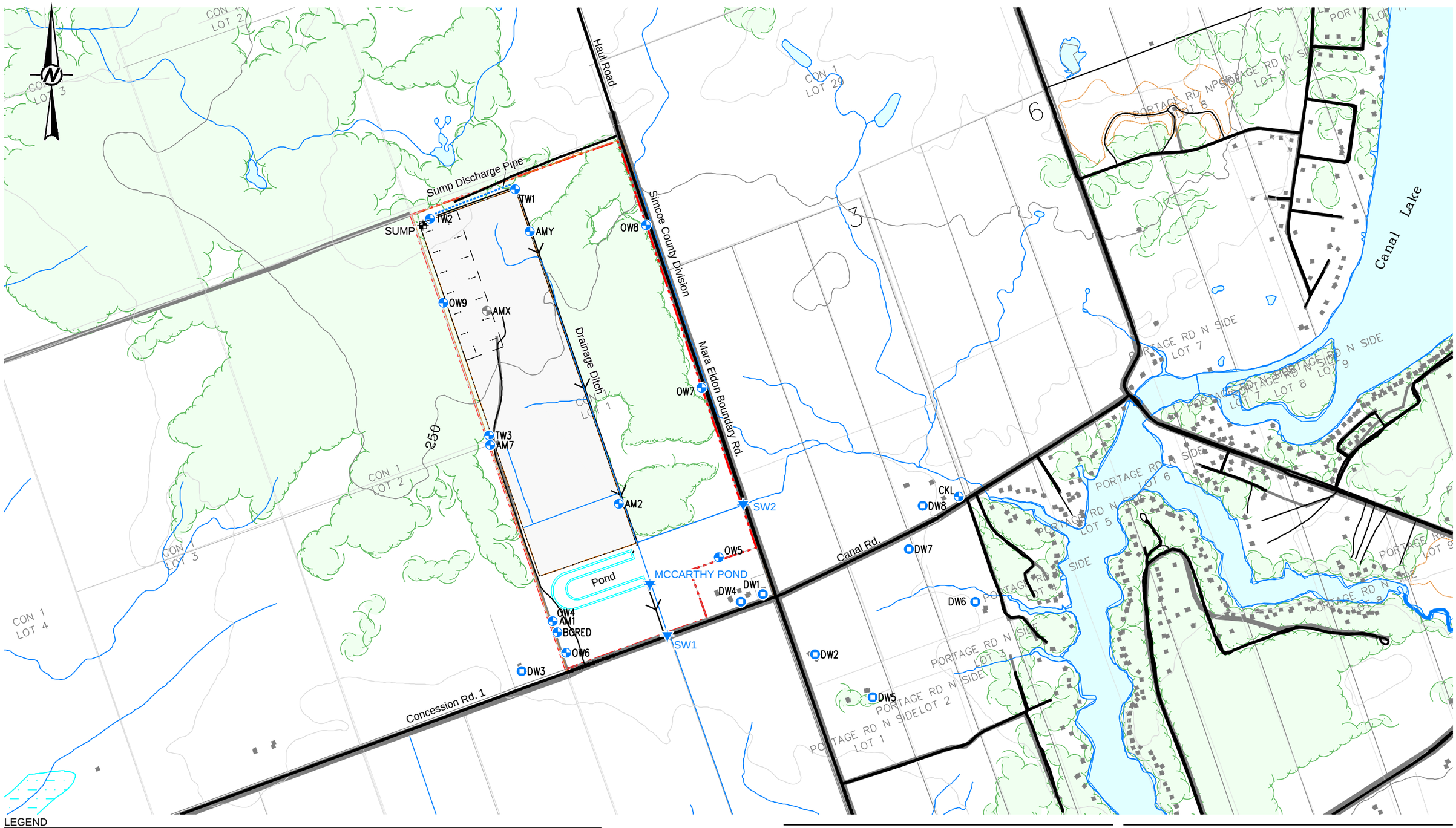
GOLDER ASSOCIATES LTD.

Jamie Bonany, M.A.Sc.
Junior Hydrogeologist

John Easton, M.Sc., P.Geo.
Associate Senior Hydrogeologist

JEB/JAE/plc

FIGURES



LEGEND

- Approximate Property Boundary
- Approximate Licenced Boundary
- Approximate Extent of Quarry
- Private Well Monitoring Location
- Observation Well Monitoring Location
- Surface Water Sampling Location
- Observation Well Monitoring Location Removed 2015

REFERENCES AND NOTES

1. Projection UTM NAD83 Zone 17
2. Mapping based on ESRI Geography Network OBM Features and 2012 Road Network
3. All Mapped features are Approximate and Not to Scale

0 200 400 600 m

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CLIENT
COCO / QBJR AGGREGATES INC.

CONSULTANT
Golder Associates

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PREPARED	STB
DESIGN	
REVIEW	
APPROVED	

PROJECT
STAN McCARTHY QUARRY
2015 ANNUAL MONITORING REPORT

TITLE
LOCATION MAP

PROJECT No.	Phase	Rev.	Figure
140-7634		WS	1

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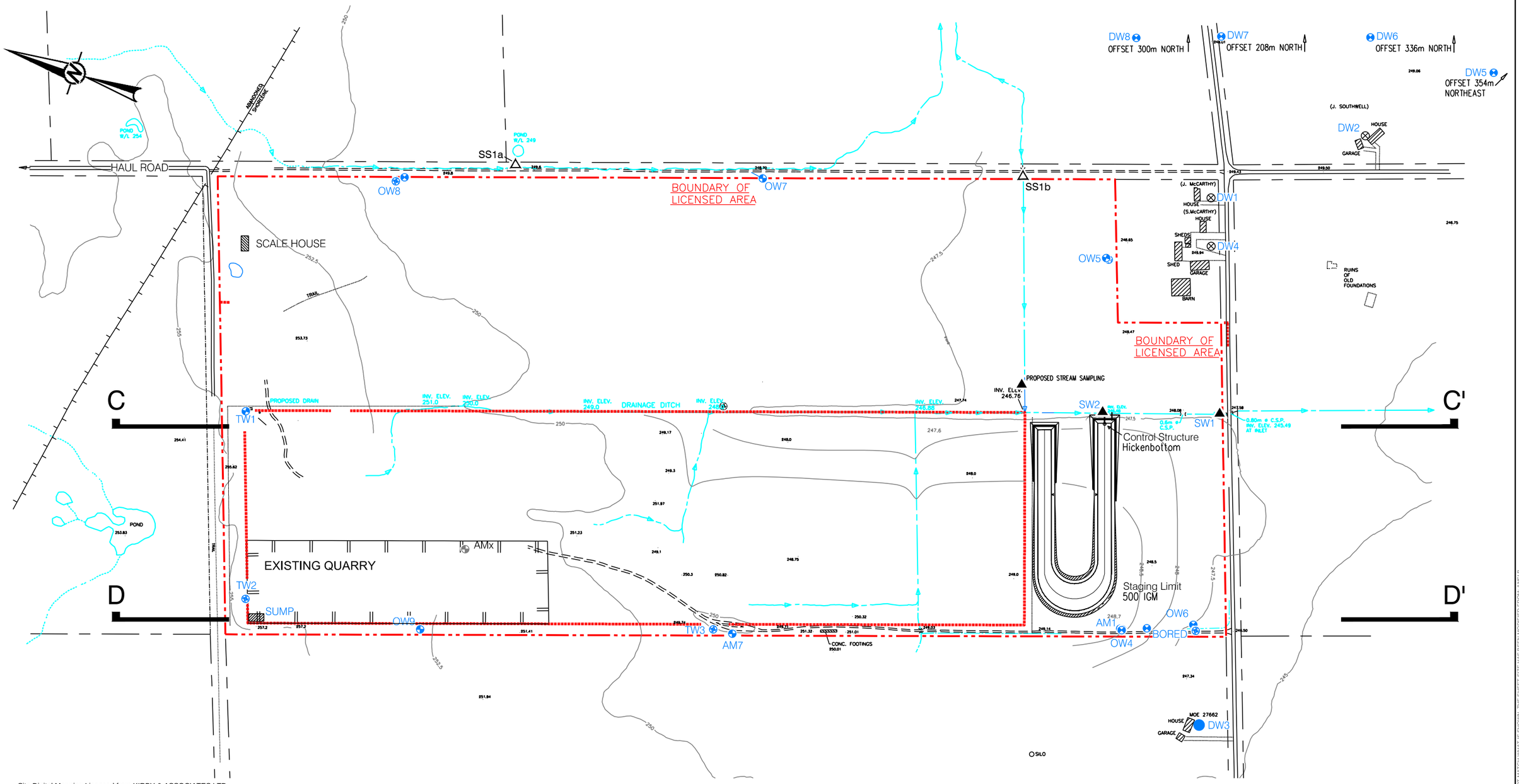

Site Digital Mapping Licenced from KIRBY & ASSOCIATES LTD

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LEGEND

- Quarry Boundary
- Limit of Extraction
- Swales and Drainage Plan
- ▲ Surface Water Sampling Location
- ⊗ Private Dug Well
- ● Private Drilled Well
- ■ Standpipe
- ◔ Observation Well
- ◔ Observation Well Removed 2015

NOTES

1. Test Well AM7 inaccessible
2. DW1 Formally Degroot
3. DW2 Formally Southwell
4. DW3 Formally Lamarre
5. DW4 Formally McCarthy

CLIENT
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CONSULTANT
Golder Associates

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DESIGN	
REVIEW	
APPROVED	

PROJECT
STAN McCARTHY QUARRY
2015 ANNUAL MONITORING REPORT

TITLE
SITE LOCATION MAP

PROJECT No.	Phase	Rev.	Figure
140-7634		WS	2

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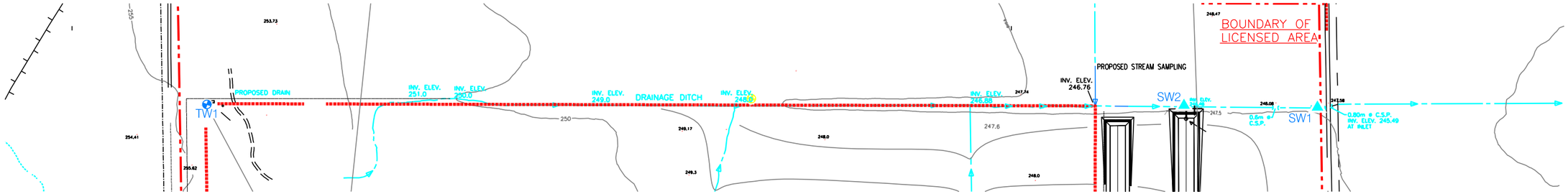

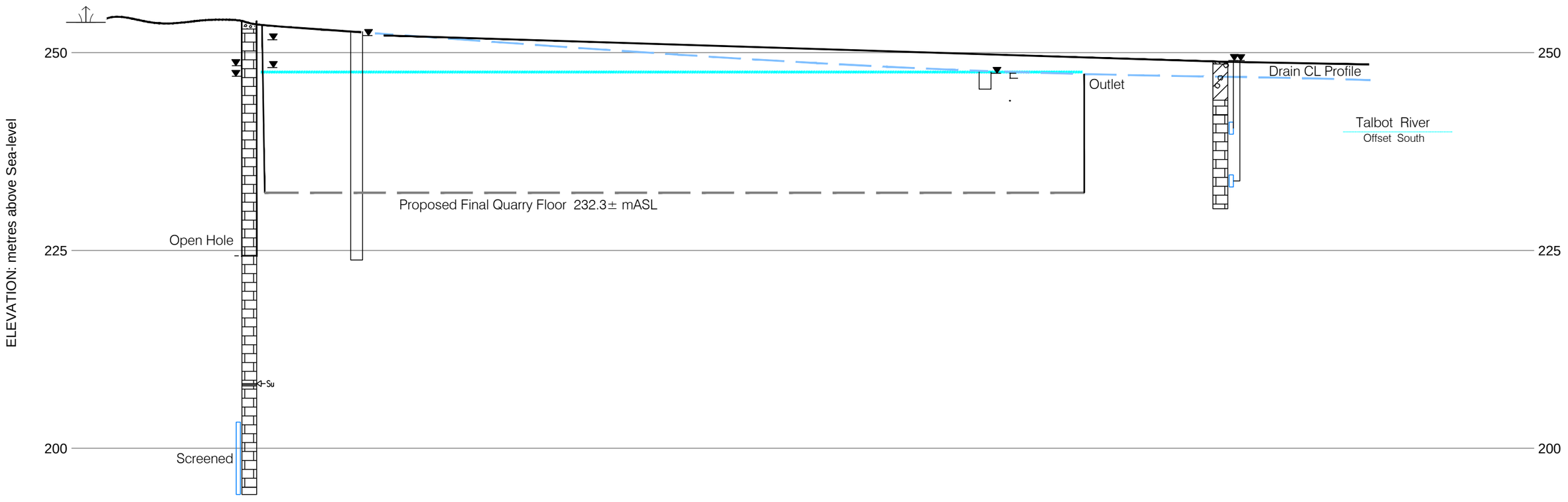

On all sections, boundaries between soil strata have been determined only at well and test well locations. Between Between the wells and test wells, boundaries are not proven but are assumed from geological evidence.

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STAN McCARTHY QUARRY

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TITLE
SITE SECTION C-C'

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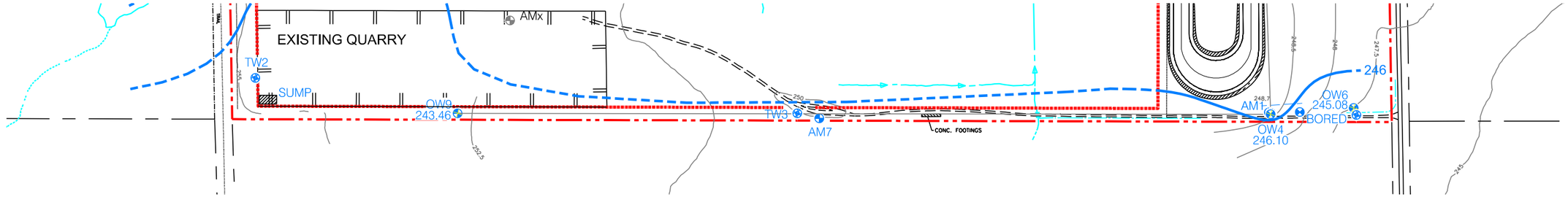
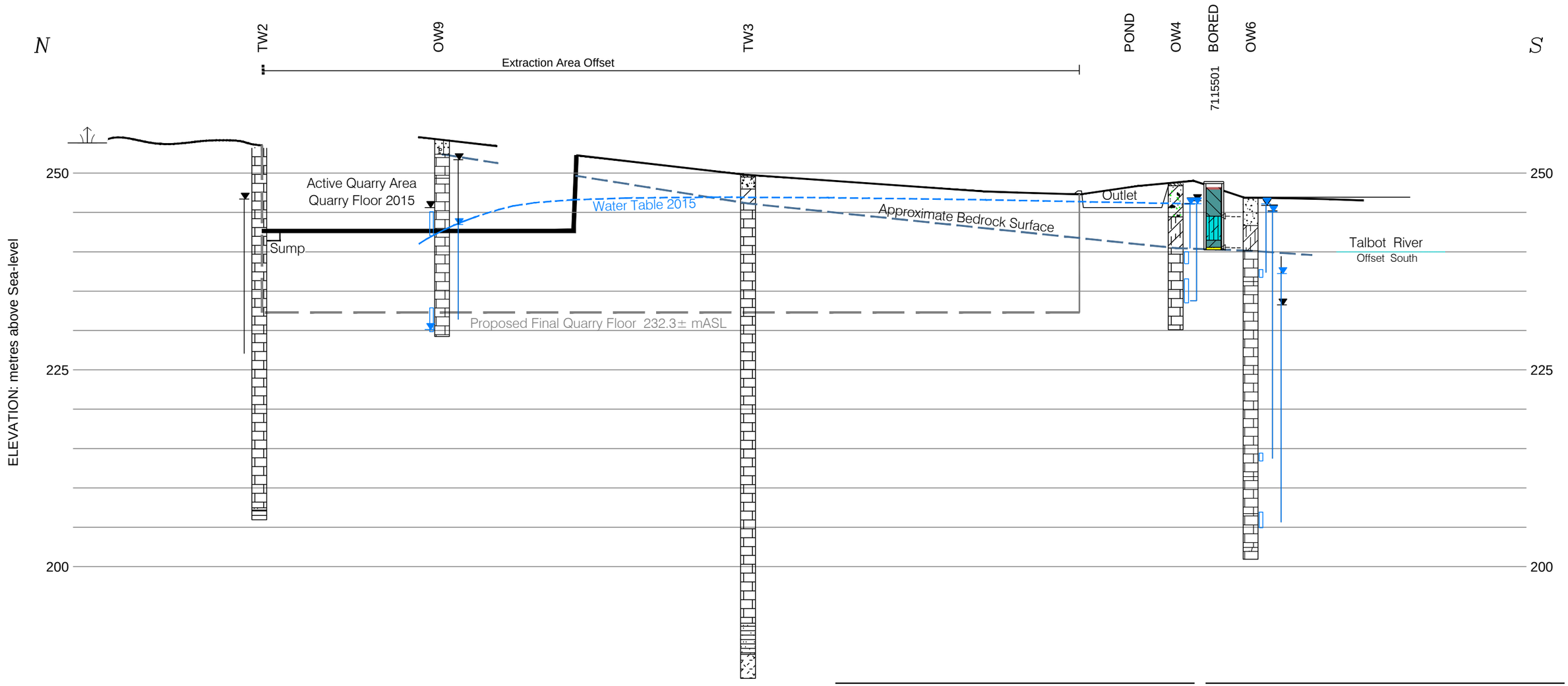
14-07634			3





On all sections, boundaries between soil strata have been determined only at well and test well locations. Between Between the wells and test wells, boundaries are not proven but are assumed from geological evidence.

Depth of Quarry measured in offset Blast Hole drilling 2014 and reflecting maximum depth

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TITLE
SITE SECTION D - D'

PROJECT No.	Phase	Rev.	Figure
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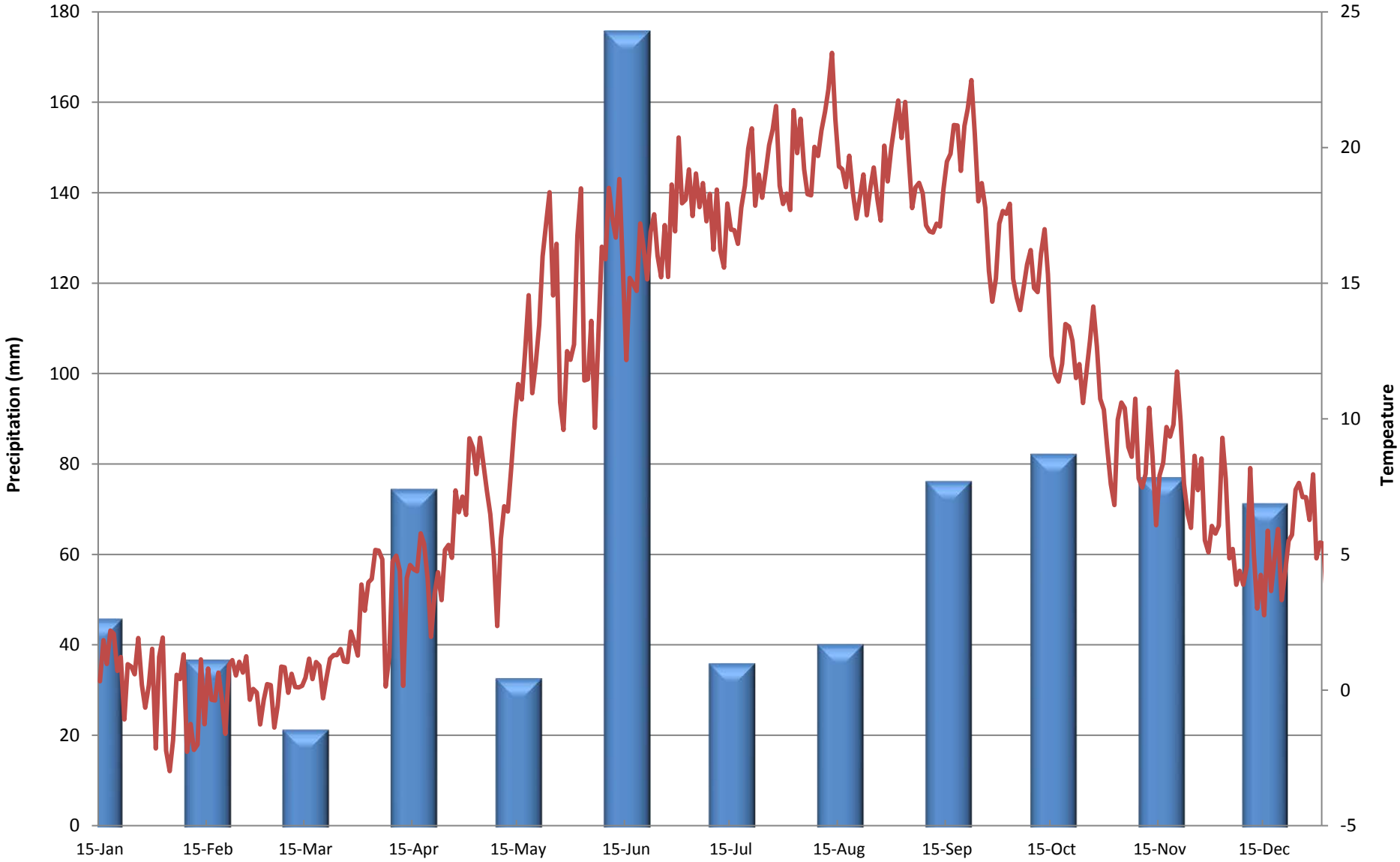

Golder Associates	SCALE: NTS	McCarthy Quarry On Site 2015 Weather	
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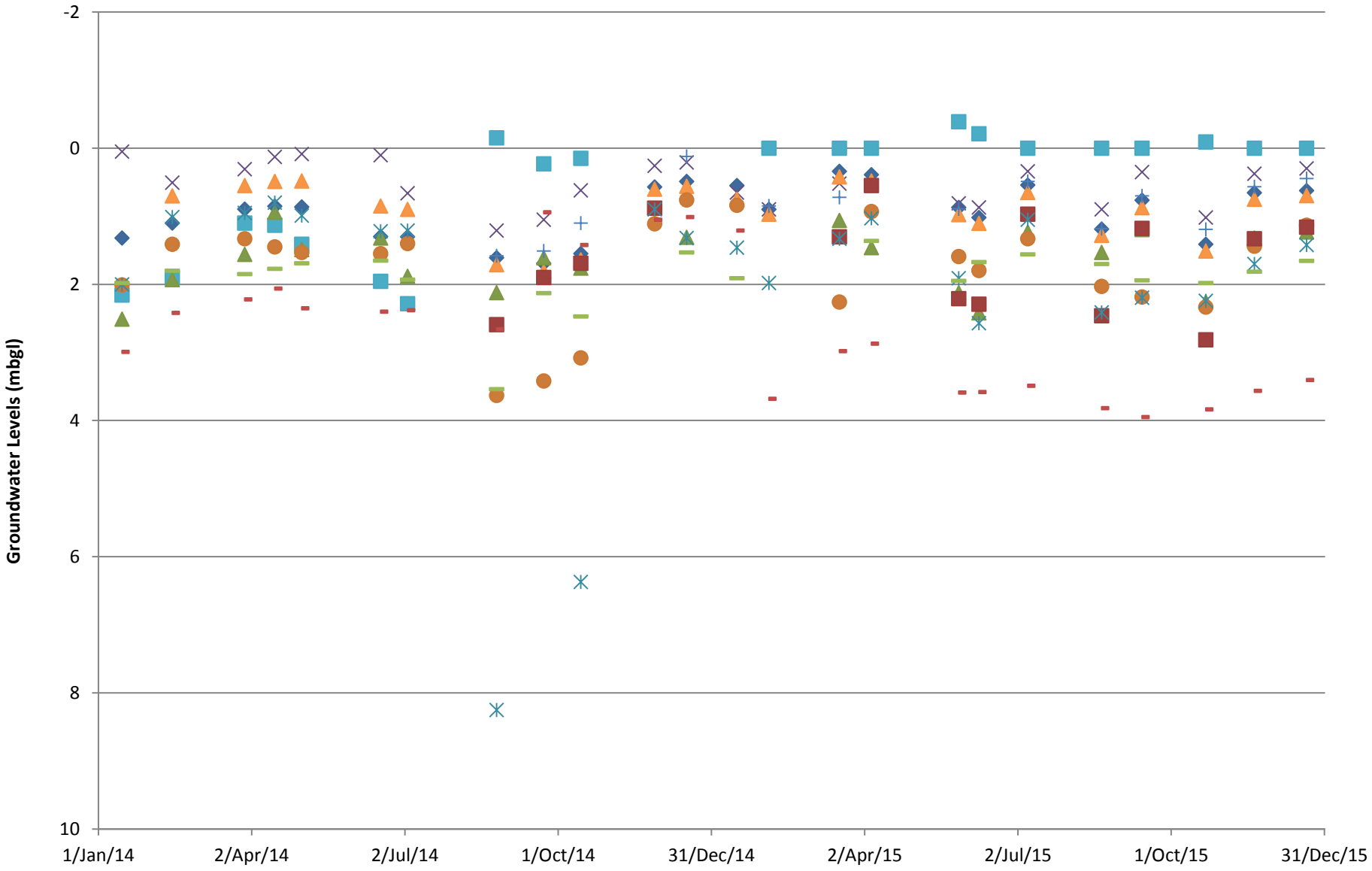
FILE No.	TEST:	QBJR/Coco Aggregates Inc. PTTW Annual Report	FIGURE No 5
PROJECT No. 1407634	REVIEW: JAE		



◆ Bored	× OW5-1	▲ AM1b	
■ CKL-1	▲ DW1	● DW2	
■ DW4	✳ DW5	▬ DW6	
+ DW7	▬ DW8		

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PROJECT No.	1407634
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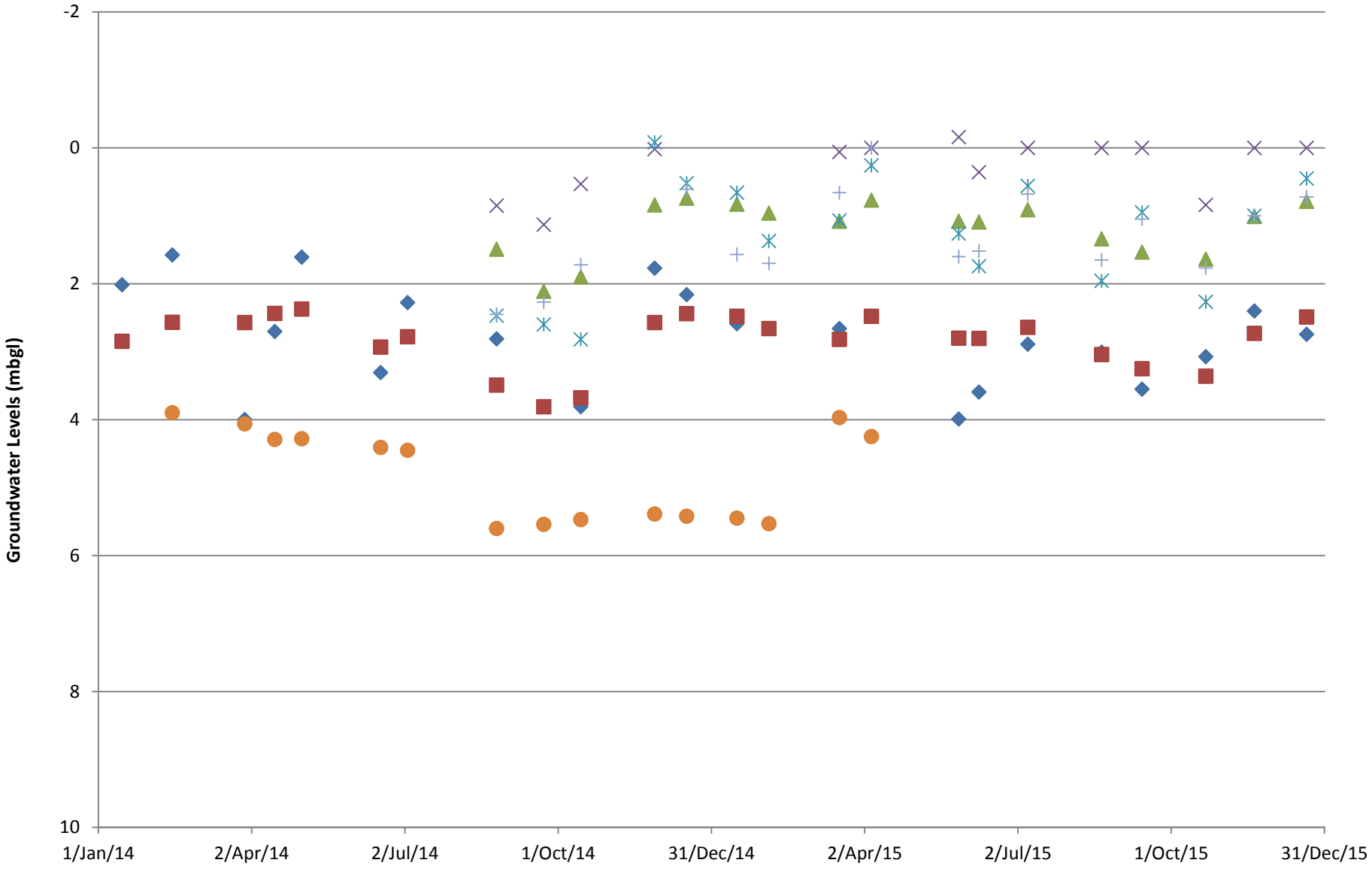
McCarthy Quarry
Overburden Monitoring Wells
Groundwater Levels

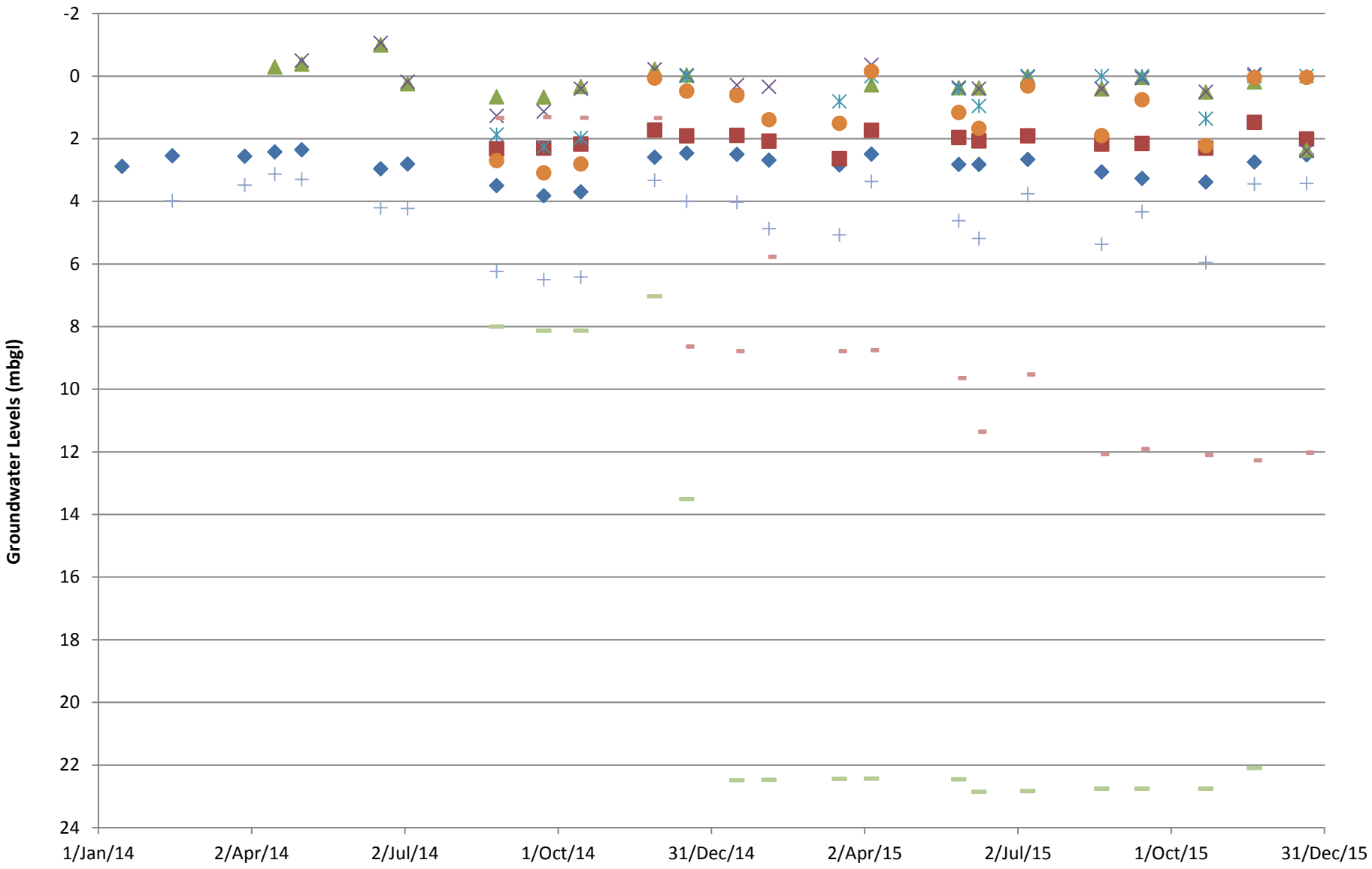
QBJR/Coco Aggregates Inc.
PTTW Annual Report

FIGURE No
6



◆ DW3 ■ OW4-1 ▲ OW6-1 × OW7-1 ✳ OW8-1 ● AMx + CKL-2	Golder Associates	SCALE: NTS DATE: 11/Feb/15 CAD: JEB	**McCarthy Quarry** **Verulam Monitoring Wells** **Groundwater Levels**
	FILE No. PROJECT No. 1407634	TEST: REVIEW: JAE	QBJR/Coco Aggregates Inc. PTTW Annual Report

FIGURE No **7**



◆ OW4-2 ■ OW6-2 ▲ OW5-2

✕ OW5-3 ✳ OW7-2 ● OW8-2

+ TW1-1 - OW9-1 — OW9-2

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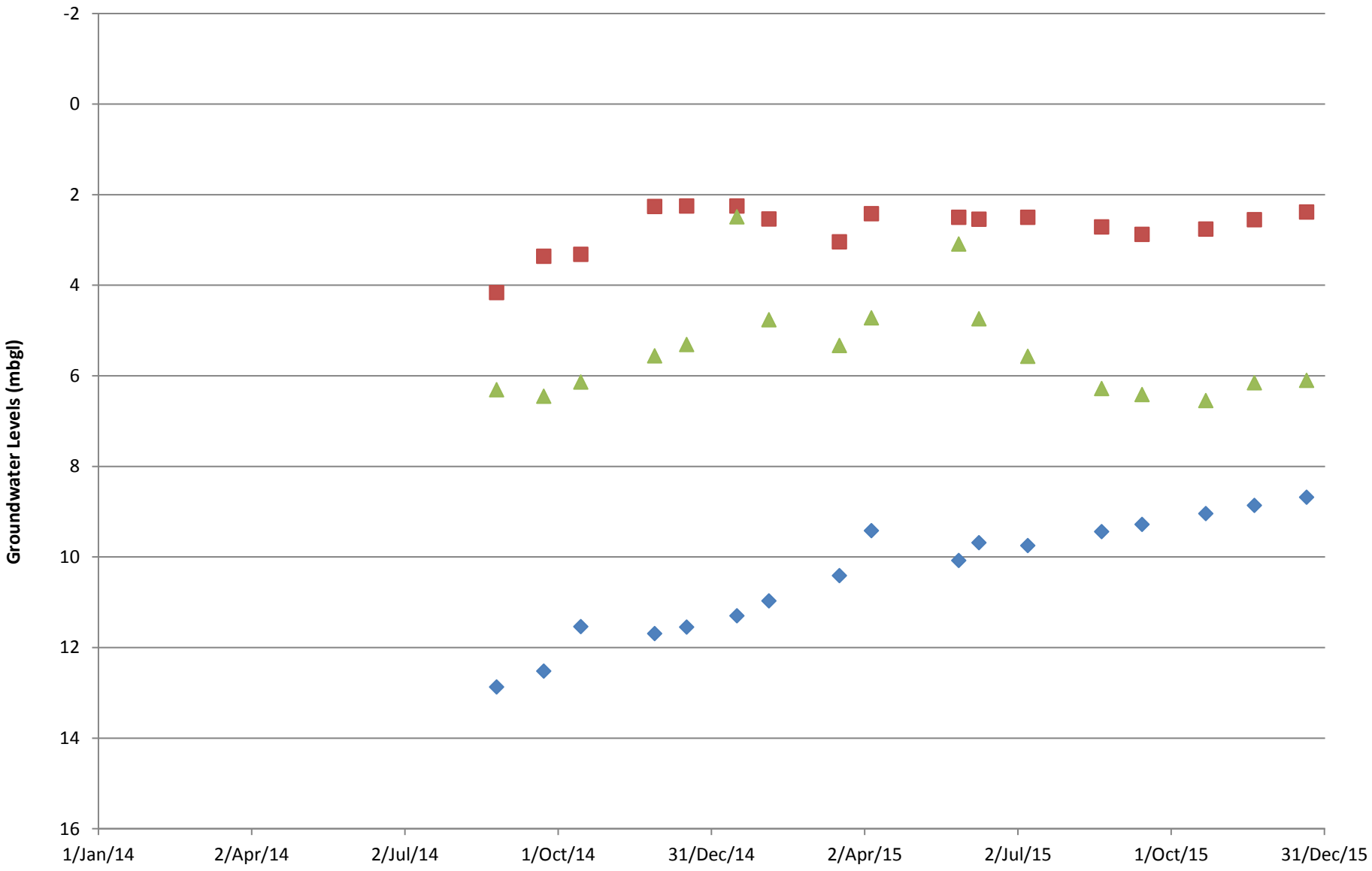
McCarthy Quarry
Bobcaygeon Monitoring Wells
Groundwater Level

QBJR/Coco Aggregates Inc.
PTTW Annual Report

FIGURE No
8



OW6-3
OW7-3
OW8-3

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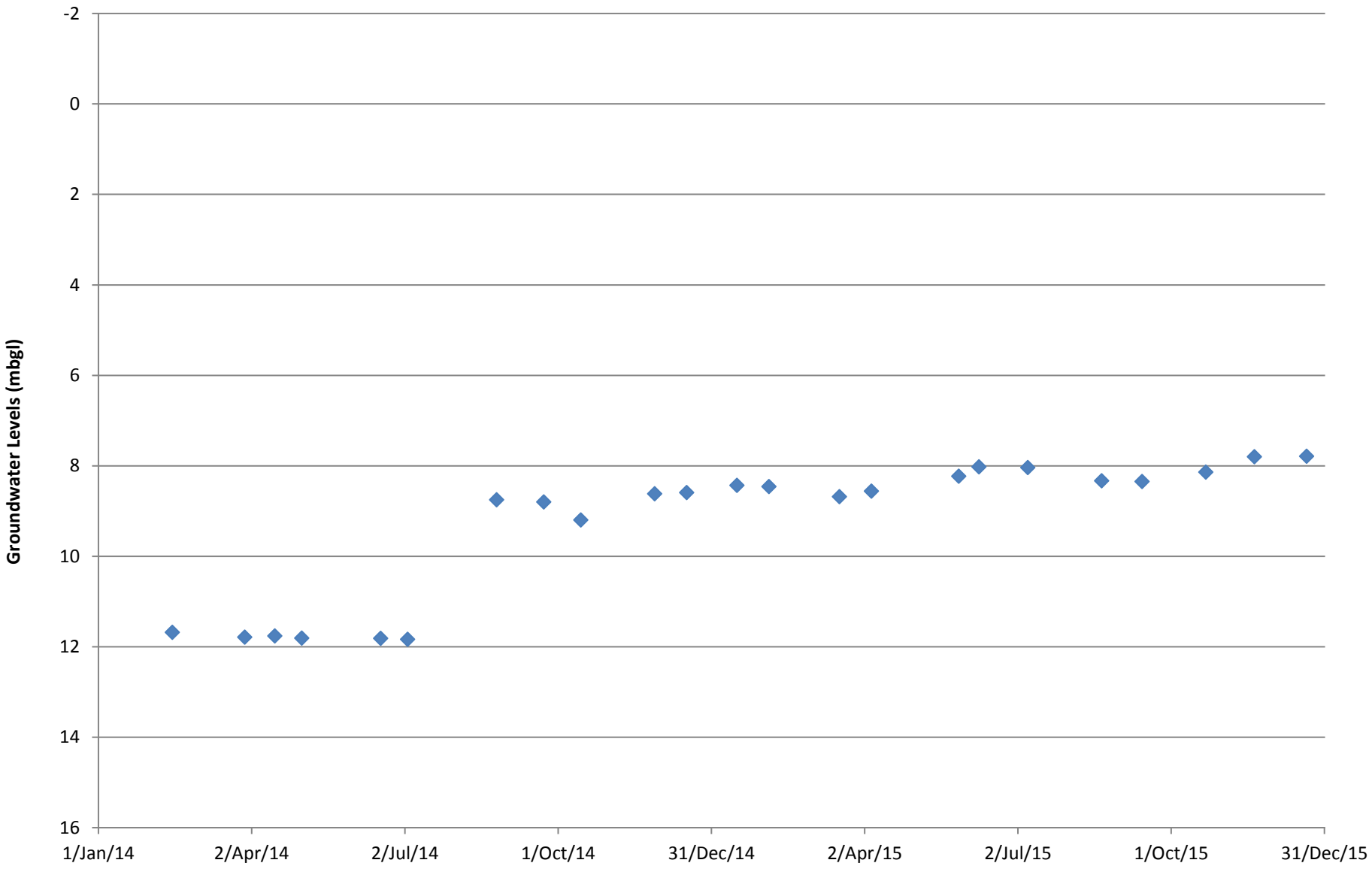
REVIEW:	JAE

McCarthy Quarry
Gull River Monitoring Wells
Groundwater Level

QBJR/Coco Aggregates Inc.
PTTW Annual Report

FIGURE No
9



	SCALE: NTS	**McCarthy Quarry**	
	DATE: 11/Feb/15	**Precambrian Monitoring Wells**	
	CAD: JEB	**Groundwater Level**	
FILE No.	TEST:	QBJR/Coco Aggregates Inc.	FIGURE No
PROJECT No. 1407634	REVIEW: JAE	PTTW Annual Report	**10**

TABLES

Well	Unit	Elevation (masl)	Stick up (m)	16-Jan-15	4-Feb-15	18-Mar-15	6-Apr-15	28-May-15	9-Jun-15	8-Jul-15	21-Aug-15	14-Sep-15	22-Oct-15	20-Nov-15	21-Dec-15
				Water Levels (mbgl)											
DW3	Verulam	246.52	0.46	2.59	NA	2.66	2.48	3.99	3.60	2.89	3.01	3.55	3.08	2.40	2.75
OW4-1	Verulam	249.57	0.88	2.48	2.66	2.82	2.48	2.80	2.81	2.64	3.04	3.25	3.36	2.73	2.49
OW4-2	Bobcaygeon	249.62	0.86	2.50	2.68	2.84	2.49	2.82	2.82	2.66	3.06	3.27	3.39	2.75	2.52
Bored	Overburden	248.86	0.66	0.55	0.90	0.34	0.39	0.87	1.02	0.54	1.19	0.77	1.41	0.66	0.62
OW6-1	Verulam	247.60	0.61	0.83	0.96	1.08	0.77	1.08	1.09	0.91	1.34	1.53	1.64	1.01	0.79
OW6-2	Bobcaygeon	247.52	0.53	1.89	2.08	2.64	1.73	1.96	2.07	1.91	2.17	2.15	2.30	1.48	2.01
OW6-3	Gull River	247.46	0.47	11.30	10.97	10.41	9.42	10.08	9.68	9.75	9.44	9.28	9.04	8.86	8.68
DW4	Overburden	250.19	0.24	NA	NA	1.30	0.55	2.21	2.29	0.97	2.46	1.18	2.82	1.33	1.16
DW1	Overburden	249.83	0.3	NA	NA	1.06	1.46	2.12	2.42	1.23	1.53	1.20	2.26	1.32	1.23
OW5-1	Overburden	249.84	0.8	0.65	0.90	0.52	frozen	0.81	0.87	0.34	0.90	0.35	1.02	0.38	0.30
OW5-2	Bobcaygeon	249.76	1	frozen	frozen	frozen	0.28	0.37	0.38	0.01	0.41	0.04	0.51	0.19	2.36
OW5-3	Bobcaygeon	249.70	1	0.29	0.34	frozen	-0.36	0.36	0.40	0.03	0.40	0.06	0.50	-0.06	2.40
DW5	Overburden		0.3	1.46	1.98	1.33	1.03	1.91	2.57	1.05	2.41	2.20	5.24	1.70	1.42
DW2	Overburden	247.50	0.8	0.84	NA	2.26	0.93	1.59	1.80	1.33	2.03	2.19	2.34	1.44	1.13
DW7	Overburden		0.32	NA	0.85	0.72	NA	0.89	NA	0.49	1.18	0.70	1.19	0.57	0.45
DW8	Overburden			1.21	3.68	2.98	2.87	3.59	3.58	3.49	3.82	3.95	3.84	3.57	3.41
DW6	Overburden		0.5	1.91	NA	NA	1.36	1.95	1.67	1.56	1.70	1.94	1.98	1.82	1.66
OW7-1	Verulam	249.80	0.62	frozen	frozen	0.06	flowing	-0.16	0.36	flowing	flowing	flowing	0.84	flowing	flowing
OW7-2	Bobcaygeon	249.78	frozen	frozen	frozen	0.81	flowing	0.40	0.95	flowing	flowing	flowing	1.37	flowing	flowing
OW7-3	Gull River	249.74	0.61	2.25	2.54	3.04	2.42	2.50	2.54	2.50	2.71	2.88	2.76	2.56	2.38
OW8-1	Verulam	251.47	0.76	0.66	1.37	1.07	0.26	1.26	1.74	0.56	1.96	0.95	2.27	1.00	0.45
OW8-2	Bobcaygeon	251.44	0.83	0.62	1.39	1.51	-0.15	1.16	1.67	0.32	1.90	0.76	2.23	0.05	0.04
OW8-3	Gull River	251.40	0.8	2.49	4.76	5.33	4.72	3.09	4.74	5.57	6.28	6.42	6.55	6.16	6.10
TW1-1	Bobcaygeon	254.10	0.6	4.03	4.87	5.07	3.37	4.62	5.19	3.76	5.37	4.33	5.96	3.44	3.43
TW1-2	Precambrian	254.10	0.52	8.43	8.46	8.68	8.56	8.23	8.02	8.04	8.33	8.35	8.14	7.80	7.79
OW9-1	Bobcaygeon	253.40	0.41	8.78	5.77	8.78	8.75	9.64	11.36	9.53	12.07	11.91	12.10	12.27	12.03
OW9-2	Bobcaygeon	253.31	0.35	22.49	22.47	22.44	22.43	22.46	22.86	22.83	22.76	22.76	22.76	22.10	24.44
Amx	Verulam	251.94	0.54	5.45	5.53	3.97	4.25	-	-	-	-	-	-	-	-
CKL-1	Overburden		0.6	frozen	frozen	frozen	flowing	-0.39	-0.21	flowing	flowing	flowing	-0.09	flowing	flowing
CKL-2	Verulam		0.6	1.57	1.70	0.66	flowing	1.60	1.52	0.68	1.65	1.05	1.77	1.00	0.72
AM1b	Overburden	249.45	0.65	0.75	0.97	0.42	0.48	0.98	1.11	0.65	1.28	0.88	1.51	0.75	0.70

Notes:

1. Highlighted cells represent groundwater measurements in terms of meters above sea level (masl)

2. Not Accessible (NA)

		Sample	DW1						DW2			
		Date	24-Apr-13	25-Oct-13	02-May-14	16-Oct-14	28-May-15	22-Oct-15	02-May-14	16-Oct-14	28-May-15	22-Oct-15
		ODWS										
Anion Sum	Sum			7.93	4.43	12.80	13	11.9	5.47	11.80	7.53	7.44
Bicarb. Alkalinity (calc. as CaCO3)	mg/L		230	396	228	340	320	320	302	290	310	290
Calculated TDS	mg/L	**500 (AO)**		450	<30	**680**	**964**	**670**	240	**680**	430	**410**
Cation Sum	Sum			4.83	6.67	12.60	13.5	13.3	9.10	11.60	8.46	8.1
Hardness (CaCO3)	mg/L	**80-100 (OG)**	2	<1	**318**	**540**	**590**	**580**	**426**	**4**	**380**	**350**
Ion Balance (% Difference)	%			-24.33	20.18	0.89	2.07	5.68	24.91	0.80	5.81	4.24
Langelier Index (@ 20C)	NA				0	1.110	0.783	0.872	0.820	-0.796	0.78	0.984
Langelier Index (@ 4C)	NA					0.863	0.537	0.625		-1.040	0.532	0.736
Saturation pH (@ 20C)	NA					6.760	6.79	6.75		8.980	6.88	6.97
Saturation pH (@ 4C)	NA					7.010	7.04	7		9.230	7.13	7.22
Total Ammonia-N	mg/L		0.086	<0.01	0.037	<0.050	<0.050	<0.050	0.047	<0.050	<0.050	<0.050
Colour	TCU	**5 (AO)**	**7.7**	**6.2**	3.9	<2	<2	<2	**5.7**	<2	<2	<2
Conductivity	uS/cm		526	723	543	1300	1300	1200	682	1300	710	730
Fluoride (F-)	mg/L	**1.5**	<0.1	<0.3	<0.1	<0.10	<0.10	<0.10	<0.1	0.150	<0.10	0.11
Dissolved Organic Carbon	mg/L	**5 (AO)**	4.23	**5.76**		1.20	1.3	1.1		1.10	2.9	1.7
Orthophosphate (P)	mg/L					<0.010	<0.010	<0.010		<0.010	<0.010	<0.010
pH	units	**6.5-8.5 (OG)**	7.84	7.24	7.72	7.87	7.57	7.62	7.69	8.19	7.66	7.96
Dissolved Sulphate (SO4)	mg/L	**500 (AO)**	9.6	12.7	8.1	35.0	36	33	10.6	37.0	19	24
Tannins & Lignins	mg/L			0.210	0.480	<0.2	<0.2	<0.2	0.920	<0.2	<0.2	<0.2
Turbidity	NTU	**5**	2.02	0.46	0.28	<0.2	<0.2	1.8	0.50	<0.2	<0.2	<0.2
Alkalinity (Total as CaCO3)	mg/L	**30-500 (OG)**	232	397	229	340	320	320	303	300	310	290
Dissolved Chloride (Cl)	mg/L	**250 (OG)**	27	46	21	190	210	170	14	180	35	41
Nitrite (N)	mg/L	**1**	<0.03	<0.09	<0.03	<0.010	<0.010	<0.010	<0.03	<0.010	<0.010	<0.010
Nitrate (N)	mg/L	**10**	2.57	1.50	0.11	0.20	0.59	0.35	0.28	0.85	<0.10	<0.10
Nitrate + Nitrite	mg/L	**10**				0.200	0.59	0.35		0.850	<0.10	<0.10
Dissolved Aluminum (Al)	mg/L	**0.1 (OG)**	0.018	0.009	0.003	<0.005	<0.005	<0.005	0.001	<0.005	<0.005	<0.005
Dissolved Antimony (Sb)	ug/L	**6**						<0.50				<0.50
Dissolved Arsenic (As)	ug/L	**25**	<1	<1	<1	<1.0	<1.0	<1.0	<1	<1.0	<1.0	<1.0
Dissolved Barium (Ba)	ug/L	**1000**	51.3	65.2	60.9	160.0	180	140	64.1	2.0	74	76
Dissolved Beryllium (Be)	ug/L							<0.50				<0.50
Dissolved Boron (B)	ug/L	**5000**	9.1	26.6	19.7	38.0	21	25	129.0	25.0	88	11
Dissolved Cadmium (Cd)	ug/L	**5**	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10
Dissolved Calcium (Ca)	mg/L		103.0	150.0	107.0	160.0	180.0	170.0	151.0	1.1	120.0	100.0
Dissolved Chromium (Cr)	ug/L	**50**	<0.8	2.2	<1	<5.0	<5.0	<5.0	7.9	<5.0	<5.0	<5.0
Dissolved Cobalt (Co)	ug/L							<0.50				<0.50
Dissolved Copper (Cu)	ug/L	**1000 (AO)**	3.1	1.6	21.4	26.0	96	1.5	1.7	24.0	2.7	<1.0
Dissolved Iron (Fe)	mg/L	**0.3 (AO)**	0.039	0.199	0.040	<0.1	<0.1	<0.1	0.062	<0.1	<0.1	<0.1
Dissolved Lead (Pb)	ug/L	**10**					3.5	<0.50			<0.50	<0.50
Dissolved Magnesium (Mg)	mg/L		10.3	12.2	13.2	33.0	36.0	35000	11.9	0.3	17.0	23.0
Dissolved Manganese (Mn)	ug/L	**50 (AO)**	4.4	6.9	1.9	**75.0**	6.8	44	2.6	<2.0	17	6.5
Dissolved Molybdenum (Mo)	ug/L		<1	<1	<1	0.5		<0.50	4.6	1.2		<0.50
Dissolved Nickel (Ni)	ug/L		1.9	<1	2.8	1.4		<1.0	5.5	<1.0		<1.0
Dissolved Phosphorus (P)	mg/L		0.013	0.011	0.008	<0.1		<0.1	0.018	<0.1		<0.1
Dissolved Potassium (K)	mg/L		0.97	1.35	0.71	1.90	1.60	2.1	5.82	0.45	7.00	3.50
Dissolved Selenium (Se)	ug/L	**10**	<1	<1	<1	<2.0	<2.0	<2.0	<1	<2.0	<2.0	<2.0
Dissolved Silicon (Si)	mg/L		5.20	<0.6		8.20		8.70	<0.6	8.20		6.7
Dissolved Silver (Ag)	ug/L		1.64	<0.1	<0.1	<0.10		<0.10	<0.1	<0.10		<0.10
Dissolved Sodium (Na)	mg/L	**200 (OG)**	9.3	14.9	10.6	40.0	37.0	41.0	17.0	**270.0**	18.0	22.0
Dissolved Strontium (Sr)	mg/L			0.305	0.182	0.550		0.570	0.264	0.003		0.0003
Dissolved Thallium (Tl)	mg/L			<0.001	0.0005	<0.00005		<0.00005	0.0002	<0.00005		<0.00005
Dissolved Titanium (Ti)	ug/L		<1	<1	<1	<5.0		<5.0	<1	<5.0		<5.0
Dissolved Uranium (U)	mg/L	**0.02**		<0.001	<0.001	0.002		0.0011	<0.001	0.003		0.00052
Dissolved Vanadium (V)	ug/L		<1	<1	<1	<0.50		<0.50	2.3	<0.50		<0.50
Dissolved Zinc (Zn)	ug/L	**5000 (AO)**	<1	<1	12.8	71.0	41	6.8	<1	32.0	5.5	5.4

Notes:
AO: aesthetic objective
OG: operational guideline

		Sample	MOE 5727662 (DW3)						
		Date	May-01	Nov-01	25-Oct-13	13-May-14	15-Oct-14	28-May-15	22-Oct-15
		ODWS							
Anion Sum	Sum		8.4	8.6	8.98	6.65	8.62	8.57	10.2
Bicarb. Alkalinity (calc. as CaCO3)	mg/L				292	220	230	230	250
Calculated TDS	mg/L	500 (AO)	463	463	472	400	460	464	**570**
Cation Sum	Sum		9.11	8.94	7.70	6.81	8.13	9.11	11
Hardness (CaCO3)	mg/L	80-100 (OG)	**168**	**173**	<1	**167**	**180**	**190**	**190**
Ion Balance (% Difference)	%		3.96	2.1	-7.69	1.19	2.94	3.06	3.82
Langelier Index (@ 20C)	NA		-0.15	-0.05			0.601	0.471	0.635
Langelier Index (@ 4C)	NA						0.353	0.223	0.387
Saturation pH (@ 20C)	NA						7.560	7.55	7.55
Saturation pH (@ 4C)	NA						7.810	7.8	7.8
Total Ammonia-N	mg/L		0.02	0.53	0.429	0.379	0.470	0.42	<0.050
Colour	TCU	5 (AO)			<2	<2	<2	<2	<2
Conductivity	uS/cm		989	903	880	393	860	890	1100
Fluoride (F-)	mg/L	1.5	0.9	1	0.480	0.560	0.730	0.72	0.8
Dissolved Organic Carbon	mg/L	5 (AO)	2	**6**	1.30	0.97	0.77	0.72	0.78
Orthophosphate (P)	mg/L						<0.010	<0.010	<0.010
pH	units	6.5-8.5 (OG)	7.6	7.7	7.36	8.05	8.16	8.02	8.19
Dissolved Sulphate (SO4)	mg/L	500 (AO)			3.9	4.1	2.0	5	<10
Tannins & Lignins	mg/L		<0.1	0.1	<0.06	0.210	<0.2	<0.2	<0.2
Turbidity	NTU	5			1.43	0.29	0.20	<0.2	<0.2
Alkalinity (Total as CaCO3)	mg/L	30-500 (OG)	222	227	293	222	240	230	250
Dissolved Chloride (Cl)	mg/L	250 (OG)	134	136	149	106	130	130	180
Nitrite (N)	mg/L	1	<0.1	<0.1	<0.09	<0.03	<0.010	<0.010	<0.010
Nitrate (N)	mg/L	10	<0.1	<0.1	<0.09	<0.1	<0.10	<0.10	<0.10
Nitrate + Nitrite	mg/L	10					<0.10	<0.10	<0.10
Dissolved Aluminum (Al)	mg/L	0.1 (OG)			0.034	0.002	<0.005	0.011	<0.005
Dissolved Antimony (Sb)	ug/L	6							<0.50
Dissolved Arsenic (As)	ug/L	25			<1	1.600	<1.0	<1.0	<1.0
Dissolved Barium (Ba)	ug/L	1000			202.0	186.0	200.0	190	220
Dissolved Beryllium (Be)	ug/L								<0.50
Dissolved Boron (B)	ug/L	5000			829.0	696.0	810.0	790	770
Dissolved Cadmium (Cd)	ug/L	5			<0.1	<0.1	<0.10	<0.10	<0.10
Dissolved Calcium (Ca)	mg/L		27.5	29.7	21.9	28.0	34.0	35.0	34.0
Dissolved Chromium (Cr)	ug/L	50			3.2	1.5	<5.0	<5.0	<5.0
Dissolved Cobalt (Co)	ug/L								<0.50
Dissolved Copper (Cu)	ug/L	1000 (AO)			1.7	6.3	4.9	2.7	97
Dissolved Iron (Fe)	mg/L	0.3 (AO)	<0.01	0.03	0.105	0.167	<0.1	<0.1	<0.1
Dissolved Lead (Pb)	ug/L	10						<0.50	<0.50
Dissolved Magnesium (Mg)	mg/L		24.1	24	25.8	23.0	22.0	26.0	26.0
Dissolved Manganese (Mn)	ug/L	50 (AO)	0.01	<0.005	5.6	5.8	4.8	4.6	<2.0
Dissolved Molybdenum (Mo)	ug/L				<1	<1	<0.50		0.65
Dissolved Nickel (Ni)	ug/L				<1	1.6	<1.0		<1.0
Dissolved Phosphorus (P)	mg/L				0.010	<0.001	<0.1		<0.1
Dissolved Potassium (K)	mg/L		7.4	7.1	7.79	6.40	7.50	7.40	7.20
Dissolved Selenium (Se)	ug/L	10			<1	1.0	<2.0	<2.0	<2.0
Dissolved Silicon (Si)	mg/L				5.22	3.18	4.60		5.40
Dissolved Silver (Ag)	ug/L				<0.1	<0.1	<0.10		0.64
Dissolved Sodium (Na)	mg/L	200 (OG)	128	121	108.0	87.4	100.0	120.0	160.0
Dissolved Strontium (Sr)	mg/L				2.780	2.350	2.400		2.50
Dissolved Thallium (Tl)	mg/L				<0.0001	0.0004	<0.00005		<0.00005
Dissolved Titanium (Ti)	ug/L				2.6	<1	<5.0		<5.0
Dissolved Uranium (U)	mg/L	0.02			<0.001	<0.001	<0.0001		<0.0001
Dissolved Vanadium (V)	ug/L				<1	<1	<0.50		<0.50
Dissolved Zinc (Zn)	ug/L	5000 (AO)			4.7	13.4	12.0	<5.0	480

Notes:
AO: aesthetic objective
OG: operational guideline

		Sample	AM1B							BORED WELL						
		Date	01-Aug-12	24-Apr-13	25-Oct-13	02-May-14	15-Oct-14	28-May-15	22-Oct-15	01-Aug-12	24-Apr-13	25-Oct-13	02-May-14	15-Oct-14	28-May-15	22-Oct-15
Parameter	Units	ODWS														
Bicarb. Alkalinity (calc. as $CaCO_3$)	mg/L		223	190	349	382	230	210	200	187	185	229	212	200	210	210
Total Ammonia-N	mg/L		<0.02	0.03	0.03	0.09	0.16	0.075	0.12	0.14	0.02	<0.01	0.02	0.07	<0.050	<0.050
Colour	TCU	**5 (AO)**	**5.7**	2.2	< 2	**7.4**	<2	<2	<2	**10.8**	2.2	< 2	< 2	<2	<2	<2
Conductivity	uS/cm		489	407	532	488	470	480	470	551	454	489	477	480	490	490
Total Dissolved Solids	mg/L	**500 (AO)**				317	244	280	280				264	274	290	290
Fluoride (F-)	mg/L	**1.5**	0.20	<0.1	<0.3	<0.3	0.24	0.23	0.26	0.20	<0.1	<0.3	<0.3	0.15	0.15	0.15
Dissolved Organic Carbon	mg/L	**5 (AO)**	1.20	1.20	1.90	1.10	0.86	0.7	0.63	1.30	1.60	2.10	1.40	1.20	0.92	0.88
Hardness	mg/L	**80-10 (OG)**						240	240						180	190
Phosphate	mg/L		< 1	< 1	< 0.3	< 0.3	<0.010	<0.010	<0.010	< 1	< 1	< 0.3	< 0.3	<0.010	<0.010	<0.010
pH	units	**6.5-8.5 (OG)**	7.48	7.81	7.10	7.56	7.97	7.92	7.92	8.73	8.06	8.77	7.57	8.33	8.18	8.2
Dissolved Sulphate (SO_4)	mg/L	**500 (AO)**	41	34	34	31	36	38	41	50	48	45	33	36	34	33
Alkalinity (Total as $CaCO_3$)	mg/L	**30-500 (OG)**	224	191	349	383	230	210	210	197	187	242	213	210	210	210
Dissolved Chloride (Cl)	mg/L	**250 (AO)**	5.20	4.41	6.84	5.52	5.00	4	3.9	13.20	3.04	4.50	4.14	6.00	7	6.1
Nitrite (N)	mg/L	**1**	<0.03	<0.03	<0.09	<0.09	<0.010	0.019	<0.010	<0.03	<0.03	<0.09	<0.09	<0.010	<0.010	<0.010
Nitrate (N)	mg/L	**10**	0.20	<0.1	<0.09	<0.09	<0.10	<0.10	<0.10	0.40	0.29	0.49	0.39	0.45	0.29	0.33
Nitrate + Nitrite	mg/L	**10**					<0.10	<0.10						0.4500	0.29	
Dissolved Calcium (Ca)	mg/L		28.80	48.50	41.70	42.20	49.00	46	46	6.00	11.40	14.70	29.20	28.00	39	40
Dissolved Magnesium (Mg)	mg/L		29.3	33.3	29.6	21.7	29.0	30	30	20.7	21.9	18.9	19.6	21.0	21	21
Dissolved Phosphorus (P)	mg/L		0.51	0.16	0.19	1.48	<0.1	<0.1	<0.1	0.02	0.01	0.01	0.02	<0.1	<0.1	<0.1
Dissolved Potassium (K)	mg/L		2.20	2.07	2.27	1.69	2.20	2.3	2	55.00	47.60	42.80	21.80	24.00	16	18
Dissolved Sodium (Na)	mg/L	**200 (AO)**	6.50	6.42	5.79	4.56	6.70	6.8	6.9	30.20	32.40	31.60	26.10	29.00	25	26

Notes:
AO: aesthetic objective
OG: operational guideline
Exceedances of the OWDS (operational guidelines excluded) are shown in bold.

		Sample	OW4-I													
		Date	28-Apr-06	17-Aug-06	15-Nov-06	19-Apr-07	16-Aug-07	07-Nov-07	16-Apr-08	01-Aug-12	24-Apr-13	25-Oct-13	02-May-14	15-Oct-14	28-May-15	22-Oct-15
Parameter	Units	ODWS														
Bicarb. Alkalinity (calc. as $CaCO_3$)	mg/L		199	201	260	212	226	230	231	311	269	324	222	280	260	270
Total Ammonia-N	mg/L		0.25	0.53	0.69	0.74	0.52	0.15	1.42	0.56	0.22	0.36	0.28	0.99	0.72	0.89
Colour	TCU	**5 (AO)**								4	**47.4**	**6.3**	**6.9**	<2	<2	3
Conductivity	uS/cm		686	595	1060	1210	1350	1600	1420	1020	897	976	830	890	760	850
Total Dissolved Solids	mg/L	**500 (AO)**	280	304	**612**	**632**	**666**	**890**	**734**				470	**608**	430	460
Fluoride (F-)	mg/L	**1.5**	0.48	0.47	0.55	0.55	0.68	0.72	0.72	1.00	1.20	0.96	1.00	1.40	1.5	1.5
Dissolved Organic Carbon	mg/L	**5 (AO)**	2.80	2.00	3.40	4.50	2.20	3.40	1.00	2.00	1.90	**6.32**	1.60	1.30	1.6	1.3
Hardness	mg/L	**80-10 (OG)**													72	76
Phosphate	mg/L									< 1	< 1	< 0.3	< 0.3	<0.010	<0.010	<0.010
pH	units	**6.5-8.5 (OG)**								8.35	8.10	7.84	8.26	8.38	8.33	8.27
Dissolved Sulphate (SO_4)	mg/L	**500 (AO)**	69	43	22	26	33	10	39	56	40	31	22	2	4	6.3
Alkalinity (Total as $CaCO_3$)	mg/L	**30-500 (OG)**	222	201	270	218	226	230	249	318	272	326	226	290	260	280
Dissolved Chloride (Cl)	mg/L	**250 (AO)**	45.50	40.50	**251.00**	244.00	**338.00**	**428.00**	**253.00**	151.00	117.00	108.00	95.80	120.00	84	95
Nitrite (N)	mg/L	**1**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.03	<0.03	<0.09	<0.09	<0.010	<0.010	<0.010
Nitrate (N)	mg/L	**10**	0.63	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	0.20	0.36	<0.09	0.16	<0.10	<0.10	<0.10
Nitrate + Nitrite	mg/L	**10**												<0.10	<0.10	
Dissolved Calcium (Ca)	mg/L		17.80	24.80	38.80	37.60	35.30	49.40	32.10	19.20	16.70	14.50	11.60	18.00	14	15
Dissolved Magnesium (Mg)	mg/L		12.0	17.1	25.7	25.4	22.9	32.1	19.1	14.0	11.2	9.8	6.7	11.0	9	9.3
Dissolved Phosphorus (P)	mg/L		0.40			0.72		0.59	0.77	1.28	1.32	1.06	3.58	<0.1	<0.1	<0.1
Dissolved Potassium (K)	mg/L		5.34	3.86	7.18	7.66	8.26	9.58	11.40	6.70	5.34	4.94	3.66	5.20	4.9	6
Dissolved Sodium (Na)	mg/L	**200 (AO)**	114.00	69.60	151.00	170	**201**	**245**	**235**	**258**	**206**	174	127	160	140	150

Notes:
AO: aesthetic objective
OG: operational guideline
Exceedances of the OWDS (operational guidelines excluded) are s

		Sample	OW4-II														
		Date	31-Jan-02	28-Apr-06	17-Aug-06	15-Nov-06	19-Apr-07	16-Aug-07	07-Nov-07	16-Apr-08	01-Aug-12	24-Apr-13	25-Oct-13	02-May-14	15-Oct-14	28-May-15	22-Oct-15
Parameter	Units	ODWS															
Bicarb. Alkalinity (calc. as $CaCO_3$)	mg/L			270	219	314	220	220	217	240	304	269	337	294	280	280	270
Total Ammonia-N	mg/L			1.15	0.86	1.17	1.11	1.12	0.08	1.16	0.57	0.45	0.63	0.59	0.82	0.77	0.81
Colour	TCU	**5 (AO)**									**5.7**	**10.5**	2.6	< 2	<2	<2	<2
Conductivity	uS/cm			1760	1740	1590	1830	1840	1720	1640	831	852	800	766	1000	900	1000
Total Dissolved Solids	mg/L	**500 (AO)**		**846**	**874**	**890**	**942**	**980**	**1310**	**890**				436	**650**	**530**	**550**
Fluoride (F-)	mg/L	**1.5**		0.61	0.64	0.78	0.79	0.77	0.79	0.76	1.20	1.28	1.10	1.30	1.30	1.5	1.4
Dissolved Organic Carbon	mg/L	**5 (AO)**		2.90	1.80	1.90	1.10	1.80	1.80	1.60	1.50	1.60	2.50	1.50	1.30	1.1	1.1
Hardness	mg/L	**80-10 (OG)**														120	120
Phosphate	mg/L										< 1	< 1	< 0.3	< 0.3	<0.010	<0.010	<0.010
pH	units	**6.5-8.5 (OG)**									7.99	8.03	7.36	7.75	8.10	8.18	8.13
Dissolved Sulphate (SO_4)	mg/L	**500 (AO)**		6	6	5	3	2	1	0	5	34	1	1	<1	<1	<1.0
Alkalinity (Total as $CaCO_3$)	mg/L	**30-500 (OG)**		270	219	320	220	220	217	240	307	272	338	296	280	280	280
Dissolved Chloride (Cl)	mg/L	**250 (AO)**		**436.0**	**415.0**	**423.0**	**459.0**	**434.0**	**439.0**	**390.0**	118.0	111.0	93.1	84.8	150.0	110	140
Nitrite (N)	mg/L	**1**		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.03	<0.03	<0.09	<0.09	<0.010	<0.010	<0.010
Nitrate (N)	mg/L	**10**		<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.1	<0.09	<0.09	<0.10	<0.10	<0.10
Nitrate + Nitrite	mg/L	**10**													<0.10	<0.10	
Dissolved Calcium (Ca)	mg/L		47.90	47.90	48.00	47.00	50.10	49.00	51.00	44.30	18.80	17.10	14.40	13.50	20.00	22	22
Dissolved Magnesium (Mg)	mg/L		34.4	33.8	33.5	32.2	34.5	32.1	35.2	28.0	15.5	11.3	10.8	8.2	13.0	15	15
Dissolved Phosphorus (P)	mg/L			0.54						0.07	0.05	4.63	0.02	0.05	<0.1	<0.1	<0.1
Dissolved Potassium (K)	mg/L		9.70	9.89	9.44	9.46	10.60	11.40	10.40	14.00	7.30	5.56	6.00	4.72	6.10	6.8	7
Dissolved Sodium (Na)	mg/L	**200 (AO)**	**311**	**250**	**243**	**233**	**254**	**258**	**261**	**242**	**205**	**212**	142	118	170	190	190

Notes:
AO: aesthetic objective
OG: operational guideline
Exceedances of the OWDS (operational guidelines excluded) are s

		Sample	OW5-I													
		Date	31-Jan-02	28-Apr-06	17-Aug-06	15-Nov-06	19-Apr-07	16-Aug-07	07-Nov-07	16-Apr-08	01-Aug-12	24-Apr-13	25-Oct-13	02-May-14	16-Oct-14	28-May-15	22-Oct-15
Parameter	Units	ODWS															
Bicarb. Alkalinity (calc. as $CaCO_3$)	mg/L			248.0000	227.0000	262.0000	225.0000	222.0000	219.0000	231.0000	237.0	232.0	448.0	179.0	240.0	220	230
Total Ammonia-N	mg/L			0.99	0.82	0.86	1.69	0.69	<2	<2	0.64	0.79	0.76	0.75	0.83	0.84	0.91
Colour	TCU	**5 (AO)**									**7.4**	**4.4**	**3.8**	**38.8**	<2	<2	<2
Conductivity	uS/cm			632	615	564	624	615	612	617	663	553	602	585	590	610	610
Total Dissolved Solids	mg/L	**500 (AO)**		**1210**	305	310	356	324	376	476				355	324	330	340
Fluoride (F-)	mg/L	**1.5**		0.66	0.93	0.94	0.85	0.92	0.94	0.82	0.80	0.91	0.66	0.60	0.91	0.85	0.9
Dissolved Organic Carbon	mg/L	**5 (AO)**		**25.40**	2.10	2.40	**23.00**	2.30	**15.40**	**15.60**	1.40	1.90	2.40	1.90	1.50	1.2	1.1
Hardness	mg/L	**80-10 (OG)**														160	160
Phosphate	mg/L										< 1	< 1	< 0.3	< 0.3	<0.010	<0.010	<0.010
pH	units	**6.5-8.5 (OG)**									7.80	7.85	7.06	7.54	8.20	8.04	8.05
Dissolved Sulphate (SO_4)	mg/L	**500 (AO)**		20	16	17	17	19	20	21	24	23	25	24	28	28	29
Alkalinity (Total as $CaCO_3$)	mg/L	**30-500 (OG)**		248	227	273	225	222	222	231	238	234	448	180	240	230	230
Dissolved Chloride (Cl)	mg/L	**250 (AO)**		56.50	51.20	45.70	52.80	49.50	45.30	47.80	47.70	44.30	37.10	32.30	34.00	36	37
Nitrite (N)	mg/L	**1**		<0.05	<0.05	<0.05	<0.05	0.09	<0.05	<0.05	<0.03	<0.03	<0.09	<0.09	0.03	0.072	0.121
Nitrate (N)	mg/L	**10**		<0.05	<0.05	<0.05	<0.05	0.71	1.02	0.82	0.60	0.28	0.53	0.65	0.59	0.24	0.25
Nitrate + Nitrite	mg/L	**10**													0.6200	0.31	
Dissolved Calcium (Ca)	mg/L		1200.00	30.40	27.50	47.30	29.90	27.70	32.20	33.70	20.70	24.90	24.50	22.90	29.00	28	31
Dissolved Magnesium (Mg)	mg/L		806.0	18.2	18.5	18.3	19.6	17.9	20.0	19.4	25.6	17.0	20.6	15.5	20.0	21	21
Dissolved Phosphorus (P)	mg/L			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	3.53		0.35	0.01	<0.1	<0.1	<0.1
Dissolved Potassium (K)	mg/L		66.40	8.64	7.49	8.15	7.76	7.64	8.16	9.44	8.20	5.65	7.72	5.47	7.00	6.6	8
Dissolved Sodium (Na)	mg/L	**200 (AO)**	**3980**	72.50	70.10	67.70	71.70	71.60	72.40	71.00	83.40	55.80	63.90	53.00	66.00	65	64

Notes:
AO: aesthetic objective
OG: operational guideline
Exceedances of the OWDS (operational guidelines excluded) are s

		Sample	OW5-II													
		Date	31-Jan-02	28-Apr-06	17-Aug-06	15-Nov-06	19-Apr-07	16-Aug-07	07-Nov-07	16-Apr-08	01-Aug-12	24-Apr-13	25-Oct-13	02-May-14	16-Oct-14	28-May-15	22-Oct-15
Parameter	Units	ODWS															
Bicarb. Alkalinity (calc. as $CaCO_3$)	mg/L			113.0	109.0	151.0	109.0	107.0	109.0	113.0	108.0	102.0	165.0	82.7	110.0	110	110
Total Ammonia-N	mg/L			9.45	3.31	11.80	11.70	9.73	0.93	11.90	9.84	9.86	9.41	10.20	9.60	9.4	9.9
Colour	TCU	**5 (AO)**									**15.9**	< 2	< 2	**25.9**	**30.0**	**73**	**26**
Conductivity	uS/cm			26200	26100	26500	26100	25500	24000	25200	36600	23700	24700	25900	28000	28000	26000
Total Dissolved Solids	mg/L	**500 (AO)**		**18800**	**20600**	**19500**	**21100**	**18800**	**17900**	**18700**				**18100**	**16100**	**17000**	**16000**
Fluoride (F-)	mg/L	**1.5**		<0.05	<0.05	0.75	<0.05	<0.05	<0.05	<2	<10	<10	<5	<0.5	0.48	0.44	0.46
Dissolved Organic Carbon	mg/L	**5 (AO)**		1.70	1.20	1.20	0.70	1.10	1.00	0.90	<0.5	0.79	<0.4	<0.4	0.61	0.49	0.34
Hardness	mg/L	**80-10 (OG)**														6100	5900
Phosphate	mg/L										< 100	< 100	< 5	< 0.5	<0.010	<0.010	<0.010
pH	units	**6.5-8.5 (OG)**									7.16	7.03	6.92	6.86	7.42	7.23	7.31
Dissolved Sulphate (SO_4)	mg/L	**500 (AO)**		<0.1	6	16	<1	15	<0.1	5	100	<100	<5	4	<1	<1	<1.0
Alkalinity (Total as $CaCO_3$)	mg/L	**30-500 (OG)**		113	109	151	109	107	109	113	108	102	165	83	110	110	110
Dissolved Chloride (Cl)	mg/L	**250 (AO)**		**11500**	**10700**	**11400**	**11400**	**11300**	**11000**	**9800**	**14800**	**10200**	**9940**	**7550**	**9900**	**11000**	**9900**
Nitrite (N)	mg/L	**1**		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<2	<3	<3	<1	<0.7	<0.050	<0.010	<0.010
Nitrate (N)	mg/L	**10**		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<2	<10	<10	<1	1.50	<0.50	<0.10	<0.10
Nitrate + Nitrite	mg/L	**10**													<0.50	<0.10	
Dissolved Calcium (Ca)	mg/L		831.00	1200.00	1150.00	1210.00	1170.00	1190.00	1310.00	1280.00	1350.00	1060.00	2020.00	1260.00	1200.00	1300	1200
Dissolved Magnesium (Mg)	mg/L		548.0	686.0	702.0	700.0	699.0	685.0	807.0	746.0	1450.0	815.0	1080.0	590.0	740.0	730	710
Dissolved Phosphorus (P)	mg/L			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.15	1.21	0.01	0.18	<0.01	<1	<1
Dissolved Potassium (K)	mg/L		50.80	69.40	68.30	75.70	74.10	81.30	78.90	124.00	104.00	77.90	73.20	76.60	66.00	68	70
Dissolved Sodium (Na)	mg/L	**200 (AO)**	**2660**	**3730**	**3640**	**3700**	**3540**	**3770**	**3960**	**3900**	**7070**	**4000**	**5370**	**3200**	**3600**	**3700**	**3700**

Notes:
AO: aesthetic objective
OG: operational guideline
Exceedances of the OWDS (operational guidelines excluded) are s

		Sample	OW5-III													
		Date	28-Apr-06	17-Aug-06	15-Nov-06	19-Apr-07	16-Aug-07	07-Nov-07	16-Apr-08	01-Aug-12	24-Apr-13	25-Oct-13	02-May-14	16-Oct-14	28-May-15	22-Oct-15
Parameter	Units	ODWS														
Bicarb. Alkalinity (calc. as $CaCO_3$)	mg/L		110	102	108	119	104	106	124	102	77	127	95.1	110	110	100
Total Ammonia-N	mg/L		9.53	3.26	10.70	12.20	9.81	0.35	14.60	9.01	10.70	9.41	10.30	9.60	9.5	11
Colour	TCU	**5 (AO)**								4	< 2	< 2	**37.3**	**6.0**	**38**	**18**
Conductivity	uS/cm		29000	26600	25800	28100	26100	24600	26000	35700	30700	31200	26500	22000	29000	37000
Total Dissolved Solids	mg/L	**500 (AO)**	**26700**	**21900**	**20100**	**21800**	**28300**	**20100**	**19200**				**19600**	**15500**	**17000**	**22000**
Fluoride (F-)	mg/L	**1.5**	<0.05	<0.05	0.72	<0.05	<0.05	0.68	<0.05	<10	<10	<5	<0.5	0.39	0.42	0.44
Dissolved Organic Carbon	mg/L	**5 (AO)**	**8.30**	1.40	1.30	2.10	1.30	1.50	2.40	<0.5	<0.4	<0.4	<0.4	0.82	0.97	1.4
Hardness	mg/L	**80-10 (OG)**													6200	8300
Phosphate	mg/L									< 100	< 100	< 5	< 0.5	<0.010	<0.010	<0.010
pH	units	**6.5-8.5 (OG)**								7.33	6.92	6.74	6.99	7.50	7.35	7.21
Dissolved Sulphate (SO_4)	mg/L	**500 (AO)**	106	44	15	64	38	16	525	200	190	113	53	27	20	150
Alkalinity (Total as $CaCO_3$)	mg/L	**30-500 (OG)**	110	102	108	119	104	106	124	102	77	127	95	110	110	100
Dissolved Chloride (Cl)	mg/L	**250 (AO)**	**13300**	**10800**	**10800**	**12400**	**11700**	**11400**	**9920**	**14600**	**13500**	**12900**	**8060**	**8000**	**11000**	**14000**
Nitrite (N)	mg/L	**1**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<3	<3	<1	<0.7	0.17	<0.010	0.015
Nitrate (N)	mg/L	**10**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<10	<10	<1	<0.1	0.12	<0.10	<0.10
Nitrate + Nitrite	mg/L	**10**												0.3000	<0.10	
Dissolved Calcium (Ca)	mg/L		1370.00	1160.00	1160.00	1240.00	1180.00	1330.00	1310.00	1410.00	1360.00	2050.00	1250.00	1200.00	1300	1700
Dissolved Magnesium (Mg)	mg/L		737.0	716.0	679.0	726.0	697.0	815.0	735.0	1270.0	1020.0	1040.0	590.0	710.0	740	960
Dissolved Phosphorus (P)	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.58	0.16	0.02	0.09	0.51	<0.01	<	<1
Dissolved Potassium (K)	mg/L		70.40	64.90	72.50	70.20	79.90	75.70	119.00	86.10	77.90	80.80	80.10	65.00	71	79
Dissolved Sodium (Na)	mg/L	**200 (AO)**	**4220**	**3740**	**3600**	**3890**	**3770**	**4000**	**4000**	**7280**	**5410**	**5410**	**3200**	**3600**	**3800**	**5200**

Notes:
AO: aesthetic objective
OG: operational guideline
Exceedances of the OWDS (operational guidelines excluded) are s

		Sample	OW6-II									OW7-I					
		Date	16-Apr-08	14-Aug-08	01-Aug-12	24-Apr-13	25-Oct-13	02-May-14	15-Oct-14	28-May-15	22-Oct-15	24-Apr-13	25-Oct-13	02-May-14	16-Oct-14	28-May-15	22-Oct-15
Parameter	Units	ODWS															
Bicarb. Alkalinity (calc. as $CaCO_3$)	mg/L		234	192	186	160	215	134	170	150	160	291	368	187	220	270	230
Total Ammonia-N	mg/L		0.72	0.43	0.60	0.02	<0.01	0.03	0.83	0.82	1.4	1.44	3.32	0.74	2.00	3.7	3.1
Colour	TCU	**5 (AO)**			9.1	2.6	3.3	2.8	3.0	<2	2	**16**	**58.6**	**289**	**16**	3	3
Conductivity	uS/cm		1090	1020	2030	1440	1780	2110	4200	5400	6000	4810	5800	5070	870	5600	700
Total Dissolved Solids	mg/L	**500 (AO)**	**710**	**558**				**1260**	**3270**	**3100**	**3800**			**2810**	496	**3200**	**520**
Fluoride (F-)	mg/L	**1.5**	0.51	0.28	<1	<0.1	<0.3	<0.3	0.38	0.46	0.49	**3.80**	**2.50**	**3.00**	0.49	**2.7**	0.51
Dissolved Organic Carbon	mg/L	**5 (AO)**	**16.90**	**10.00**	1.60	2.10	2.50	1.30	1.60	1.2	0.86	0.82	<0.4	0.56	2.10	1	1.8
Hardness	mg/L	**80-10 (OG)**								1100	1400					890	450
Phosphate	mg/L				< 10	< 1	< 0.3	< 0.3	<0.010	<0.010	<0.010	< 10	< 0.3	< 0.3	<0.010	<0.010	<0.010
pH	units	**6.5-8.5 (OG)**	8.54	8.23	8.00	7.79	7.80	7.78	7.89	7.82	7.67	7.72	7.24	7.49	7.95	7.76	7.98
Dissolved Sulphate (SO_4)	mg/L	**500 (AO)**	138	83	170	132	148	199	450	570	1000	<10	28	30	86	23	49
Alkalinity (Total as $CaCO_3$)	mg/L	**30-500 (OG)**	254	192	188	161	216	135	170	150	160	292	369	188	230	270	230
Dissolved Chloride (Cl)	mg/L	**250 (AO)**	75.10	150.00	**402.00**	**355.00**	**364.00**	112.00	**1000.00**	**1400**	**1400**	**1780.00**	**1760.00**	**1300.00**	89.00	**1700**	55
Nitrite (N)	mg/L	**1**	<0.05	<0.05	<0.3	<0.03	<0.09	<0.09	0.02	0.256	0.026	<0.3	<1	<0.09	<0.010	<0.010	<0.010
Nitrate (N)	mg/L	**10**	<0.05	<0.05	<1	0.71	0.80	0.75	0.11	0.66	<0.10	4.10	<1	<0.09	<0.10	<0.10	<0.10
Nitrate + Nitrite	mg/L	**10**							0.1300	0.91					<0.10	<0.10	
Dissolved Calcium (Ca)	mg/L		13.00	50.60	71.10	66.40	91.50	110.00	250.00	230	280	136.00	179.00	139.00	65.00	180	91
Dissolved Magnesium (Mg)	mg/L		6.0	15.7	45.7	32.9	31.0	30.5	130.0	120	170	96.8	99.9	61.7	39.0	110	54
Dissolved Phosphorus (P)	mg/L		3.35	<0.05	0.03	0.05	0.02	0.03	<0.1	<0.1	<0.1	0.07	0.15	0.02	<0.1	<0.1	<0.1
Dissolved Potassium (K)	mg/L		4.14	4.43	7.20	5.38	7.43	5.38	13.00	13	14	11.40	13.80	9.82	12.00	15	13
Dissolved Sodium (Na)	mg/L	**200 (AO)**	**225.00**	142.00	**326.00**	**230.00**	**206.00**	**224.00**	**580.00**	**650**	**790**	**892.00**	**919.00**	**659.00**	57.00	**910**	110

Notes:
AO: aesthetic objective
OG: operational guideline
Exceedances of the OWDS (operational guidelines excluded) are s

		Sample	OW7-II								OW8-I						
		Date	16-Apr-08	01-Aug-12	24-Apr-13	25-Oct-13	02-May-14	16-Oct-14	28-May-15	22-Oct-15	01-Aug-12	24-Apr-13	25-Oct-13	02-May-14	16-Oct-14	28-May-15	22-Oct-15
Parameter	Units	ODWS															
Bicarb. Alkalinity (calc. as $CaCO_3$)	mg/L		154	304	307	360	137	290	270	280	455	311	419	229	300	340	240
Total Ammonia-N	mg/L		11.00	1.46	1.61	1.12	1.42	2.40	2.3	2.4	0.70	0.29	0.35	0.29	0.84	0.58	2.4
Colour	TCU	**5 (AO)**		**7.4**	< 2	< 2	< 2	3.0000	3	<2	**9.1**	**15.2**	**14.7**	2.2	<2	<2	3
Conductivity	uS/cm		29900	676	4810	5760	4570	2100	8000	7300	1380	977	1070	1100	1500	1300	7300
Total Dissolved Solids	mg/L	**500 (AO)**	**22800**				**2660**	**2490**	**4700**	**3800**				**591**	**768**	**680**	**3900**
Fluoride (F-)	mg/L	**1.5**	<0.05	0.40	**3.00**	**2.20**	**2.90**	0.87	**2.4**	1.2	**2.60**	0.66	0.66	0.78	0.68	**2.4**	0.82
Dissolved Organic Carbon	mg/L	**5 (AO)**	**7.70**	1.90	0.73	<0.4	0.62	2.60	0.86	1.9	1.50	2.20	2.90	1.60	1.90	1.3	1.1
Hardness	mg/L	**80-10 (OG)**							1500	1500						250	1500
Phosphate	mg/L			< 1	< 10	< 0.3	< 0.3	<0.010	<0.010	<0.010	< 1	< 1	< 0.3	< 0.3	<0.010	<0.010	<0.010
pH	units	**6.5-8.5 (OG)**	7.72	8.03	7.70	7.20	7.54	8.04	7.78	7.83	8.30	7.63	7.30	7.41	7.83	8.02	7.62
Dissolved Sulphate (SO_4)	mg/L	**500 (AO)**	31	67	29	40	34	63	31	55	<1	67	55	48	37	33	19
Alkalinity (Total as $CaCO_3$)	mg/L	**30-500 (OG)**	154	307	310	361	137	290	280	280	464	312	420	230	300	350	240
Dissolved Chloride (Cl)	mg/L	**250 (AO)**	**11400.00**	24.60	**1570.00**	**1980.00**	**1200.00**	**440.00**	**2700**	**2200**	**256.00**	129.00	115.00	127.00	**260.00**	160	**2300**
Nitrite (N)	mg/L	**1**	<0.05	<0.03	<0.3	<0.09	<0.09	0.02	<0.010	<0.010	<0.03	<0.03	<0.09	<0.09	<0.010	<0.010	<0.010
Nitrate (N)	mg/L	**10**	<0.05	<0.1	<1	<0.09	<0.09	<0.10	<0.10	<0.10	<0.1	<0.1	<0.09	<0.09	<0.10	<0.10	<0.10
Nitrate + Nitrite	mg/L	**10**						<0.10	<0.10						<0.10	<0.10	
Dissolved Calcium (Ca)	mg/L		1510.00	45.80	148.00	186.00	126.00	150.00	320	300	26.90	114.00	103.00	96.90	120.00	66	370
Dissolved Magnesium (Mg)	mg/L		863.0	64.5	98.8	118.0	53.8	89.0	180	180	31.3	32.8	22.0	19.2	40.0	21	150
Dissolved Phosphorus (P)	mg/L		5.66	0.13	0.01	0.00	0.03	<0.1	<0.1	<0.1	0.02	0.17	0.42	0.04	<0.1	<0.1	<0.1
Dissolved Potassium (K)	mg/L		81.30	17.80	11.80	14.10	9.20	13.00	20	19	10.00	4.37	4.34	3.95	6.70	5.4	20
Dissolved Sodium (Na)	mg/L	**200 (AO)**	**4960.00**	70.60	**905.00**	**1080.00**	**610.00**	**370.00**	**1300**	**880**	**338.00**	83.80	72.00	91.40	120.00	170	920

Notes:
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		Sample	OW8-II								OW9-I			
		Date	16-Apr-08	01-Aug-12	24-Apr-13	25-Oct-13	02-May-14	16-Oct-14	28-May-15	22-Oct-15	02-May-14	15-Oct-14	28-May-15	22-Oct-15
Parameter	Units	ODWS												
Bicarb. Alkalinity (calc. as $CaCO_3$)	mg/L		289	293	320	392	151	290	300	250	164	220	220	470
Total Ammonia-N	mg/L		0.93	1.12	1.88	0.26	0.27	0.64	0.93	2.4	2.04	3.70	5.2	2.5
Colour	TCU	**5 (AO)**	**14.5**	2.3	< 2	3	3.3	<2	<2	9	26.2	**8**	**7**	**6**
Conductivity	uS/cm		1750	7380	8000	833	841	1700	1200	8400	5880	12000	15000	5200
Total Dissolved Solids	mg/L	**500 (AO)**	**1130**				498	**982**	**1000**	**4500**	**3640**	**7840**	**8500**	**3200**
Fluoride (F-)	mg/L	**1.5**	0.41	<1	<1	<0.3	0.36	0.66	0.8	0.71	<0.3	0.21	0.18	0.23
Dissolved Organic Carbon	mg/L	**5 (AO)**	**7.10**	1.40	1.70	3.10	2.20	1.80	1.7	1.2	3.80	**9.10**	**8.8**	**11**
Hardness	mg/L	**80-10 (OG)**							890	1900			2900	1200
Phosphate	mg/L			< 10	< 10	< 0.3	< 0.3	<0.010	<0.010	<0.010	< 0.3		<0.010	<0.010
pH	units	**6.5-8.5 (OG)**	7.98	7.70	7.43	6.74	7.29	7.76	7.88	7.62	7.35	7.62	7.6	7.63
Dissolved Sulphate (SO_4)	mg/L	**500 (AO)**	77	20	<10	64	66	39	37	20	194	200	150	77
Alkalinity (Total as $CaCO_3$)	mg/L	**30-500 (OG)**	289	294	321	392	151	290	300	260	164	220	220	470
Dissolved Chloride (Cl)	mg/L	**250 (AO)**	**387.00**	**3100.00**	**2990.00**	65.00	51.90	**340.00**	180	**2700**	**1420.00**	**3800.00**	**5200**	**1400**
Nitrite (N)	mg/L	**1**	<0.05	<0.3	<0.3	<0.09	<0.09	<0.010	<0.010	<0.010	<0.09	0.02	<0.010	<0.010
Nitrate (N)	mg/L	**10**	<0.05	<1	<1	<0.09	<0.09	<0.10	<0.10	<0.10	0.33	<0.10	<0.10	<0.10
Nitrate + Nitrite	mg/L	**10**						<0.10	<0.10			<0.10	<0.10	
Dissolved Calcium (Ca)	mg/L		174.00	263.00	279.00	118.00	131.00	140.00	220	450	289.00	370.00	660	260
Dissolved Magnesium (Mg)	mg/L		38.0	173.0	145.0	21.2	17.6	41.0	85	180	85.0	170.0	300	120
Dissolved Phosphorus (P)	mg/L		0.75	0.03	0.23	0.03	0.03	<0.1	<0.1	<0.1	0.97	<0.5	<0.1	<0.1
Dissolved Potassium (K)	mg/L		6.44	15.30	8.47	3.76	3.18	5.90	7.3	20	19.60	27.00	40	24
Dissolved Sodium (Na)	mg/L	**200 (AO)**	134.00	**585.00**	**534.00**	42.00	33.60	140.00	**310**	**1000**	**888.00**	**1300.00**	**2000**	**1000**

Notes:
AO: aesthetic objective
OG: operational guideline
Exceedances of the OWDS (operational guidelines excluded) are s

		Sample	OW9-II				TW1-1					
		Date	02-May-14	15-Oct-14	28-May-15	22-Oct-15	01-Aug-12	25-Oct-13	02-May-14	15-Oct-14	28-May-15	22-Oct-15
Parameter	Units	ODWS										
Bicarb. Alkalinity (calc. as $CaCO_3$)	mg/L		238	290	280	260	228	332	145	270	250	270
Total Ammonia-N	mg/L		1.12	1.90	1.9	2.9	0.86	0.97	0.68	0.49	0.89	0.93
Colour	TCU	**5 (AO)**	2.3	**9**	**7**	**8**	4	< 2	< 2	<2	<2	<2
Conductivity	uS/cm		1290	7200	7000	13000	2340	2000	548	860	2400	3000
Total Dissolved Solids	mg/L	**500 (AO)**	**900**	**4690**	**4600**	**7400**			394	482	**1200**	**1400**
Fluoride (F-)	mg/L	**1.5**	1.30	0.35	0.36	0.12	<1	<1	0.30	0.52	0.55	0.51
Dissolved Organic Carbon	mg/L	**5 (AO)**	2.70	**9.00**	**8.8**	**9.6**	1.80	1.90	1.10	1.70	1.5	1.5
Hardness	mg/L	**80-10 (OG)**			1900	2700					550	640
Phosphate	mg/L		< 0.3	<0.010	<0.010	<0.010	< 10	< 1	< 0.3	<0.010	<0.010	<0.010
pH	units	**6.5-8.5 (OG)**	7.84	7.74	7.61	7.4	8.17	7.40	8.07	8.00	7.82	7.76
Dissolved Sulphate (SO_4)	mg/L	**500 (AO)**	32	280	270	380	30	19	9	23	14	12
Alkalinity (Total as $CaCO_3$)	mg/L	**30-500 (OG)**	240	290	290	260	231	333	147	270	250	270
Dissolved Chloride (Cl)	mg/L	**250 (AO)**	180.00	**2200.00**	**2100**	**4200**	**570.00**	**443.00**	44.20	100.00	**580**	**770**
Nitrite (N)	mg/L	**1**	<0.09	<0.050	<0.010	<0.010	<0.3	<0.3	<0.09	<0.010	<0.010	<0.010
Nitrate (N)	mg/L	**10**	0.15	<0.50	<0.10	<0.10	<1	<0.3	0.14	<0.10	<0.10	<0.10
Nitrate + Nitrite	mg/L	**10**		<0.50	<0.10					<0.10	<0.10	
Dissolved Calcium (Ca)	mg/L		23.90	340.00	480	670	48.00	98.70	48.60	79.00	120	140
Dissolved Magnesium (Mg)	mg/L		13.3	120.0	180	260	52.8	46.9	22.7	31.0	61	69
Dissolved Phosphorus (P)	mg/L		0.02	<0.5	<0.1	<0.1	0.13	0.01	0.09	<0.1	<0.1	<0.1
Dissolved Potassium (K)	mg/L		8.11	18.00	25	33	13.10	10.80	5.93	5.30	9.6	10
Dissolved Sodium (Na)	mg/L	**200 (AO)**	196.00	**970.00**	**1300**	**1700**	**300.00**	**209.00**	69.90	52.00	**230**	**250**

Notes:
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Exceedances of the OWDS (operational guidelines excluded) are s

Table 6: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
ECA Permitted Rate					**6,550,000**	**76**	**4545**
5-Jan-15	6AM	3PM	32400	540	1,134,000	35	2100
6-Jan-15	6AM	3PM	32400	540	1,134,000	35	2100
7-Jan-15	9AM	12PM	10800	180	378,000	35	2100
8-Jan-15	9AM	12PM	10800	180	378,000	35	2100
9-Jan-15	9AM	12PM	10800	180	378,000	35	2100
12-Jan-15	9AM	12PM	10800	180	378,000	35	2100
13-Jan-15	9AM	12PM	10800	180	378,000	35	2100
14-Jan-15	9AM	12PM	10800	180	378,000	35	2100
15-Jan-15	9AM	12PM	10800	180	378,000	35	2100
16-Jan-15	9AM	12PM	10800	180	378,000	35	2100
19-Jan-15	9AM	12PM	10800	180	378,000	35	2100
20-Jan-15	9AM	12PM	10800	180	378,000	35	2100
21-Jan-15	NO PUMP		0	0	-	-	-
22-Jan-15	NO PUMP		0	0	-	-	-
23-Jan-15	NO PUMP		0	0	-	-	-
26-Jan-15	NO PUMP		0	0	-	-	-
27-Jan-15	NO PUMP		0	0	-	-	-
28-Jan-15	NO PUMP		0	0	-	-	-
29-Jan-15	NO PUMP		0	0	-	-	-
30-Jan-15	NO PUMP		0	0	-	-	-
2-Feb-15	6AM	3PM	32400	540	1,134,000	35	2100
3-Feb-15	NO PUMP		0	0	-	-	-
4-Feb-15	NO PUMP		0	0	-	-	-
5-Feb-15	NO PUMP		0	0	-	-	-
6-Feb-15	NO PUMP		0	0	-	-	-
9-Feb-15	6AM	3PM	32400	540	1,134,000	35	2100
10-Feb-15	NO PUMP		0	0	-	-	-
11-Feb-15	NO PUMP		0	0	-	-	-
12-Feb-15	NO PUMP		0	0	-	-	-
13-Feb-15	NO PUMP		0	0	-	-	-
17-Feb-15	6AM	3PM	32400	540	1,134,000	35	2100
18-Feb-15	NO PUMP		0	0	-	-	-
19-Feb-15	NO PUMP		0	0	-	-	-
20-Feb-15	NO PUMP		0	0	-	-	-
23-Feb-15	6AM	3PM	32400	540	1,134,000	35	2100
24-Feb-15	NO PUMP		0	0	-	-	-
25-Feb-15	NO PUMP		0	0	-	-	-
26-Feb-15	NO PUMP		0	0	-	-	-

Table 6: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
ECA Permitted Rate					**6,550,000**	**76**	**4545**
27-Feb-15	NO PUMP		0	0	-	-	-
2-Mar-15	6AM	3PM	32400	540	1,134,000	35	2100
3-Mar-15	NO PUMP		0	0	-	-	-
4-Mar-15	NO PUMP		0	0	-	-	-
5-Mar-15	NO PUMP		0	0	-	-	-
6-Mar-15	NO PUMP		0	0	-	-	-
9-Mar-15	NO PUMP		0	0	-	-	-
10-Mar-15	NO PUMP		0	0	-	-	-
11-Mar-15	NO PUMP		0	0	-	-	-
12-Mar-15	NO PUMP		0	0	-	-	-
13-Mar-15	NO PUMP		0	0	-	-	-
16-Mar-15	NO PUMP		0	0	-	-	-
17-Mar-15	NO PUMP		0	0	-	-	-
18-Mar-15	NO PUMP		0	0	-	-	-
19-Mar-15	NO PUMP		0	0	-	-	-
20-Mar-15	NO PUMP		0	0	-	-	-
23-Mar-15	NO PUMP		0	0	-	-	-
24-Mar-15	NO PUMP		0	0	-	-	-
25-Mar-15	NO PUMP		0	0	-	-	-
26-Mar-15	NO PUMP		0	0	-	-	-
27-Mar-15	NO PUMP		0	0	-	-	-
30-Mar-15	NO PUMP		0	0	-	-	-
31-Mar-15	NO PUMP		0	0	-	-	-
1-Apr-15	7AM	2PM	25200	420	882,000	35	2100
2-Apr-15	7AM	2PM	25200	420	882,000	35	2100
7-Apr-15	7AM	2PM	25200	420	882,000	35	2100
8-Apr-15	7AM	2PM	25200	420	882,000	35	2100
9-Apr-15	7AM	2PM	25200	420	882,000	35	2100
10-Apr-15	7AM	2PM	25200	420	882,000	35	2100
13-Apr-15	7AM	2PM	25200	420	882,000	35	2100
14-Apr-15	7AM	2PM	25200	420	882,000	35	2100
15-Apr-15	7AM	2PM	25200	420	882,000	35	2100
16-Apr-15	7AM	2PM	25200	420	882,000	35	2100
17-Apr-15	7AM	2PM	25200	420	882,000	35	2100
20-Apr-15	7AM	2PM	25200	420	882,000	35	2100
21-Apr-15	7AM	2PM	25200	420	882,000	35	2100
22-Apr-15	7AM	2PM	25200	420	882,000	35	2100

Table 6: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
ECA Permitted Rate					**6,550,000**	**76**	**4545**
23-Apr-15	7AM	2PM	25200	420	882,000	35	2100
24-Apr-15	7AM	2PM	25200	420	882,000	35	2100
27-Apr-15	7AM	2PM	25200	420	882,000	35	2100
27-Apr-15	7AM	2PM	25200	420	882,000	35	2100
29-Apr-15	7AM	2PM	25200	420	882,000	35	2100
30-Apr-15	7AM	2PM	25200	420	882,000	35	2100
1-May-15	7AM	2PM	25200	420	882,000	35	2100
4-May-15	7AM	2PM	25200	420	882,000	35	2100
5-May-15	7AM	2PM	25200	420	882,000	35	2100
6-May-15	7AM	2PM	25200	420	882,000	35	2100
7-May-15	7AM	2PM	25200	420	882,000	35	2100
8-May-15	7AM	2PM	25200	420	882,000	35	2100
11-May-15	7AM	2PM	25200	420	882,000	35	2100
12-May-15	7AM	2PM	25200	420	882,000	35	2100
13-May-15	7AM	2PM	25200	420	882,000	35	2100
14-May-15	7AM	2PM	25200	420	882,000	35	2100
15-May-15	7AM	2PM	25200	420	882,000	35	2100
19-May-15	8AM	2PM	25200	420	882,000	35	2100
21-May-15	7AM	2PM	25200	420	882,000	35	2100
22-May-15	7AM	2PM	25200	420	882,000	35	2100
25-May-15	7AM	2PM	25200	420	882,000	35	2100
26-May-15	7AM	2PM	25200	420	882,000	35	2100
27-May-15	7AM	2PM	25200	420	882,000	35	2100
28-May-15	7AM	2PM	25200	420	882,000	35	2100
29-May-15	7AM	2PM	25200	420	882,000	35	2100
1-Jun-15	8AM	2PM	21600	360	756,000	35	2100
2-Jun-15	8AM	2PM	21600	360	756,000	35	2100
3-Jun-15	7AM	2PM	25200	420	882,000	35	2100
4-Jun-15	8AM	3PM	25200	420	882,000	35	2100
5-Jun-15	8AM	3PM	25200	420	882,000	35	2100
8-Jun-15	7AM	2PM	25200	420	882,000	35	2100
9-Jun-15	7AM	1PM	21600	360	756,000	35	2100
10-Jun-15	8AM	2PM	21600	360	756,000	35	2100
11-Jun-15	7AM	3PM	28800	480	1,008,000	35	2100
12-Jun-15	8AM	2PM	21600	360	756,000	35	2100
15-Jun-15	7AM	2PM	25200	420	882,000	35	2100
16-Jun-15	8AM	3PM	25200	420	882,000	35	2100
17-Jun-15	7AM	2PM	25200	420	882,000	35	2100
18-Jun-15	8AM	4PM	28800	480	1,008,000	35	2100
19-Jun-15	8AM	3PM	25200	420	882,000	35	2100

Table 6: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
ECA Permitted Rate					**6,550,000**	**76**	**4545**
22-Jun-15	8AM	3PM	25200	420	882,000	35	2100
23-Jun-15	8AM	2PM	21600	360	756,000	35	2100
24-Jun-15	8AM	3PM	25200	420	882,000	35	2100
25-Jun-15	8AM	2PM	21600	360	756,000	35	2100
26-Jun-15	8AM	2PM	21600	360	756,000	35	2100
29-Jun-15	8AM	2PM	21600	360	756,000	35	2100
30-Jun-15	8AM	2PM	21600	360	756,000	35	2100
1-Jul-15	7AM	3PM	28800	480	1,008,000	35	2100
2-Jul-15	8AM	3PM	25200	420	882,000	35	2100
3-Jul-15	NO PUMP		0	0	-	-	-
4-Jul-15	NO PUMP		0	0	-	-	-
5-Jul-15	NO PUMP		0	0	-	-	-
6-Jul-15	7AM	3PM	25200	420	882,000	35	2100
7-Jul-15	7AM	3PM	25200	420	882,000	35	2100
8-Jul-15	8AM	3PM	25200	420	882,000	35	2100
9-Jul-15	7AM	3PM	28800	480	1,008,000	35	2100
10-Jul-15	NO PUMP		0	0	-	-	-
11-Jul-15	NO PUMP		0	0	-	-	-
12-Jul-15	8AM	3PM	25200	420	882,000	35	2100
13-Jul-15	7AM	2PM	25200	420	882,000	35	2100
14-Jul-15	8AM	1PM	18000	300	630,000	35	2100
15-Jul-15	7AM	2PM	25200	420	882,000	35	2100
16-Jul-15	8AM	3PM	25200	420	882,000	35	2100
17-Jul-15	8AM	1PM	18000	300	630,000	35	2100
18-Jul-15	NO PUMP		0	0	-	-	-
19-Jul-15	NO PUMP		0	0	-	-	-
20-Jul-15	8AM	3PM	25200	420	882,000	35	2100
21-Jul-15	7AM	2PM	25200	420	882,000	35	2100
22-Jul-15	7AM	3PM	28800	480	1,008,000	35	2100
23-Jul-15	7AM	1PM	21600	360	756,000	35	2100
24-Jul-15	8AM	3PM	25200	420	882,000	35	2100
25-Jul-15	NO PUMP		0	0	-	-	-
26-Jul-15	NO PUMP		0	0	-	-	-
27-Jul-15	NO PUMP		0	0	-	-	-
28-Jul-15	NO PUMP		0	0	-	-	-
29-Jul-15	NO PUMP		0	0	-	-	-
30-Jul-15	NO PUMP		0	0	-	-	-
31-Jul-15	NO PUMP		0	0	-	-	-
1-Aug-15	NO PUMP		0	0	-	-	-
2-Aug-15	NO PUMP		0	0	-	-	-

Table 6: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
ECA Permitted Rate					**6,550,000**	**76**	**4545**
3-Aug-15	NO PUMP		0	0	-	-	-
4-Aug-15	7AM	4PM	32400	540	1,134,000	35	2100
5-Aug-15	7AM	4PM	32400	540	1,134,000	35	2100
6-Aug-15	7AM	4PM	32400	540	1,134,000	35	2100
7-Aug-15	7AM	4PM	32400	540	1,134,000	35	2100
8-Aug-15	NO PUMP		0	0	-	-	-
9-Aug-15	NO PUMP		0	0	-	-	-
10-Aug-15	8AM	2PM	21600	360	756,000	35	2100
11-Aug-15	8AM	2PM	21600	360	756,000	35	2100
12-Aug-15	8AM	2PM	21600	360	756,000	35	2100
13-Aug-15	8AM	2PM	21600	360	756,000	35	2100
14-Aug-15	8AM	3PM	25200	420	882,000	35	2100
15-Aug-15	NO PUMP		0	0	-	-	-
16-Aug-15	NO PUMP		0	0	-	-	-
17-Aug-15	8AM	2PM	21600	360	756,000	35	2100
18-Aug-15	8AM	2PM	21600	360	756,000	35	2100
19-Aug-15	7AM	2PM	25200	420	882,000	35	2100
20-Aug-15	7AM	2PM	25200	420	882,000	35	2100
21-Aug-15	7AM	2PM	25200	420	882,000	35	2100
22-Aug-15	NO PUMP		0	0	-	-	-
23-Aug-15	NO PUMP		0	0	-	-	-
24-Aug-15	8AM	2PM	21600	360	756,000	35	2100
25-Aug-15	8AM	2PM	21600	360	756,000	35	2100
26-Aug-15	8AM	2PM	21600	360	756,000	35	2100
27-Aug-15	8AM	2PM	21600	360	756,000	35	2100
28-Aug-15	8AM	2PM	21600	360	756,000	35	2100
29-Aug-15	NO PUMP		0	0	-	-	-
30-Aug-15	NO PUMP		0	0	-	-	-
31-Aug-15	8AM	2PM	21600	360	756,000	35	2100
1-Sep-15	7AM	2PM	25200	420	882,000	35	2100
2-Sep-15	8AM	2PM	21600	360	756,000	35	2100
3-Sep-15	8AM	2PM	21600	360	756,000	35	2100
4-Sep-15	8AM	2PM	21600	360	756,000	35	2100
5-Sep-15	NO PUMP		0	0	-	-	-
6-Sep-15	NO PUMP		0	0	-	-	-
7-Sep-15	NO PUMP		0	0	-	-	-
8-Sep-15	7AM	3PM	28800	480	1,008,000	35	2100
9-Sep-15	7AM	3PM	28800	480	1,008,000	35	2100
10-Sep-15	8AM	2PM	21600	360	756,000	35	2100
11-Sep-15	8AM	2PM	21600	360	756,000	35	2100

Table 6: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
ECA Permitted Rate					**6,550,000**	**76**	**4545**
12-Sep-15	NO PUMP		0	0	-	-	-
13-Sep-15	NO PUMP		0	0	-	-	-
14-Sep-15	8AM	2PM	21600	360	756,000	35	2100
15-Sep-15	8AM	2PM	21600	360	756,000	35	2100
16-Sep-15	8AM	2PM	21600	360	756,000	35	2100
17-Sep-15	8AM	2PM	21600	360	756,000	35	2100
18-Sep-15	8AM	2PM	21600	360	756,000	35	2100
19-Sep-15	NO PUMP		0	0	-	-	-
20-Sep-15	NO PUMP		0	0	-	-	-
21-Sep-15	NO PUMP		0	0	-	-	-
22-Sep-15	NO PUMP		0	0	-	-	-
23-Sep-15	NO PUMP		0	0	-	-	-
24-Sep-15	NO PUMP		0	0	-	-	-
25-Sep-15	NO PUMP		0	0	-	-	-
26-Sep-15	NO PUMP		0	0	-	-	-
27-Sep-15	NO PUMP		0	0	-	-	-
28-Sep-15	NO PUMP		0	0	-	-	-
29-Sep-15	NO PUMP		0	0	-	-	-
30-Sep-15	NO PUMP		0	0	-	-	-
1-Oct-15	NO PUMP		0	0	-	-	-
2-Oct-15	NO PUMP		0	0	-	-	-
3-Oct-15	NO PUMP		0	0	-	-	-
4-Oct-15	NO PUMP		0	0	-	-	-
5-Oct-15	NO PUMP		0	0	-	-	-
6-Oct-15	NO PUMP		0	0	-	-	-
7-Oct-15	NO PUMP		0	0	-	-	-
8-Oct-15	NO PUMP		0	0	-	-	-
9-Oct-15	NO PUMP		0	0	-	-	-
10-Oct-15	NO PUMP		0	0	-	-	-
11-Oct-15	NO PUMP		0	0	-	-	-
12-Oct-15	NO PUMP		0	0	-	-	-
13-Oct-15	7AM	4PM	32400	540	1,134,000	35	2100
14-Oct-15	7AM	4PM	32400	540	1,134,000	35	2100
15-Oct-15	7AM	4PM	32400	540	1,134,000	35	2100
16-Oct-15	7AM	4PM	32400	540	1,134,000	35	2100
17-Oct-15	NO PUMP		0	0	-	-	-
18-Oct-15	NO PUMP		0	0	-	-	-
19-Oct-15	7AM	4PM	32400	540	1,134,000	35	2100
20-Oct-15	7AM	4PM	32400	540	1,134,000	35	2100
21-Oct-15	7AM	4PM	32400	540	1,134,000	35	2100

Table 6: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
ECA Permitted Rate					**6,550,000**	**76**	**4545**
22-Oct-15	7AM	4PM	32400	540	1,134,000	35	2100
23-Oct-15	7AM	4PM	32400	540	1,134,000	35	2100
24-Oct-15	NO PUMP		0	0	-	-	-
25-Oct-15	NO PUMP		0	0	-	-	-
26-Oct-15	7AM	4PM	32400	540	1,134,000	35	2100
27-Oct-15	7AM	4PM	32400	540	1,134,000	35	2100
28-Oct-15	7AM	4PM	32400	540	1,134,000	35	2100
29-Oct-15	7AM	4PM	32400	540	1,134,000	35	2100
30-Oct-15	7AM	4PM	32400	540	1,134,000	35	2100
31-Oct-15	NO PUMP		0	0	-	-	-
1-Nov-15	NO PUMP		0	0	-	-	-
2-Nov-15	7AM	2PM	25200	420	882,000	35	2100
3-Nov-15	7AM	2PM	25200	420	882,000	35	2100
4-Nov-15	7AM	2PM	25200	420	882,000	35	2100
5-Nov-15	NO PUMP		0	0	-	-	-
6-Nov-15	NO PUMP		0	0	-	-	-
7-Nov-15	NO PUMP		0	0	-	-	-
8-Nov-15	7AM	3PM	28800	480	1,008,000	35	2100
9-Nov-15	7AM	3PM	28800	480	1,008,000	35	2100
10-Nov-15	7AM	3PM	28800	480	1,008,000	35	2100
11-Nov-15	7AM	2PM	25200	420	882,000	35	2100
12-Nov-15	7AM	3PM	28800	480	1,008,000	35	2100
13-Nov-15	7AM	3PM	28800	480	1,008,000	35	2100
14-Nov-15	NO PUMP		0	0	-	-	-
15-Nov-15	NO PUMP		0	0	-	-	-
16-Nov-15	7AM	3PM	28800	480	1,008,000	35	2100
17-Nov-15	7AM	3PM	28800	480	1,008,000	35	2100
18-Nov-15	7AM	3PM	28800	480	1,008,000	35	2100
19-Nov-15	7AM	3PM	28800	480	1,008,000	35	2100
20-Nov-15	7AM	2PM	25200	420	882,000	35	2100
21-Nov-15	NO PUMP		0	0	-	-	-
22-Nov-15	NO PUMP		0	0	-	-	-
23-Nov-15	8AM	4PM	28800	480	1,008,000	35	2100
24-Nov-15	8AM	4PM	28800	480	1,008,000	35	2100
25-Nov-15	8AM	4PM	28800	480	1,008,000	35	2100
26-Nov-15	7AM	3PM	28800	480	1,008,000	35	2100
27-Nov-15	7AM	2PM	25200	420	882,000	35	2100
28-Nov-15	NO PUMP		0	0	-	-	-
29-Nov-15	NO PUMP		0	0	-	-	-
30-Nov-15	NO PUMP		0	0	-	-	-

Table 6: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
ECA Permitted Rate					**6,550,000**	**76**	**4545**
1-Dec-15	7AM	3PM	28800	480	1,008,000	35	2100
2-Dec-15	7AM	3PM	28800	480	1,008,000	35	2100
3-Dec-15	7AM	3PM	28800	480	1,008,000	35	2100
4-Dec-15	7AM	3PM	28800	480	1,008,000	35	2100
5-Dec-15	NO PUMP		0	0	-	-	-
6-Dec-15	NO PUMP		0	0	-	-	-
7-Dec-15	7AM	3PM	28800	480	1,008,000	35	2100
8-Dec-15	7AM	3PM	28800	480	1,008,000	35	2100
9-Dec-15	7AM	3PM	28800	480	1,008,000	35	2100
10-Dec-15	7AM	3PM	28800	480	1,008,000	35	2100
11-Dec-15	7AM	3PM	28800	480	1,008,000	35	2100
12-Dec-15	NO PUMP		0	0	-	-	-
13-Dec-15	NO PUMP		0	0	-	-	-
14-Dec-15	7AM	3PM	28800	480	1,008,000	35	2100
15-Dec-15	7AM	3PM	28800	480	1,008,000	35	2100
16-Dec-15	7AM	3PM	28800	480	1,008,000	35	2100
17-Dec-15	7AM	3PM	28800	480	1,008,000	35	2100
18-Dec-15	NO PUMP		0	0	-	-	-
19-Dec-15	NO PUMP		0	0	-	-	-
20-Dec-15	NO PUMP		0	0	-	-	-
21-Dec-15	7AM	3PM	28800	480	1,008,000	35	2100
22-Dec-15	7AM	3PM	28800	480	1,008,000	35	2100
23-Dec-15	7AM	12PM	18000	300	630,000	35	2100
24-Dec-15	NO PUMP		0	0	-	-	-
25-Dec-15	NO PUMP		0	0	-	-	-
26-Dec-15	NO PUMP		0	0	-	-	-
27-Dec-15	8AM	12PM	14400	240	504,000	35	2100
28-Dec-15	NO PUMP		0	0	-	-	-
29-Dec-15	NO PUMP		0	0	-	-	-
30-Dec-15	8AM	12PM	14400	240	504,000	35	2100
31-Dec-15	NO PUMP		0	0	-	-	-

APPENDIX A

PTTW No. 7818-9QJNL4

Ontario

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

PERMIT TO TAKE WATER

Ground Water
NUMBER 7818-9QJNL4

Pursuant to Section 34 of the Ontario Water Resources Act, R.S.O. 1990 this Permit To Take Water is hereby issued to:

QBJR Aggregates Inc.
949 Wilson Ave
Toronto, Ontario, M3K 1G2
Canada

For the water taking from: Quarry Sump, McCarthy Quarry

Located at: Lot 1, Concession 1, Geographic Township of Mara
Ramara, County of Simcoe

For the purposes of this Permit, and the terms and conditions specified below, the following definitions apply:

DEFINITIONS

(a) "Director" means any person appointed in writing as a Director pursuant to section 5 of the OWRA for the purposes of section 34, OWRA.

(b) "Provincial Officer" means any person designated in writing by the Minister as a Provincial Officer pursuant to section 5 of the OWRA.

(c) "Ministry" means Ontario Ministry of the Environment and Climate Change.

(d) "District Office" means the Barrie District Office.

(e) "Permit" means this Permit to Take Water No. 7818-9QJNL4 including its Schedules, if any, issued in accordance with Section 34 of the OWRA.

(f) "Permit Holder" means QBJR Aggregates Inc..

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

You are hereby notified that this Permit is issued subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. Compliance with Permit

1.1 Except where modified by this Permit, the water taking shall be in accordance with the application for this Permit To Take Water, dated October 7, 2014 and signed by Jenny Coco, and all Schedules included in this Permit.

1.2 The Permit Holder shall ensure that any person authorized by the Permit Holder to take water under this Permit is provided with a copy of this Permit and shall take all reasonable measures to ensure that any such person complies with the conditions of this Permit.

1.3 Any person authorized by the Permit Holder to take water under this Permit shall comply with the conditions of this Permit.

1.4 This Permit is not transferable to another person.

1.5 This Permit provides the Permit Holder with permission to take water in accordance with the conditions of this Permit, up to the date of the expiry of this Permit. This Permit does not constitute a legal right, vested or otherwise, to a water allocation, and the issuance of this Permit does not guarantee that, upon its expiry, it will be renewed.

1.6 The Permit Holder shall keep this Permit available at all times at or near the site of the taking, and shall produce this Permit immediately for inspection by a Provincial Officer upon his or her request.

1.7 The Permit Holder shall report any changes of address to the Director within thirty days of any such change. The Permit Holder shall report any change of ownership of the property for which this Permit is issued within thirty days of any such change. A change in ownership in the property shall cause this Permit to be cancelled.

2. General Conditions and Interpretation

2.1 Inspections

The Permit Holder must forthwith, upon presentation of credentials, permit a Provincial Officer to carry out any and all inspections authorized by the OWRA, the *Environmental Protection Act* , R.S.O. 1990, the *Pesticides Act* , R.S.O. 1990, or the *Safe Drinking Water Act,* S. O. 2002.

2.2 Other Approvals

The issuance of, and compliance with this Permit, does not:

(a) relieve the Permit Holder or any other person from any obligation to comply with any other applicable legal requirements, including the provisions of the *Ontario Water Resources Act* , and the *Environmental Protection Act* , and any regulations made thereunder; or

(b) limit in any way any authority of the Ministry, a Director, or a Provincial Officer, including the authority to require certain steps be taken or to require the Permit Holder to furnish any further information related to this Permit.

2.3 Information

The receipt of any information by the Ministry, the failure of the Ministry to take any action or require any person to take any action in relation to the information, or the failure of a Provincial Officer to prosecute any person in relation to the information, shall not be construed as:

(a) an approval, waiver or justification by the Ministry of any act or omission of any person that contravenes this Permit or other legal requirement; or

(b) acceptance by the Ministry of the information's completeness or accuracy.

2.4 Rights of Action

The issuance of, and compliance with this Permit shall not be construed as precluding or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the Permit Holder, its officers, employees, agents, and contractors.

2.5 Severability

The requirements of this Permit are severable. If any requirements of this Permit, or the application of any requirements of this Permit to any circumstance, is held invalid or unenforceable, the application of such requirements to other circumstances and the remainder of this Permit shall not be affected thereby.

2.6 Conflicts

Where there is a conflict between a provision of any submitted document referred to in this Permit, including its Schedules, and the conditions of this Permit, the conditions in this Permit shall take precedence.

3. Water Takings Authorized by This Permit

3.1 **Expiry**

This Permit expires on **December 31, 2019**. No water shall be taken under authority of this Permit after the expiry date.

3.2 Amounts of Taking Permitted

The Permit Holder shall only take water from the source, during the periods and at the rates and amounts of taking specified in Table A. Water takings are authorized only for the purposes specified in Table A.

Table A

	Source Name / Description:	Source: Type:	Taking Specific Purpose:	Taking Major Category:	Max. Taken per Minute (litres):	Max. Num. of Hrs Taken per Day:	Max. Taken per Day (litres):	Max. Num. of Days Taken per Year:	Zone/ Easting/ Northing:
1	Quarry Sump	Pond Connected	Pits and Quarries	Dewatering	4,545	24	6,544,800	150	17 650950 4933500
						Total Taking:	6,544,800		

3.3 There is an additional water taking limitation per year for Source 1 described as Quarry Sump within Table A. The maximum taking per year from the Quarry Sump is 196,500,000 litres.

4. Monitoring

4.1 The Permit Holder shall not lower the water in the quarry below an elevation of 232.0 metres above sea level.

4.2 The Permit Holder shall establish and maintain a weather station within 1 km of the McCarthy Quarry property that collects and records, at a minimum, the following climatic data on a daily basis:

a) Precipitation (rain and/or snow); and
b) Temperature (maximum and minimum).

4.3 The Permit Holder shall conduct daily water level monitoring with the use of pressure transducers and data loggers at:

a) The residential well known by the MOE Water Well Record Number 5727662 and identified as well DW3 on Figure 2 in Item 2 of Schedule A of this Permit, if granted permission by the property owner.
b) The monitoring wells named OW4-1, OW4-2, OW5-1, OW6-1, OW6-2, OW9-1, OW9-2, and Bored Well (shown on Figure 2, in Item 2 of Schedule A of this Permit).
c) The City of Kwartha Lakes monitoring well CKL-1, if granted permission by the property owner .

These pressure transducers and data loggers shall be inspected and downloaded at least every 6 months.

4.4 The Permit Holder shall conduct monthly water level monitoring with the use of a manual water level meter at:

a) The residential well known by the MOE Water Well Record Number 5727662 and identified as well DW3 on Figure 2 in Item 2 of Schedule A of this Permit, if granted permission by the property owner.
b) The residential wells named DW1, DW2, and DW4, if granted permission by the property owner (shown on Figure 2, in Item 2 of Schedule A of this Permit).

c) The monitoring wells named AM1b, AMx, TW1-1, OW4-1, OW4-2, OW5-1, OW5-2, OW5-3, OW6-1, OW6-2, OW6-3, OW7-1, OW7-2, OW7-3, OW8-1, OW8-2, OW8-3, OW9-1, OW9-2, and Bored Well (shown on Figure 2 in Item 2 of Schedule A of this Permit).

d) The City of Kwartha Lakes monitoring wells CKL-1 and CKL-2, if granted permission by the property owner .

The Permit Holder may suspend monthly water level monitoring under Condition 4.4 for the months of January and/or February if no water is taken from the quarry on those months.

4.5 The Permit Holder shall, if granted permission by the property owner, measure and record static water levels in the residential wells named DW5, DW6, DW7, and DW8, as shown on Figure 2 in Item 2 of Schedule A of this Permit, at least once in every two (2) month period during which water is taken from the quarry. The Permit Holder may suspend monthly water level monitoring under Condition 4.5 for the months of January and/or February if no water is taken from the quarry on those months.

4.6 The Permit Holder shall, if granted permission by the property owner, on a semi-annual basis collect raw water samples from the residential wells named DW1, DW2, and the well identified in condition 4.3(a). Each sample shall be tested, at a minimum, for the parameters listed in Table 1 below:

Table 1: Water Quality Parameters for Residential Wells

pH	Sulphate	DOC	Copper
Alkalinity (CaCO3)	Magnesium	Colour	Iron
Bicarbonate	Calcium	Turbidity	Lead
Conductivity	Sodium	Aluminium	Manganese
Fluoride	Potassium	Arsenic	Selenium
Chloride	Ammonia (N)	Barium	Zinc
Nitrate	Phosphate	Boron	Hardness (CaCO3)
Nitrite	Phosphorus	Cadmium	TDS (iron sum calc.)
Chromium	Anion Sum	Ion Ratio	Langelier Index
Tannins	Cation Sum	% Difference	

The Permit Holder shall immediately report to the respective well owner, the Director, and District Office any sampling result that exceeds the Ontario Drinking Water Quality Standards as prescribed by O.Reg. 169/03, as amended.

4.7 The Permit Holder shall on a semi-annual basis conduct the groundwater quality monitoring from the on-site groundwater monitors listed in Table 2. Each sample shall be tested, at a minimum, for the parameters listed in Table 3.

Table 2: On-Site Groundwater Monitors for Water Quality Sampling

AM1b	OW4-I	OW5-III	OW8-I
AMx	OW4-II	OW6-II	OW8-II
TW1-1	OW5-I	OW7-I	OW9-I
Bored Well	OW5-II	OW7-II	OW9-II

Table 3: Water Quality Parameters for On-Site Groundwater Monitors

pH	Magnesium	Sulphate	Conductivity
Alkalinity	Calcium	Nitrate	DOC
Bicarbonate	Sodium	Nitrite	Colour
Fluoride	Potassium	Phosphate	TDS
Chloride	Ammonia	Phosphorus	Hardness

4.8 Monitoring well AMx is within the quarry extraction area and will be mined out as the quarry face advances to the south. The Permit Holder shall continue to monitor AMx as listed in Conditions 4.4 and 4.7 until such monitoring is either deemed unsafe or the monitoring is not possible due to damage to AMx. Once monitoring of AMx is not possible under Conditions 4.4 and/or 4.7, then a replacement monitoring well must be established along the western property boundary between the quarry face and OW4. This replacement well shall be monitored as per Conditions 4.4 and 4.7 instead of AMx.

4.9 The Permit Holder shall notify the Director, in writing, within 30 days if the groundwater level or groundwater quality monitoring of any well listed under conditions 4.3, 4.4, 4.5, 4.6, and 4.7 is not possible, including being denied access to a private well. In the event of damage or loss of any monitoring well, monitoring devices or related equipment, the Permit Holder shall be allowed 30 calendar days from the date of discovery of the occurrence to repair or replace equipment. If a well is too damaged to be repaired or monitored, or if the well is deemed unsafe to be monitored, then the Director will decide if a replacement well is required and will modify the appropriate monitoring conditions in a written letter to the Permit Holder.

4.10 The Permit Holder shall maintain a record of all water takings. This record shall include the dates and times of water takings, and the total measured or calculated amounts for water pumped per day for each day that water is taken under the authorization of this Permit.

4.11 The Permit Holder shall keep all required records up to date and available at or near the site of the taking and shall produce the records immediately for inspection by a Provincial Officer upon his or her request.

4.12 The Permit Holder shall provide to the Director an annual monitoring report no

later than March 1 each year during the life of this Permit. The annual monitoring report shall be prepared by an individual with P.Geo. or equivalent qualifications and shall include, at a minimum:

a) The review and assessment of all monitoring data required by this Permit.
b) An up-date of the quarry operations and predicted quarrying and dewatering for the next twelve (12) months.
c) An assessment of the groundwater trends using the on-site on off-site monitoring data. This analysis should state the actual impact area of quarry dewatering and determine the potential for off-site impacts. If any impacts are predicted then a detailed mitigation plan shall be included within this report.
d) Analysis that includes amount of water pumped, precipitation data, and an estimate of how much groundwater was pumped versus surface water.
e) Figures that include site maps with current quarry depths, groundwater contour maps, impact area of quarry dewatering, groundwater elevation graphs, and geological cross-sections.
f) Any groundwater interference complaints.
g) Description of all communication with the public.
h) Conclusions and recommendations, if any, to improve the monitoring and reporting at the site.

An electronic copy of the data collected must also accompany the report.

4.13 The Permit Holder shall make available on a publicly-accessible site on the internet the water quality and quantity data that it is required to monitor and record under this Permit and O.Reg. 387/04, as amended, and a copy of every report that is required to be prepared under this Permit. For greater clarity, the Permit Holder shall not publish any personal information as defined by the *Freedom of Information and Protection of Privacy Act,* R.S.O. 1990, c. F.31, as amended.

4.14 The Permit Holder shall maintain a Public Liaison Committee ("PLC") comprised of not more than seven (7) members that will meet at least once every four (4) months, unless the majority of the PLC decide that more or less frequent meetings are required. The PLC shall be comprised of: two (2) members appointed by the Permit Holder - one of whom shall act as Chairperson; one (1) member from each of the Township and the County, if they wish to have representatives; and three (3) members appointed by the public, if they wish to have representatives, who must be permanent residents within a 3 kilometre radius of the quarry property. The PLC shall serve in an advisory / community liaison role and shall have no powers to direct the Permit Holder or the Ministry.

4.15 Any request for an amendment or renewal of this Permit must be accompanied by a report prepared by an individual with P.Geo. or equivalent qualifications and shall include, at a minimum:

a) The review and assessment of all monitoring data required by this Permit.
b) An up-date of the quarry operations and predicted quarrying and dewatering for the duration of the requested permit.
c) An assessment of the groundwater trends using the on-site on off-site monitoring

data. This analysis should state the actual impact area of quarry dewatering and determine the potential for off-site impacts. If any impacts are predicted then a detailed mitigation plan shall be included within this report.

d) Analysis that includes amount of water pumped, precipitation data, and an estimate of how much groundwater was pumped versus surface water.

e) Figures that include site maps with current quarry depths, groundwater contour maps, impact area of quarry dewatering, groundwater elevation graphs, and geological cross-sections.

f) Any groundwater interference complaints.

g) Description of all communication with the public.

h) Conclusions and recommendations, if any, to improve the monitoring and reporting at the site.

An electronic copy of the data collected must also accompany the report. Any application for renewal of this Permit must be submitted to the Ministry at least ninety (90) days prior to the expiry of this Permit.

4.16 The Permit Holder shall, as directed by the Ministry, participate in a cumulative impact assessment for the Carden Plain Area with other quarry operators who have been issued a permit to take water in this area.

5. Impacts of the Water Taking

5.1 Notification

The Permit Holder shall immediately notify the local District Office of any complaint arising from the taking of water authorized under this Permit and shall report any action which has been taken or is proposed with regard to such complaint. The Permit Holder shall immediately notify the local District Office if the taking of water is observed to have any significant impact on the surrounding waters. After hours, calls shall be directed to the Ministry's Spills Action Centre at 1-800-268-6060.

5.2 For Groundwater Takings

If the taking of water is observed to cause any negative impact to other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit Holder shall take such action necessary to make available to those affected, a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking to prevent or alleviate the observed negative impact. Pending permanent restoration of the affected supplies, the Permit Holder shall provide, to those affected, temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of doing so.

If permanent interference is caused by the water taking, the Permit Holder shall restore the water supplies of those permanently affected.

5.2.1 Where the water supply provided by the well known by MOE Water Well Record Number 5727662 is restored in accordance with Condition 5.2, the Permit Holder shall

restore the supply in a manner satisfactory to the Director, taking into account the residential needs, requirements and preferences of the persons serviced by the well.

5.3 Upon the receipt of a groundwater interference complaint, the Permit Holder shall:

a) Implement the McCarthy Quarry Complaint Resolution Process as described in Item 3 of Schedule A of this Permit.

b) In addition, appropriate notification and actions must be taken as described in conditions 5.1 and 5.2 of this Permit. The provisions of conditions 5.1 and 5.2 shall take precedence over the provisions of condition 5.3(a) if there is a conflict.

6. Director May Amend Permit

The Director may amend this Permit by letter requiring the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director in the letter. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the suspension or reduction in taking to the Environmental Review Tribunal under the *Ontario Water Resources Act* , Section 100 (4).

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

1. Condition 1 is included to ensure that the conditions in this Permit are complied with and can be enforced.

2. Condition 2 is included to clarify the legal interpretation of aspects of this Permit.

3. Conditions 3 through 6 are included to protect the quality of the natural environment so as to safeguard the ecosystem and human health and foster efficient use and conservation of waters. These conditions allow for the beneficial use of waters while ensuring the fair sharing, conservation and sustainable use of the waters of Ontario. The conditions also specify the water takings that are authorized by this Permit and the scope of this Permit.

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, you may by written notice served upon me, the Environmental Review Tribunal and the Environmental Commissioner, ***Environmental Bill of Rights****, R.S.O. 1993, Chapter 28, within 15 days after receipt of this Notice, require a hearing by the Tribunal. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 101 of the Ontario Water Resources Act, as amended provides that the Notice requiring a hearing shall state:*

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

In addition to these legal requirements, the Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Permit to Take Water number;
6. The date of the Permit to Take Water;
7. The name of the Director;
8. The municipality within which the works are located;

This notice must be served upon:

The Secretary
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto ON
M5G 1E5
Fax: (416) 314-4506
Email:
ERTTribunalsecretary@ontario.ca

AND

The Environmental Commissioner
1075 Bay Street
6th Floor, Suite 605
Toronto, Ontario M5S 2W5

AND

The Director, Section 34,
Ministry of the Environment and Climate Change
8th Floor
5775 Yonge St
Toronto ON M2M 4J1
Fax: (416) 325-6347

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal:

by telephone at (416) 314-4600 ***by fax at (416) 314-4506*** ***by e-mail at www.ert.gov.on.ca***

This instrument is subject to Section 38 of the ***Environmental Bill of Rights*** *that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek to appeal for 15 days from the date this decision is placed on the Environmental Registry. By accessing the Environmental Registry, you can determine when the leave to appeal period ends.*

This Permit cancels and replaces Permit Number 8271-8VQJGU, issued on 2012/07/11.

Dated at Toronto this 30th day of December, 2014.

H. Zhang

Helen Zhang, P.Eng.
Director, Section 34
Ontario Water Resources Act , R.S.O. 1990

Schedule A

This Schedule "A" forms part of Permit To Take Water 7818-9QJNL4, dated December 30, 2014.

1. Permit To Take Water Application, signed by Jenny Coco, October 7, 2014.

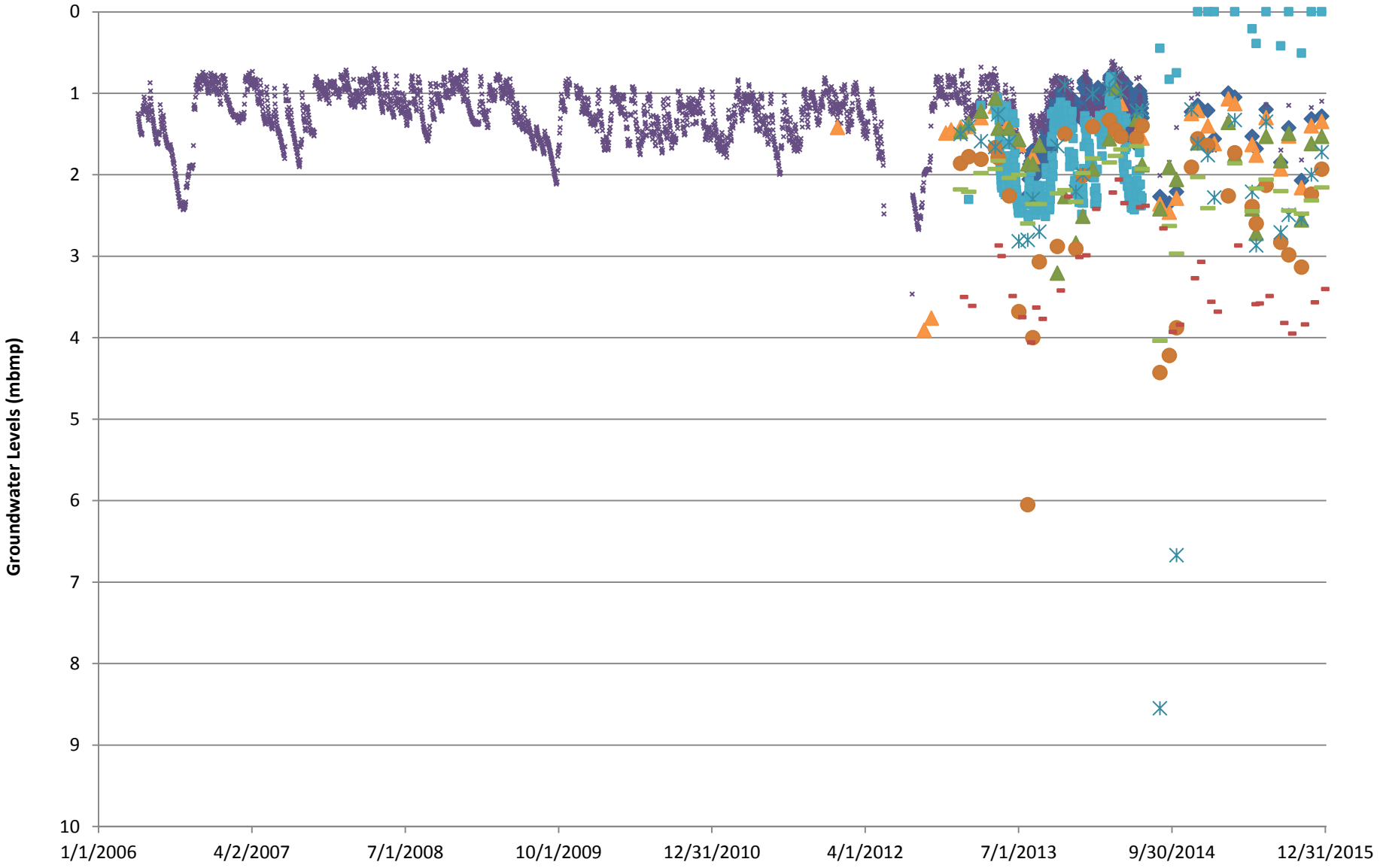
2. Permit To Take Water Application - Renewal Application for McCarthy Quarry, Township of Ramara. Golder Associates Ltd. October 2014.

3. McCarthy Quarry Complaint Resolution Process, Golder Associates Ltd. November 2014.

4. Further Changes to PTTW No. 8271-8VQJGU. Golder Associates Ltd. November 11, 2014.

APPENDIX B

Hydrographs



◆ Bored	× OW5-1	▲ AM1b	
■ CKL-1	▲ DW1	● DW2	
✳ DW5	— DW6	- DW8	

Golder Associates

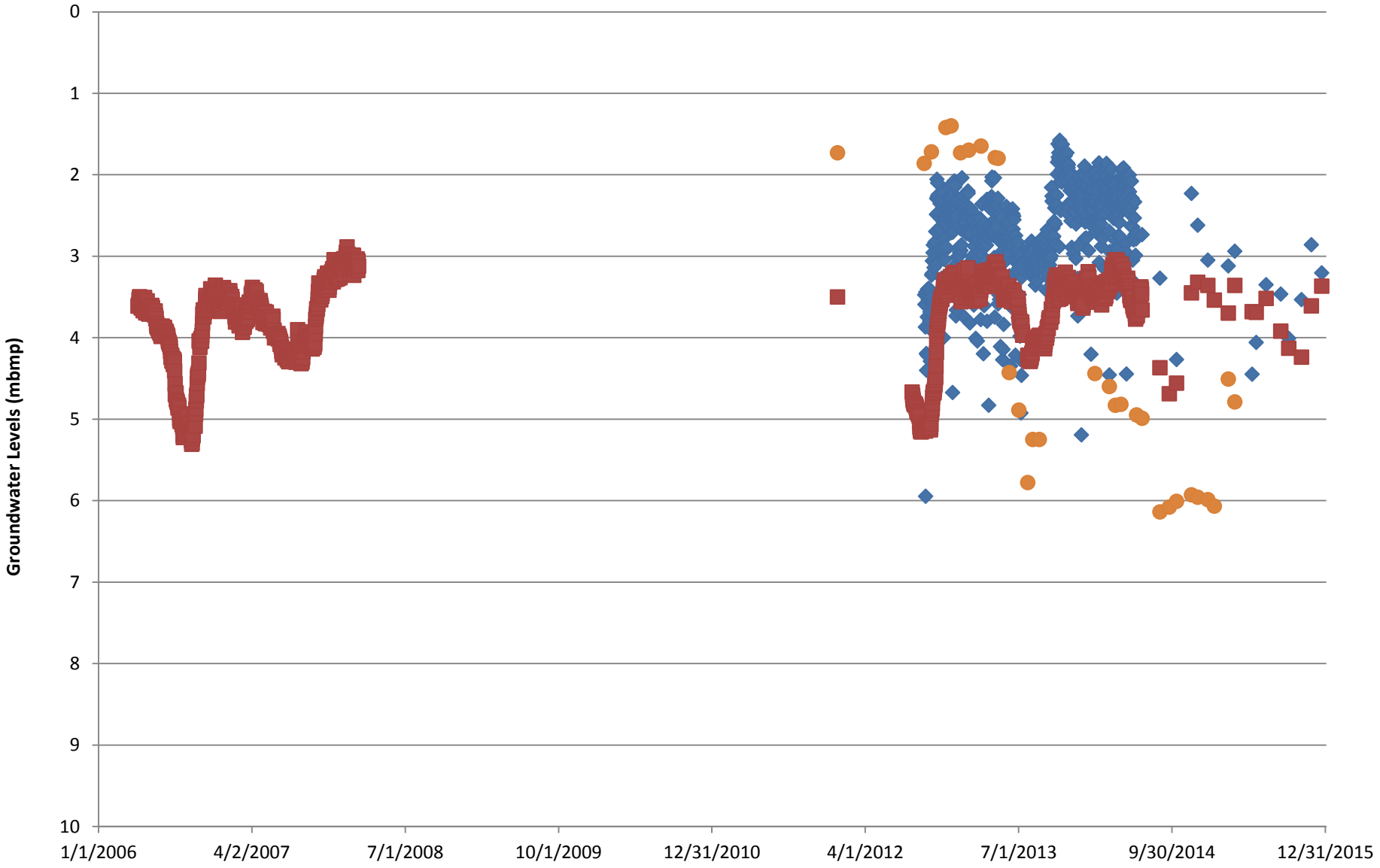
FILE No.		TEST:	
PROJECT No.	1407634	REVIEW:	JAE

SCALE:	NTS
DATE:	11/Feb/16
CAD:	JEB

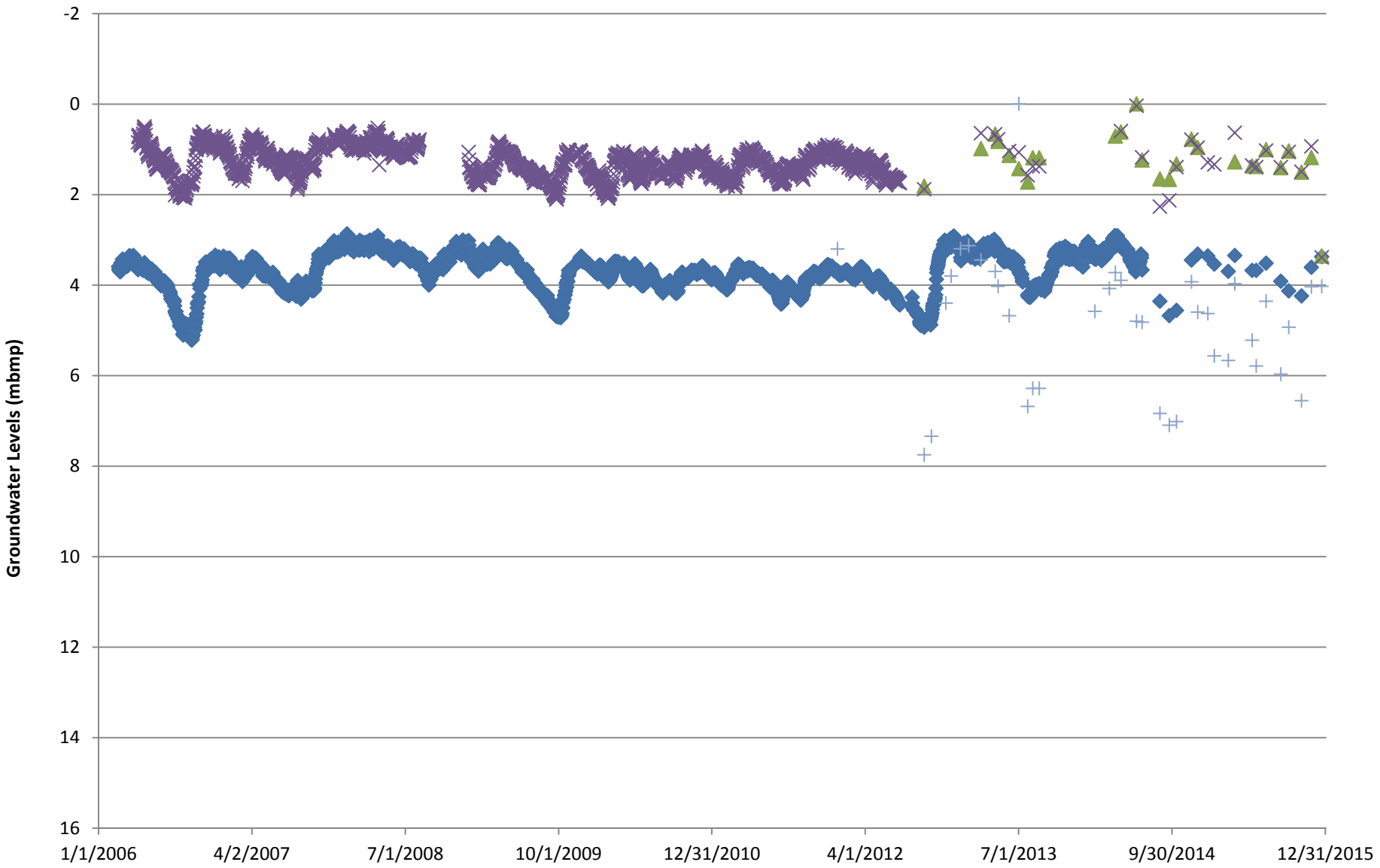
McCarthy Quarry
Overburden Monitoring Wells
GroundwaterLevel

QBJR/Coco Aggregates Inc.
PTTW Annual Report

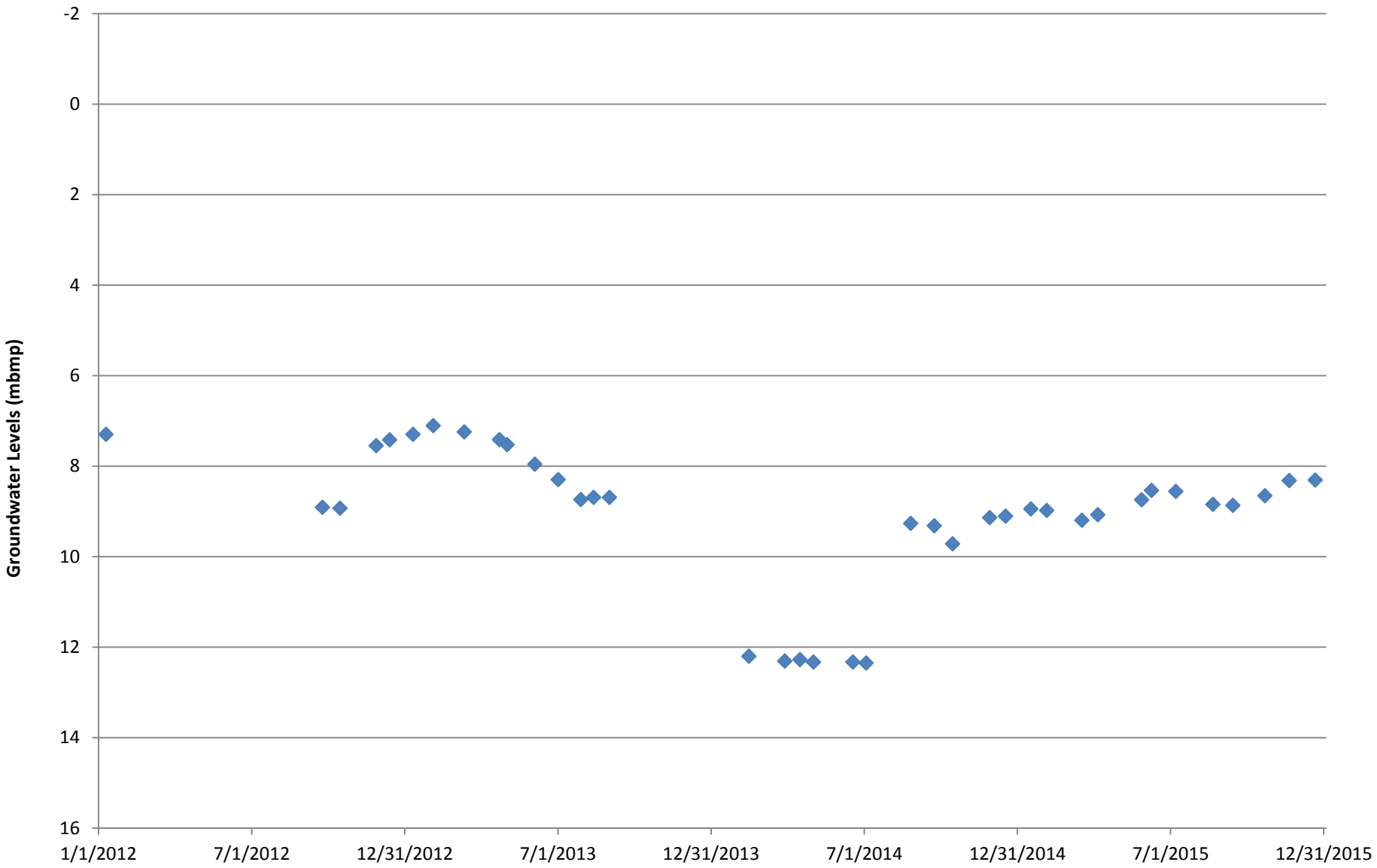
FIGURE No
B-1



Golder Associates	SCALE: NTS	McCarthy Quarry Verulam Monitoring Wells Groundwater Level	
	DATE: 11/Feb/16		
	CAD: JEB		
FILE No.	TEST:	QBJR/Coco Aggregates Inc. PTTW Annual Report	FIGURE No B-2
PROJECT No. 1407634	REVIEW: JAE		



Golder Associates	SCALE: NTS	McCarthy Quarry Bobcaygeon Monitoring Wells Groundwater Level	
	DATE: 11/Feb/16		
	CAD: JEB		
FILE No.	TEST:	QBJR/Coco Aggregates Inc. PTTW Annual Report	FIGURE No B-3
PROJECT No. 1407634	REVIEW: JAE		



	SCALE: NTS	**McCarthy Quarry**	
	DATE: 11/Feb/16	**Precambrian Monitoring Wells**	
	CAD: JEB	**Groundwater Level**	
FILE No.	TEST:	QBJR/Coco Aggregates Inc.	FIGURE No
PROJECT No. 1407634	REVIEW: JAE	PTTW Annual Report	**B-4**

APPENDIX C

Certificates of Analysis

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 507174-01-01

Attention:Alicia Beynon

Golder Associates Ltd
121 Commerce Park Drive
Unit L
Barrie, ON
L4N 8X1

Report Date: 2015/06/05
Report #: R3454094
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5A1196
Received: 2015/05/29, 08:30

Sample Matrix: Water
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	3	N/A	2015/05/30	CAM SOP-00448	SM 22 2320 B m
Carbonate, Bicarbonate and Hydroxide	3	N/A	2015/06/01	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	3	N/A	2015/06/03	CAM SOP-00463	EPA 325.2 m
Colour	2	N/A	2015/06/02	CAM SOP-00412	SM 22 2120 m
Colour	1	N/A	2015/06/03	CAM SOP-00412	SM 22 2120 m
Conductivity	3	N/A	2015/05/30	CAM SOP-00414	SM 22 2510 m
Dissolved Organic Carbon (DOC) (1)	1	N/A	2015/06/02	CAM SOP-00446	SM 22 5310 B m
Dissolved Organic Carbon (DOC) (1)	2	N/A	2015/06/03	CAM SOP-00446	SM 22 5310 B m
Fluoride	3	2015/05/30	2015/05/30	CAM SOP-00449	SM 22 4500-F C m
Hardness (calculated as CaCO3)	3	N/A	2015/06/04	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Metals by ICPMS	3	N/A	2015/06/04	CAM SOP-00447	EPA 6020A m
Ion Balance (% Difference)	3	N/A	2015/06/04		
Anion and Cation Sum	3	N/A	2015/06/04		
Total Ammonia-N	3	N/A	2015/06/05	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	2	N/A	2015/06/02	CAM SOP-00440	SM 22 4500-NO3I/NO2B
Nitrate (NO3) and Nitrite (NO2) in Water (2)	1	N/A	2015/06/03	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	3	N/A	2015/05/30	CAM SOP-00413	SM 4500H+ B m
Orthophosphate	3	N/A	2015/06/02	CAM SOP-00461	EPA 365.1 m
Sat. pH and Langelier Index (@ 20C)	3	N/A	2015/06/04		
Sat. pH and Langelier Index (@ 4C)	3	N/A	2015/06/04		
Sulphate by Automated Colourimetry	3	N/A	2015/06/02	CAM SOP-00464	EPA 375.4 m
Tannins & Lignins	3	N/A	2015/06/01	CAM SOP-00410	SM 22 5550 B m
Total Dissolved Solids	3	N/A	2015/06/01	CAM SOP-00428	SM 22 2540C m
Total Phosphorus (Colourimetric)	3	2015/06/03	2015/06/04	CAM SOP-00407	SM 4500 P B H m
Turbidity	3	N/A	2015/05/31	CAM SOP-00417	SM 22 2130 B m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 507174-01-01

Attention:Alicia Beynon

Golder Associates Ltd
121 Commerce Park Drive
Unit L
Barrie, ON
L4N 8X1

Report Date: 2015/06/05
Report #: R3454094
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5A1196
Received: 2015/05/29, 08:30

(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Antonella Brasil, Senior Project Manager
Email: ABrasil@maxxam.ca
Phone# (905)817-5817

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B5A1196
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

RESULTS OF ANALYSES OF WATER

Maxxam ID		AIX244	AIX244			AIX245	AIX245		
Sampling Date		2015/05/28 12:00	2015/05/28 12:00			2015/05/28 15:40	2015/05/28 15:40		
COC Number		507174-01-01	507174-01-01			507174-01-01	507174-01-01		
	Units	DW1	DW1 Lab-Dup	RDL	QC Batch	DW2	DW2 Lab-Dup	RDL	QC Batch
Calculated Parameters									
Anion Sum	me/L	13.0		N/A	4043235	7.53		N/A	4043235
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	320		1.0	4043236	310		1.0	4043236
Carb. Alkalinity (calc. as CaCO3)	mg/L	1.1		1.0	4043236	1.3		1.0	4043236
Cation Sum	me/L	13.5		N/A	4043235	8.46		N/A	4043235
Hardness (CaCO3)	mg/L	590		1.0	4042709	380		1.0	4042709
Ion Balance (% Difference)	%	2.07		N/A	4042708	5.81		N/A	4042708
Langelier Index (@ 20C)	N/A	0.783			4043237	0.780			4043237
Langelier Index (@ 4C)	N/A	0.537			4043238	0.532			4043238
Saturation pH (@ 20C)	N/A	6.79			4043237	6.88			4043237
Saturation pH (@ 4C)	N/A	7.04			4043238	7.13			4043238
Inorganics									
Total Ammonia-N	mg/L	<0.050		0.050	4051720	<0.050		0.050	4051720
Colour	TCU	<2	<2	2	4047684	<2		2	4046582
Conductivity	umho/cm	1300		1.0	4044927	710		1.0	4044927
Total Dissolved Solids	mg/L	964	972	10	4045678	430		10	4045155
Fluoride (F-)	mg/L	<0.10		0.10	4044934	<0.10		0.10	4044934
Dissolved Organic Carbon	mg/L	1.3		0.20	4047280	2.9	2.9	0.20	4047280
Orthophosphate (P)	mg/L	<0.010		0.010	4046719	<0.010		0.010	4046719
pH	pH	7.57		N/A	4044928	7.66		N/A	4044928
Total Phosphorus	mg/L	<0.020		0.020	4049449	<0.020		0.020	4049449
Dissolved Sulphate (SO4)	mg/L	36		1	4046720	19		1	4046720
Tannins & Lignins	mg/L	<0.2	<0.2	0.2	4045685	<0.2		0.2	4045685
Turbidity	NTU	<0.2		0.2	4044908	<0.2		0.2	4044908
Alkalinity (Total as CaCO3)	mg/L	320		1.0	4044926	310		1.0	4044926
Dissolved Chloride (Cl)	mg/L	210		3	4046712	35		1	4046712
Nitrite (N)	mg/L	<0.010		0.010	4045687	<0.010		0.010	4046567
Nitrate (N)	mg/L	0.59		0.10	4045687	<0.10		0.10	4046567
Nitrate + Nitrite	mg/L	0.59		0.10	4045687	<0.10		0.10	4046567

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B5A1196
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

RESULTS OF ANALYSES OF WATER

Maxxam ID		AIX246		
Sampling Date		2015/05/28 08:00		
COC Number		507174-01-01		
	Units	DW3	RDL	QC Batch
Calculated Parameters				
Anion Sum	me/L	8.57	N/A	4043235
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	230	1.0	4043236
Carb. Alkalinity (calc. as CaCO3)	mg/L	2.3	1.0	4043236
Cation Sum	me/L	9.11	N/A	4043235
Hardness (CaCO3)	mg/L	190	1.0	4042709
Ion Balance (% Difference)	%	3.06	N/A	4042708
Langelier Index (@ 20C)	N/A	0.471		4043237
Langelier Index (@ 4C)	N/A	0.223		4043238
Saturation pH (@ 20C)	N/A	7.55		4043237
Saturation pH (@ 4C)	N/A	7.80		4043238
Inorganics				
Total Ammonia-N	mg/L	0.42	0.050	4051720
Colour	TCU	<2	2	4046582
Conductivity	umho/cm	890	1.0	4044927
Total Dissolved Solids	mg/L	464	10	4045678
Fluoride (F-)	mg/L	0.72	0.10	4044934
Dissolved Organic Carbon	mg/L	0.72	0.20	4047280
Orthophosphate (P)	mg/L	<0.010	0.010	4046743
pH	pH	8.02	N/A	4044928
Total Phosphorus	mg/L	<0.020	0.020	4049449
Dissolved Sulphate (SO4)	mg/L	5	1	4046744
Tannins & Lignins	mg/L	<0.2	0.2	4045685
Turbidity	NTU	<0.2	0.2	4044908
Alkalinity (Total as CaCO3)	mg/L	230	1.0	4044926
Dissolved Chloride (Cl)	mg/L	130	2	4046742
Nitrite (N)	mg/L	<0.010	0.010	4045687
Nitrate (N)	mg/L	<0.10	0.10	4045687
Nitrate + Nitrite	mg/L	<0.10	0.10	4045687

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B5A1196
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		AIX244	AIX245	AIX246		
Sampling Date		2015/05/28 12:00	2015/05/28 15:40	2015/05/28 08:00		
COC Number		507174-01-01	507174-01-01	507174-01-01		
	Units	DW1	DW2	DW3	RDL	QC Batch
Metals						
Dissolved Aluminum (Al)	ug/L	<5.0	<5.0	11	5.0	4049302
Dissolved Arsenic (As)	ug/L	<1.0	<1.0	<1.0	1.0	4049302
Dissolved Barium (Ba)	ug/L	180	74	190	2.0	4049302
Dissolved Boron (B)	ug/L	21	88	790	10	4049302
Dissolved Cadmium (Cd)	ug/L	<0.10	<0.10	<0.10	0.10	4049302
Dissolved Calcium (Ca)	ug/L	180000	120000	35000	200	4049302
Dissolved Chromium (Cr)	ug/L	<5.0	<5.0	<5.0	5.0	4049302
Dissolved Copper (Cu)	ug/L	96	2.7	2.7	1.0	4049302
Dissolved Iron (Fe)	ug/L	<100	<100	<100	100	4049302
Dissolved Lead (Pb)	ug/L	3.5	<0.50	<0.50	0.50	4049302
Dissolved Magnesium (Mg)	ug/L	36000	17000	26000	50	4049302
Dissolved Manganese (Mn)	ug/L	6.8	17	4.7	2.0	4049302
Dissolved Potassium (K)	ug/L	1600	7000	7400	200	4049302
Dissolved Selenium (Se)	ug/L	<2.0	<2.0	<2.0	2.0	4049302
Dissolved Sodium (Na)	ug/L	37000	18000	120000	100	4049302
Dissolved Zinc (Zn)	ug/L	41	5.5	<5.0	5.0	4049302

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B5A1196
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

TEST SUMMARY

Maxxam ID: AIX244
Sample ID: DW1
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4044926	N/A	2015/05/30	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4043236	N/A	2015/06/01	Automated Statchk
Chloride by Automated Colourimetry	KONE	4046712	N/A	2015/06/03	Deonarine Ramnarine
Colour	SPEC	4047684	N/A	2015/06/03	Christine Pham
Conductivity	AT	4044927	N/A	2015/05/30	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4047280	N/A	2015/06/03	Elsamma Alex
Fluoride	ISE	4044934	2015/05/30	2015/05/30	Yogesh Patel
Hardness (calculated as CaCO3)		4042709	N/A	2015/06/04	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	4049302	N/A	2015/06/04	Prempal Bhatti
Ion Balance (% Difference)	CALC	4042708	N/A	2015/06/04	Automated Statchk
Anion and Cation Sum	CALC	4043235	N/A	2015/06/04	Automated Statchk
Total Ammonia-N	LACH/NH4	4051720	N/A	2015/06/05	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4045687	N/A	2015/06/02	Chandra Nandlal
pH	AT	4044928	N/A	2015/05/30	Yogesh Patel
Orthophosphate	KONE	4046719	N/A	2015/06/02	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4043237	N/A	2015/06/04	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4043238	N/A	2015/06/04	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4046720	N/A	2015/06/02	Alina Dobreanu
Tannins & Lignins	SPEC	4045685	N/A	2015/06/01	Elsamma Alex
Total Dissolved Solids	BAL	4045678	N/A	2015/06/01	Alpa Patel
Total Phosphorus (Colourimetric)	LACH/P	4049449	2015/06/03	2015/06/04	Viorica Rotaru
Turbidity	AT	4044908	N/A	2015/05/31	Neil Dassanayake

Maxxam ID: AIX244 Dup
Sample ID: DW1
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Colour	SPEC	4047684	N/A	2015/06/03	Christine Pham
Tannins & Lignins	SPEC	4045685	N/A	2015/06/01	Elsamma Alex
Total Dissolved Solids	BAL	4045678	N/A	2015/06/01	Alpa Patel

Maxxam ID: AIX245
Sample ID: DW2
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4044926	N/A	2015/05/30	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4043236	N/A	2015/06/01	Automated Statchk
Chloride by Automated Colourimetry	KONE	4046712	N/A	2015/06/03	Deonarine Ramnarine
Colour	SPEC	4046582	N/A	2015/06/02	Christine Pham
Conductivity	AT	4044927	N/A	2015/05/30	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4047280	N/A	2015/06/02	Elsamma Alex
Fluoride	ISE	4044934	2015/05/30	2015/05/30	Yogesh Patel

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Maxxam Job #: B5A1196
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

TEST SUMMARY

Maxxam ID: AIX245
Sample ID: DW2
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hardness (calculated as CaCO3)		4042709	N/A	2015/06/04	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	4049302	N/A	2015/06/04	Prempal Bhatti
Ion Balance (% Difference)	CALC	4042708	N/A	2015/06/04	Automated Statchk
Anion and Cation Sum	CALC	4043235	N/A	2015/06/04	Automated Statchk
Total Ammonia-N	LACH/NH4	4051720	N/A	2015/06/05	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4046567	N/A	2015/06/03	Chandra Nandlal
pH	AT	4044928	N/A	2015/05/30	Yogesh Patel
Orthophosphate	KONE	4046719	N/A	2015/06/02	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4043237	N/A	2015/06/04	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4043238	N/A	2015/06/04	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4046720	N/A	2015/06/02	Alina Dobreanu
Tannins & Lignins	SPEC	4045685	N/A	2015/06/01	Elsamma Alex
Total Dissolved Solids	BAL	4045155	N/A	2015/06/01	Gurpreet Kaur
Total Phosphorus (Colourimetric)	LACH/P	4049449	2015/06/03	2015/06/04	Viorica Rotaru
Turbidity	AT	4044908	N/A	2015/05/31	Neil Dassanayake

Maxxam ID: AIX245 Dup
Sample ID: DW2
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4047280	N/A	2015/06/02	Elsamma Alex

Maxxam ID: AIX246
Sample ID: DW3
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4044926	N/A	2015/05/30	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4043236	N/A	2015/06/01	Automated Statchk
Chloride by Automated Colourimetry	KONE	4046742	N/A	2015/06/03	Deonarine Ramnarine
Colour	SPEC	4046582	N/A	2015/06/02	Christine Pham
Conductivity	AT	4044927	N/A	2015/05/30	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4047280	N/A	2015/06/03	Elsamma Alex
Fluoride	ISE	4044934	2015/05/30	2015/05/30	Yogesh Patel
Hardness (calculated as CaCO3)		4042709	N/A	2015/06/04	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	4049302	N/A	2015/06/04	Prempal Bhatti
Ion Balance (% Difference)	CALC	4042708	N/A	2015/06/04	Automated Statchk
Anion and Cation Sum	CALC	4043235	N/A	2015/06/04	Automated Statchk
Total Ammonia-N	LACH/NH4	4051720	N/A	2015/06/05	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4045687	N/A	2015/06/02	Chandra Nandlal
pH	AT	4044928	N/A	2015/05/30	Yogesh Patel
Orthophosphate	KONE	4046743	N/A	2015/06/02	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4043237	N/A	2015/06/04	Automated Statchk

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Maxxam Job #: B5A1196
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

TEST SUMMARY

Maxxam ID: AIX246
Sample ID: DW3
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sat. pH and Langelier Index (@ 4C)	CALC	4043238	N/A	2015/06/04	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4046744	N/A	2015/06/02	Alina Dobreanu
Tannins & Lignins	SPEC	4045685	N/A	2015/06/01	Elsamma Alex
Total Dissolved Solids	BAL	4045678	N/A	2015/06/01	Alpa Patel
Total Phosphorus (Colourimetric)	LACH/P	4049449	2015/06/03	2015/06/04	Viorica Rotaru
Turbidity	AT	4044908	N/A	2015/05/31	Neil Dassanayake

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GENERAL COMMENTS

Results relate only to the items tested.

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Maxxam Job #: B5A1196
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
4044908	NYS	Spiked Blank	Turbidity	2015/05/30		95	%	85 - 115
4044908	NYS	Method Blank	Turbidity	2015/05/30	<0.2		NTU	
4044908	NYS	RPD	Turbidity	2015/05/31	3.1		%	20
4044926	YPA	Spiked Blank	Alkalinity (Total as CaCO3)	2015/05/30		93	%	85 - 115
4044926	YPA	Method Blank	Alkalinity (Total as CaCO3)	2015/05/30	<1.0		mg/L	
4044926	YPA	RPD	Alkalinity (Total as CaCO3)	2015/05/30	2.2		%	25
4044927	YPA	Spiked Blank	Conductivity	2015/05/30		100	%	85 - 115
4044927	YPA	Method Blank	Conductivity	2015/05/30	<1.0		umho/c	
4044927	YPA	RPD	Conductivity	2015/05/30	1.2		%	25
4044928	YPA	Spiked Blank	pH	2015/05/30		101	%	98 - 103
4044928	YPA	RPD	pH	2015/05/30	0.27		%	N/A
4044934	YPA	Matrix Spike	Fluoride (F-)	2015/05/30		78 (1)	%	80 - 120
4044934	YPA	Spiked Blank	Fluoride (F-)	2015/05/30		101	%	80 - 120
4044934	YPA	Method Blank	Fluoride (F-)	2015/05/30	<0.10		mg/L	
4044934	YPA	RPD	Fluoride (F-)	2015/05/30	NC		%	20
4045155	GKR	QC Standard	Total Dissolved Solids	2015/06/01		95	%	90 - 110
4045155	GKR	Method Blank	Total Dissolved Solids	2015/06/01	<10		mg/L	
4045155	GKR	RPD	Total Dissolved Solids	2015/06/01	6.5		%	25
4045678	ALP	QC Standard	Total Dissolved Solids	2015/06/01		99	%	90 - 110
4045678	ALP	Method Blank	Total Dissolved Solids	2015/06/01	<10		mg/L	
4045678	ALP	RPD [AIX244-01]	Total Dissolved Solids	2015/06/01	0.83		%	25
4045685	EAX	Matrix Spike [AIX244-01]	Tannins & Lignins	2015/06/01		98	%	80 - 120
4045685	EAX	Spiked Blank	Tannins & Lignins	2015/06/01		96	%	80 - 120
4045685	EAX	Method Blank	Tannins & Lignins	2015/06/01	<0.2		mg/L	
4045685	EAX	RPD [AIX244-01]	Tannins & Lignins	2015/06/01	NC		%	25
4045687	C_N	Matrix Spike	Nitrite (N)	2015/06/02		97	%	80 - 120
			Nitrate (N)	2015/06/02		102	%	80 - 120
4045687	C_N	Spiked Blank	Nitrite (N)	2015/06/02		97	%	80 - 120
			Nitrate (N)	2015/06/02		100	%	80 - 120
4045687	C_N	Method Blank	Nitrite (N)	2015/06/02	<0.010		mg/L	
			Nitrate (N)	2015/06/02	<0.10		mg/L	
4045687	C_N	RPD	Nitrite (N)	2015/06/02	NC		%	25
			Nitrate (N)	2015/06/02	NC		%	25
4046567	C_N	Matrix Spike	Nitrite (N)	2015/06/03		96	%	80 - 120
			Nitrate (N)	2015/06/03		97	%	80 - 120
4046567	C_N	Spiked Blank	Nitrite (N)	2015/06/03		98	%	80 - 120
			Nitrate (N)	2015/06/03		100	%	80 - 120
4046567	C_N	Method Blank	Nitrite (N)	2015/06/03	<0.010		mg/L	
			Nitrate (N)	2015/06/03	<0.10		mg/L	
4046567	C_N	RPD	Nitrite (N)	2015/06/03	NC		%	25
			Nitrate (N)	2015/06/03	NC		%	25
4046582	CP	Spiked Blank	Colour	2015/06/02		99	%	80 - 120
4046582	CP	Method Blank	Colour	2015/06/02	<2		TCU	
4046582	CP	RPD	Colour	2015/06/02	NC		%	25
4046712	DRM	Matrix Spike	Dissolved Chloride (Cl)	2015/06/03		NC	%	80 - 120
4046712	DRM	Spiked Blank	Dissolved Chloride (Cl)	2015/06/03		103	%	80 - 120
4046712	DRM	Method Blank	Dissolved Chloride (Cl)	2015/06/03	<1		mg/L	
4046712	DRM	RPD	Dissolved Chloride (Cl)	2015/06/03	3.1		%	20
4046719	ADB	Matrix Spike	Orthophosphate (P)	2015/06/02		111	%	75 - 125
4046719	ADB	Spiked Blank	Orthophosphate (P)	2015/06/02		100	%	80 - 120
4046719	ADB	Method Blank	Orthophosphate (P)	2015/06/02	<0.010		mg/L	
4046719	ADB	RPD	Orthophosphate (P)	2015/06/02	4.1		%	25

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Maxxam Job #: B5A1196
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
4046720	ADB	Matrix Spike	Dissolved Sulphate (SO4)	2015/06/02		NC	%	75 - 125
4046720	ADB	Spiked Blank	Dissolved Sulphate (SO4)	2015/06/02		98	%	80 - 120
4046720	ADB	Method Blank	Dissolved Sulphate (SO4)	2015/06/02	<1		mg/L	
4046720	ADB	RPD	Dissolved Sulphate (SO4)	2015/06/02	0.062		%	20
4046742	DRM	Matrix Spike	Dissolved Chloride (Cl)	2015/06/03		104	%	80 - 120
4046742	DRM	Spiked Blank	Dissolved Chloride (Cl)	2015/06/03		103	%	80 - 120
4046742	DRM	Method Blank	Dissolved Chloride (Cl)	2015/06/03	<1		mg/L	
4046742	DRM	RPD	Dissolved Chloride (Cl)	2015/06/03	NC		%	20
4046743	ADB	Matrix Spike	Orthophosphate (P)	2015/06/02		104	%	75 - 125
4046743	ADB	Spiked Blank	Orthophosphate (P)	2015/06/02		100	%	80 - 120
4046743	ADB	Method Blank	Orthophosphate (P)	2015/06/02	<0.010		mg/L	
4046743	ADB	RPD	Orthophosphate (P)	2015/06/02	NC		%	25
4046744	ADB	Matrix Spike	Dissolved Sulphate (SO4)	2015/06/02		NC	%	75 - 125
4046744	ADB	Spiked Blank	Dissolved Sulphate (SO4)	2015/06/02		99	%	80 - 120
4046744	ADB	Method Blank	Dissolved Sulphate (SO4)	2015/06/02	<1		mg/L	
4046744	ADB	RPD	Dissolved Sulphate (SO4)	2015/06/02	0.53		%	20
4047280	EAX	Matrix Spike [AIX245-03]	Dissolved Organic Carbon	2015/06/02		97	%	80 - 120
4047280	EAX	Spiked Blank	Dissolved Organic Carbon	2015/06/02		99	%	80 - 120
4047280	EAX	Method Blank	Dissolved Organic Carbon	2015/06/02	0.24, RDL=0.20		mg/L	
4047280	EAX	RPD [AIX245-03]	Dissolved Organic Carbon	2015/06/02	0.28		%	20
4047684	CP	Spiked Blank	Colour	2015/06/03		98	%	80 - 120
4047684	CP	Method Blank	Colour	2015/06/03	<2		TCU	
4047684	CP	RPD [AIX244-01]	Colour	2015/06/03	NC		%	25
4049302	PBA	Matrix Spike	Dissolved Aluminum (Al)	2015/06/04		101	%	80 - 120
			Dissolved Arsenic (As)	2015/06/04		102	%	80 - 120
			Dissolved Barium (Ba)	2015/06/04		NC	%	80 - 120
			Dissolved Boron (B)	2015/06/04		99	%	80 - 120
			Dissolved Cadmium (Cd)	2015/06/04		102	%	80 - 120
			Dissolved Calcium (Ca)	2015/06/04		NC	%	80 - 120
			Dissolved Chromium (Cr)	2015/06/04		97	%	80 - 120
			Dissolved Copper (Cu)	2015/06/04		93	%	80 - 120
			Dissolved Iron (Fe)	2015/06/04		98	%	80 - 120
			Dissolved Lead (Pb)	2015/06/04		91	%	80 - 120
			Dissolved Magnesium (Mg)	2015/06/04		NC	%	80 - 120
			Dissolved Manganese (Mn)	2015/06/04		NC	%	80 - 120
			Dissolved Potassium (K)	2015/06/04		99	%	80 - 120
			Dissolved Selenium (Se)	2015/06/04		98	%	80 - 120
			Dissolved Sodium (Na)	2015/06/04		NC	%	80 - 120
			Dissolved Zinc (Zn)	2015/06/04		96	%	80 - 120
4049302	PBA	Spiked Blank	Dissolved Aluminum (Al)	2015/06/04		108	%	80 - 120
			Dissolved Arsenic (As)	2015/06/04		103	%	80 - 120
			Dissolved Barium (Ba)	2015/06/04		102	%	80 - 120
			Dissolved Boron (B)	2015/06/04		104	%	80 - 120
			Dissolved Cadmium (Cd)	2015/06/04		103	%	80 - 120
			Dissolved Calcium (Ca)	2015/06/04		105	%	80 - 120
			Dissolved Chromium (Cr)	2015/06/04		103	%	80 - 120
			Dissolved Copper (Cu)	2015/06/04		103	%	80 - 120
			Dissolved Iron (Fe)	2015/06/04		106	%	80 - 120
			Dissolved Lead (Pb)	2015/06/04		100	%	80 - 120
			Dissolved Magnesium (Mg)	2015/06/04		106	%	80 - 120
			Dissolved Manganese (Mn)	2015/06/04		106	%	80 - 120

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Maxxam Job #: B5A1196
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Dissolved Potassium (K)	2015/06/04		106	%	80 - 120
			Dissolved Selenium (Se)	2015/06/04		103	%	80 - 120
			Dissolved Sodium (Na)	2015/06/04		105	%	80 - 120
			Dissolved Zinc (Zn)	2015/06/04		102	%	80 - 120
4049302	PBA	Method Blank	Dissolved Aluminum (Al)	2015/06/04	<5.0		ug/L	
			Dissolved Arsenic (As)	2015/06/04	<1.0		ug/L	
			Dissolved Barium (Ba)	2015/06/04	<2.0		ug/L	
			Dissolved Boron (B)	2015/06/04	<10		ug/L	
			Dissolved Cadmium (Cd)	2015/06/04	<0.10		ug/L	
			Dissolved Calcium (Ca)	2015/06/04	<200		ug/L	
			Dissolved Chromium (Cr)	2015/06/04	<5.0		ug/L	
			Dissolved Copper (Cu)	2015/06/04	<1.0		ug/L	
			Dissolved Iron (Fe)	2015/06/04	<100		ug/L	
			Dissolved Lead (Pb)	2015/06/04	<0.50		ug/L	
			Dissolved Magnesium (Mg)	2015/06/04	65, RDL=50		ug/L	
			Dissolved Manganese (Mn)	2015/06/04	<2.0		ug/L	
			Dissolved Potassium (K)	2015/06/04	<200		ug/L	
			Dissolved Selenium (Se)	2015/06/04	<2.0		ug/L	
			Dissolved Sodium (Na)	2015/06/04	<100		ug/L	
			Dissolved Zinc (Zn)	2015/06/04	<5.0		ug/L	
4049302	PBA	RPD	Dissolved Arsenic (As)	2015/06/04	NC		%	20
			Dissolved Barium (Ba)	2015/06/04	1.9		%	20
			Dissolved Boron (B)	2015/06/04	NC		%	20
			Dissolved Cadmium (Cd)	2015/06/04	NC		%	20
			Dissolved Chromium (Cr)	2015/06/04	NC		%	20
			Dissolved Copper (Cu)	2015/06/04	NC		%	20
			Dissolved Lead (Pb)	2015/06/04	NC		%	20
			Dissolved Selenium (Se)	2015/06/04	NC		%	20
			Dissolved Sodium (Na)	2015/06/04	3.8		%	20
			Dissolved Zinc (Zn)	2015/06/04	NC		%	20
4049449	VRO	Matrix Spike	Total Phosphorus	2015/06/04		97	%	80 - 120
4049449	VRO	QC Standard	Total Phosphorus	2015/06/04		101	%	80 - 120
4049449	VRO	Spiked Blank	Total Phosphorus	2015/06/04		99	%	80 - 120
4049449	VRO	Method Blank	Total Phosphorus	2015/06/04	<0.020		mg/L	
4049449	VRO	RPD	Total Phosphorus	2015/06/04	3.5		%	20
4051720	COP	Matrix Spike	Total Ammonia-N	2015/06/05		103	%	80 - 120
4051720	COP	Spiked Blank	Total Ammonia-N	2015/06/05		103	%	85 - 115
4051720	COP	Method Blank	Total Ammonia-N	2015/06/05	<0.050		mg/L	

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Maxxam Job #: B5A1196
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
4051720	COP	RPD	Total Ammonia-N	2015/06/05	NC		%	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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Maxxam Job #: B5A1196
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere

Cristina Carriere, Scientific Services

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 511947-01-01

Attention:Alicia Beynon

Golder Associates Ltd
121 Commerce Park Drive
Unit L
Barrie, ON
L4N 8X1

Report Date: 2015/06/05
Report #: R3454242
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5A1281
Received: 2015/05/29, 08:30

Sample Matrix: Water
Samples Received: 17

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	17	N/A	2015/06/03	CAM SOP-00448	SM 22 2320 B m
Carbonate, Bicarbonate and Hydroxide	3	N/A	2015/06/03	CAM SOP-00102	APHA 4500-CO2 D
Carbonate, Bicarbonate and Hydroxide	14	N/A	2015/06/04	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	17	N/A	2015/06/04	CAM SOP-00463	EPA 325.2 m
Colour	17	N/A	2015/06/03	CAM SOP-00412	SM 22 2120 m
Conductivity	17	N/A	2015/06/03	CAM SOP-00414	SM 22 2510 m
Dissolved Organic Carbon (DOC) (1)	16	N/A	2015/06/02	CAM SOP-00446	SM 22 5310 B m
Dissolved Organic Carbon (DOC) (1)	1	N/A	2015/06/03	CAM SOP-00446	SM 22 5310 B m
Fluoride	17	2015/06/02	2015/06/03	CAM SOP-00449	SM 22 4500-F C m
Hardness (calculated as CaCO3)	17	N/A	2015/06/03	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Metals by ICPMS	15	N/A	2015/06/03	CAM SOP-00447	EPA 6020A m
Dissolved Metals by ICPMS	2	N/A	2015/06/05	CAM SOP-00447	EPA 6020A m
Total Ammonia-N	17	N/A	2015/06/04	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	17	N/A	2015/06/04	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	17	N/A	2015/06/03	CAM SOP-00413	SM 4500H+ B m
Orthophosphate	17	N/A	2015/06/03	CAM SOP-00461	EPA 365.1 m
Sulphate by Automated Colourimetry	17	N/A	2015/06/03	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids (TDS calc)	17	N/A	2015/06/04		

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

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Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 511947-01-01

Attention:Alicia Beynon

Golder Associates Ltd
121 Commerce Park Drive
Unit L
Barrie, ON
L4N 8X1

Report Date: 2015/06/05
Report #: R3454242
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5A1281
Received: 2015/05/29, 08:30

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Antonella Brasil, Senior Project Manager
Email: ABrasil@maxxam.ca
Phone# (905)817-5817

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Maxxam Job #: B5A1281
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

RESULTS OF ANALYSES OF WATER

Maxxam ID				AIX829	AIX829			AIX830		
Sampling Date				2015/05/28 15:15	2015/05/28 15:15			2015/05/28 09:45		
COC Number				511947-01-01	511947-01-01			511947-01-01		
	Units	MAC	A/O	AM1b	AM1b Lab-Dup	RDL	QC Batch	TW1-1	RDL	QC Batch
Calculated Parameters										
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	210		1.0	4043953	250	1.0	4043953
Calculated TDS	mg/L	-	500	280		1.0	4042791	1200	1.0	4042791
Hardness (CaCO3)	mg/L	-	80:100	240		1.0	4044366	550	1.0	4044366
Inorganics										
Total Ammonia-N	mg/L	-	-	0.075		0.050	4048934	0.89	0.050	4048934
Colour	TCU	-	5	<2		2	4047684	<2	2	4047684
Conductivity	umho/cm	-	-	480	480	1.0	4047982	2400	1.0	4047821
Fluoride (F-)	mg/L	**1.5**	-	0.23	0.24	0.10	4047967	0.55	0.10	4047822
Dissolved Organic Carbon	mg/L	-	5	0.70		0.20	4047398	1.5	0.20	4047470
Orthophosphate (P)	mg/L	-	-	<0.010		0.010	4048160	<0.010	0.010	4048160
pH	pH	-	6.5:8.5	7.92	7.92	N/A	4047981	7.82	N/A	4047818
Dissolved Sulphate (SO4)	mg/L	-	500	38		1	4048161	14	1	4048161
Alkalinity (Total as CaCO3)	mg/L	-	30:500	210	210	1.0	4047979	250	1.0	4047801
Dissolved Chloride (Cl)	mg/L	-	250	4		1	4048151	580	5	4048151
Nitrite (N)	mg/L	**1**	-	0.019		0.010	4048003	<0.010	0.010	4047559
Nitrate (N)	mg/L	**10**	-	<0.10		0.10	4048003	<0.10	0.10	4047559
Nitrate + Nitrite	mg/L	**10**	-	<0.10		0.10	4048003	<0.10	0.10	4047559

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)
N/A = Not Applicable

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Maxxam Job #: B5A1281
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

RESULTS OF ANALYSES OF WATER

Maxxam ID				AIX831		AIX832		AIX833		
Sampling Date				2015/05/28 14:30		2015/05/28 14:45		2015/05/28 14:45		
COC Number				511947-01-01		511947-01-01		511947-01-01		
	Units	MAC	A/O	Bored	QC Batch	OW4-1	QC Batch	OW4-2	RDL	QC Batch
Calculated Parameters										
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	210	4043953	260	4043953	280	1.0	4043953
Calculated TDS	mg/L	-	500	290	4042791	430	4042791	530	1.0	4042791
Hardness (CaCO3)	mg/L	-	80:100	180	4044366	72	4044366	120	1.0	4044366
Inorganics										
Total Ammonia-N	mg/L	-	-	<0.050	4048934	0.72	4048934	0.77	0.050	4048934
Colour	TCU	-	5	<2	4047684	<2	4047684	<2	2	4047684
Conductivity	umho/cm	-	-	490	4047821	760	4047821	900	1.0	4047821
Fluoride (F-)	mg/L	**1.5**	-	0.15	4047822	1.5	4047822	1.5	0.10	4047822
Dissolved Organic Carbon	mg/L	-	5	0.92	4047398	1.6	4047470	1.1	0.20	4047470
Orthophosphate (P)	mg/L	-	-	<0.010	4048160	<0.010	4048160	<0.010	0.010	4048160
pH	pH	-	6.5:8.5	8.18	4047818	8.33	4047818	8.18	N/A	4047818
Dissolved Sulphate (SO4)	mg/L	-	500	34	4048161	4	4048161	<1	1	4048161
Alkalinity (Total as CaCO3)	mg/L	-	30:500	210	4047801	260	4047801	280	1.0	4047801
Dissolved Chloride (Cl)	mg/L	-	250	7	4048151	84	4048151	110	1	4048151
Nitrite (N)	mg/L	**1**	-	<0.010	4047559	<0.010	4048003	<0.010	0.010	4047559
Nitrate (N)	mg/L	**10**	-	0.29	4047559	<0.10	4048003	<0.10	0.10	4047559
Nitrate + Nitrite	mg/L	**10**	-	0.29	4047559	<0.10	4048003	<0.10	0.10	4047559

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
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Maxxam Job #: B5A1281
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

RESULTS OF ANALYSES OF WATER

Maxxam ID				AIX834			AIX835	AIX835		
Sampling Date				2015/05/28 12:45			2015/05/28 12:45	2015/05/28 12:45		
COC Number				511947-01-01			511947-01-01	511947-01-01		
	Units	MAC	A/O	OW5-1	RDL	QC Batch	OW5-2	OW5-2 Lab-Dup	RDL	QC Batch
Calculated Parameters										
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	220	1.0	4043953	110		1.0	4043953
Calculated TDS	mg/L	-	500	330	1.0	4042791	17000		1.0	4042791
Hardness (CaCO3)	mg/L	-	80:100	160	1.0	4044366	6100		1.0	4044366
Inorganics										
Total Ammonia-N	mg/L	-	-	0.84	0.050	4048934	9.4		0.25	4048934
Colour	TCU	-	5	<2	2	4047684	73		2	4047684
Conductivity	umho/cm	-	-	610	1.0	4047821	28000		1.0	4047982
Fluoride (F-)	mg/L	**1.5**	-	0.85	0.10	4047822	0.44		0.10	4047967
Dissolved Organic Carbon	mg/L	-	5	1.2	0.20	4047470	0.49		0.20	4047398
Orthophosphate (P)	mg/L	-	-	<0.010	0.010	4048160	<0.010	<0.010	0.010	4048484
pH	pH	-	6.5:8.5	8.04	N/A	4047818	7.23		N/A	4047981
Dissolved Sulphate (SO4)	mg/L	-	500	28	1	4048161	<1	<1	1	4048483
Alkalinity (Total as CaCO3)	mg/L	-	30:500	230	1.0	4047801	110		1.0	4047979
Dissolved Chloride (Cl)	mg/L	-	250	36	1	4048151	11000	11000	100	4048471
Nitrite (N)	mg/L	**1**	-	0.072	0.010	4047559	<0.010		0.010	4047995
Nitrate (N)	mg/L	**10**	-	0.24	0.10	4047559	<0.10		0.10	4047995
Nitrate + Nitrite	mg/L	**10**	-	0.31	0.10	4047559	<0.10		0.10	4047995

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
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Maxxam Job #: B5A1281
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

RESULTS OF ANALYSES OF WATER

Maxxam ID				AIX836			AIX837		
Sampling Date				2015/05/28 12:45			2015/05/28 14:15		
COC Number				511947-01-01			511947-01-01		
	Units	MAC	A/O	OW5-3	RDL	QC Batch	OW6-2	RDL	QC Batch
Calculated Parameters									
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	110	1.0	4043953	150	1.0	4043953
Calculated TDS	mg/L	-	500	17000	1.0	4044587	3100	1.0	4044587
Hardness (CaCO3)	mg/L	-	80:100	6200	1.0	4044366	1100	1.0	4044366
Inorganics									
Total Ammonia-N	mg/L	-	-	9.5	0.25	4048934	0.82	0.050	4048934
Colour	TCU	-	5	38	2	4047684	<2	2	4047684
Conductivity	umho/cm	-	-	29000	1.0	4047821	5400	1.0	4047821
Fluoride (F-)	mg/L	**1.5**	-	0.42	0.10	4047822	0.46	0.10	4047822
Dissolved Organic Carbon	mg/L	-	5	0.97	0.20	4047470	1.2	0.20	4047398
Orthophosphate (P)	mg/L	-	-	<0.010	0.010	4048160	<0.010	0.010	4048160
pH	pH	-	6.5:8.5	7.35	N/A	4047818	7.82	N/A	4047818
Dissolved Sulphate (SO4)	mg/L	-	500	20	1	4048161	570	5	4048161
Alkalinity (Total as CaCO3)	mg/L	-	30:500	110	1.0	4047801	150	1.0	4047801
Dissolved Chloride (Cl)	mg/L	-	250	11000	100	4048151	1400	20	4048151
Nitrite (N)	mg/L	**1**	-	<0.010	0.010	4048003	0.256	0.010	4047995
Nitrate (N)	mg/L	**10**	-	<0.10	0.10	4048003	0.66	0.10	4047995
Nitrate + Nitrite	mg/L	**10**	-	<0.10	0.10	4048003	0.91	0.10	4047995

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)
N/A = Not Applicable

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Maxxam Job #: B5A1281
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

RESULTS OF ANALYSES OF WATER

Maxxam ID				AIX838			AIX839		
Sampling Date				2015/05/28 11:15			2015/05/28 11:15		
COC Number				511947-01-01			511947-01-01		
	Units	MAC	A/O	OW7-1	RDL	QC Batch	OW7-2	RDL	QC Batch
Calculated Parameters									
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	270	1.0	4043953	270	1.0	4043953
Calculated TDS	mg/L	-	500	3200	1.0	4044587	4700	1.0	4044587
Hardness (CaCO3)	mg/L	-	80:100	890	1.0	4044366	1500	1.0	4044366
Inorganics									
Total Ammonia-N	mg/L	-	-	3.7	0.050	4048934	2.3	0.050	4048934
Colour	TCU	-	5	3	2	4047684	3	2	4047684
Conductivity	umho/cm	-	-	5600	1.0	4047982	8000	1.0	4047821
Fluoride (F-)	mg/L	**1.5**	-	**2.7**	0.10	4047967	**2.4**	0.10	4047822
Dissolved Organic Carbon	mg/L	-	5	1.0	0.20	4047470	0.86	0.20	4047470
Orthophosphate (P)	mg/L	-	-	<0.010	0.010	4048160	<0.010	0.010	4048160
pH	pH	-	6.5:8.5	7.76	N/A	4047981	7.78	N/A	4047818
Dissolved Sulphate (SO4)	mg/L	-	500	23	1	4048161	31	1	4048161
Alkalinity (Total as CaCO3)	mg/L	-	30:500	270	1.0	4047979	280	1.0	4047801
Dissolved Chloride (Cl)	mg/L	-	250	1700	20	4048151	2700	30	4048151
Nitrite (N)	mg/L	**1**	-	<0.010	0.010	4048003	<0.010	0.010	4047559
Nitrate (N)	mg/L	**10**	-	<0.10	0.10	4048003	<0.10	0.10	4047559
Nitrate + Nitrite	mg/L	**10**	-	<0.10	0.10	4048003	<0.10	0.10	4047559

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)

N/A = Not Applicable

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Maxxam Job #: B5A1281
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

RESULTS OF ANALYSES OF WATER

Maxxam ID				AIX840		AIX841			AIX842		
Sampling Date				2015/05/28 10:15		2015/05/28 10:15			2015/05/28 08:30		
COC Number				511947-01-01		511947-01-01			511947-01-01		
	Units	MAC	A/O	OW8-1	QC Batch	OW8-2	RDL	QC Batch	OW9-1	RDL	QC Batch
Calculated Parameters											
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	340	4044586	300	1.0	4044586	220	1.0	4044586
Calculated TDS	mg/L	-	500	680	4044587	1000	1.0	4044587	8500	1.0	4044587
Hardness (CaCO3)	mg/L	-	80:100	250	4044366	890	1.0	4044366	2900	1.0	4044366
Inorganics											
Total Ammonia-N	mg/L	-	-	0.58	4048934	0.93	0.050	4048934	5.2	0.25	4048934
Colour	TCU	-	5	<2	4047684	<2	2	4047684	7	2	4047684
Conductivity	umho/cm	-	-	1300	4047821	1200	1.0	4047821	15000	1.0	4047821
Fluoride (F-)	mg/L	**1.5**	-	**2.4**	4047822	0.80	0.10	4047822	0.18	0.10	4047822
Dissolved Organic Carbon	mg/L	-	5	1.3	4047470	1.7	0.20	4047470	8.8	0.20	4047280
Orthophosphate (P)	mg/L	-	-	<0.010	4048160	<0.010	0.010	4048160	<0.010	0.010	4048160
pH	pH	-	6.5:8.5	8.02	4047818	7.88	N/A	4047818	7.60	N/A	4047818
Dissolved Sulphate (SO4)	mg/L	-	500	33	4048161	37	1	4048161	150	1	4048161
Alkalinity (Total as CaCO3)	mg/L	-	30:500	350	4047801	300	1.0	4047801	220	1.0	4047801
Dissolved Chloride (Cl)	mg/L	-	250	160	4048151	180	2	4048151	5200	50	4048151
Nitrite (N)	mg/L	**1**	-	<0.010	4047559	<0.010	0.010	4048003	<0.010	0.010	4047559
Nitrate (N)	mg/L	**10**	-	<0.10	4047559	<0.10	0.10	4048003	<0.10	0.10	4047559
Nitrate + Nitrite	mg/L	**10**	-	<0.10	4047559	<0.10	0.10	4048003	<0.10	0.10	4047559

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
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N/A = Not Applicable

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Maxxam Job #: B5A1281
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

RESULTS OF ANALYSES OF WATER

Maxxam ID				AIX843	AIX843			AIX844		
Sampling Date				2015/05/28 08:30	2015/05/28 08:30			2015/05/28 12:45		
COC Number				511947-01-01	511947-01-01			511947-01-01		
	Units	MAC	A/O	OW9-2	OW9-2 Lab-Dup	RDL	QC Batch	OW5-2D	RDL	QC Batch
Calculated Parameters										
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	280		1.0	4044586	110	1.0	4044586
Calculated TDS	mg/L	-	500	4600		1.0	4044587	16000	1.0	4044587
Hardness (CaCO3)	mg/L	-	80:100	1900		1.0	4044366	6200	1.0	4044366
Inorganics										
Total Ammonia-N	mg/L	-	-	1.9		0.050	4048934	9.5	0.25	4048934
Colour	TCU	-	5	7		2	4047684	56	2	4047684
Conductivity	umho/cm	-	-	7000		1.0	4047821	28000	1.0	4047821
Fluoride (F-)	mg/L	**1.5**	-	0.36		0.10	4047822	0.43	0.10	4047822
Dissolved Organic Carbon	mg/L	-	5	8.8		0.20	4047470	0.52	0.20	4047398
Orthophosphate (P)	mg/L	-	-	<0.010		0.010	4048160	<0.010	0.010	4048160
pH	pH	-	6.5:8.5	7.61		N/A	4047818	7.39	N/A	4047818
Dissolved Sulphate (SO4)	mg/L	-	500	270		1	4048161	<1	1	4048161
Alkalinity (Total as CaCO3)	mg/L	-	30:500	290		1.0	4047801	110	1.0	4047801
Dissolved Chloride (Cl)	mg/L	-	250	2100		20	4048151	10000	100	4048151
Nitrite (N)	mg/L	**1**	-	<0.010	<0.010	0.010	4048003	<0.010	0.010	4048003
Nitrate (N)	mg/L	**10**	-	<0.10	<0.10	0.10	4048003	<0.10	0.10	4048003
Nitrate + Nitrite	mg/L	**10**	-	<0.10	<0.10	0.10	4048003	<0.10	0.10	4048003

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
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Maxxam Job #: B5A1281
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

RESULTS OF ANALYSES OF WATER

Maxxam ID				AIX844			AIX845		
Sampling Date				2015/05/28 12:45			2015/05/28 14:45		
COC Number				511947-01-01			511947-01-01		
	Units	MAC	A/O	OW5-2D Lab-Dup	RDL	QC Batch	OW4-1D	RDL	QC Batch
Calculated Parameters									
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-		1.0	4044586	260	1.0	4044586
Calculated TDS	mg/L	-	500		1.0	4044587	430	1.0	4044587
Hardness (CaCO3)	mg/L	-	80:100		1.0	4044366	77	1.0	4044366
Inorganics									
Total Ammonia-N	mg/L	-	-	9.5	0.25	4048934	0.71	0.050	4048934
Colour	TCU	-	5		2	4047684	<2	2	4047684
Conductivity	umho/cm	-	-		1.0	4047821	760	1.0	4047821
Fluoride (F-)	mg/L	**1.5**	-		0.10	4047822	1.5	0.10	4047822
Dissolved Organic Carbon	mg/L	-	5		0.20	4047398	2.0	0.20	4047398
Orthophosphate (P)	mg/L	-	-		0.010	4048160	<0.010	0.010	4048484
pH	pH	-	6.5:8.5		N/A	4047818	8.38	N/A	4047818
Dissolved Sulphate (SO4)	mg/L	-	500		1	4048161	4	1	4048483
Alkalinity (Total as CaCO3)	mg/L	-	30:500		1.0	4047801	260	1.0	4047801
Dissolved Chloride (Cl)	mg/L	-	250		100	4048151	82	1	4048471
Nitrite (N)	mg/L	**1**	-		0.010	4048003	<0.010	0.010	4047995
Nitrate (N)	mg/L	**10**	-		0.10	4048003	<0.10	0.10	4047995
Nitrate + Nitrite	mg/L	**10**	-		0.10	4048003	<0.10	0.10	4047995

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)
N/A = Not Applicable

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Maxxam Job #: B5A1281
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID				AIX829	AIX829		AIX830		AIX831		
Sampling Date				2015/05/28 15:15	2015/05/28 15:15		2015/05/28 09:45		2015/05/28 14:30		
COC Number				511947-01-01	511947-01-01		511947-01-01		511947-01-01		
	Units	**MAC**	**A/O**	**AM1b**	**AM1b Lab-Dup**	**RDL**	**TW1-1**	**RDL**	**Bored**	**RDL**	**QC Batch**
Metals											
Dissolved Calcium (Ca)	ug/L	-	-	46000	45000	200	120000	400	39000	200	4048267
Dissolved Magnesium (Mg)	ug/L	-	-	30000	29000	50	61000	50	21000	50	4048267
Dissolved Phosphorus (P)	ug/L	-	-	<100	<100	100	<100	100	<100	100	4048267
Dissolved Potassium (K)	ug/L	-	-	2300	2000	200	9600	200	16000	200	4048267
Dissolved Sodium (Na)	ug/L	**20000**	200000	6800	6600	100	230000	100	**25000**	100	4048267

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
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Maxxam ID				AIX832	AIX833	AIX834		AIX835	AIX836		
Sampling Date				2015/05/28 14:45	2015/05/28 14:45	2015/05/28 12:45		2015/05/28 12:45	2015/05/28 12:45		
COC Number				511947-01-01	511947-01-01	511947-01-01		511947-01-01	511947-01-01		
	Units	**MAC**	**A/O**	**OW4-1**	**OW4-2**	**OW5-1**	**RDL**	**OW5-2**	**OW5-3**	**RDL**	**QC Batch**
Metals											
Dissolved Calcium (Ca)	ug/L	-	-	14000	22000	28000	200	1300000	1300000	4000	4048267
Dissolved Magnesium (Mg)	ug/L	-	-	9000	15000	21000	50	730000	740000	500	4048267
Dissolved Phosphorus (P)	ug/L	-	-	<100	<100	<100	100	<1000	<1000	1000	4048267
Dissolved Potassium (K)	ug/L	-	-	4900	6800	6600	200	68000	71000	2000	4048267
Dissolved Sodium (Na)	ug/L	**20000**	200000	**140000**	**190000**	**65000**	100	3700000	3800000	1000	4048267

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
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Maxxam Job #: B5A1281
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID				AIX837		AIX838	AIX839		AIX840		
Sampling Date				2015/05/28 14:15		2015/05/28 11:15	2015/05/28 11:15		2015/05/28 10:15		
COC Number				511947-01-01		511947-01-01	511947-01-01		511947-01-01		
	Units	MAC	A/O	OW6-2	RDL	OW7-1	OW7-2	RDL	OW8-1	RDL	QC Batch
Metals											
Dissolved Calcium (Ca)	ug/L	-	-	230000	400	180000	320000	1000	66000	200	4048267
Dissolved Magnesium (Mg)	ug/L	-	-	120000	50	110000	180000	50	21000	50	4048267
Dissolved Phosphorus (P)	ug/L	-	-	<100	100	<100	<100	100	<100	100	4048267
Dissolved Potassium (K)	ug/L	-	-	13000	200	15000	20000	200	5400	200	4048267
Dissolved Sodium (Na)	ug/L	**20000**	200000	650000	500	910000	1300000	500	**170000**	100	4048267

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

Maxxam ID				AIX841			AIX842			AIX843		
Sampling Date				2015/05/28 10:15			2015/05/28 08:30			2015/05/28 08:30		
COC Number				511947-01-01			511947-01-01			511947-01-01		
	Units	MAC	A/O	OW8-2	RDL	QC Batch	OW9-1	RDL	QC Batch	OW9-2	RDL	QC Batch
Metals												
Dissolved Calcium (Ca)	ug/L	-	-	220000	400	4053128	660000	2000	4048267	480000	400	4053128
Dissolved Magnesium (Mg)	ug/L	-	-	85000	50	4053128	300000	50	4048267	180000	50	4053128
Dissolved Phosphorus (P)	ug/L	-	-	<100	100	4053128	<100	100	4048267	<100	100	4053128
Dissolved Potassium (K)	ug/L	-	-	7300	200	4053128	40000	200	4048267	25000	200	4053128
Dissolved Sodium (Na)	ug/L	**20000**	200000	310000	100	4053128	2000000	500	4048267	1300000	500	4053128

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
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Maxxam Job #: B5A1281
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID				AIX844		AIX845		
Sampling Date				2015/05/28 12:45		2015/05/28 14:45		
COC Number				511947-01-01		511947-01-01		
	Units	MAC	A/O	OW5-2D	RDL	OW4-1D	RDL	QC Batch
Metals								
Dissolved Calcium (Ca)	ug/L	-	-	1300000	4000	15000	200	4048267
Dissolved Magnesium (Mg)	ug/L	-	-	740000	500	9300	50	4048267
Dissolved Phosphorus (P)	ug/L	-	-	<1000	1000	<100	100	4048267
Dissolved Potassium (K)	ug/L	-	-	69000	2000	5200	200	4048267
Dissolved Sodium (Na)	ug/L	**20000**	200000	3800000	1000	**140000**	100	4048267

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
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Maxxam Job #: B5A1281
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

TEST SUMMARY

Maxxam ID: AIX829
Sample ID: AM1b
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4047979	N/A	2015/06/03	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4043953	N/A	2015/06/03	Automated Statchk
Chloride by Automated Colourimetry	KONE	4048151	N/A	2015/06/04	Deonarine Ramnarine
Colour	SPEC	4047684	N/A	2015/06/03	Christine Pham
Conductivity	AT	4047982	N/A	2015/06/03	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4047398	N/A	2015/06/02	Elsamma Alex
Fluoride	ISE	4047967	2015/06/02	2015/06/03	Surinder Rai
Hardness (calculated as CaCO3)		4044366	N/A	2015/06/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	4048267	N/A	2015/06/03	Cristina Petran
Total Ammonia-N	LACH/NH4	4048934	N/A	2015/06/04	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4048003	N/A	2015/06/04	Anastasia Hamanov
pH	AT	4047981	N/A	2015/06/03	Surinder Rai
Orthophosphate	KONE	4048160	N/A	2015/06/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4048161	N/A	2015/06/03	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4042791	N/A	2015/06/04	Automated Statchk

Maxxam ID: AIX829 Dup
Sample ID: AM1b
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4047979	N/A	2015/06/03	Surinder Rai
Conductivity	AT	4047982	N/A	2015/06/03	Surinder Rai
Fluoride	ISE	4047967	2015/06/02	2015/06/03	Surinder Rai
Dissolved Metals by ICPMS	ICP/MS	4048267	N/A	2015/06/03	Cristina Petran
pH	AT	4047981	N/A	2015/06/03	Surinder Rai

Maxxam ID: AIX830
Sample ID: TW1-1
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4047801	N/A	2015/06/03	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4043953	N/A	2015/06/04	Automated Statchk
Chloride by Automated Colourimetry	KONE	4048151	N/A	2015/06/04	Deonarine Ramnarine
Colour	SPEC	4047684	N/A	2015/06/03	Christine Pham
Conductivity	AT	4047821	N/A	2015/06/03	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4047470	N/A	2015/06/02	Elsamma Alex
Fluoride	ISE	4047822	2015/06/02	2015/06/03	Surinder Rai
Hardness (calculated as CaCO3)		4044366	N/A	2015/06/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	4048267	N/A	2015/06/03	Cristina Petran
Total Ammonia-N	LACH/NH4	4048934	N/A	2015/06/04	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4047559	N/A	2015/06/04	Anastasia Hamanov
pH	AT	4047818	N/A	2015/06/03	Surinder Rai

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Maxxam Job #: B5A1281
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

TEST SUMMARY

Maxxam ID: AIX830
Sample ID: TW1-1
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Orthophosphate	KONE	4048160	N/A	2015/06/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4048161	N/A	2015/06/03	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4042791	N/A	2015/06/04	Automated Statchk

Maxxam ID: AIX831
Sample ID: Bored
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4047801	N/A	2015/06/03	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4043953	N/A	2015/06/04	Automated Statchk
Chloride by Automated Colourimetry	KONE	4048151	N/A	2015/06/04	Deonarine Ramnarine
Colour	SPEC	4047684	N/A	2015/06/03	Christine Pham
Conductivity	AT	4047821	N/A	2015/06/03	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4047398	N/A	2015/06/02	Elsamma Alex
Fluoride	ISE	4047822	2015/06/02	2015/06/03	Surinder Rai
Hardness (calculated as CaCO3)		4044366	N/A	2015/06/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	4048267	N/A	2015/06/03	Cristina Petran
Total Ammonia-N	LACH/NH4	4048934	N/A	2015/06/04	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4047559	N/A	2015/06/04	Anastasia Hamanov
pH	AT	4047818	N/A	2015/06/03	Surinder Rai
Orthophosphate	KONE	4048160	N/A	2015/06/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4048161	N/A	2015/06/03	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4042791	N/A	2015/06/04	Automated Statchk

Maxxam ID: AIX832
Sample ID: OW4-1
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4047801	N/A	2015/06/03	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4043953	N/A	2015/06/04	Automated Statchk
Chloride by Automated Colourimetry	KONE	4048151	N/A	2015/06/04	Deonarine Ramnarine
Colour	SPEC	4047684	N/A	2015/06/03	Christine Pham
Conductivity	AT	4047821	N/A	2015/06/03	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4047470	N/A	2015/06/02	Elsamma Alex
Fluoride	ISE	4047822	2015/06/02	2015/06/03	Surinder Rai
Hardness (calculated as CaCO3)		4044366	N/A	2015/06/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	4048267	N/A	2015/06/03	Cristina Petran
Total Ammonia-N	LACH/NH4	4048934	N/A	2015/06/04	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4048003	N/A	2015/06/04	Anastasia Hamanov
pH	AT	4047818	N/A	2015/06/03	Surinder Rai
Orthophosphate	KONE	4048160	N/A	2015/06/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4048161	N/A	2015/06/03	Alina Dobreanu

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Maxxam Job #: B5A1281
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

TEST SUMMARY

Maxxam ID: AIX832
Sample ID: OW4-1
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Dissolved Solids (TDS calc)	CALC	4042791	N/A	2015/06/04	Automated Statchk

Maxxam ID: AIX833
Sample ID: OW4-2
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4047801	N/A	2015/06/03	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4043953	N/A	2015/06/04	Automated Statchk
Chloride by Automated Colourimetry	KONE	4048151	N/A	2015/06/04	Deonarine Ramnarine
Colour	SPEC	4047684	N/A	2015/06/03	Christine Pham
Conductivity	AT	4047821	N/A	2015/06/03	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4047470	N/A	2015/06/02	Elsamma Alex
Fluoride	ISE	4047822	2015/06/02	2015/06/03	Surinder Rai
Hardness (calculated as CaCO3)		4044366	N/A	2015/06/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	4048267	N/A	2015/06/03	Cristina Petran
Total Ammonia-N	LACH/NH4	4048934	N/A	2015/06/04	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4047559	N/A	2015/06/04	Anastasia Hamanov
pH	AT	4047818	N/A	2015/06/03	Surinder Rai
Orthophosphate	KONE	4048160	N/A	2015/06/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4048161	N/A	2015/06/03	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4042791	N/A	2015/06/04	Automated Statchk

Maxxam ID: AIX834
Sample ID: OW5-1
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4047801	N/A	2015/06/03	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4043953	N/A	2015/06/04	Automated Statchk
Chloride by Automated Colourimetry	KONE	4048151	N/A	2015/06/04	Deonarine Ramnarine
Colour	SPEC	4047684	N/A	2015/06/03	Christine Pham
Conductivity	AT	4047821	N/A	2015/06/03	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4047470	N/A	2015/06/02	Elsamma Alex
Fluoride	ISE	4047822	2015/06/02	2015/06/03	Surinder Rai
Hardness (calculated as CaCO3)		4044366	N/A	2015/06/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	4048267	N/A	2015/06/03	Cristina Petran
Total Ammonia-N	LACH/NH4	4048934	N/A	2015/06/04	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4047559	N/A	2015/06/04	Anastasia Hamanov
pH	AT	4047818	N/A	2015/06/03	Surinder Rai
Orthophosphate	KONE	4048160	N/A	2015/06/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4048161	N/A	2015/06/03	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4042791	N/A	2015/06/04	Automated Statchk

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Maxxam Job #: B5A1281
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

TEST SUMMARY

Maxxam ID: AIX835
Sample ID: OW5-2
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4047979	N/A	2015/06/03	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4043953	N/A	2015/06/03	Automated Statchk
Chloride by Automated Colourimetry	KONE	4048471	N/A	2015/06/04	Deonarine Ramnarine
Colour	SPEC	4047684	N/A	2015/06/03	Christine Pham
Conductivity	AT	4047982	N/A	2015/06/03	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4047398	N/A	2015/06/02	Elsamma Alex
Fluoride	ISE	4047967	2015/06/02	2015/06/03	Surinder Rai
Hardness (calculated as CaCO3)		4044366	N/A	2015/06/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	4048267	N/A	2015/06/03	Cristina Petran
Total Ammonia-N	LACH/NH4	4048934	N/A	2015/06/04	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4047995	N/A	2015/06/04	Anastasia Hamanov
pH	AT	4047981	N/A	2015/06/03	Surinder Rai
Orthophosphate	KONE	4048484	N/A	2015/06/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4048483	N/A	2015/06/03	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4042791	N/A	2015/06/04	Automated Statchk

Maxxam ID: AIX835 Dup
Sample ID: OW5-2
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	4048471	N/A	2015/06/04	Deonarine Ramnarine
Orthophosphate	KONE	4048484	N/A	2015/06/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4048483	N/A	2015/06/03	Alina Dobreanu

Maxxam ID: AIX836
Sample ID: OW5-3
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4047801	N/A	2015/06/03	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4043953	N/A	2015/06/04	Automated Statchk
Chloride by Automated Colourimetry	KONE	4048151	N/A	2015/06/04	Deonarine Ramnarine
Colour	SPEC	4047684	N/A	2015/06/03	Christine Pham
Conductivity	AT	4047821	N/A	2015/06/03	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4047470	N/A	2015/06/02	Elsamma Alex
Fluoride	ISE	4047822	2015/06/02	2015/06/03	Surinder Rai
Hardness (calculated as CaCO3)		4044366	N/A	2015/06/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	4048267	N/A	2015/06/03	Cristina Petran
Total Ammonia-N	LACH/NH4	4048934	N/A	2015/06/04	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4048003	N/A	2015/06/04	Anastasia Hamanov
pH	AT	4047818	N/A	2015/06/03	Surinder Rai
Orthophosphate	KONE	4048160	N/A	2015/06/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4048161	N/A	2015/06/03	Alina Dobreanu

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Maxxam Job #: B5A1281
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

TEST SUMMARY

Maxxam ID: AIX836
Sample ID: OW5-3
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Dissolved Solids (TDS calc)	CALC	4044587	N/A	2015/06/04	Automated Statchk

Maxxam ID: AIX837
Sample ID: OW6-2
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4047801	N/A	2015/06/03	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4043953	N/A	2015/06/04	Automated Statchk
Chloride by Automated Colourimetry	KONE	4048151	N/A	2015/06/04	Deonarine Ramnarine
Colour	SPEC	4047684	N/A	2015/06/03	Christine Pham
Conductivity	AT	4047821	N/A	2015/06/03	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4047398	N/A	2015/06/02	Elsamma Alex
Fluoride	ISE	4047822	2015/06/02	2015/06/03	Surinder Rai
Hardness (calculated as CaCO3)		4044366	N/A	2015/06/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	4048267	N/A	2015/06/03	Cristina Petran
Total Ammonia-N	LACH/NH4	4048934	N/A	2015/06/04	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4047995	N/A	2015/06/04	Anastasia Hamanov
pH	AT	4047818	N/A	2015/06/03	Surinder Rai
Orthophosphate	KONE	4048160	N/A	2015/06/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4048161	N/A	2015/06/03	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4044587	N/A	2015/06/04	Automated Statchk

Maxxam ID: AIX838
Sample ID: OW7-1
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4047979	N/A	2015/06/03	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4043953	N/A	2015/06/03	Automated Statchk
Chloride by Automated Colourimetry	KONE	4048151	N/A	2015/06/04	Deonarine Ramnarine
Colour	SPEC	4047684	N/A	2015/06/03	Christine Pham
Conductivity	AT	4047982	N/A	2015/06/03	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4047470	N/A	2015/06/02	Elsamma Alex
Fluoride	ISE	4047967	2015/06/02	2015/06/03	Surinder Rai
Hardness (calculated as CaCO3)		4044366	N/A	2015/06/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	4048267	N/A	2015/06/03	Cristina Petran
Total Ammonia-N	LACH/NH4	4048934	N/A	2015/06/04	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4048003	N/A	2015/06/04	Anastasia Hamanov
pH	AT	4047981	N/A	2015/06/03	Surinder Rai
Orthophosphate	KONE	4048160	N/A	2015/06/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4048161	N/A	2015/06/03	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4044587	N/A	2015/06/04	Automated Statchk

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Maxxam Job #: B5A1281
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

TEST SUMMARY

Maxxam ID: AIX839
Sample ID: OW7-2
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4047801	N/A	2015/06/03	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4043953	N/A	2015/06/04	Automated Statchk
Chloride by Automated Colourimetry	KONE	4048151	N/A	2015/06/04	Deonarine Ramnarine
Colour	SPEC	4047684	N/A	2015/06/03	Christine Pham
Conductivity	AT	4047821	N/A	2015/06/03	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4047470	N/A	2015/06/02	Elsamma Alex
Fluoride	ISE	4047822	2015/06/02	2015/06/03	Surinder Rai
Hardness (calculated as CaCO3)		4044366	N/A	2015/06/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	4048267	N/A	2015/06/03	Cristina Petran
Total Ammonia-N	LACH/NH4	4048934	N/A	2015/06/04	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4047559	N/A	2015/06/04	Anastasia Hamanov
pH	AT	4047818	N/A	2015/06/03	Surinder Rai
Orthophosphate	KONE	4048160	N/A	2015/06/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4048161	N/A	2015/06/03	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4044587	N/A	2015/06/04	Automated Statchk

Maxxam ID: AIX840
Sample ID: OW8-1
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4047801	N/A	2015/06/03	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4044586	N/A	2015/06/04	Automated Statchk
Chloride by Automated Colourimetry	KONE	4048151	N/A	2015/06/04	Deonarine Ramnarine
Colour	SPEC	4047684	N/A	2015/06/03	Christine Pham
Conductivity	AT	4047821	N/A	2015/06/03	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4047470	N/A	2015/06/02	Elsamma Alex
Fluoride	ISE	4047822	2015/06/02	2015/06/03	Surinder Rai
Hardness (calculated as CaCO3)		4044366	N/A	2015/06/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	4048267	N/A	2015/06/03	Cristina Petran
Total Ammonia-N	LACH/NH4	4048934	N/A	2015/06/04	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4047559	N/A	2015/06/04	Anastasia Hamanov
pH	AT	4047818	N/A	2015/06/03	Surinder Rai
Orthophosphate	KONE	4048160	N/A	2015/06/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4048161	N/A	2015/06/03	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4044587	N/A	2015/06/04	Automated Statchk

Maxxam ID: AIX841
Sample ID: OW8-2
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4047801	N/A	2015/06/03	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4044586	N/A	2015/06/04	Automated Statchk

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Maxxam Job #: B5A1281
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

TEST SUMMARY

Maxxam ID: AIX841
Sample ID: OW8-2
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	4048151	N/A	2015/06/04	Deonarine Ramnarine
Colour	SPEC	4047684	N/A	2015/06/03	Christine Pham
Conductivity	AT	4047821	N/A	2015/06/03	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4047470	N/A	2015/06/02	Elsamma Alex
Fluoride	ISE	4047822	2015/06/02	2015/06/03	Surinder Rai
Hardness (calculated as CaCO3)		4044366	N/A	2015/06/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	4053128	N/A	2015/06/05	Prempal Bhatti
Total Ammonia-N	LACH/NH4	4048934	N/A	2015/06/04	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4048003	N/A	2015/06/04	Anastasia Hamanov
pH	AT	4047818	N/A	2015/06/03	Surinder Rai
Orthophosphate	KONE	4048160	N/A	2015/06/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4048161	N/A	2015/06/03	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4044587	N/A	2015/06/04	Automated Statchk

Maxxam ID: AIX842
Sample ID: OW9-1
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4047801	N/A	2015/06/03	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4044586	N/A	2015/06/04	Automated Statchk
Chloride by Automated Colourimetry	KONE	4048151	N/A	2015/06/04	Deonarine Ramnarine
Colour	SPEC	4047684	N/A	2015/06/03	Christine Pham
Conductivity	AT	4047821	N/A	2015/06/03	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4047280	N/A	2015/06/03	Elsamma Alex
Fluoride	ISE	4047822	2015/06/02	2015/06/03	Surinder Rai
Hardness (calculated as CaCO3)		4044366	N/A	2015/06/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	4048267	N/A	2015/06/03	Cristina Petran
Total Ammonia-N	LACH/NH4	4048934	N/A	2015/06/04	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4047559	N/A	2015/06/04	Anastasia Hamanov
pH	AT	4047818	N/A	2015/06/03	Surinder Rai
Orthophosphate	KONE	4048160	N/A	2015/06/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4048161	N/A	2015/06/03	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4044587	N/A	2015/06/04	Automated Statchk

Maxxam ID: AIX843
Sample ID: OW9-2
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4047801	N/A	2015/06/03	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4044586	N/A	2015/06/04	Automated Statchk
Chloride by Automated Colourimetry	KONE	4048151	N/A	2015/06/04	Deonarine Ramnarine
Colour	SPEC	4047684	N/A	2015/06/03	Christine Pham

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Maxxam Job #: B5A1281
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

TEST SUMMARY

Maxxam ID: AIX843
Sample ID: OW9-2
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	4047821	N/A	2015/06/03	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4047470	N/A	2015/06/02	Elsamma Alex
Fluoride	ISE	4047822	2015/06/02	2015/06/03	Surinder Rai
Hardness (calculated as CaCO3)		4044366	N/A	2015/06/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	4053128	N/A	2015/06/05	Prempal Bhatti
Total Ammonia-N	LACH/NH4	4048934	N/A	2015/06/04	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4048003	N/A	2015/06/04	Anastasia Hamanov
pH	AT	4047818	N/A	2015/06/03	Surinder Rai
Orthophosphate	KONE	4048160	N/A	2015/06/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4048161	N/A	2015/06/03	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4044587	N/A	2015/06/04	Automated Statchk

Maxxam ID: AIX843 Dup
Sample ID: OW9-2
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4048003	N/A	2015/06/04	Anastasia Hamanov

Maxxam ID: AIX844
Sample ID: OW5-2D
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4047801	N/A	2015/06/03	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4044586	N/A	2015/06/04	Automated Statchk
Chloride by Automated Colourimetry	KONE	4048151	N/A	2015/06/04	Deonarine Ramnarine
Colour	SPEC	4047684	N/A	2015/06/03	Christine Pham
Conductivity	AT	4047821	N/A	2015/06/03	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4047398	N/A	2015/06/02	Elsamma Alex
Fluoride	ISE	4047822	2015/06/02	2015/06/03	Surinder Rai
Hardness (calculated as CaCO3)		4044366	N/A	2015/06/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	4048267	N/A	2015/06/03	Cristina Petran
Total Ammonia-N	LACH/NH4	4048934	N/A	2015/06/04	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4048003	N/A	2015/06/04	Anastasia Hamanov
pH	AT	4047818	N/A	2015/06/03	Surinder Rai
Orthophosphate	KONE	4048160	N/A	2015/06/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4048161	N/A	2015/06/03	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4044587	N/A	2015/06/04	Automated Statchk

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Maxxam Job #: B5A1281
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

TEST SUMMARY

Maxxam ID: AIX844 Dup
Sample ID: OW5-2D
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Ammonia-N	LACH/NH4	4048934	N/A	2015/06/04	Charles Opoku-Ware

Maxxam ID: AIX845
Sample ID: OW4-1D
Matrix: Water

Collected: 2015/05/28
Shipped:
Received: 2015/05/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4047801	N/A	2015/06/03	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4044586	N/A	2015/06/04	Automated Statchk
Chloride by Automated Colourimetry	KONE	4048471	N/A	2015/06/04	Deonarine Ramnarine
Colour	SPEC	4047684	N/A	2015/06/03	Christine Pham
Conductivity	AT	4047821	N/A	2015/06/03	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4047398	N/A	2015/06/02	Elsamma Alex
Fluoride	ISE	4047822	2015/06/02	2015/06/03	Surinder Rai
Hardness (calculated as CaCO3)		4044366	N/A	2015/06/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	4048267	N/A	2015/06/03	Cristina Petran
Total Ammonia-N	LACH/NH4	4048934	N/A	2015/06/04	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4047995	N/A	2015/06/04	Anastasia Hamanov
pH	AT	4047818	N/A	2015/06/03	Surinder Rai
Orthophosphate	KONE	4048484	N/A	2015/06/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4048483	N/A	2015/06/03	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4044587	N/A	2015/06/04	Automated Statchk

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GENERAL COMMENTS

Sample AIX835-01 : Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample AIX836-01 : Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample AIX841-01 : Elevated ion balance result was confirmed by re-analysis.

Sample AIX843-01 : Elevated ion balance result was confirmed by re-analysis.

Sample AIX844-01 : Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
4047280	EAX	Matrix Spike	Dissolved Organic Carbon	2015/06/02		97	%	80 - 120
4047280	EAX	Spiked Blank	Dissolved Organic Carbon	2015/06/02		99	%	80 - 120
4047280	EAX	Method Blank	Dissolved Organic Carbon	2015/06/02	0.24, RDL=0.20		mg/L	
4047280	EAX	RPD	Dissolved Organic Carbon	2015/06/02	0.28		%	20
4047398	EAX	Matrix Spike	Dissolved Organic Carbon	2015/06/02		91	%	80 - 120
4047398	EAX	Spiked Blank	Dissolved Organic Carbon	2015/06/02		101	%	80 - 120
4047398	EAX	Method Blank	Dissolved Organic Carbon	2015/06/02	<0.20		mg/L	
4047398	EAX	RPD	Dissolved Organic Carbon	2015/06/02	NC		%	20
4047470	EAX	Matrix Spike	Dissolved Organic Carbon	2015/06/02		97	%	80 - 120
4047470	EAX	Spiked Blank	Dissolved Organic Carbon	2015/06/02		99	%	80 - 120
4047470	EAX	Method Blank	Dissolved Organic Carbon	2015/06/02	<0.20		mg/L	
4047470	EAX	RPD	Dissolved Organic Carbon	2015/06/02	2.6		%	20
4047559	AHA	Matrix Spike	Nitrite (N)	2015/06/04		107	%	80 - 120
			Nitrate (N)	2015/06/04		91	%	80 - 120
4047559	AHA	Spiked Blank	Nitrite (N)	2015/06/04		97	%	80 - 120
			Nitrate (N)	2015/06/04		95	%	80 - 120
4047559	AHA	Method Blank	Nitrite (N)	2015/06/04	<0.010		mg/L	
			Nitrate (N)	2015/06/04	<0.10		mg/L	
4047559	AHA	RPD	Nitrite (N)	2015/06/04	NC		%	25
			Nitrate (N)	2015/06/04	1.2		%	25
4047684	CP	Spiked Blank	Colour	2015/06/03		98	%	80 - 120
4047684	CP	Method Blank	Colour	2015/06/03	<2		TCU	
4047684	CP	RPD	Colour	2015/06/03	NC		%	25
4047801	SAU	Spiked Blank	Alkalinity (Total as CaCO3)	2015/06/03		94	%	85 - 115
4047801	SAU	Method Blank	Alkalinity (Total as CaCO3)	2015/06/03	<1.0		mg/L	
4047801	SAU	RPD	Alkalinity (Total as CaCO3)	2015/06/03	0.35		%	25
4047818	SAU	Spiked Blank	pH	2015/06/03		101	%	98 - 103
4047818	SAU	RPD	pH	2015/06/03	0.29		%	N/A
4047821	SAU	Spiked Blank	Conductivity	2015/06/03		101	%	85 - 115
4047821	SAU	Method Blank	Conductivity	2015/06/03	<1.0		umho/c	
4047821	SAU	RPD	Conductivity	2015/06/03	0.46		%	25
4047822	SAU	Matrix Spike	Fluoride (F-)	2015/06/03		98	%	80 - 120
4047822	SAU	Spiked Blank	Fluoride (F-)	2015/06/03		100	%	80 - 120
4047822	SAU	Method Blank	Fluoride (F-)	2015/06/03	<0.10		mg/L	
4047822	SAU	RPD	Fluoride (F-)	2015/06/03	NC		%	20
4047967	SAU	Matrix Spike [AIX829-01]	Fluoride (F-)	2015/06/03		102	%	80 - 120
4047967	SAU	Spiked Blank	Fluoride (F-)	2015/06/03		102	%	80 - 120
4047967	SAU	Method Blank	Fluoride (F-)	2015/06/03	<0.10		mg/L	
4047967	SAU	RPD [AIX829-01]	Fluoride (F-)	2015/06/03	NC		%	20
4047979	SAU	Spiked Blank	Alkalinity (Total as CaCO3)	2015/06/03		93	%	85 - 115
4047979	SAU	Method Blank	Alkalinity (Total as CaCO3)	2015/06/03	<1.0		mg/L	
4047979	SAU	RPD [AIX829-01]	Alkalinity (Total as CaCO3)	2015/06/03	1.1		%	25
4047981	SAU	Spiked Blank	pH	2015/06/03		102	%	98 - 103
4047981	SAU	RPD [AIX829-01]	pH	2015/06/03	0.0038		%	N/A
4047982	SAU	Spiked Blank	Conductivity	2015/06/03		101	%	85 - 115
4047982	SAU	Method Blank	Conductivity	2015/06/03	<1.0		umho/c	
4047982	SAU	RPD [AIX829-01]	Conductivity	2015/06/03	0.21		%	25
4047995	AHA	Matrix Spike	Nitrite (N)	2015/06/04		96	%	80 - 120
			Nitrate (N)	2015/06/04		102	%	80 - 120
4047995	AHA	Spiked Blank	Nitrite (N)	2015/06/04		96	%	80 - 120
			Nitrate (N)	2015/06/04		103	%	80 - 120

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Maxxam Job #: B5A1281
Report Date: 2015/06/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: DEH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
4047995	AHA	Method Blank	Nitrite (N)	2015/06/04	<0.010		mg/L	
			Nitrate (N)	2015/06/04	<0.10		mg/L	
4047995	AHA	RPD	Nitrite (N)	2015/06/04	NC		%	25
			Nitrate (N)	2015/06/04	NC		%	25
4048003	AHA	Matrix Spike [AIX843-01]	Nitrite (N)	2015/06/04		95	%	80 - 120
			Nitrate (N)	2015/06/04		99	%	80 - 120
4048003	AHA	Spiked Blank	Nitrite (N)	2015/06/04		96	%	80 - 120
			Nitrate (N)	2015/06/04		101	%	80 - 120
4048003	AHA	Method Blank	Nitrite (N)	2015/06/04	<0.010		mg/L	
			Nitrate (N)	2015/06/04	<0.10		mg/L	
4048003	AHA	RPD [AIX843-01]	Nitrite (N)	2015/06/04	NC		%	25
			Nitrate (N)	2015/06/04	NC		%	25
4048151	DRM	Matrix Spike	Dissolved Chloride (Cl)	2015/06/04		103	%	80 - 120
4048151	DRM	Spiked Blank	Dissolved Chloride (Cl)	2015/06/04		103	%	80 - 120
4048151	DRM	Method Blank	Dissolved Chloride (Cl)	2015/06/04	<1		mg/L	
4048151	DRM	RPD	Dissolved Chloride (Cl)	2015/06/04	NC		%	20
4048160	ADB	Matrix Spike	Orthophosphate (P)	2015/06/03		104	%	75 - 125
4048160	ADB	Spiked Blank	Orthophosphate (P)	2015/06/03		99	%	80 - 120
4048160	ADB	Method Blank	Orthophosphate (P)	2015/06/03	<0.010		mg/L	
4048160	ADB	RPD	Orthophosphate (P)	2015/06/03	NC		%	25
4048161	ADB	Matrix Spike	Dissolved Sulphate (SO4)	2015/06/03		102	%	75 - 125
4048161	ADB	Spiked Blank	Dissolved Sulphate (SO4)	2015/06/03		102	%	80 - 120
4048161	ADB	Method Blank	Dissolved Sulphate (SO4)	2015/06/03	<1		mg/L	
4048161	ADB	RPD	Dissolved Sulphate (SO4)	2015/06/03	NC		%	20
4048267	CPE	Matrix Spike [AIX829-04]	Dissolved Calcium (Ca)	2015/06/03		NC	%	80 - 120
			Dissolved Magnesium (Mg)	2015/06/03		NC	%	80 - 120
			Dissolved Phosphorus (P)	2015/06/03		102	%	80 - 120
			Dissolved Potassium (K)	2015/06/03		95	%	80 - 120
			Dissolved Sodium (Na)	2015/06/03		100	%	80 - 120
4048267	CPE	Spiked Blank	Dissolved Calcium (Ca)	2015/06/03		102	%	80 - 120
			Dissolved Magnesium (Mg)	2015/06/03		101	%	80 - 120
			Dissolved Phosphorus (P)	2015/06/03		101	%	80 - 120
			Dissolved Potassium (K)	2015/06/03		99	%	80 - 120
			Dissolved Sodium (Na)	2015/06/03		104	%	80 - 120
4048267	CPE	Method Blank	Dissolved Calcium (Ca)	2015/06/03	<200		ug/L	
			Dissolved Magnesium (Mg)	2015/06/03	<50		ug/L	
			Dissolved Phosphorus (P)	2015/06/03	<100		ug/L	
			Dissolved Potassium (K)	2015/06/03	<200		ug/L	
			Dissolved Sodium (Na)	2015/06/03	<100		ug/L	
4048267	CPE	RPD [AIX829-04]	Dissolved Calcium (Ca)	2015/06/03	2.0		%	20
			Dissolved Magnesium (Mg)	2015/06/03	3.0		%	20
			Dissolved Phosphorus (P)	2015/06/03	NC		%	20
			Dissolved Potassium (K)	2015/06/03	9.4		%	20
			Dissolved Sodium (Na)	2015/06/03	4.0		%	20
4048471	DRM	Matrix Spike [AIX835-01]	Dissolved Chloride (Cl)	2015/06/04		NC	%	80 - 120
4048471	DRM	Spiked Blank	Dissolved Chloride (Cl)	2015/06/04		103	%	80 - 120
4048471	DRM	Method Blank	Dissolved Chloride (Cl)	2015/06/04	<1		mg/L	
4048471	DRM	RPD [AIX835-01]	Dissolved Chloride (Cl)	2015/06/04	0.72		%	20
4048483	ADB	Matrix Spike [AIX835-01]	Dissolved Sulphate (SO4)	2015/06/03		99	%	75 - 125
4048483	ADB	Spiked Blank	Dissolved Sulphate (SO4)	2015/06/03		100	%	80 - 120
4048483	ADB	Method Blank	Dissolved Sulphate (SO4)	2015/06/03	<1		mg/L	
4048483	ADB	RPD [AIX835-01]	Dissolved Sulphate (SO4)	2015/06/03	NC		%	20

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Maxxam Job #: B5A1281
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Golder Associates Ltd
Client Project #: 1407634
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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
4048484	ADB	Matrix Spike [AIX835-01]	Orthophosphate (P)	2015/06/03		99	%	75 - 125
4048484	ADB	Spiked Blank	Orthophosphate (P)	2015/06/03		100	%	80 - 120
4048484	ADB	Method Blank	Orthophosphate (P)	2015/06/03	<0.010		mg/L	
4048484	ADB	RPD [AIX835-01]	Orthophosphate (P)	2015/06/03	NC		%	25
4048934	COP	Matrix Spike [AIX844-02]	Total Ammonia-N	2015/06/04		NC	%	80 - 120
4048934	COP	Spiked Blank	Total Ammonia-N	2015/06/04		100	%	85 - 115
4048934	COP	Method Blank	Total Ammonia-N	2015/06/04	<0.050		mg/L	
4048934	COP	RPD [AIX844-02]	Total Ammonia-N	2015/06/04	0.70		%	20
4053128	PBA	Matrix Spike	Dissolved Calcium (Ca)	2015/06/05		NC	%	80 - 120
			Dissolved Magnesium (Mg)	2015/06/05		97	%	80 - 120
			Dissolved Phosphorus (P)	2015/06/05		100	%	80 - 120
			Dissolved Potassium (K)	2015/06/05		96	%	80 - 120
			Dissolved Sodium (Na)	2015/06/05		NC	%	80 - 120
4053128	PBA	Spiked Blank	Dissolved Calcium (Ca)	2015/06/05		101	%	80 - 120
			Dissolved Magnesium (Mg)	2015/06/05		104	%	80 - 120
			Dissolved Phosphorus (P)	2015/06/05		106	%	80 - 120
			Dissolved Potassium (K)	2015/06/05		101	%	80 - 120
			Dissolved Sodium (Na)	2015/06/05		104	%	80 - 120
4053128	PBA	Method Blank	Dissolved Calcium (Ca)	2015/06/05	<200		ug/L	
			Dissolved Magnesium (Mg)	2015/06/05	<50		ug/L	
			Dissolved Phosphorus (P)	2015/06/05	<100		ug/L	
			Dissolved Potassium (K)	2015/06/05	<200		ug/L	
			Dissolved Sodium (Na)	2015/06/05	<100		ug/L	

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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Sampler Initials: DEH

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere

Cristina Carriere, Scientific Services

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Exceedence Summary Table – ODWS (2002)

Result Exceedences

Sample ID	Maxxam ID	Parameter	Criteria	Result	DL	Units
TW1-1	AIX830-04	Dissolved Sodium (Na)	20000	230000	100	ug/L
Bored	AIX831-04	Dissolved Sodium (Na)	20000	25000	100	ug/L
OW4-1	AIX832-04	Dissolved Sodium (Na)	20000	140000	100	ug/L
OW4-2	AIX833-04	Dissolved Sodium (Na)	20000	190000	100	ug/L
OW5-1	AIX834-04	Dissolved Sodium (Na)	20000	65000	100	ug/L
OW5-2	AIX835-04	Dissolved Sodium (Na)	20000	3700000	1000	ug/L
OW5-3	AIX836-04	Dissolved Sodium (Na)	20000	3800000	1000	ug/L
OW6-2	AIX837-04	Dissolved Sodium (Na)	20000	650000	500	ug/L
OW7-1	AIX838-01	Fluoride (F-)	1.5	2.7	0.10	mg/L
OW7-1	AIX838-04	Dissolved Sodium (Na)	20000	910000	500	ug/L
OW7-2	AIX839-01	Fluoride (F-)	1.5	2.4	0.10	mg/L
OW7-2	AIX839-04	Dissolved Sodium (Na)	20000	1300000	500	ug/L
OW8-1	AIX840-01	Fluoride (F-)	1.5	2.4	0.10	mg/L
OW8-1	AIX840-04	Dissolved Sodium (Na)	20000	170000	100	ug/L
OW8-2	AIX841-04	Dissolved Sodium (Na)	20000	310000	100	ug/L
OW9-1	AIX842-04	Dissolved Sodium (Na)	20000	2000000	500	ug/L
OW9-2	AIX843-04	Dissolved Sodium (Na)	20000	1300000	500	ug/L
OW5-2D	AIX844-04	Dissolved Sodium (Na)	20000	3800000	1000	ug/L
OW4-1D	AIX845-04	Dissolved Sodium (Na)	20000	140000	100	ug/L

The exceedence summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 535096-01-01

Attention:Dawn Hoyle

Golder Associates Ltd
121 Commerce Park Drive
Unit L
Barrie, ON
L4N 8X1

Report Date: 2015/11/02
Report #: R3746112
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5L7564
Received: 2015/10/24, 09:52

Sample Matrix: Water
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	3	N/A	2015/10/27	CAM SOP-00448	SM 22 2320 B m
Carbonate, Bicarbonate and Hydroxide	2	N/A	2015/10/27	CAM SOP-00102	APHA 4500-CO2 D
Carbonate, Bicarbonate and Hydroxide	1	N/A	2015/10/28	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	3	N/A	2015/10/28	CAM SOP-00463	EPA 325.2 m
Colour	3	N/A	2015/10/29	CAM SOP-00412	SM 22 2120 m
Conductivity	3	N/A	2015/10/27	CAM SOP-00414	SM 22 2510 m
Dissolved Organic Carbon (DOC) (1)	3	N/A	2015/10/28	CAM SOP-00446	SM 22 5310 B m
Fluoride	3	2015/10/26	2015/10/27	CAM SOP-00449	SM 22 4500-F C m
Hardness (calculated as CaCO3)	3	N/A	2015/10/30	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Metals by ICPMS	3	N/A	2015/10/30	CAM SOP-00447	EPA 6020A m
Ion Balance (% Difference)	3	N/A	2015/10/30		
Anion and Cation Sum	3	N/A	2015/10/30		
Total Ammonia-N	3	N/A	2015/10/31	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	3	N/A	2015/10/29	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	3	N/A	2015/10/27	CAM SOP-00413	SM 4500H+ B m
Orthophosphate	3	N/A	2015/10/28	CAM SOP-00461	EPA 365.1 m
Sat. pH and Langelier Index (@ 20C)	3	N/A	2015/10/30		
Sat. pH and Langelier Index (@ 4C)	3	N/A	2015/10/30		
Sulphate by Automated Colourimetry	3	N/A	2015/10/28	CAM SOP-00464	EPA 375.4 m
Tannins & Lignins	3	N/A	2015/10/28	CAM SOP-00410	SM 22 5550 B m
Total Dissolved Solids (TDS calc)	3	N/A	2015/10/30		
Turbidity	3	N/A	2015/10/25	CAM SOP-00417	SM 22 2130 B m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 535096-01-01

Attention:Dawn Hoyle

Golder Associates Ltd
121 Commerce Park Drive
Unit L
Barrie, ON
L4N 8X1

Report Date: 2015/11/02
Report #: R3746112
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5L7564
Received: 2015/10/24, 09:52

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Stephen McMillan, Project Manager
Email: smcmillan@maxxam.ca
Phone# (905)817-5700 Ext:5735

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Maxxam Job #: B5L7564
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

RESULTS OF ANALYSES OF WATER

Maxxam ID				BFL850	BFL850			BFL851		
Sampling Date				2015/10/22 13:15	2015/10/22 13:15			2015/10/22 12:30		
COC Number				535096-01-01	535096-01-01			535096-01-01		
	UNITS	MAC	A/O	DW1	DW1 Lab-Dup	RDL	QC Batch	DW2	RDL	QC Batch
Calculated Parameters										
Anion Sum	me/L	-	-	11.9		N/A	4244110	7.44	N/A	4244110
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	320		1.0	4244109	290	1.0	4244109
Calculated TDS	mg/L	-	500	670		1.0	4244113	410	1.0	4244113
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	-	1.3		1.0	4244109	2.4	1.0	4244109
Cation Sum	me/L	-	-	13.3		N/A	4244110	8.10	N/A	4244110
Hardness (CaCO3)	mg/L	-	80:100	580		1.0	4243882	350	1.0	4243882
Ion Balance (% Difference)	%	-	-	5.68		N/A	4243883	4.24	N/A	4243883
Langelier Index (@ 20C)	N/A	-	-	0.872			4244111	0.984		4244111
Langelier Index (@ 4C)	N/A	-	-	0.625			4244112	0.736		4244112
Saturation pH (@ 20C)	N/A	-	-	6.75			4244111	6.97		4244111
Saturation pH (@ 4C)	N/A	-	-	7.00			4244112	7.22		4244112
Inorganics										
Total Ammonia-N	mg/L	-	-	<0.050		0.050	4252664	<0.050	0.050	4252664
Colour	TCU	-	5	<2		2	4245615	<2	2	4245615
Conductivity	umho/cm	-	-	1200	1200	1.0	4245663	730	1.0	4245317
Fluoride (F-)	mg/L	**1.5**	-	<0.10	<0.10	0.10	4245664	0.11	0.10	4245312
Dissolved Organic Carbon	mg/L	-	5	1.1		0.20	4245161	1.7	0.20	4245161
Orthophosphate (P)	mg/L	-	-	<0.010		0.010	4248117	<0.010	0.010	4248117
pH	pH	-	6.5:8.5	7.62	7.71	N/A	4245665	7.96	N/A	4245319
Dissolved Sulphate (SO4)	mg/L	-	500	33		1.0	4248118	24	1.0	4248118
Tannins & Lignins	mg/L	-	-	<0.2		0.2	4248442	<0.2	0.2	4248442
Turbidity	NTU	-	5	1.8	1.9	0.2	4244329	<0.2	0.2	4244329
Alkalinity (Total as CaCO3)	mg/L	-	30:500	320	330	1.0	4245655	290	1.0	4245314
Dissolved Chloride (Cl)	mg/L	-	250	170		2.0	4245397	41	1.0	4245397
Nitrite (N)	mg/L	**1**	-	<0.010		0.010	4245339	<0.010	0.010	4245339
Nitrate (N)	mg/L	**10**	-	0.35		0.10	4245339	<0.10	0.10	4245339
Nitrate + Nitrite (N)	mg/L	**10**	-	0.35		0.10	4245339	<0.10	0.10	4245339

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)
N/A = Not Applicable

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Maxxam Job #: B5L7564
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

RESULTS OF ANALYSES OF WATER

Maxxam ID				BFL852	BFL852		
Sampling Date				2015/10/22 05:00	2015/10/22 05:00		
COC Number				535096-01-01	535096-01-01		
	UNITS	MAC	A/O	DW3	DW3 Lab-Dup	RDL	QC Batch
Calculated Parameters							
Anion Sum	me/L	-	-	10.2		N/A	4244110
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	250		1.0	4244109
Calculated TDS	mg/L	-	500	570		1.0	4244113
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	-	3.6		1.0	4244109
Cation Sum	me/L	-	-	11.0		N/A	4244110
Hardness (CaCO3)	mg/L	-	80:100	190		1.0	4243882
Ion Balance (% Difference)	%	-	-	3.82		N/A	4243883
Langelier Index (@ 20C)	N/A	-	-	0.635			4244111
Langelier Index (@ 4C)	N/A	-	-	0.387			4244112
Saturation pH (@ 20C)	N/A	-	-	7.55			4244111
Saturation pH (@ 4C)	N/A	-	-	7.80			4244112
Inorganics							
Total Ammonia-N	mg/L	-	-	<0.050		0.050	4252664
Colour	TCU	-	5	<2		2	4245307
Conductivity	umho/cm	-	-	1100	1100	1.0	4245317
Fluoride (F-)	mg/L	**1.5**	-	0.80	0.79	0.10	4245312
Dissolved Organic Carbon	mg/L	-	5	0.78		0.20	4245161
Orthophosphate (P)	mg/L	-	-	<0.010		0.010	4248117
pH	pH	-	6.5:8.5	8.19	8.17	N/A	4245319
Dissolved Sulphate (SO4)	mg/L	-	500	<10 (1)		10	4248118
Tannins & Lignins	mg/L	-	-	<0.2		0.2	4248442
Turbidity	NTU	-	5	<0.2		0.2	4244329
Alkalinity (Total as CaCO3)	mg/L	-	30:500	250	260	1.0	4245314
Dissolved Chloride (Cl)	mg/L	-	250	180		2.0	4245397
Nitrite (N)	mg/L	**1**	-	<0.010		0.010	4245384
Nitrate (N)	mg/L	**10**	-	<0.10		0.10	4245384

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
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(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

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Maxxam Job #: B5L7564
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

RESULTS OF ANALYSES OF WATER

Maxxam ID				BFL852	BFL852		
Sampling Date				2015/10/22 05:00	2015/10/22 05:00		
COC Number				535096-01-01	535096-01-01		
	UNITS	MAC	A/O	DW3	DW3 Lab-Dup	RDL	QC Batch
Nitrate + Nitrite (N)	mg/L	**10**	-	<0.10		0.10	4245384

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Lab-Dup = Laboratory Initiated Duplicate

MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
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Maxxam Job #: B5L7564
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID					BFL850	BFL850	BFL851	BFL852		
Sampling Date					2015/10/22 13:15	2015/10/22 13:15	2015/10/22 12:30	2015/10/22 05:00		
COC Number					535096-01-01	535096-01-01	535096-01-01	535096-01-01		
	UNITS	MAC	IMC	A/O	DW1	DW1 Lab-Dup	DW2	DW3	RDL	QC Batch
Metals										
Dissolved Aluminum (Al)	ug/L	-	-	100	<5.0	<5.0	<5.0	<5.0	5.0	4251902
Dissolved Antimony (Sb)	ug/L	-	6	-	<0.50	<0.50	<0.50	<0.50	0.50	4251902
Dissolved Arsenic (As)	ug/L	-	25	-	<1.0	<1.0	<1.0	<1.0	1.0	4251902
Dissolved Barium (Ba)	ug/L	**1000**	-	-	140	130	76	220	2.0	4251902
Dissolved Beryllium (Be)	ug/L	-	-	-	<0.50	<0.50	<0.50	<0.50	0.50	4251902
Dissolved Boron (B)	ug/L	-	5000	-	25	25	11	770	10	4251902
Dissolved Cadmium (Cd)	ug/L	**5**	-	-	<0.10	<0.10	<0.10	<0.10	0.10	4251902
Dissolved Calcium (Ca)	ug/L	-	-	-	170000	170000	100000	34000	200	4251902
Dissolved Chromium (Cr)	ug/L	**50**	-	-	<5.0	<5.0	<5.0	<5.0	5.0	4251902
Dissolved Cobalt (Co)	ug/L	-	-	-	<0.50	<0.50	<0.50	<0.50	0.50	4251902
Dissolved Copper (Cu)	ug/L	-	-	1000	1.5	1.5	<1.0	97	1.0	4251902
Dissolved Iron (Fe)	ug/L	-	-	300	<100	<100	<100	<100	100	4251902
Dissolved Lead (Pb)	ug/L	**10**	-	-	<0.50	<0.50	<0.50	<0.50	0.50	4251902
Dissolved Magnesium (Mg)	ug/L	-	-	-	35000	34000	23000	26000	50	4251902
Dissolved Manganese (Mn)	ug/L	-	-	50	44	42	6.5	<2.0	2.0	4251902
Dissolved Molybdenum (Mo)	ug/L	-	-	-	<0.50	<0.50	<0.50	0.65	0.50	4251902
Dissolved Nickel (Ni)	ug/L	-	-	-	<1.0	<1.0	<1.0	<1.0	1.0	4251902
Dissolved Phosphorus (P)	ug/L	-	-	-	<100	<100	<100	<100	100	4251902
Dissolved Potassium (K)	ug/L	-	-	-	2100	2000	3500	7200	200	4251902
Dissolved Selenium (Se)	ug/L	**10**	-	-	<2.0	<2.0	<2.0	<2.0	2.0	4251902
Dissolved Silicon (Si)	ug/L	-	-	-	8700	8800	6700	5400	50	4251902
Dissolved Silver (Ag)	ug/L	-	-	-	<0.10	<0.10	<0.10	0.64	0.10	4251902
Dissolved Sodium (Na)	ug/L	**20000**	-	200000	**41000**	**40000**	**22000**	**160000**	100	4251902
Dissolved Strontium (Sr)	ug/L	-	-	-	570	550	300	2500	1.0	4251902
Dissolved Thallium (Tl)	ug/L	-	-	-	<0.050	<0.050	<0.050	<0.050	0.050	4251902
Dissolved Titanium (Ti)	ug/L	-	-	-	<5.0	<5.0	<5.0	<5.0	5.0	4251902
Dissolved Uranium (U)	ug/L	**20**	-	-	1.1	1.0	0.52	<0.10	0.10	4251902
Dissolved Vanadium (V)	ug/L	-	-	-	<0.50	<0.50	<0.50	<0.50	0.50	4251902
Dissolved Zinc (Zn)	ug/L	-	-	5000	6.8	6.6	5.4	480	5.0	4251902

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Lab-Dup = Laboratory Initiated Duplicate

MAC,IMC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
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Maxxam Job #: B5L7564
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

TEST SUMMARY

Maxxam ID: BFL850
Sample ID: DW1
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4245655	N/A	2015/10/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4244109	N/A	2015/10/28	Automated Statchk
Chloride by Automated Colourimetry	KONE	4245397	N/A	2015/10/28	Deonarine Ramnarine
Colour	SPEC	4245615	N/A	2015/10/29	Elsamma Alex
Conductivity	AT	4245663	N/A	2015/10/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4245161	N/A	2015/10/28	Anastasia Hamanov
Fluoride	ISE	4245664	2015/10/26	2015/10/27	Yogesh Patel
Hardness (calculated as CaCO3)		4243882	N/A	2015/10/30	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	4251902	N/A	2015/10/30	Arefa Dabhad
Ion Balance (% Difference)	CALC	4243883	N/A	2015/10/30	Automated Statchk
Anion and Cation Sum	CALC	4244110	N/A	2015/10/30	Automated Statchk
Total Ammonia-N	LACH/NH4	4252664	N/A	2015/10/31	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4245339	N/A	2015/10/29	Chandra Nandlal
pH	AT	4245665	N/A	2015/10/27	Yogesh Patel
Orthophosphate	KONE	4248117	N/A	2015/10/28	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4244111	N/A	2015/10/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4244112	N/A	2015/10/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4248118	N/A	2015/10/28	Alina Dobreanu
Tannins & Lignins	SPEC	4248442	N/A	2015/10/28	Birenkumar Patel
Total Dissolved Solids (TDS calc)	CALC	4244113	N/A	2015/10/30	Automated Statchk
Turbidity	AT	4244329	N/A	2015/10/25	Lemeneh Addis

Maxxam ID: BFL850 Dup
Sample ID: DW1
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4245655	N/A	2015/10/27	Yogesh Patel
Conductivity	AT	4245663	N/A	2015/10/27	Yogesh Patel
Fluoride	ISE	4245664	2015/10/26	2015/10/27	Yogesh Patel
Dissolved Metals by ICPMS	ICP/MS	4251902	N/A	2015/10/30	Arefa Dabhad
pH	AT	4245665	N/A	2015/10/27	Yogesh Patel
Turbidity	AT	4244329	N/A	2015/10/25	Lemeneh Addis

Maxxam ID: BFL851
Sample ID: DW2
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4245314	N/A	2015/10/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4244109	N/A	2015/10/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	4245397	N/A	2015/10/28	Deonarine Ramnarine
Colour	SPEC	4245615	N/A	2015/10/29	Elsamma Alex
Conductivity	AT	4245317	N/A	2015/10/27	Yogesh Patel

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Maxxam Job #: B5L7564
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

TEST SUMMARY

Maxxam ID: BFL851
Sample ID: DW2
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4245161	N/A	2015/10/28	Anastasia Hamanov
Fluoride	ISE	4245312	2015/10/26	2015/10/27	Yogesh Patel
Hardness (calculated as CaCO3)		4243882	N/A	2015/10/30	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	4251902	N/A	2015/10/30	Arefa Dabhad
Ion Balance (% Difference)	CALC	4243883	N/A	2015/10/30	Automated Statchk
Anion and Cation Sum	CALC	4244110	N/A	2015/10/30	Automated Statchk
Total Ammonia-N	LACH/NH4	4252664	N/A	2015/10/31	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4245339	N/A	2015/10/29	Chandra Nandlal
pH	AT	4245319	N/A	2015/10/27	Yogesh Patel
Orthophosphate	KONE	4248117	N/A	2015/10/28	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4244111	N/A	2015/10/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4244112	N/A	2015/10/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4248118	N/A	2015/10/28	Alina Dobreanu
Tannins & Lignins	SPEC	4248442	N/A	2015/10/28	Birenkumar Patel
Total Dissolved Solids (TDS calc)	CALC	4244113	N/A	2015/10/30	Automated Statchk
Turbidity	AT	4244329	N/A	2015/10/25	Lemeneh Addis

Maxxam ID: BFL852
Sample ID: DW3
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4245314	N/A	2015/10/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4244109	N/A	2015/10/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	4245397	N/A	2015/10/28	Deonarine Ramnarine
Colour	SPEC	4245307	N/A	2015/10/29	Elsamma Alex
Conductivity	AT	4245317	N/A	2015/10/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4245161	N/A	2015/10/28	Anastasia Hamanov
Fluoride	ISE	4245312	2015/10/26	2015/10/27	Yogesh Patel
Hardness (calculated as CaCO3)		4243882	N/A	2015/10/30	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	4251902	N/A	2015/10/30	Arefa Dabhad
Ion Balance (% Difference)	CALC	4243883	N/A	2015/10/30	Automated Statchk
Anion and Cation Sum	CALC	4244110	N/A	2015/10/30	Automated Statchk
Total Ammonia-N	LACH/NH4	4252664	N/A	2015/10/31	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4245384	N/A	2015/10/29	Chandra Nandlal
pH	AT	4245319	N/A	2015/10/27	Yogesh Patel
Orthophosphate	KONE	4248117	N/A	2015/10/28	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4244111	N/A	2015/10/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4244112	N/A	2015/10/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4248118	N/A	2015/10/28	Alina Dobreanu
Tannins & Lignins	SPEC	4248442	N/A	2015/10/28	Birenkumar Patel
Total Dissolved Solids (TDS calc)	CALC	4244113	N/A	2015/10/30	Automated Statchk
Turbidity	AT	4244329	N/A	2015/10/25	Lemeneh Addis

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Maxxam Job #: B5L7564
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

TEST SUMMARY

Maxxam ID: BFL852 Dup
Sample ID: DW3
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4245314	N/A	2015/10/27	Yogesh Patel
Conductivity	AT	4245317	N/A	2015/10/27	Yogesh Patel
Fluoride	ISE	4245312	2015/10/26	2015/10/27	Yogesh Patel
pH	AT	4245319	N/A	2015/10/27	Yogesh Patel

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Maxxam Job #: B5L7564
Report Date: 2015/11/02

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GENERAL COMMENTS

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4244329	L_A	Spiked Blank	Turbidity	2015/10/25		101	%	85 - 115
4244329	L_A	Method Blank	Turbidity	2015/10/25	<0.2		NTU	
4244329	L_A	RPD [BFL850-02]	Turbidity	2015/10/25	8.7		%	20
4245161	AHA	Matrix Spike	Dissolved Organic Carbon	2015/10/28		97	%	80 - 120
4245161	AHA	Spiked Blank	Dissolved Organic Carbon	2015/10/28		100	%	80 - 120
4245161	AHA	Method Blank	Dissolved Organic Carbon	2015/10/28	<0.20		mg/L	
4245161	AHA	RPD	Dissolved Organic Carbon	2015/10/28	2.1		%	20
4245307	EAX	Spiked Blank	Colour	2015/10/29		101	%	80 - 120
4245307	EAX	Method Blank	Colour	2015/10/29	<2		TCU	
4245307	EAX	RPD	Colour	2015/10/29	0.21		%	25
4245312	YPA	Matrix Spike [BFL852-01]	Fluoride (F-)	2015/10/27		106	%	80 - 120
4245312	YPA	Spiked Blank	Fluoride (F-)	2015/10/27		104	%	80 - 120
4245312	YPA	Method Blank	Fluoride (F-)	2015/10/27	<0.10		mg/L	
4245312	YPA	RPD [BFL852-01]	Fluoride (F-)	2015/10/27	0.97		%	20
4245314	YPA	Spiked Blank	Alkalinity (Total as CaCO3)	2015/10/27		93	%	85 - 115
4245314	YPA	Method Blank	Alkalinity (Total as CaCO3)	2015/10/27	<1.0		mg/L	
4245314	YPA	RPD [BFL852-01]	Alkalinity (Total as CaCO3)	2015/10/27	1.5		%	25
4245317	YPA	Spiked Blank	Conductivity	2015/10/27		101	%	85 - 115
4245317	YPA	Method Blank	Conductivity	2015/10/27	<1.0		umho/c	
4245317	YPA	RPD [BFL852-01]	Conductivity	2015/10/27	0.18		%	25
4245319	YPA	Spiked Blank	pH	2015/10/27		101	%	98 - 103
4245319	YPA	RPD [BFL852-01]	pH	2015/10/27	0.22		%	N/A
4245339	C_N	Matrix Spike	Nitrite (N)	2015/10/29		105	%	80 - 120
			Nitrate (N)	2015/10/29		91	%	80 - 120
4245339	C_N	Spiked Blank	Nitrite (N)	2015/10/29		106	%	80 - 120
			Nitrate (N)	2015/10/29		90	%	80 - 120
4245339	C_N	Method Blank	Nitrite (N)	2015/10/29	<0.010		mg/L	
			Nitrate (N)	2015/10/29	<0.10		mg/L	
4245339	C_N	RPD	Nitrite (N)	2015/10/29	NC		%	25
			Nitrate (N)	2015/10/29	NC		%	25
4245384	C_N	Matrix Spike	Nitrite (N)	2015/10/29		106	%	80 - 120
			Nitrate (N)	2015/10/29		99	%	80 - 120
4245384	C_N	Spiked Blank	Nitrite (N)	2015/10/29		105	%	80 - 120
			Nitrate (N)	2015/10/29		96	%	80 - 120
4245384	C_N	Method Blank	Nitrite (N)	2015/10/29	<0.010		mg/L	
			Nitrate (N)	2015/10/29	<0.10		mg/L	
4245384	C_N	RPD	Nitrite (N)	2015/10/29	NC		%	25
			Nitrate (N)	2015/10/29	NC		%	25
4245397	DRM	Matrix Spike	Dissolved Chloride (Cl)	2015/10/28		104	%	80 - 120
4245397	DRM	Spiked Blank	Dissolved Chloride (Cl)	2015/10/28		103	%	80 - 120
4245397	DRM	Method Blank	Dissolved Chloride (Cl)	2015/10/28	<1.0		mg/L	
4245397	DRM	RPD	Dissolved Chloride (Cl)	2015/10/28	NC		%	20
4245615	EAX	Spiked Blank	Colour	2015/10/29		98	%	80 - 120
4245615	EAX	Method Blank	Colour	2015/10/29	<2		TCU	
4245615	EAX	RPD	Colour	2015/10/29	0.16		%	25
4245655	YPA	Spiked Blank	Alkalinity (Total as CaCO3)	2015/10/27		95	%	85 - 115
4245655	YPA	Method Blank	Alkalinity (Total as CaCO3)	2015/10/27	<1.0		mg/L	
4245655	YPA	RPD [BFL850-01]	Alkalinity (Total as CaCO3)	2015/10/27	1.9		%	25
4245663	YPA	Spiked Blank	Conductivity	2015/10/27		101	%	85 - 115
4245663	YPA	Method Blank	Conductivity	2015/10/27	<1.0		umho/c	
4245663	YPA	RPD [BFL850-01]	Conductivity	2015/10/27	0.91		%	25
4245664	YPA	Matrix Spike [BFL850-01]	Fluoride (F-)	2015/10/27		99	%	80 - 120

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Maxxam Job #: B5L7564
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4245664	YPA	Spiked Blank	Fluoride (F-)	2015/10/27		102	%	80 - 120
4245664	YPA	Method Blank	Fluoride (F-)	2015/10/27	<0.10		mg/L	
4245664	YPA	RPD [BFL850-01]	Fluoride (F-)	2015/10/27	NC		%	20
4245665	YPA	Spiked Blank	pH	2015/10/27		102	%	98 - 103
4245665	YPA	RPD [BFL850-01]	pH	2015/10/27	1.2		%	N/A
4248117	ADB	Matrix Spike	Orthophosphate (P)	2015/10/28		112	%	75 - 125
4248117	ADB	Spiked Blank	Orthophosphate (P)	2015/10/28		99	%	80 - 120
4248117	ADB	Method Blank	Orthophosphate (P)	2015/10/28	<0.010		mg/L	
4248117	ADB	RPD	Orthophosphate (P)	2015/10/28	NC		%	25
4248118	ADB	Matrix Spike	Dissolved Sulphate (SO4)	2015/10/28		NC	%	75 - 125
4248118	ADB	Spiked Blank	Dissolved Sulphate (SO4)	2015/10/28		99	%	80 - 120
4248118	ADB	Method Blank	Dissolved Sulphate (SO4)	2015/10/28	<1.0		mg/L	
4248118	ADB	RPD	Dissolved Sulphate (SO4)	2015/10/28	0.15		%	20
4248442	BIP	Matrix Spike	Tannins & Lignins	2015/10/28		95	%	80 - 120
4248442	BIP	Spiked Blank	Tannins & Lignins	2015/10/28		95	%	80 - 120
4248442	BIP	Method Blank	Tannins & Lignins	2015/10/28	<0.2		mg/L	
4248442	BIP	RPD	Tannins & Lignins	2015/10/28	NC		%	25
4251902	ADA	Matrix Spike [BFL850-04]	Dissolved Aluminum (Al)	2015/10/30		108	%	80 - 120
			Dissolved Antimony (Sb)	2015/10/30		105	%	80 - 120
			Dissolved Arsenic (As)	2015/10/30		102	%	80 - 120
			Dissolved Barium (Ba)	2015/10/30		100	%	80 - 120
			Dissolved Beryllium (Be)	2015/10/30		99	%	80 - 120
			Dissolved Boron (B)	2015/10/30		97	%	80 - 120
			Dissolved Cadmium (Cd)	2015/10/30		103	%	80 - 120
			Dissolved Calcium (Ca)	2015/10/30		NC	%	80 - 120
			Dissolved Chromium (Cr)	2015/10/30		96	%	80 - 120
			Dissolved Cobalt (Co)	2015/10/30		100	%	80 - 120
			Dissolved Copper (Cu)	2015/10/30		99	%	80 - 120
			Dissolved Iron (Fe)	2015/10/30		104	%	80 - 120
			Dissolved Lead (Pb)	2015/10/30		97	%	80 - 120
			Dissolved Magnesium (Mg)	2015/10/30		NC	%	80 - 120
			Dissolved Manganese (Mn)	2015/10/30		99	%	80 - 120
			Dissolved Molybdenum (Mo)	2015/10/30		102	%	80 - 120
			Dissolved Nickel (Ni)	2015/10/30		98	%	80 - 120
			Dissolved Phosphorus (P)	2015/10/30		106	%	80 - 120
			Dissolved Potassium (K)	2015/10/30		107	%	80 - 120
			Dissolved Selenium (Se)	2015/10/30		100	%	80 - 120
			Dissolved Silicon (Si)	2015/10/30		102	%	80 - 120
			Dissolved Silver (Ag)	2015/10/30		98	%	80 - 120
			Dissolved Sodium (Na)	2015/10/30		NC	%	80 - 120
			Dissolved Strontium (Sr)	2015/10/30		NC	%	80 - 120
			Dissolved Thallium (Tl)	2015/10/30		99	%	80 - 120
			Dissolved Titanium (Ti)	2015/10/30		102	%	80 - 120
			Dissolved Uranium (U)	2015/10/30		97	%	80 - 120
			Dissolved Vanadium (V)	2015/10/30		98	%	80 - 120
			Dissolved Zinc (Zn)	2015/10/30		100	%	80 - 120
4251902	ADA	Spiked Blank	Dissolved Aluminum (Al)	2015/10/30		103	%	80 - 120
			Dissolved Antimony (Sb)	2015/10/30		100	%	80 - 120
			Dissolved Arsenic (As)	2015/10/30		101	%	80 - 120
			Dissolved Barium (Ba)	2015/10/30		102	%	80 - 120
			Dissolved Beryllium (Be)	2015/10/30		99	%	80 - 120
			Dissolved Boron (B)	2015/10/30		91	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Cadmium (Cd)	2015/10/30		100	%	80 - 120
			Dissolved Calcium (Ca)	2015/10/30		106	%	80 - 120
			Dissolved Chromium (Cr)	2015/10/30		96	%	80 - 120
			Dissolved Cobalt (Co)	2015/10/30		101	%	80 - 120
			Dissolved Copper (Cu)	2015/10/30		99	%	80 - 120
			Dissolved Iron (Fe)	2015/10/30		102	%	80 - 120
			Dissolved Lead (Pb)	2015/10/30		99	%	80 - 120
			Dissolved Magnesium (Mg)	2015/10/30		106	%	80 - 120
			Dissolved Manganese (Mn)	2015/10/30		100	%	80 - 120
			Dissolved Molybdenum (Mo)	2015/10/30		98	%	80 - 120
			Dissolved Nickel (Ni)	2015/10/30		99	%	80 - 120
			Dissolved Phosphorus (P)	2015/10/30		107	%	80 - 120
			Dissolved Potassium (K)	2015/10/30		106	%	80 - 120
			Dissolved Selenium (Se)	2015/10/30		99	%	80 - 120
			Dissolved Silicon (Si)	2015/10/30		101	%	80 - 120
			Dissolved Silver (Ag)	2015/10/30		94	%	80 - 120
			Dissolved Sodium (Na)	2015/10/30		106	%	80 - 120
			Dissolved Strontium (Sr)	2015/10/30		99	%	80 - 120
			Dissolved Thallium (Tl)	2015/10/30		99	%	80 - 120
			Dissolved Titanium (Ti)	2015/10/30		101	%	80 - 120
			Dissolved Uranium (U)	2015/10/30		96	%	80 - 120
			Dissolved Vanadium (V)	2015/10/30		96	%	80 - 120
			Dissolved Zinc (Zn)	2015/10/30		100	%	80 - 120
4251902	ADA	Method Blank	Dissolved Aluminum (Al)	2015/10/30	<5.0		ug/L	
			Dissolved Antimony (Sb)	2015/10/30	<0.50		ug/L	
			Dissolved Arsenic (As)	2015/10/30	<1.0		ug/L	
			Dissolved Barium (Ba)	2015/10/30	<2.0		ug/L	
			Dissolved Beryllium (Be)	2015/10/30	<0.50		ug/L	
			Dissolved Boron (B)	2015/10/30	<10		ug/L	
			Dissolved Cadmium (Cd)	2015/10/30	<0.10		ug/L	
			Dissolved Calcium (Ca)	2015/10/30	<200		ug/L	
			Dissolved Chromium (Cr)	2015/10/30	<5.0		ug/L	
			Dissolved Cobalt (Co)	2015/10/30	<0.50		ug/L	
			Dissolved Copper (Cu)	2015/10/30	<1.0		ug/L	
			Dissolved Iron (Fe)	2015/10/30	<100		ug/L	
			Dissolved Lead (Pb)	2015/10/30	<0.50		ug/L	
			Dissolved Magnesium (Mg)	2015/10/30	<50		ug/L	
			Dissolved Manganese (Mn)	2015/10/30	<2.0		ug/L	
			Dissolved Molybdenum (Mo)	2015/10/30	<0.50		ug/L	
			Dissolved Nickel (Ni)	2015/10/30	<1.0		ug/L	
			Dissolved Phosphorus (P)	2015/10/30	<100		ug/L	
			Dissolved Potassium (K)	2015/10/30	<200		ug/L	
			Dissolved Selenium (Se)	2015/10/30	<2.0		ug/L	
			Dissolved Silicon (Si)	2015/10/30	<50		ug/L	
			Dissolved Silver (Ag)	2015/10/30	<0.10		ug/L	
			Dissolved Sodium (Na)	2015/10/30	<100		ug/L	
			Dissolved Strontium (Sr)	2015/10/30	<1.0		ug/L	
			Dissolved Thallium (Tl)	2015/10/30	<0.050		ug/L	
			Dissolved Titanium (Ti)	2015/10/30	<5.0		ug/L	
			Dissolved Uranium (U)	2015/10/30	<0.10		ug/L	
			Dissolved Vanadium (V)	2015/10/30	<0.50		ug/L	
			Dissolved Zinc (Zn)	2015/10/30	<5.0		ug/L	

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Report Date: 2015/11/02

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Site Location: MCCARTHY
Sampler Initials: AJM

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4251902	ADA	RPD [BFL850-04]	Dissolved Aluminum (Al)	2015/10/30	NC		%	20
			Dissolved Antimony (Sb)	2015/10/30	NC		%	20
			Dissolved Arsenic (As)	2015/10/30	NC		%	20
			Dissolved Barium (Ba)	2015/10/30	0.99		%	20
			Dissolved Beryllium (Be)	2015/10/30	NC		%	20
			Dissolved Boron (B)	2015/10/30	NC		%	20
			Dissolved Cadmium (Cd)	2015/10/30	NC		%	20
			Dissolved Calcium (Ca)	2015/10/30	0.49		%	20
			Dissolved Chromium (Cr)	2015/10/30	NC		%	20
			Dissolved Cobalt (Co)	2015/10/30	NC		%	20
			Dissolved Copper (Cu)	2015/10/30	NC		%	20
			Dissolved Iron (Fe)	2015/10/30	NC		%	20
			Dissolved Lead (Pb)	2015/10/30	NC		%	20
			Dissolved Magnesium (Mg)	2015/10/30	1.1		%	20
			Dissolved Manganese (Mn)	2015/10/30	3.9		%	20
			Dissolved Molybdenum (Mo)	2015/10/30	NC		%	20
			Dissolved Nickel (Ni)	2015/10/30	NC		%	20
			Dissolved Phosphorus (P)	2015/10/30	NC		%	20
			Dissolved Potassium (K)	2015/10/30	3.4		%	20
			Dissolved Selenium (Se)	2015/10/30	NC		%	20
			Dissolved Silicon (Si)	2015/10/30	0.69		%	20
			Dissolved Silver (Ag)	2015/10/30	NC		%	20
			Dissolved Sodium (Na)	2015/10/30	2.4		%	20
			Dissolved Strontium (Sr)	2015/10/30	3.4		%	20
			Dissolved Thallium (Tl)	2015/10/30	NC		%	20
			Dissolved Titanium (Ti)	2015/10/30	NC		%	20
			Dissolved Uranium (U)	2015/10/30	4.1		%	20
			Dissolved Vanadium (V)	2015/10/30	NC		%	20
			Dissolved Zinc (Zn)	2015/10/30	NC		%	20
4252664	COP	Matrix Spike	Total Ammonia-N	2015/10/31		95	%	80 - 120
4252664	COP	Spiked Blank	Total Ammonia-N	2015/10/31		96	%	85 - 115
4252664	COP	Method Blank	Total Ammonia-N	2015/10/31	<0.050		mg/L	
4252664	COP	RPD	Total Ammonia-N	2015/10/31	NC		%	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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Site Location: MCCARTHY
Sampler Initials: AJM

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Brad Newman, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Exceedence Summary Table – ODWS (2002)

Result Exceedences

Sample ID	Maxxam ID	Parameter	Criteria	Result	DL	Units
DW1	BFL850-04-Lab Dup	Dissolved Sodium (Na)	20000	40000	100	ug/L
DW1	BFL850-04	Dissolved Sodium (Na)	20000	41000	100	ug/L
DW2	BFL851-04	Dissolved Sodium (Na)	20000	22000	100	ug/L
DW3	BFL852-04	Dissolved Sodium (Na)	20000	160000	100	ug/L

The exceedence summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 535097-01-01, 535097-02-01

Attention:Dawn Hoyle

Golder Associates Ltd
121 Commerce Park Drive
Unit L
Barrie, ON
L4N 8X1

Report Date: 2015/11/02
Report #: R3747376
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5L7576
Received: 2015/10/24, 09:52

Sample Matrix: Water
Samples Received: 17

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	17	N/A	2015/10/27	CAM SOP-00448	SM 22 2320 B m
Carbonate, Bicarbonate and Hydroxide	13	N/A	2015/10/27	CAM SOP-00102	APHA 4500-CO2 D
Carbonate, Bicarbonate and Hydroxide	4	N/A	2015/10/28	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	1	N/A	2015/10/27	CAM SOP-00463	EPA 325.2 m
Chloride by Automated Colourimetry	16	N/A	2015/10/28	CAM SOP-00463	EPA 325.2 m
Colour	17	N/A	2015/10/29	CAM SOP-00412	SM 22 2120 m
Conductivity	17	N/A	2015/10/27	CAM SOP-00414	SM 22 2510 m
Dissolved Organic Carbon (DOC) (1)	16	N/A	2015/10/28	CAM SOP-00446	SM 22 5310 B m
Dissolved Organic Carbon (DOC) (1)	1	N/A	2015/10/29	CAM SOP-00446	SM 22 5310 B m
Fluoride	17	2015/10/26	2015/10/27	CAM SOP-00449	SM 22 4500-F C m
Hardness (calculated as CaCO3)	17	N/A	2015/10/30	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Metals Analysis by ICP	7	2015/10/29	2015/10/29	CAM SOP-00408	EPA 6010C m
Dissolved Metals Analysis by ICP	8	2015/10/29	2015/10/30	CAM SOP-00408	EPA 6010C m
Dissolved Metals Analysis by ICP	2	2015/10/31	2015/11/02	CAM SOP-00408	EPA 6010C m
Ion Balance (% Difference)	17	N/A	2015/10/30		
Anion and Cation Sum	17	N/A	2015/10/30		
Total Ammonia-N	17	N/A	2015/10/30	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	14	N/A	2015/10/29	CAM SOP-00440	SM 22 4500-NO3I/NO2B
Nitrate (NO3) and Nitrite (NO2) in Water (2)	3	N/A	2015/10/30	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	17	N/A	2015/10/27	CAM SOP-00413	SM 4500H+ B m
Orthophosphate	1	N/A	2015/10/27	CAM SOP-00461	EPA 365.1 m
Orthophosphate	16	N/A	2015/10/28	CAM SOP-00461	EPA 365.1 m
Sat. pH and Langelier Index (@ 20C)	17	N/A	2015/10/30		
Sat. pH and Langelier Index (@ 4C)	17	N/A	2015/10/30		
Sulphate by Automated Colourimetry	1	N/A	2015/10/27	CAM SOP-00464	EPA 375.4 m
Sulphate by Automated Colourimetry	16	N/A	2015/10/28	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids (TDS calc)	17	N/A	2015/10/30		

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.

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Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 535097-01-01, 535097-02-01

Attention:Dawn Hoyle

Golder Associates Ltd
121 Commerce Park Drive
Unit L
Barrie, ON
L4N 8X1

Report Date: 2015/11/02
Report #: R3747376
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5L7576
Received: 2015/10/24, 09:52

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Stephen McMillan, Project Manager
Email: smcmillan@maxxam.ca
Phone# (905)817-5700 Ext:5735

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Maxxam Job #: B5L7576
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

RESULTS OF ANALYSES OF WATER

Maxxam ID				BFL896			BFL897	BFL897		
Sampling Date				2015/10/22 16:30			2015/10/22 10:45	2015/10/22 10:45		
COC Number				535097-01-01			535097-01-01	535097-01-01		
	UNITS	MAC	A/O	AM1B	RDL	QC Batch	TW1-1	TW1-1 Lab-Dup	RDL	QC Batch
Calculated Parameters										
Anion Sum	me/L	-	-	5.10	N/A	4244110	27.3		N/A	4244110
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	200	1.0	4244109	270		1.0	4244109
Calculated TDS	mg/L	-	500	280	1.0	4244113	1400		1.0	4244113
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	-	1.6	1.0	4244109	1.5		1.0	4244109
Cation Sum	me/L	-	-	5.15	N/A	4244110	24.0		N/A	4244110
Hardness (CaCO3)	mg/L	-	80:100	240	1.0	4243882	640		1.0	4243882
Ion Balance (% Difference)	%	-	-	0.500	N/A	4243883	6.31		N/A	4243883
Langelier Index (@ 20C)	N/A	-	-	0.483		4244111	0.752			4244111
Langelier Index (@ 4C)	N/A	-	-	0.233		4244112	0.508			4244112
Saturation pH (@ 20C)	N/A	-	-	7.43		4244111	7.01			4244111
Saturation pH (@ 4C)	N/A	-	-	7.68		4244112	7.26			4244112
Inorganics										
Total Ammonia-N	mg/L	-	-	0.12	0.050	4248389	0.93		0.050	4248229
Colour	TCU	-	5	<2	2	4245615	<2		2	4245615
Conductivity	umho/cm	-	-	470	1.0	4245663	3000		1.0	4245663
Fluoride (F-)	mg/L	**1.5**	-	0.26	0.10	4245664	0.51		0.10	4245664
Dissolved Organic Carbon	mg/L	-	5	0.63	0.20	4245634	1.5		0.20	4245161
Orthophosphate (P)	mg/L	-	-	<0.010	0.010	4248117	<0.010	<0.010	0.010	4245805
pH	pH	-	6.5:8.5	7.92	N/A	4245665	7.76		N/A	4245665
Dissolved Sulphate (SO4)	mg/L	-	500	41	1.0	4248118	12	12	1.0	4245807
Alkalinity (Total as CaCO3)	mg/L	-	30:500	210	1.0	4245655	270		1.0	4245655
Dissolved Chloride (Cl)	mg/L	-	250	3.9	1.0	4245397	770	780	10	4245803
Nitrite (N)	mg/L	**1**	-	<0.010	0.010	4245762	<0.010	<0.010	0.010	4245762
Nitrate (N)	mg/L	**10**	-	<0.10	0.10	4245762	<0.10	<0.10	0.10	4245762

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)
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Maxxam Job #: B5L7576
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

RESULTS OF ANALYSES OF WATER

Maxxam ID				BFL898		BFL899		BFL900		
Sampling Date				2015/10/22 16:15		2015/10/22 16:15		2015/10/22 16:30		
COC Number				535097-01-01		535097-01-01		535097-01-01		
	UNITS	MAC	A/O	BORED	QC Batch	OW4-1	QC Batch	OW4-2	RDL	QC Batch
Calculated Parameters										
Anion Sum	me/L	-	-	5.14	4244110	8.50	4244110	9.69	N/A	4244110
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	210	4244109	270	4244109	270	1.0	4244109
Calculated TDS	mg/L	-	500	290	4244113	460	4244113	550	1.0	4244113
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	-	3.1	4244109	4.9	4244109	3.5	1.0	4244109
Cation Sum	me/L	-	-	5.29	4244110	8.36	4244110	10.7	N/A	4244110
Hardness (CaCO3)	mg/L	-	80:100	190	4243882	76	4243882	120	1.0	4243882
Ion Balance (% Difference)	%	-	-	1.44	4243883	0.840	4243883	5.08	N/A	4243883
Langelier Index (@ 20C)	N/A	-	-	0.718	4244111	0.443	4244111	0.444		4244111
Langelier Index (@ 4C)	N/A	-	-	0.469	4244112	0.195	4244112	0.196		4244112
Saturation pH (@ 20C)	N/A	-	-	7.48	4244111	7.83	4244111	7.69		4244111
Saturation pH (@ 4C)	N/A	-	-	7.73	4244112	8.08	4244112	7.93		4244112
Inorganics										
Total Ammonia-N	mg/L	-	-	<0.050	4248229	0.89	4248389	0.81	0.050	4248389
Colour	TCU	-	5	<2	4245615	3	4245307	<2	2	4245307
Conductivity	umho/cm	-	-	490	4245317	850	4245317	1000	1.0	4245317
Fluoride (F-)	mg/L	**1.5**	-	0.15	4245312	1.5	4245312	1.4	0.10	4245312
Dissolved Organic Carbon	mg/L	-	5	0.88	4245634	1.3	4247275	1.1	0.20	4245634
Orthophosphate (P)	mg/L	-	-	<0.010	4248117	<0.010	4248117	<0.010	0.010	4248117
pH	pH	-	6.5:8.5	8.20	4245319	8.27	4245319	8.13	N/A	4245319
Dissolved Sulphate (SO4)	mg/L	-	500	33	4248118	6.3	4248118	<1.0	1.0	4248118
Alkalinity (Total as CaCO3)	mg/L	-	30:500	210	4245314	280	4245314	280	1.0	4245314
Dissolved Chloride (Cl)	mg/L	-	250	6.1	4245397	95	4245397	140	1.0	4245397
Nitrite (N)	mg/L	**1**	-	<0.010	4245393	<0.010	4245393	<0.010	0.010	4245393
Nitrate (N)	mg/L	**10**	-	0.33	4245393	<0.10	4245393	<0.10	0.10	4245393

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
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Maxxam Job #: B5L7576
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

RESULTS OF ANALYSES OF WATER

Maxxam ID				BFL901		BFL902	BFL902		
Sampling Date				2015/10/22 14:00		2015/10/22 14:15	2015/10/22 14:15		
COC Number				535097-01-01		535097-01-01	535097-01-01		
	UNITS	MAC	A/O	OW5-1	RDL	OW5-2	OW5-2 Lab-Dup	RDL	QC Batch
Calculated Parameters									
Anion Sum	me/L	-	-	6.35	N/A	282		N/A	4244110
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	230	1.0	110		1.0	4244109
Calculated TDS	mg/L	-	500	340	1.0	16000		1.0	4244113
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	-	2.4	1.0	<1.0		1.0	4244109
Cation Sum	me/L	-	-	6.31	N/A	283		N/A	4244110
Hardness (CaCO3)	mg/L	-	80:100	160	1.0	5900		1.0	4243882
Ion Balance (% Difference)	%	-	-	0.280	N/A	0.220		N/A	4243883
Langelier Index (@ 20C)	N/A	-	-	0.471		0.527			4244111
Langelier Index (@ 4C)	N/A	-	-	0.222		0.290			4244112
Saturation pH (@ 20C)	N/A	-	-	7.58		6.79			4244111
Saturation pH (@ 4C)	N/A	-	-	7.83		7.02			4244112
Inorganics									
Total Ammonia-N	mg/L	-	-	0.91	0.050	9.9	9.9	0.25	4248389
Colour	TCU	-	5	<2	2	26		2	4245307
Conductivity	umho/cm	-	-	610	1.0	26000		1.0	4245317
Fluoride (F-)	mg/L	**1.5**	-	0.90	0.10	0.46		0.10	4245312
Dissolved Organic Carbon	mg/L	-	5	1.1	0.20	0.34		0.20	4245634
Orthophosphate (P)	mg/L	-	-	<0.010	0.010	<0.010		0.010	4248117
pH	pH	-	6.5:8.5	8.05	N/A	7.31		N/A	4245319
Dissolved Sulphate (SO4)	mg/L	-	500	29	1.0	<1.0		1.0	4248118
Alkalinity (Total as CaCO3)	mg/L	-	30:500	230	1.0	110		1.0	4245314
Dissolved Chloride (Cl)	mg/L	-	250	37	1.0	9900		100	4245397
Nitrite (N)	mg/L	**1**	-	0.121	0.010	<0.010		0.010	4245393
Nitrate (N)	mg/L	**10**	-	0.25	0.10	<0.10		0.10	4245393

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)
N/A = Not Applicable

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Maxxam Job #: B5L7576
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

RESULTS OF ANALYSES OF WATER

Maxxam ID				BFL903			BFL904		
Sampling Date				2015/10/22 14:30			2015/10/22 15:15		
COC Number				535097-01-01			535097-01-01		
	UNITS	MAC	A/O	OW5-3	RDL	QC Batch	OW6-2	RDL	QC Batch
Calculated Parameters									
Anion Sum	me/L	-	-	401	N/A	4244110	63.2	N/A	4244110
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	100	1.0	4244109	160	1.0	4244109
Calculated TDS	mg/L	-	500	22000	1.0	4244113	3800	1.0	4244113
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	-	<1.0	1.0	4244109	<1.0	1.0	4244109
Cation Sum	me/L	-	-	395	N/A	4244110	62.6	N/A	4244110
Hardness (CaCO3)	mg/L	-	80:100	8300	1.0	4243882	1400	1.0	4243882
Ion Balance (% Difference)	%	-	-	0.810	N/A	4243883	0.480	N/A	4243883
Langelier Index (@ 20C)	N/A	-	-	0.573		4244111	0.578		4244111
Langelier Index (@ 4C)	N/A	-	-	0.335		4244112	0.337		4244112
Saturation pH (@ 20C)	N/A	-	-	6.63		4244111	7.10		4244111
Saturation pH (@ 4C)	N/A	-	-	6.87		4244112	7.34		4244112
Inorganics									
Total Ammonia-N	mg/L	-	-	11	0.50	4248229	1.4	0.050	4248389
Colour	TCU	-	5	18	2	4245307	2	2	4245615
Conductivity	umho/cm	-	-	37000	1.0	4245317	6000	1.0	4245317
Fluoride (F-)	mg/L	**1.5**	-	0.44	0.10	4245312	0.49	0.10	4245312
Dissolved Organic Carbon	mg/L	-	5	1.4	0.20	4245634	0.86	0.20	4245634
Orthophosphate (P)	mg/L	-	-	<0.010	0.010	4248117	<0.010	0.010	4248117
pH	pH	-	6.5:8.5	7.21	N/A	4245319	7.67	N/A	4245319
Dissolved Sulphate (SO4)	mg/L	-	500	150	1.0	4248118	1000	5.0	4248118
Alkalinity (Total as CaCO3)	mg/L	-	30:500	100	1.0	4245314	160	1.0	4245314
Dissolved Chloride (Cl)	mg/L	-	250	14000	120	4245397	1400	15	4245397
Nitrite (N)	mg/L	**1**	-	0.015	0.010	4245384	0.026	0.010	4245352
Nitrate (N)	mg/L	**10**	-	<0.10	0.10	4245384	<0.10	0.10	4245352

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)

N/A = Not Applicable

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Maxxam Job #: B5L7576
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

RESULTS OF ANALYSES OF WATER

Maxxam ID				BFL905			BFL906		BFL907		
Sampling Date				2015/10/22 12:00			2015/10/22 12:15		2015/10/22 11:15		
COC Number				535097-02-01			535097-02-01		535097-02-01		
	UNITS	MAC	A/O	OW7-1	RDL	QC Batch	OW7-2	QC Batch	OW8-1	RDL	QC Batch
Calculated Parameters											
Anion Sum	me/L	-	-	7.17	N/A	4244110	69.5	4244110	69.1	N/A	4244110
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	230	1.0	4244109	280	4244109	240	1.0	4244109
Calculated TDS	mg/L	-	500	520	1.0	4244113	3800	4244113	3900	1.0	4244113
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	-	2.0	1.0	4244109	1.8	4244109	<1.0	1.0	4244109
Cation Sum	me/L	-	-	14.2	N/A	4244110	68.5	4244110	71.6	N/A	4244110
Hardness (CaCO3)	mg/L	-	80:100	450	1.0	4243882	1500	4243882	1500	1.0	4243882
Ion Balance (% Difference)	%	-	-	33.0	N/A	4243883	0.720	4243883	1.76	N/A	4243883
Langelier Index (@ 20C)	N/A	-	-	0.822		4244111	1.01	4244111	0.819		4244111
Langelier Index (@ 4C)	N/A	-	-	0.574		4244112	0.770	4244112	0.579		4244112
Saturation pH (@ 20C)	N/A	-	-	7.15		4244111	6.82	4244111	6.81		4244111
Saturation pH (@ 4C)	N/A	-	-	7.40		4244112	7.06	4244112	7.05		4244112
Inorganics											
Total Ammonia-N	mg/L	-	-	3.1	0.050	4248389	2.4	4248229	2.4	0.050	4248389
Colour	TCU	-	5	3	2	4245307	<2	4245307	3	2	4245307
Conductivity	umho/cm	-	-	700	1.0	4245317	7300	4245317	7300	1.0	4245317
Fluoride (F-)	mg/L	**1.5**	-	0.51	0.10	4245312	1.2	4245312	0.82	0.10	4245312
Dissolved Organic Carbon	mg/L	-	5	1.8	0.20	4245634	1.9	4245634	1.1	0.20	4245634
Orthophosphate (P)	mg/L	-	-	<0.010	0.010	4248117	<0.010	4248117	<0.010	0.010	4248117
pH	pH	-	6.5:8.5	7.98	N/A	4245319	7.83	4245319	7.62	N/A	4245319
Dissolved Sulphate (SO4)	mg/L	-	500	49	1.0	4248118	55	4248118	19	1.0	4248118
Alkalinity (Total as CaCO3)	mg/L	-	30:500	230	1.0	4245314	280	4245314	240	1.0	4245314
Dissolved Chloride (Cl)	mg/L	-	250	55	1.0	4245397	2200	4245397	2300	20	4245397
Nitrite (N)	mg/L	**1**	-	<0.010	0.010	4245384	<0.010	4245384	<0.010	0.010	4245393
Nitrate (N)	mg/L	**10**	-	<0.10	0.10	4245384	<0.10	4245384	<0.10	0.10	4245393

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

N/A = Not Applicable

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Maxxam Job #: B5L7576
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

RESULTS OF ANALYSES OF WATER

Maxxam ID				BFL908		BFL909		BFL910	BFL910		
Sampling Date				2015/10/22 11:30		2015/10/22 09:00		2015/10/22 09:15	2015/10/22 09:15		
COC Number				535097-02-01		535097-02-01		535097-02-01	535097-02-01		
	UNITS	MAC	A/O	OW8-2	RDL	OW9-1	RDL	OW9-2	OW9-2 Lab-Dup	RDL	QC Batch
Calculated Parameters											
Anion Sum	me/L	-	-	80.8	N/A	50.4	N/A	131		N/A	4244110
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	250	1.0	470	1.0	260		1.0	4244109
Calculated TDS	mg/L	-	500	4500	1.0	3200	1.0	7400		1.0	4244113
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	-	1.0	1.0	1.9	1.0	<1.0		1.0	4244109
Cation Sum	me/L	-	-	83.4	N/A	67.9	N/A	130		N/A	4244110
Hardness (CaCO3)	mg/L	-	80:100	1900	1.0	1200	1.0	2700		1.0	4244228
Ion Balance (% Difference)	%	-	-	1.56	N/A	14.8	N/A	0.450		N/A	4243883
Langelier Index (@ 20C)	N/A	-	-	0.909		0.995		0.800			4244111
Langelier Index (@ 4C)	N/A	-	-	0.669		0.754		0.562			4244112
Saturation pH (@ 20C)	N/A	-	-	6.72		6.64		6.60			4244111
Saturation pH (@ 4C)	N/A	-	-	6.96		6.88		6.84			4244112
Inorganics											
Total Ammonia-N	mg/L	-	-	2.4	0.050	2.5	0.050	2.9		0.050	4248389
Colour	TCU	-	5	9	2	6	2	8		2	4245615
Conductivity	umho/cm	-	-	8400	1.0	5200	1.0	13000		1.0	4245317
Fluoride (F-)	mg/L	**1.5**	-	0.71	0.10	0.23	0.10	0.12		0.10	4245312
Dissolved Organic Carbon	mg/L	-	5	1.2	0.20	11	0.20	9.6		0.20	4245634
Orthophosphate (P)	mg/L	-	-	<0.010	0.010	<0.010	0.010	<0.010		0.010	4248117
pH	pH	-	6.5:8.5	7.62	N/A	7.63	N/A	7.40		N/A	4245319
Dissolved Sulphate (SO4)	mg/L	-	500	20	1.0	77	1.0	380		1.0	4248118
Alkalinity (Total as CaCO3)	mg/L	-	30:500	260	1.0	470	1.0	260		1.0	4245314
Dissolved Chloride (Cl)	mg/L	-	250	2700	25	1400	15	4200		40	4245397
Nitrite (N)	mg/L	**1**	-	<0.010	0.010	<0.010	0.010	<0.010	<0.010	0.010	4245393
Nitrate (N)	mg/L	**10**	-	<0.10	0.10	<0.10	0.10	<0.10	<0.10	0.10	4245393

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
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Maxxam Job #: B5L7576
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

RESULTS OF ANALYSES OF WATER

Maxxam ID				BFL911			BFL912	BFL912		
Sampling Date				2015/10/22 14:15			2015/10/22 16:30	2015/10/22 16:30		
COC Number				535097-02-01			535097-02-01	535097-02-01		
	UNITS	MAC	A/O	OW5-2-D	RDL	QC Batch	OW4-2-D	OW4-2-D Lab-Dup	RDL	QC Batch
Calculated Parameters										
Anion Sum	me/L	-	-	274	N/A	4244110	9.69		N/A	4244110
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	110	1.0	4244109	270		1.0	4244109
Calculated TDS	mg/L	-	500	15000	1.0	4244113	550		1.0	4244113
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	-	<1.0	1.0	4244109	3.2		1.0	4244109
Cation Sum	me/L	-	-	286	N/A	4244110	10.6		N/A	4244110
Hardness (CaCO3)	mg/L	-	80:100	6000	1.0	4244228	120		1.0	4244228
Ion Balance (% Difference)	%	-	-	2.29	N/A	4243883	4.71		N/A	4243883
Langelier Index (@ 20C)	N/A	-	-	0.482		4244111	0.411			4244111
Langelier Index (@ 4C)	N/A	-	-	0.245		4244112	0.164			4244112
Saturation pH (@ 20C)	N/A	-	-	6.78		4244111	7.69			4244111
Saturation pH (@ 4C)	N/A	-	-	7.01		4244112	7.94			4244112
Inorganics										
Total Ammonia-N	mg/L	-	-	9.9	0.25	4248389	0.64		0.050	4248389
Colour	TCU	-	5	33	2	4245615	<2		2	4245615
Conductivity	umho/cm	-	-	27000	1.0	4245663	980		1.0	4245663
Fluoride (F-)	mg/L	**1.5**	-	0.45	0.10	4245664	1.4		0.10	4245664
Dissolved Organic Carbon	mg/L	-	5	0.39	0.20	4245634	1.1		0.20	4245634
Orthophosphate (P)	mg/L	-	-	<0.010	0.010	4248117	<0.010		0.010	4248117
pH	pH	-	6.5:8.5	7.26	N/A	4245665	8.10		N/A	4245665
Dissolved Sulphate (SO4)	mg/L	-	500	<1.0	1.0	4248118	<1.0		1.0	4248118
Alkalinity (Total as CaCO3)	mg/L	-	30:500	110	1.0	4245655	280		1.0	4245655
Dissolved Chloride (Cl)	mg/L	-	250	9600	100	4245397	150		1.0	4245397
Nitrite (N)	mg/L	**1**	-	<0.050	0.050	4245762	<0.010	<0.010	0.010	4245339
Nitrate (N)	mg/L	**10**	-	<0.50	0.50	4245762	<0.10	<0.10	0.10	4245339

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
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Maxxam Job #: B5L7576
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID				BFL896		BFL897	BFL898	BFL899	BFL900		
Sampling Date				2015/10/22 16:30		2015/10/22 10:45	2015/10/22 16:15	2015/10/22 16:15	2015/10/22 16:30		
COC Number				535097-01-01		535097-01-01	535097-01-01	535097-01-01	535097-01-01		
	UNITS	MAC	A/O	AM1B	QC Batch	TW1-1	BORED	OW4-1	OW4-2	RDL	QC Batch
Metals											
Dissolved Calcium (Ca)	mg/L	-	-	46	4250501	140	40	15	22	0.05	4250489
Dissolved Magnesium (Mg)	mg/L	-	-	30	4250501	69	21	9.3	15	0.05	4250489
Dissolved Phosphorus (P)	mg/L	-	-	<0.1	4250501	<0.1	<0.1	<0.1	<0.1	0.1	4250489
Dissolved Potassium (K)	mg/L	-	-	2	4250501	10	18	6	7	1	4250489
Dissolved Sodium (Na)	mg/L	**20**	200	6.9	4250501	250	**26**	**150**	**190**	0.5	4250489

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

Maxxam ID				BFL901			BFL902	BFL902		BFL903		
Sampling Date				2015/10/22 14:00			2015/10/22 14:15	2015/10/22 14:15		2015/10/22 14:30		
COC Number				535097-01-01			535097-01-01	535097-01-01		535097-01-01		
	UNITS	MAC	A/O	OW5-1	RDL	QC Batch	OW5-2	OW5-2 Lab-Dup	RDL	OW5-3	RDL	QC Batch
Metals												
Dissolved Calcium (Ca)	mg/L	-	-	31	0.05	4250489	1200	1200	0.5	1700	0.5	4250501
Dissolved Magnesium (Mg)	mg/L	-	-	21	0.05	4250489	710	710	0.5	960	0.5	4250501
Dissolved Phosphorus (P)	mg/L	-	-	<0.1	0.1	4250489	<1	<1	1	<1	1	4250501
Dissolved Potassium (K)	mg/L	-	-	8	1	4250489	70	70	10	79	10	4250501
Dissolved Sodium (Na)	mg/L	**20**	200	**64**	0.5	4250489	3700	3700	5	5200	50	4250501

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
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Maxxam Job #: B5L7576
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID				BFL904			BFL905			BFL906		
Sampling Date				2015/10/22 15:15			2015/10/22 12:00			2015/10/22 12:15		
COC Number				535097-01-01			535097-02-01			535097-02-01		
	UNITS	MAC	A/O	OW6-2	RDL	QC Batch	OW7-1	RDL	QC Batch	OW7-2	RDL	QC Batch
Metals												
Dissolved Calcium (Ca)	mg/L	-	-	280	0.05	4250489	91	0.05	4253936	300	0.05	4250489
Dissolved Magnesium (Mg)	mg/L	-	-	170	0.05	4250489	54	0.05	4253936	180	0.05	4250489
Dissolved Phosphorus (P)	mg/L	-	-	<0.1	0.1	4250489	<0.1	0.1	4253936	<0.1	0.1	4250489
Dissolved Potassium (K)	mg/L	-	-	14	1	4250489	13	1	4253936	19	1	4250489
Dissolved Sodium (Na)	mg/L	**20**	200	790	5	4250489	**110**	0.5	4253936	880	5	4250489

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

Maxxam ID				BFL907		BFL908		BFL909		
Sampling Date				2015/10/22 11:15		2015/10/22 11:30		2015/10/22 09:00		
COC Number				535097-02-01		535097-02-01		535097-02-01		
	UNITS	MAC	A/O	OW8-1	QC Batch	OW8-2	QC Batch	OW9-1	RDL	QC Batch
Metals										
Dissolved Calcium (Ca)	mg/L	-	-	370	4250501	450	4250489	260	0.05	4253936
Dissolved Magnesium (Mg)	mg/L	-	-	150	4250501	180	4250489	120	0.05	4253936
Dissolved Phosphorus (P)	mg/L	-	-	<0.1	4250501	<0.1	4250489	<0.1	0.1	4253936
Dissolved Potassium (K)	mg/L	-	-	20	4250501	20	4250489	24	1	4253936
Dissolved Sodium (Na)	mg/L	**20**	200	920	4250501	1000	4250489	1000	5	4253936

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
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Maxxam Job #: B5L7576
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID				BFL910		BFL911		BFL912		
Sampling Date				2015/10/22 09:15		2015/10/22 14:15		2015/10/22 16:30		
COC Number				535097-02-01		535097-02-01		535097-02-01		
	UNITS	MAC	A/O	OW9-2	RDL	OW5-2-D	RDL	OW4-2-D	RDL	QC Batch
Metals										
Dissolved Calcium (Ca)	mg/L	-	-	670	0.5	1200	0.5	22	0.05	4250489
Dissolved Magnesium (Mg)	mg/L	-	-	260	0.05	720	0.5	15	0.05	4250489
Dissolved Phosphorus (P)	mg/L	-	-	<0.1	0.1	<1	1	<0.1	0.1	4250489
Dissolved Potassium (K)	mg/L	-	-	33	1	71	10	7	1	4250489
Dissolved Sodium (Na)	mg/L	**20**	200	1700	5	3800	5	**190**	0.5	4250489

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [Criteria A / MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)

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Maxxam Job #: B5L7576
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

TEST SUMMARY

Maxxam ID: BFL896
Sample ID: AM1B
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4245655	N/A	2015/10/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4244109	N/A	2015/10/28	Automated Statchk
Chloride by Automated Colourimetry	KONE	4245397	N/A	2015/10/28	Deonarine Ramnarine
Colour	SPEC	4245615	N/A	2015/10/29	Elsamma Alex
Conductivity	AT	4245663	N/A	2015/10/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4245634	N/A	2015/10/28	Anastasia Hamanov
Fluoride	ISE	4245664	2015/10/26	2015/10/27	Yogesh Patel
Hardness (calculated as CaCO3)		4243882	N/A	2015/10/30	Automated Statchk
Dissolved Metals Analysis by ICP	ICP	4250501	2015/10/29	2015/10/29	Azita Fazaeli
Ion Balance (% Difference)	CALC	4243883	N/A	2015/10/30	Automated Statchk
Anion and Cation Sum	CALC	4244110	N/A	2015/10/30	Automated Statchk
Total Ammonia-N	LACH/NH4	4248389	N/A	2015/10/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4245762	N/A	2015/10/30	Chandra Nandlal
pH	AT	4245665	N/A	2015/10/27	Yogesh Patel
Orthophosphate	KONE	4248117	N/A	2015/10/28	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4244111	N/A	2015/10/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4244112	N/A	2015/10/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4248118	N/A	2015/10/28	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4244113	N/A	2015/10/30	Automated Statchk

Maxxam ID: BFL897
Sample ID: TW1-1
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4245655	N/A	2015/10/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4244109	N/A	2015/10/28	Automated Statchk
Chloride by Automated Colourimetry	KONE	4245803	N/A	2015/10/27	Deonarine Ramnarine
Colour	SPEC	4245615	N/A	2015/10/29	Elsamma Alex
Conductivity	AT	4245663	N/A	2015/10/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4245161	N/A	2015/10/28	Anastasia Hamanov
Fluoride	ISE	4245664	2015/10/26	2015/10/27	Yogesh Patel
Hardness (calculated as CaCO3)		4243882	N/A	2015/10/30	Automated Statchk
Dissolved Metals Analysis by ICP	ICP	4250489	2015/10/29	2015/10/29	Azita Fazaeli
Ion Balance (% Difference)	CALC	4243883	N/A	2015/10/30	Automated Statchk
Anion and Cation Sum	CALC	4244110	N/A	2015/10/30	Automated Statchk
Total Ammonia-N	LACH/NH4	4248229	N/A	2015/10/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4245762	N/A	2015/10/30	Chandra Nandlal
pH	AT	4245665	N/A	2015/10/27	Yogesh Patel
Orthophosphate	KONE	4245805	N/A	2015/10/27	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4244111	N/A	2015/10/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4244112	N/A	2015/10/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4245807	N/A	2015/10/27	Deonarine Ramnarine
Total Dissolved Solids (TDS calc)	CALC	4244113	N/A	2015/10/30	Automated Statchk

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Maxxam Job #: B5L7576
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

TEST SUMMARY

Maxxam ID: BFL897 Dup
Sample ID: TW1-1
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	4245803	N/A	2015/10/27	Deonarine Ramnarine
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4245762	N/A	2015/10/30	Chandra Nandlal
Orthophosphate	KONE	4245805	N/A	2015/10/27	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4245807	N/A	2015/10/27	Deonarine Ramnarine

Maxxam ID: BFL898
Sample ID: BORED
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4245314	N/A	2015/10/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4244109	N/A	2015/10/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	4245397	N/A	2015/10/28	Deonarine Ramnarine
Colour	SPEC	4245615	N/A	2015/10/29	Elsamma Alex
Conductivity	AT	4245317	N/A	2015/10/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4245634	N/A	2015/10/28	Anastasia Hamanov
Fluoride	ISE	4245312	2015/10/26	2015/10/27	Yogesh Patel
Hardness (calculated as CaCO3)		4243882	N/A	2015/10/30	Automated Statchk
Dissolved Metals Analysis by ICP	ICP	4250489	2015/10/29	2015/10/29	Azita Fazaeli
Ion Balance (% Difference)	CALC	4243883	N/A	2015/10/30	Automated Statchk
Anion and Cation Sum	CALC	4244110	N/A	2015/10/30	Automated Statchk
Total Ammonia-N	LACH/NH4	4248229	N/A	2015/10/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4245393	N/A	2015/10/29	Chandra Nandlal
pH	AT	4245319	N/A	2015/10/27	Yogesh Patel
Orthophosphate	KONE	4248117	N/A	2015/10/28	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4244111	N/A	2015/10/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4244112	N/A	2015/10/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4248118	N/A	2015/10/28	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4244113	N/A	2015/10/30	Automated Statchk

Maxxam ID: BFL899
Sample ID: OW4-1
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4245314	N/A	2015/10/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4244109	N/A	2015/10/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	4245397	N/A	2015/10/28	Deonarine Ramnarine
Colour	SPEC	4245307	N/A	2015/10/29	Elsamma Alex
Conductivity	AT	4245317	N/A	2015/10/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4247275	N/A	2015/10/29	Anastasia Hamanov
Fluoride	ISE	4245312	2015/10/26	2015/10/27	Yogesh Patel
Hardness (calculated as CaCO3)		4243882	N/A	2015/10/30	Automated Statchk
Dissolved Metals Analysis by ICP	ICP	4250489	2015/10/29	2015/10/29	Azita Fazaeli

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Maxxam Job #: B5L7576
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

TEST SUMMARY

Maxxam ID: BFL899
Sample ID: OW4-1
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ion Balance (% Difference)	CALC	4243883	N/A	2015/10/30	Automated Statchk
Anion and Cation Sum	CALC	4244110	N/A	2015/10/30	Automated Statchk
Total Ammonia-N	LACH/NH4	4248389	N/A	2015/10/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4245393	N/A	2015/10/29	Chandra Nandlal
pH	AT	4245319	N/A	2015/10/27	Yogesh Patel
Orthophosphate	KONE	4248117	N/A	2015/10/28	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4244111	N/A	2015/10/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4244112	N/A	2015/10/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4248118	N/A	2015/10/28	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4244113	N/A	2015/10/30	Automated Statchk

Maxxam ID: BFL900
Sample ID: OW4-2
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4245314	N/A	2015/10/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4244109	N/A	2015/10/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	4245397	N/A	2015/10/28	Deonarine Ramnarine
Colour	SPEC	4245307	N/A	2015/10/29	Elsamma Alex
Conductivity	AT	4245317	N/A	2015/10/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4245634	N/A	2015/10/28	Anastasia Hamanov
Fluoride	ISE	4245312	2015/10/26	2015/10/27	Yogesh Patel
Hardness (calculated as CaCO3)		4243882	N/A	2015/10/30	Automated Statchk
Dissolved Metals Analysis by ICP	ICP	4250489	2015/10/29	2015/10/29	Azita Fazaeli
Ion Balance (% Difference)	CALC	4243883	N/A	2015/10/30	Automated Statchk
Anion and Cation Sum	CALC	4244110	N/A	2015/10/30	Automated Statchk
Total Ammonia-N	LACH/NH4	4248389	N/A	2015/10/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4245393	N/A	2015/10/29	Chandra Nandlal
pH	AT	4245319	N/A	2015/10/27	Yogesh Patel
Orthophosphate	KONE	4248117	N/A	2015/10/28	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4244111	N/A	2015/10/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4244112	N/A	2015/10/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4248118	N/A	2015/10/28	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4244113	N/A	2015/10/30	Automated Statchk

Maxxam ID: BFL901
Sample ID: OW5-1
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4245314	N/A	2015/10/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4244109	N/A	2015/10/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	4245397	N/A	2015/10/28	Deonarine Ramnarine

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Maxxam Job #: B5L7576
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

TEST SUMMARY

Maxxam ID: BFL901
Sample ID: OW5-1
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Colour	SPEC	4245307	N/A	2015/10/29	Elsamma Alex
Conductivity	AT	4245317	N/A	2015/10/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4245634	N/A	2015/10/28	Anastasia Hamanov
Fluoride	ISE	4245312	2015/10/26	2015/10/27	Yogesh Patel
Hardness (calculated as CaCO3)		4243882	N/A	2015/10/30	Automated Statchk
Dissolved Metals Analysis by ICP	ICP	4250489	2015/10/29	2015/10/29	Azita Fazaeli
Ion Balance (% Difference)	CALC	4243883	N/A	2015/10/30	Automated Statchk
Anion and Cation Sum	CALC	4244110	N/A	2015/10/30	Automated Statchk
Total Ammonia-N	LACH/NH4	4248389	N/A	2015/10/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4245393	N/A	2015/10/29	Chandra Nandlal
pH	AT	4245319	N/A	2015/10/27	Yogesh Patel
Orthophosphate	KONE	4248117	N/A	2015/10/28	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4244111	N/A	2015/10/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4244112	N/A	2015/10/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4248118	N/A	2015/10/28	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4244113	N/A	2015/10/30	Automated Statchk

Maxxam ID: BFL902
Sample ID: OW5-2
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4245314	N/A	2015/10/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4244109	N/A	2015/10/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	4245397	N/A	2015/10/28	Deonarine Ramnarine
Colour	SPEC	4245307	N/A	2015/10/29	Elsamma Alex
Conductivity	AT	4245317	N/A	2015/10/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4245634	N/A	2015/10/28	Anastasia Hamanov
Fluoride	ISE	4245312	2015/10/26	2015/10/27	Yogesh Patel
Hardness (calculated as CaCO3)		4243882	N/A	2015/10/30	Automated Statchk
Dissolved Metals Analysis by ICP	ICP	4250501	2015/10/29	2015/10/30	Azita Fazaeli
Ion Balance (% Difference)	CALC	4243883	N/A	2015/10/30	Automated Statchk
Anion and Cation Sum	CALC	4244110	N/A	2015/10/30	Automated Statchk
Total Ammonia-N	LACH/NH4	4248389	N/A	2015/10/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4245393	N/A	2015/10/29	Chandra Nandlal
pH	AT	4245319	N/A	2015/10/27	Yogesh Patel
Orthophosphate	KONE	4248117	N/A	2015/10/28	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4244111	N/A	2015/10/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4244112	N/A	2015/10/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4248118	N/A	2015/10/28	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4244113	N/A	2015/10/30	Automated Statchk

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Maxxam Job #: B5L7576
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

TEST SUMMARY

Maxxam ID: BFL902 Dup
Sample ID: OW5-2
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals Analysis by ICP	ICP	4250501	2015/10/29	2015/10/30	Azita Fazaeli
Total Ammonia-N	LACH/NH4	4248389	N/A	2015/10/30	Charles Opoku-Ware

Maxxam ID: BFL903
Sample ID: OW5-3
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4245314	N/A	2015/10/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4244109	N/A	2015/10/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	4245397	N/A	2015/10/28	Deonarine Ramnarine
Colour	SPEC	4245307	N/A	2015/10/29	Elsamma Alex
Conductivity	AT	4245317	N/A	2015/10/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4245634	N/A	2015/10/28	Anastasia Hamanov
Fluoride	ISE	4245312	2015/10/26	2015/10/27	Yogesh Patel
Hardness (calculated as CaCO3)		4243882	N/A	2015/10/30	Automated Statchk
Dissolved Metals Analysis by ICP	ICP	4250501	2015/10/29	2015/10/30	Azita Fazaeli
Ion Balance (% Difference)	CALC	4243883	N/A	2015/10/30	Automated Statchk
Anion and Cation Sum	CALC	4244110	N/A	2015/10/30	Automated Statchk
Total Ammonia-N	LACH/NH4	4248229	N/A	2015/10/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4245384	N/A	2015/10/29	Chandra Nandlal
pH	AT	4245319	N/A	2015/10/27	Yogesh Patel
Orthophosphate	KONE	4248117	N/A	2015/10/28	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4244111	N/A	2015/10/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4244112	N/A	2015/10/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4248118	N/A	2015/10/28	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4244113	N/A	2015/10/30	Automated Statchk

Maxxam ID: BFL904
Sample ID: OW6-2
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4245314	N/A	2015/10/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4244109	N/A	2015/10/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	4245397	N/A	2015/10/28	Deonarine Ramnarine
Colour	SPEC	4245615	N/A	2015/10/29	Elsamma Alex
Conductivity	AT	4245317	N/A	2015/10/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4245634	N/A	2015/10/28	Anastasia Hamanov
Fluoride	ISE	4245312	2015/10/26	2015/10/27	Yogesh Patel
Hardness (calculated as CaCO3)		4243882	N/A	2015/10/30	Automated Statchk
Dissolved Metals Analysis by ICP	ICP	4250489	2015/10/29	2015/10/30	Azita Fazaeli
Ion Balance (% Difference)	CALC	4243883	N/A	2015/10/30	Automated Statchk
Anion and Cation Sum	CALC	4244110	N/A	2015/10/30	Automated Statchk

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Maxxam Job #: B5L7576
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

TEST SUMMARY

Maxxam ID: BFL904
Sample ID: OW6-2
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Ammonia-N	LACH/NH4	4248389	N/A	2015/10/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4245352	N/A	2015/10/29	Chandra Nandlal
pH	AT	4245319	N/A	2015/10/27	Yogesh Patel
Orthophosphate	KONE	4248117	N/A	2015/10/28	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4244111	N/A	2015/10/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4244112	N/A	2015/10/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4248118	N/A	2015/10/28	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4244113	N/A	2015/10/30	Automated Statchk

Maxxam ID: BFL905
Sample ID: OW7-1
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4245314	N/A	2015/10/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4244109	N/A	2015/10/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	4245397	N/A	2015/10/28	Deonarine Ramnarine
Colour	SPEC	4245307	N/A	2015/10/29	Elsamma Alex
Conductivity	AT	4245317	N/A	2015/10/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4245634	N/A	2015/10/28	Anastasia Hamanov
Fluoride	ISE	4245312	2015/10/26	2015/10/27	Yogesh Patel
Hardness (calculated as CaCO3)		4243882	N/A	2015/10/30	Automated Statchk
Dissolved Metals Analysis by ICP	ICP	4253936	2015/10/31	2015/11/02	Azita Fazaeli
Ion Balance (% Difference)	CALC	4243883	N/A	2015/10/30	Automated Statchk
Anion and Cation Sum	CALC	4244110	N/A	2015/10/30	Automated Statchk
Total Ammonia-N	LACH/NH4	4248389	N/A	2015/10/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4245384	N/A	2015/10/29	Chandra Nandlal
pH	AT	4245319	N/A	2015/10/27	Yogesh Patel
Orthophosphate	KONE	4248117	N/A	2015/10/28	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4244111	N/A	2015/10/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4244112	N/A	2015/10/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4248118	N/A	2015/10/28	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4244113	N/A	2015/10/30	Automated Statchk

Maxxam ID: BFL906
Sample ID: OW7-2
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4245314	N/A	2015/10/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4244109	N/A	2015/10/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	4245397	N/A	2015/10/28	Deonarine Ramnarine
Colour	SPEC	4245307	N/A	2015/10/29	Elsamma Alex
Conductivity	AT	4245317	N/A	2015/10/27	Yogesh Patel

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Maxxam Job #: B5L7576
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

TEST SUMMARY

Maxxam ID: BFL906
Sample ID: OW7-2
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4245634	N/A	2015/10/28	Anastasia Hamanov
Fluoride	ISE	4245312	2015/10/26	2015/10/27	Yogesh Patel
Hardness (calculated as CaCO3)		4243882	N/A	2015/10/30	Automated Statchk
Dissolved Metals Analysis by ICP	ICP	4250489	2015/10/29	2015/10/30	Azita Fazaeli
Ion Balance (% Difference)	CALC	4243883	N/A	2015/10/30	Automated Statchk
Anion and Cation Sum	CALC	4244110	N/A	2015/10/30	Automated Statchk
Total Ammonia-N	LACH/NH4	4248229	N/A	2015/10/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4245384	N/A	2015/10/29	Chandra Nandlal
pH	AT	4245319	N/A	2015/10/27	Yogesh Patel
Orthophosphate	KONE	4248117	N/A	2015/10/28	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4244111	N/A	2015/10/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4244112	N/A	2015/10/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4248118	N/A	2015/10/28	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4244113	N/A	2015/10/30	Automated Statchk

Maxxam ID: BFL907
Sample ID: OW8-1
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4245314	N/A	2015/10/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4244109	N/A	2015/10/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	4245397	N/A	2015/10/28	Deonarine Ramnarine
Colour	SPEC	4245307	N/A	2015/10/29	Elsamma Alex
Conductivity	AT	4245317	N/A	2015/10/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4245634	N/A	2015/10/28	Anastasia Hamanov
Fluoride	ISE	4245312	2015/10/26	2015/10/27	Yogesh Patel
Hardness (calculated as CaCO3)		4243882	N/A	2015/10/30	Automated Statchk
Dissolved Metals Analysis by ICP	ICP	4250501	2015/10/29	2015/10/30	Azita Fazaeli
Ion Balance (% Difference)	CALC	4243883	N/A	2015/10/30	Automated Statchk
Anion and Cation Sum	CALC	4244110	N/A	2015/10/30	Automated Statchk
Total Ammonia-N	LACH/NH4	4248389	N/A	2015/10/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4245393	N/A	2015/10/29	Chandra Nandlal
pH	AT	4245319	N/A	2015/10/27	Yogesh Patel
Orthophosphate	KONE	4248117	N/A	2015/10/28	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4244111	N/A	2015/10/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4244112	N/A	2015/10/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4248118	N/A	2015/10/28	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4244113	N/A	2015/10/30	Automated Statchk

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Maxxam Job #: B5L7576
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

TEST SUMMARY

Maxxam ID: BFL908
Sample ID: OW8-2
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4245314	N/A	2015/10/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4244109	N/A	2015/10/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	4245397	N/A	2015/10/28	Deonarine Ramnarine
Colour	SPEC	4245615	N/A	2015/10/29	Elsamma Alex
Conductivity	AT	4245317	N/A	2015/10/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4245634	N/A	2015/10/28	Anastasia Hamanov
Fluoride	ISE	4245312	2015/10/26	2015/10/27	Yogesh Patel
Hardness (calculated as CaCO3)		4244228	N/A	2015/10/30	Automated Statchk
Dissolved Metals Analysis by ICP	ICP	4250489	2015/10/29	2015/10/30	Azita Fazaeli
Ion Balance (% Difference)	CALC	4243883	N/A	2015/10/30	Automated Statchk
Anion and Cation Sum	CALC	4244110	N/A	2015/10/30	Automated Statchk
Total Ammonia-N	LACH/NH4	4248389	N/A	2015/10/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4245393	N/A	2015/10/29	Chandra Nandlal
pH	AT	4245319	N/A	2015/10/27	Yogesh Patel
Orthophosphate	KONE	4248117	N/A	2015/10/28	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4244111	N/A	2015/10/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4244112	N/A	2015/10/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4248118	N/A	2015/10/28	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4244113	N/A	2015/10/30	Automated Statchk

Maxxam ID: BFL909
Sample ID: OW9-1
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4245314	N/A	2015/10/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4244109	N/A	2015/10/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	4245397	N/A	2015/10/28	Deonarine Ramnarine
Colour	SPEC	4245615	N/A	2015/10/29	Elsamma Alex
Conductivity	AT	4245317	N/A	2015/10/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4245634	N/A	2015/10/28	Anastasia Hamanov
Fluoride	ISE	4245312	2015/10/26	2015/10/27	Yogesh Patel
Hardness (calculated as CaCO3)		4244228	N/A	2015/10/30	Automated Statchk
Dissolved Metals Analysis by ICP	ICP	4253936	2015/10/31	2015/11/02	Azita Fazaeli
Ion Balance (% Difference)	CALC	4243883	N/A	2015/10/30	Automated Statchk
Anion and Cation Sum	CALC	4244110	N/A	2015/10/30	Automated Statchk
Total Ammonia-N	LACH/NH4	4248389	N/A	2015/10/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4245393	N/A	2015/10/29	Chandra Nandlal
pH	AT	4245319	N/A	2015/10/27	Yogesh Patel
Orthophosphate	KONE	4248117	N/A	2015/10/28	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4244111	N/A	2015/10/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4244112	N/A	2015/10/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4248118	N/A	2015/10/28	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4244113	N/A	2015/10/30	Automated Statchk

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Maxxam Job #: B5L7576
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

TEST SUMMARY

Maxxam ID: BFL910
Sample ID: OW9-2
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4245314	N/A	2015/10/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4244109	N/A	2015/10/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	4245397	N/A	2015/10/28	Deonarine Ramnarine
Colour	SPEC	4245615	N/A	2015/10/29	Elsamma Alex
Conductivity	AT	4245317	N/A	2015/10/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4245634	N/A	2015/10/28	Anastasia Hamanov
Fluoride	ISE	4245312	2015/10/26	2015/10/27	Yogesh Patel
Hardness (calculated as CaCO3)		4244228	N/A	2015/10/30	Automated Statchk
Dissolved Metals Analysis by ICP	ICP	4250489	2015/10/29	2015/10/30	Azita Fazaeli
Ion Balance (% Difference)	CALC	4243883	N/A	2015/10/30	Automated Statchk
Anion and Cation Sum	CALC	4244110	N/A	2015/10/30	Automated Statchk
Total Ammonia-N	LACH/NH4	4248389	N/A	2015/10/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4245393	N/A	2015/10/29	Chandra Nandlal
pH	AT	4245319	N/A	2015/10/27	Yogesh Patel
Orthophosphate	KONE	4248117	N/A	2015/10/28	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4244111	N/A	2015/10/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4244112	N/A	2015/10/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4248118	N/A	2015/10/28	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4244113	N/A	2015/10/30	Automated Statchk

Maxxam ID: BFL910 Dup
Sample ID: OW9-2
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4245393	N/A	2015/10/29	Chandra Nandlal

Maxxam ID: BFL911
Sample ID: OW5-2-D
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4245655	N/A	2015/10/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4244109	N/A	2015/10/28	Automated Statchk
Chloride by Automated Colourimetry	KONE	4245397	N/A	2015/10/28	Deonarine Ramnarine
Colour	SPEC	4245615	N/A	2015/10/29	Elsamma Alex
Conductivity	AT	4245663	N/A	2015/10/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4245634	N/A	2015/10/28	Anastasia Hamanov
Fluoride	ISE	4245664	2015/10/26	2015/10/27	Yogesh Patel
Hardness (calculated as CaCO3)		4244228	N/A	2015/10/30	Automated Statchk
Dissolved Metals Analysis by ICP	ICP	4250489	2015/10/29	2015/10/30	Azita Fazaeli
Ion Balance (% Difference)	CALC	4243883	N/A	2015/10/30	Automated Statchk
Anion and Cation Sum	CALC	4244110	N/A	2015/10/30	Automated Statchk
Total Ammonia-N	LACH/NH4	4248389	N/A	2015/10/30	Charles Opoku-Ware

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Maxxam Job #: B5L7576
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

TEST SUMMARY

Maxxam ID: BFL911
Sample ID: OW5-2-D
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4245762	N/A	2015/10/30	Chandra Nandlal
pH	AT	4245665	N/A	2015/10/27	Yogesh Patel
Orthophosphate	KONE	4248117	N/A	2015/10/28	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4244111	N/A	2015/10/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4244112	N/A	2015/10/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4248118	N/A	2015/10/28	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4244113	N/A	2015/10/30	Automated Statchk

Maxxam ID: BFL912
Sample ID: OW4-2-D
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4245655	N/A	2015/10/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4244109	N/A	2015/10/28	Automated Statchk
Chloride by Automated Colourimetry	KONE	4245397	N/A	2015/10/28	Deonarine Ramnarine
Colour	SPEC	4245615	N/A	2015/10/29	Elsamma Alex
Conductivity	AT	4245663	N/A	2015/10/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4245634	N/A	2015/10/28	Anastasia Hamanov
Fluoride	ISE	4245664	2015/10/26	2015/10/27	Yogesh Patel
Hardness (calculated as CaCO3)		4244228	N/A	2015/10/30	Automated Statchk
Dissolved Metals Analysis by ICP	ICP	4250489	2015/10/29	2015/10/29	Azita Fazaeli
Ion Balance (% Difference)	CALC	4243883	N/A	2015/10/30	Automated Statchk
Anion and Cation Sum	CALC	4244110	N/A	2015/10/30	Automated Statchk
Total Ammonia-N	LACH/NH4	4248389	N/A	2015/10/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4245339	N/A	2015/10/29	Chandra Nandlal
pH	AT	4245665	N/A	2015/10/27	Yogesh Patel
Orthophosphate	KONE	4248117	N/A	2015/10/28	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4244111	N/A	2015/10/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4244112	N/A	2015/10/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4248118	N/A	2015/10/28	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4244113	N/A	2015/10/30	Automated Statchk

Maxxam ID: BFL912 Dup
Sample ID: OW4-2-D
Matrix: Water

Collected: 2015/10/22
Shipped:
Received: 2015/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4245339	N/A	2015/10/29	Chandra Nandlal

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Maxxam Job #: B5L7576
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

GENERAL COMMENTS

Sample BFL902-01 : Metals: Due to high concentrations of the target analytes, sample required dilution. Detection limits were adjusted accordingly.

Sample BFL903-01 : Metals: Due to high concentrations of the target analytes, sample required dilution. Detection limits were adjusted accordingly.

Sample BFL905-01 : Elevated ion balance was confirmed by re-analysis.

Sample BFL909-01 : Elevated ion balance was confirmed by re-analysis.

Sample BFL911-01 : Metals: Due to high concentrations of the target analytes, sample required dilution. Detection limits were adjusted accordingly.

Nitrite+Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Results relate only to the items tested.

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Maxxam Job #: B5L7576
Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4245161	AHA	Matrix Spike	Dissolved Organic Carbon	2015/10/28		97	%	80 - 120
4245161	AHA	Spiked Blank	Dissolved Organic Carbon	2015/10/28		100	%	80 - 120
4245161	AHA	Method Blank	Dissolved Organic Carbon	2015/10/28	<0.20		mg/L	
4245161	AHA	RPD	Dissolved Organic Carbon	2015/10/28	2.1		%	20
4245307	EAX	Spiked Blank	Colour	2015/10/29		101	%	80 - 120
4245307	EAX	Method Blank	Colour	2015/10/29	<2		TCU	
4245307	EAX	RPD	Colour	2015/10/29	0.21		%	25
4245312	YPA	Matrix Spike	Fluoride (F-)	2015/10/27		106	%	80 - 120
4245312	YPA	Spiked Blank	Fluoride (F-)	2015/10/27		104	%	80 - 120
4245312	YPA	Method Blank	Fluoride (F-)	2015/10/27	<0.10		mg/L	
4245312	YPA	RPD	Fluoride (F-)	2015/10/27	0.97		%	20
4245314	YPA	Spiked Blank	Alkalinity (Total as CaCO3)	2015/10/27		93	%	85 - 115
4245314	YPA	Method Blank	Alkalinity (Total as CaCO3)	2015/10/27	<1.0		mg/L	
4245314	YPA	RPD	Alkalinity (Total as CaCO3)	2015/10/27	1.5		%	25
4245317	YPA	Spiked Blank	Conductivity	2015/10/27		101	%	85 - 115
4245317	YPA	Method Blank	Conductivity	2015/10/27	<1.0		umho/c	
4245317	YPA	RPD	Conductivity	2015/10/27	0.18		%	25
4245319	YPA	Spiked Blank	pH	2015/10/27		101	%	98 - 103
4245319	YPA	RPD	pH	2015/10/27	0.22		%	N/A
4245339	C_N	Matrix Spike [BFL912-01]	Nitrite (N)	2015/10/29		105	%	80 - 120
			Nitrate (N)	2015/10/29		91	%	80 - 120
4245339	C_N	Spiked Blank	Nitrite (N)	2015/10/29		106	%	80 - 120
			Nitrate (N)	2015/10/29		90	%	80 - 120
4245339	C_N	Method Blank	Nitrite (N)	2015/10/29	<0.010		mg/L	
			Nitrate (N)	2015/10/29	<0.10		mg/L	
4245339	C_N	RPD [BFL912-01]	Nitrite (N)	2015/10/29	NC		%	25
			Nitrate (N)	2015/10/29	NC		%	25
4245352	C_N	Matrix Spike	Nitrite (N)	2015/10/29		109	%	80 - 120
			Nitrate (N)	2015/10/29		98	%	80 - 120
4245352	C_N	Spiked Blank	Nitrite (N)	2015/10/29		105	%	80 - 120
			Nitrate (N)	2015/10/29		96	%	80 - 120
4245352	C_N	Method Blank	Nitrite (N)	2015/10/29	<0.010		mg/L	
			Nitrate (N)	2015/10/29	<0.10		mg/L	
4245352	C_N	RPD	Nitrite (N)	2015/10/29	NC		%	25
			Nitrate (N)	2015/10/29	0.47		%	25
4245384	C_N	Matrix Spike	Nitrite (N)	2015/10/29		106	%	80 - 120
			Nitrate (N)	2015/10/29		99	%	80 - 120
4245384	C_N	Spiked Blank	Nitrite (N)	2015/10/29		105	%	80 - 120
			Nitrate (N)	2015/10/29		96	%	80 - 120
4245384	C_N	Method Blank	Nitrite (N)	2015/10/29	<0.010		mg/L	
			Nitrate (N)	2015/10/29	<0.10		mg/L	
4245384	C_N	RPD	Nitrite (N)	2015/10/29	NC		%	25
			Nitrate (N)	2015/10/29	NC		%	25
4245393	C_N	Matrix Spike [BFL910-01]	Nitrite (N)	2015/10/29		107	%	80 - 120
			Nitrate (N)	2015/10/29		96	%	80 - 120
4245393	C_N	Spiked Blank	Nitrite (N)	2015/10/29		103	%	80 - 120
			Nitrate (N)	2015/10/29		95	%	80 - 120
4245393	C_N	Method Blank	Nitrite (N)	2015/10/29	<0.010		mg/L	
			Nitrate (N)	2015/10/29	<0.10		mg/L	
4245393	C_N	RPD [BFL910-01]	Nitrite (N)	2015/10/29	NC		%	25
			Nitrate (N)	2015/10/29	NC		%	25
4245397	DRM	Matrix Spike	Dissolved Chloride (Cl)	2015/10/28		104	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4245397	DRM	Spiked Blank	Dissolved Chloride (Cl)	2015/10/28		103	%	80 - 120
4245397	DRM	Method Blank	Dissolved Chloride (Cl)	2015/10/28	<1.0		mg/L	
4245397	DRM	RPD	Dissolved Chloride (Cl)	2015/10/28	NC		%	20
4245615	EAX	Spiked Blank	Colour	2015/10/29		98	%	80 - 120
4245615	EAX	Method Blank	Colour	2015/10/29	<2		TCU	
4245615	EAX	RPD	Colour	2015/10/29	0.16		%	25
4245634	AHA	Matrix Spike	Dissolved Organic Carbon	2015/10/28		98	%	80 - 120
4245634	AHA	Spiked Blank	Dissolved Organic Carbon	2015/10/28		98	%	80 - 120
4245634	AHA	Method Blank	Dissolved Organic Carbon	2015/10/28	<0.20		mg/L	
4245634	AHA	RPD	Dissolved Organic Carbon	2015/10/28	2.0		%	20
4245655	YPA	Spiked Blank	Alkalinity (Total as CaCO3)	2015/10/27		95	%	85 - 115
4245655	YPA	Method Blank	Alkalinity (Total as CaCO3)	2015/10/27	<1.0		mg/L	
4245655	YPA	RPD	Alkalinity (Total as CaCO3)	2015/10/27	1.9		%	25
4245663	YPA	Spiked Blank	Conductivity	2015/10/27		101	%	85 - 115
4245663	YPA	Method Blank	Conductivity	2015/10/27	<1.0		umho/c	
4245663	YPA	RPD	Conductivity	2015/10/27	0.91		%	25
4245664	YPA	Matrix Spike	Fluoride (F-)	2015/10/27		99	%	80 - 120
4245664	YPA	Spiked Blank	Fluoride (F-)	2015/10/27		102	%	80 - 120
4245664	YPA	Method Blank	Fluoride (F-)	2015/10/27	<0.10		mg/L	
4245664	YPA	RPD	Fluoride (F-)	2015/10/27	NC		%	20
4245665	YPA	Spiked Blank	pH	2015/10/27		102	%	98 - 103
4245665	YPA	RPD	pH	2015/10/27	1.2		%	N/A
4245762	C_N	Matrix Spike [BFL897-01]	Nitrite (N)	2015/10/30		108	%	80 - 120
			Nitrate (N)	2015/10/30		100	%	80 - 120
4245762	C_N	Spiked Blank	Nitrite (N)	2015/10/30		103	%	80 - 120
			Nitrate (N)	2015/10/30		100	%	80 - 120
4245762	C_N	Method Blank	Nitrite (N)	2015/10/30	<0.010		mg/L	
			Nitrate (N)	2015/10/30	<0.10		mg/L	
4245762	C_N	RPD [BFL897-01]	Nitrite (N)	2015/10/30	NC		%	25
			Nitrate (N)	2015/10/30	NC		%	25
4245803	DRM	Matrix Spike [BFL897-01]	Dissolved Chloride (Cl)	2015/10/27		NC	%	80 - 120
4245803	DRM	Spiked Blank	Dissolved Chloride (Cl)	2015/10/27		103	%	80 - 120
4245803	DRM	Method Blank	Dissolved Chloride (Cl)	2015/10/27	<1.0		mg/L	
4245803	DRM	RPD [BFL897-01]	Dissolved Chloride (Cl)	2015/10/27	2.2		%	20
4245805	ADB	Matrix Spike [BFL897-01]	Orthophosphate (P)	2015/10/27		119	%	75 - 125
4245805	ADB	Spiked Blank	Orthophosphate (P)	2015/10/27		100	%	80 - 120
4245805	ADB	Method Blank	Orthophosphate (P)	2015/10/27	<0.010		mg/L	
4245805	ADB	RPD [BFL897-01]	Orthophosphate (P)	2015/10/27	NC		%	25
4245807	DRM	Matrix Spike [BFL897-01]	Dissolved Sulphate (SO4)	2015/10/27		NC	%	75 - 125
4245807	DRM	Spiked Blank	Dissolved Sulphate (SO4)	2015/10/27		102	%	80 - 120
4245807	DRM	Method Blank	Dissolved Sulphate (SO4)	2015/10/27	<1.0		mg/L	
4245807	DRM	RPD [BFL897-01]	Dissolved Sulphate (SO4)	2015/10/27	1.7		%	20
4247275	AHA	Matrix Spike	Dissolved Organic Carbon	2015/10/28		92	%	80 - 120
4247275	AHA	Spiked Blank	Dissolved Organic Carbon	2015/10/28		96	%	80 - 120
4247275	AHA	Method Blank	Dissolved Organic Carbon	2015/10/28	<0.20		mg/L	
4247275	AHA	RPD	Dissolved Organic Carbon	2015/10/28	NC		%	20
4248117	ADB	Matrix Spike	Orthophosphate (P)	2015/10/28		112	%	75 - 125
4248117	ADB	Spiked Blank	Orthophosphate (P)	2015/10/28		99	%	80 - 120
4248117	ADB	Method Blank	Orthophosphate (P)	2015/10/28	<0.010		mg/L	
4248117	ADB	RPD	Orthophosphate (P)	2015/10/28	NC		%	25
4248118	ADB	Matrix Spike	Dissolved Sulphate (SO4)	2015/10/28		NC	%	75 - 125
4248118	ADB	Spiked Blank	Dissolved Sulphate (SO4)	2015/10/28		99	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4248118	ADB	Method Blank	Dissolved Sulphate (SO4)	2015/10/28	<1.0		mg/L	
4248118	ADB	RPD	Dissolved Sulphate (SO4)	2015/10/28	0.15		%	20
4248229	COP	Matrix Spike	Total Ammonia-N	2015/10/30		97	%	80 - 120
4248229	COP	Spiked Blank	Total Ammonia-N	2015/10/30		97	%	85 - 115
4248229	COP	Method Blank	Total Ammonia-N	2015/10/30	<0.050		mg/L	
4248229	COP	RPD	Total Ammonia-N	2015/10/30	NC		%	20
4248389	COP	Matrix Spike [BFL902-02]	Total Ammonia-N	2015/10/30		NC	%	80 - 120
4248389	COP	Spiked Blank	Total Ammonia-N	2015/10/30		102	%	85 - 115
4248389	COP	Method Blank	Total Ammonia-N	2015/10/30	<0.050		mg/L	
4248389	COP	RPD [BFL902-02]	Total Ammonia-N	2015/10/30	0.40		%	20
4250489	AFZ	Matrix Spike [BFL909-03]	Dissolved Calcium (Ca)	2015/10/29		NC	%	80 - 120
			Dissolved Magnesium (Mg)	2015/10/29		NC	%	80 - 120
			Dissolved Phosphorus (P)	2015/10/29		103	%	80 - 120
			Dissolved Potassium (K)	2015/10/29		NC	%	80 - 120
			Dissolved Sodium (Na)	2015/10/29		NC	%	80 - 120
4250489	AFZ	Spiked Blank	Dissolved Calcium (Ca)	2015/10/29		102	%	80 - 120
			Dissolved Magnesium (Mg)	2015/10/29		98	%	80 - 120
			Dissolved Phosphorus (P)	2015/10/29		98	%	80 - 120
			Dissolved Potassium (K)	2015/10/29		101	%	80 - 120
			Dissolved Sodium (Na)	2015/10/29		100	%	80 - 120
4250489	AFZ	Method Blank	Dissolved Calcium (Ca)	2015/10/29	<0.05		mg/L	
			Dissolved Magnesium (Mg)	2015/10/29	<0.05		mg/L	
			Dissolved Phosphorus (P)	2015/10/29	<0.1		mg/L	
			Dissolved Potassium (K)	2015/10/29	<1		mg/L	
			Dissolved Sodium (Na)	2015/10/29	<0.5		mg/L	
4250501	AFZ	Matrix Spike [BFL902-03]	Dissolved Calcium (Ca)	2015/10/29		NC	%	80 - 120
			Dissolved Magnesium (Mg)	2015/10/29		NC	%	80 - 120
			Dissolved Phosphorus (P)	2015/10/29		NC	%	80 - 120
			Dissolved Potassium (K)	2015/10/29		NC	%	80 - 120
			Dissolved Sodium (Na)	2015/10/29		NC	%	80 - 120
4250501	AFZ	Spiked Blank	Dissolved Calcium (Ca)	2015/10/29		102	%	80 - 120
			Dissolved Magnesium (Mg)	2015/10/29		98	%	80 - 120
			Dissolved Phosphorus (P)	2015/10/29		98	%	80 - 120
			Dissolved Potassium (K)	2015/10/29		101	%	80 - 120
			Dissolved Sodium (Na)	2015/10/29		99	%	80 - 120
4250501	AFZ	Method Blank	Dissolved Calcium (Ca)	2015/10/29	<0.05		mg/L	
			Dissolved Magnesium (Mg)	2015/10/29	<0.05		mg/L	
			Dissolved Phosphorus (P)	2015/10/29	<0.1		mg/L	
			Dissolved Potassium (K)	2015/10/29	<1		mg/L	
			Dissolved Sodium (Na)	2015/10/29	<0.5		mg/L	
4250501	AFZ	RPD [BFL902-03]	Dissolved Calcium (Ca)	2015/10/30	1.1		%	25
			Dissolved Magnesium (Mg)	2015/10/30	0.65		%	25
			Dissolved Phosphorus (P)	2015/10/30	NC		%	25
			Dissolved Potassium (K)	2015/10/30	0.64		%	25
			Dissolved Sodium (Na)	2015/10/30	0		%	25
4253936	AFZ	Matrix Spike	Dissolved Calcium (Ca)	2015/11/02		NC	%	80 - 120
			Dissolved Magnesium (Mg)	2015/11/02		NC	%	80 - 120
			Dissolved Phosphorus (P)	2015/11/02		103	%	80 - 120
			Dissolved Potassium (K)	2015/11/02		105	%	80 - 120
			Dissolved Sodium (Na)	2015/11/02		NC	%	80 - 120
4253936	AFZ	Spiked Blank	Dissolved Calcium (Ca)	2015/11/02		102	%	80 - 120
			Dissolved Magnesium (Mg)	2015/11/02		97	%	80 - 120

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Report Date: 2015/11/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AJM

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Phosphorus (P)	2015/11/02		98	%	80 - 120
			Dissolved Potassium (K)	2015/11/02		101	%	80 - 120
			Dissolved Sodium (Na)	2015/11/02		104	%	80 - 120
4253936	AFZ	Method Blank	Dissolved Calcium (Ca)	2015/11/02	<0.05		mg/L	
			Dissolved Magnesium (Mg)	2015/11/02	<0.05		mg/L	
			Dissolved Phosphorus (P)	2015/11/02	<0.1		mg/L	
			Dissolved Potassium (K)	2015/11/02	<1		mg/L	
			Dissolved Sodium (Na)	2015/11/02	<0.5		mg/L	
4253936	AFZ	RPD	Dissolved Calcium (Ca)	2015/11/02	0.80		%	25
			Dissolved Magnesium (Mg)	2015/11/02	0.30		%	25
			Dissolved Potassium (K)	2015/11/02	NC		%	25
			Dissolved Sodium (Na)	2015/11/02	0.083		%	25

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere, Scientific Services

Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Exceedence Summary Table – ODWS (2002)

Result Exceedences

Sample ID	Maxxam ID	Parameter	Criteria	Result	DL	Units
TW1-1	BFL897-03	Dissolved Sodium (Na)	20	250	0.5	mg/L
BORED	BFL898-03	Dissolved Sodium (Na)	20	26	0.5	mg/L
OW4-1	BFL899-03	Dissolved Sodium (Na)	20	150	0.5	mg/L
OW4-2	BFL900-03	Dissolved Sodium (Na)	20	190	0.5	mg/L
OW5-1	BFL901-03	Dissolved Sodium (Na)	20	64	0.5	mg/L
OW5-2	BFL902-03	Dissolved Sodium (Na)	20	3700	5	mg/L
OW5-2	BFL902-03-Lab Dup	Dissolved Sodium (Na)	20	3700	5	mg/L
OW5-3	BFL903-03	Dissolved Sodium (Na)	20	5200	50	mg/L
OW6-2	BFL904-03	Dissolved Sodium (Na)	20	790	5	mg/L
OW7-1	BFL905-03	Dissolved Sodium (Na)	20	110	0.5	mg/L
OW7-2	BFL906-03	Dissolved Sodium (Na)	20	880	5	mg/L
OW8-1	BFL907-03	Dissolved Sodium (Na)	20	920	5	mg/L
OW8-2	BFL908-03	Dissolved Sodium (Na)	20	1000	5	mg/L
OW9-1	BFL909-03	Dissolved Sodium (Na)	20	1000	5	mg/L
OW9-2	BFL910-03	Dissolved Sodium (Na)	20	1700	5	mg/L
OW5-2-D	BFL911-03	Dissolved Sodium (Na)	20	3800	5	mg/L
OW4-2-D	BFL912-03	Dissolved Sodium (Na)	20	190	0.5	mg/L

The exceedence summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.

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