GOLDER

REPORT

MCCARTHY QUARRY

Environmental Compliance Approval Annual Report

Submitted to:

Cindy Hood
Ministry of the Environment, Conservation and Parks
Barrie District Office
1203-54 Cedar Pointe Drive
Barrie, Ontario, L4N 5R7

Submitted by:

Golder Associates Ltd.
121 Commerce Park Drive, Unit L, Barrie, Ontario, L4N 8X1, Canada

+1 705 722 4492

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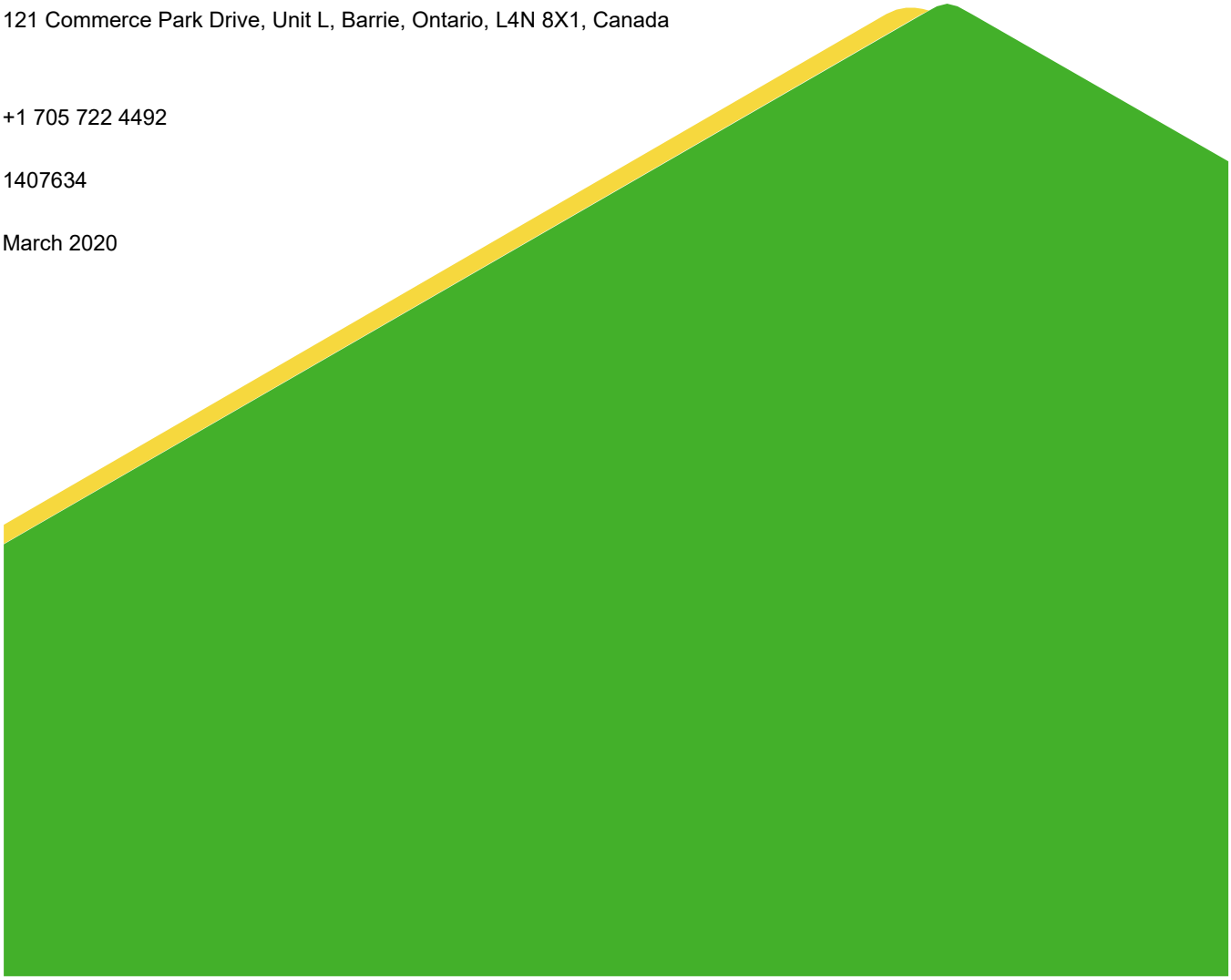
March 2020



Distribution List

1 Copy - Ministry of the Environment, Conservation and Parks

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E Copy - Golder Associates Ltd.

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ECA No. 4731-987KM8
ECA No. 7737-BH6QEA

APPENDIX B
Permit To Take Water No. 7818-9QJNL4

APPENDIX C
Water Quality Results

1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by QBJR/Coco Aggregates Inc. (Coco) to prepare the annual compliance report for the McCarthy Quarry located in the Township of Ramara, County of Simcoe (Figure 1), as a requirement of Environmental Compliance Approval (ECA) No. 7737-BH6QEA issued on October 22, 2019. ECA No. 7737-BH6QEA replaced ECA No. 4731-987KM8, which was issued on October 15, 2013. Copies of the ECA No. 7737-BH6QEA and ECA No. 4731-987KM8 are provided in Appendix A.

Coco has been conducting monthly lethality monitoring for Rainbow Trout and *Daphnia Magna* for the past seven years and water from the quarry sump passed the test every time. As a result of this perfect record Golder prepared a letter requesting the removal of Condition 8 of the ECA No. 4731-987KM8, dated April 12, 2019. Condition 8 of the ECA requires monthly lethality monitoring of the pond discharge for Rainbow Trout and *Daphnia Magna*. In an email from the Ministry of the Environment, Conservation and Parks (MECP) Barrie District Office dated April 18, 2019, Darren Peltoniemi, Provincial Officer, provided their support for the removal of Condition 8. In addition, the Barrie District Office also recommended the removal of Condition 5(3) and Condition 5(7) which related to the compliance and enforcement of Condition 8. An application to amend the ECA was submitted to the MECP in September 2019; the updated ECA No. 7737-BH6QEA was issued on October 22, 2019 and is found in Appendix A.

The following report includes a summary of the requirements listed in Section 8(5) of the ECA for the period from November 1, 2018 to December 31, 2019. Included herein are a summary of:

- Quarry discharge monitoring data including the water quality results and flow measurements;
- Any operational problems encountered;
- Maintenance work completed on any part of the sewage works;
- Effluent discharge quality assurance or control measures undertaken; and
- Calibration and maintenance carried out on the quarry discharge monitoring equipment.

2.0 BACKGROUND

The McCarthy Quarry dewatering system consists of the collection of groundwater and surface water at the base of the quarry floor to a settling pond to the south of the active quarry area (Figure 1). Groundwater and precipitation that enters the quarry is collected in a sump at the base of the quarry floor. The sump is equipped with a 4-inch Grindex pump which is rated at 35 L/sec and is attached to a 4-inch discharge line. Water is pumped from the quarry floor up the quarry face via the discharge line to a 101 mm diameter pipeline that directs the water to the 14,000 m^3 settling pond. The water in the settling pond is equipped with a Hickenbottom control structure that discharges the water to the roadside ditch along Concession Road 1. The water flows eastward along the north side of Concession Road 1 to a municipal drain and eventually to the Talbot River, which discharges into Lake Simcoe.

The dewatering activities from the McCarthy Quarry are currently carried out under the existing Permit to Take Water (PTTW) No. 7818-9QJNL4 (Appendix B) issued on December 30, 2014. Under the current PTTW Coco is permitted to pump water from the quarry sump at a rate of 4,545 L/min.

3.0 QUARRY DISCHARGE MONITORING

3.1 Quarry discharge Monitoring Requirements

Quarry discharge monitoring is required by the ECA at three locations, as shown on Figure 1:

- McCarthy Pond: the outfall of the settling pond;
- SW1: the culvert along Concession Road 1 at the McCarthy property downstream of the McCarthy Pond discharge location; and
- SW2: 260 m north of the intersection of Concession Road 1 and Mara Eldon Boundary Road, representing upstream conditions.

Condition 6(2) Table 2

Weekly quarry discharge monitoring is required at the McCarthy Pond for Total Suspended Solids (TSS), Oil and Grease and Phenols (4AAP). These results are summarized in Table 1 and the monthly averages are summarized in Table 2. No sample was collected for the weeks when quarry staff reported there was no discharge at the time of sampling.

The weekly quarry discharge samples (Section 6(2)) were collected by staff at the McCarthy Quarry. The weekly quality samples were sent to Maxxam Analytics Laboratory for analysis. Laboratory analysis results are included in Appendix C.

Condition 6(2) Table 3

Additional water quality sampling is required under Section 6(2) Table 3 at a semi-annual frequency at all three locations. The parameters required for semi-annual water quality monitoring at all three locations are listed in Table 3 of the ECA.

The semi-annual water quality samples (Section 6(2)) were collected by Golder. The semi-annual water quality samples were sent to Maxxam Analytics Laboratory for analysis. The laboratory analysis results are included in Appendix C.

Condition 6(4)

Section 6(4) requires measurement, recording and calculation of the discharge rate and volume from the works during the discharge period. The flow rates are recorded and provided to Golder by staff at the McCarthy Quarry. These results are summarized in Table 7.

Condition 8 of ECA No. 4731-987KM8

Monthly lethality monitoring for Rainbow Trout and *Daphna magna* was previously required under ECA No. 4731-987KM8 and these results are summarized in Table 6.

The monthly lethality testing was carried out by Golder and sent to AGAT Laboratories Ltd. The laboratory analysis results are included in Appendix C.

4.0 QUARRY DISCHARGE MONITORING RESULTS

Condition 6(2)

No exceedances occurred during this monitoring period; the TSS, pH, Oil and Grease, Phenols (4AAP) concentrations were all below the daily (Table 1) and monthly (Table 2) concentration limits of the ECA.

The TSS exceedances observed historically at the site are considered to be the result of the small quarry footprint. When the quarry was in its initial stages and the area in which the work was being completed was relatively small, the dust that was generated from the quarry activities settled on the quarry floor which was then repeatedly disturbed by the quarry traffic. In addition to this, the sump is located within this work area which does not allow the rock dust to settle out before it reaches the sump. As the quarry has started to expand and working space increased, the amount of dust entering the sump has decreased. With less dust entering the sump the TSS concentrations remained low in 2019 in comparison to previous years.

Condition 6(2)

All of the parameters tested for samples collected at the McCarthy Pond location were reported at concentrations below the Provincial Water Quality Objectives (PWQO); results are provided in Table 3. No samples was collected in October 2019 as there was no quarry discharge at the time of sampling. Additional attempts to collect a sample were completed in November and December 2019, however there was no quarry discharge at the time of sampling.

All of the parameters tested for samples collected at both the SW1 and SW2 locations were reported at concentrations below the PWQO, with the exception of phenols, phosphorus and iron on May 8, 2019 and October 4, 2019 (Table 5) at the SW2 location. SW2 represents an upstream sampling location and the water quality at this location is not impacted by quarry operations.

Elevated phosphorous concentrations are typically observed upstream, on-Site, and at downstream ditch locations. The presence of elevated phosphorus at all three locations indicates that the phosphorous is due to off-Site activities; most likely the result of farming in the area.

Condition 8 of ECA No. 4731-987KM8

The quarry discharge was found to be non-lethal to Rainbow Trout and *Daphnia magna* between November 2019 and October 2019 (Table 6). For both *Daphnia magna* and Rainbow Trout there has been 0% mortality between November 2017 and October 2018. The monthly lethality sample was not collected from the McCarthy Pond during the months of June, July, September and October 2018 as there was no quarry discharge at the time of sampling.

5.0 MEASURED DISCHARGE FROM QUARRY SUMP

A continuous record of flow rates and discharge volumes has been maintained throughout this monitoring period. The pump records are provided by McCarthy Quarry staff. The pump records for November 1, 2018 to December 31, 2019 are found in Table 7. The discharge rates were below the permitted rate of 4,545 L/min (76 L/sec) throughout the monitoring period. There has been no indication of erosion and/or flooding of the downstream ditches.

6.0 OPERATIONAL PROBLEMS AND CORRECTIVE ACTIONS TAKEN

Coco has indicated that no operational problems were encountered with the dewatering system during the monitoring period of November 2018 to December 2019. Coco also indicted that no spills occurred during the November 2018 to December 2019 monitoring period.

7.0 MAINTENANCE OF SEWAGE WORKS

Coco indicated that no upgrades or maintenance works were carried out on any part of the sewage works during the November 2018 to December 2019 monitoring period.

8.0 QUARRY DISCHARGE QUALITY ASSURANCE OR CONTROL MEASURES

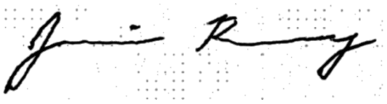
Coco indicated that no major quarry discharge quality assurance or control measures were put in place during this monitoring period.

9.0 SUMMARY

- ECA Condition 6(2) Table 2:
  - All of the weekly quarry discharge monitoring samples from the McCarthy Pond were below the permitted daily concentration limits; and
  - All of the monthly quarry discharge concentrations for the McCarthy Pond were below the permitted monthly concentration limits.
- Condition 6(2) Table 3:
  - At the McCarthy Pond, all parameters were below the PWQO;
  - At SW1, all parameters were below the PWQO; and,
  - At SW2 all parameters were below the PWQO with the exception of phenols, phosphorus and iron on May 8, 2019 and October 4, 2019. SW2 represents an upstream sampling location and the water quality at this location is not impacted by quarry operations.
- Condition 8 of No. 4731-987KM8:
  - The quarry discharge has been non-lethal to Rainbow Trout and *Daphnia magna* throughout the monitoring period (November 2018 to October 2019).
- Condition 6(4):
  - A continuous record of flow rates has been maintained throughout the monitoring period and all water takings were below the permitted rate of 4,545 L/min.

Signature Page

Golder Associates Ltd.



Jamie Bonany, M.A.Sc.
Project Scientist

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

JEB/JAE/cdr

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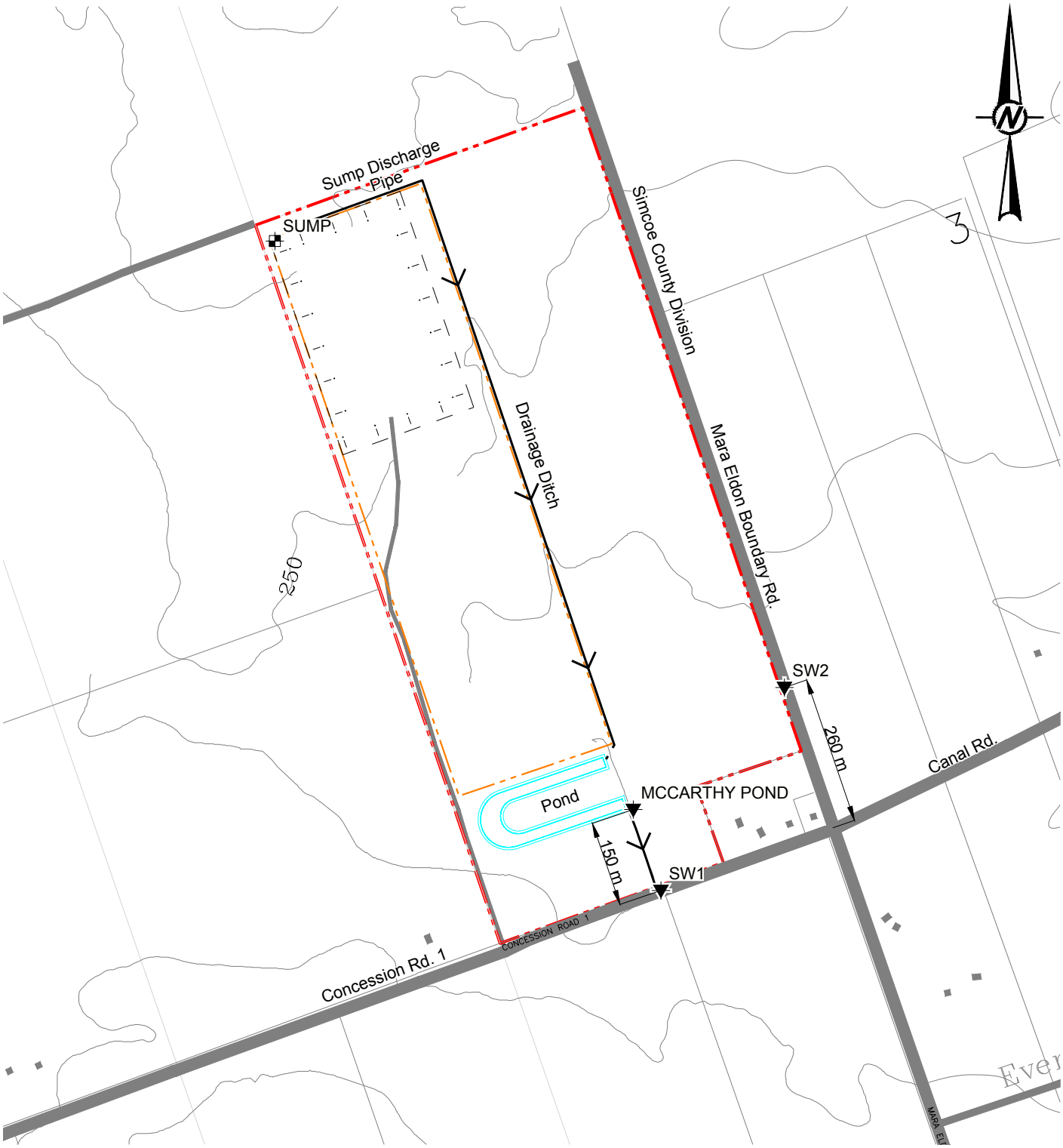
Figures



LEGEND

- Approximate Property Boundary
- Approximate Licenced Boundary
- 5 m Contour Line
- Surface Water Sampling Location
- Approximate Extent of Quarry

REFERENCES AND NOTES

1. Projection UTM NAD83 Zone 17
2. Mapping based on ESRI Geography Network OBM Features and Bing Orthophotos

0 200 400 600 m

1:10000

CLIENT
COCO / QBJR AGGREGATES INC.

PROJECT
STAN McCARTHY QUARRY

TITLE
LOCATION MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2019-11-08
PREPARED	STB
DESIGN	
REVIEW	
APPROVED	

PROJECT No.	SCALE	Rev.	Figure
14-07634	AS SHOWN	A	1

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A

0 25 mm

TABLES

Table 1: Condition 6(2) McCarthy Pond Weekly Water Quality Results

	Unit	RDL	PWQO [1]	Daily Limit[2]	McCarthy Quarry												
Sample ID					Pond												
Date					18-Apr-19	25-Apr-19	02-May-19	09-May-19	16-May-19	23-May-19	30-May-19	06-Jun-19	13-Jun-19	20-Jun-19	27-Jun-19	04-Jul-19	11-Jul-19	25-Jul-19
pH	pH	n/a		6.0-9.5	8.02	7.87	8.01	8.03	7.93	7.99	7.95	7.79	7.75	7.78	7.92	7.94	8.09	8.32
Total Suspended Solids	mg/L	1		30	5	5	4	3	2	2	3	3	3	3	4	2	2	3
Total Oil and Grease	mg/L	0.5	Note 3	30	<0.5	<0.5	<0.5	<0.5	1.3	1.2	<0.5	<0.5	<0.5	<0.5	1.8	0.9	<0.5	<0.5
Phenols (4AAP)	mg/L	<0.0010		0.04	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Notes:

1. Provincial Water Quality Objectives (PWQO); shaded cells denote PWQO exceedance; some PWQOs are dependent on other water quality parameters hence the range in guideline values, refer to PWQO notes.
2. Daily Concentration Limit; bolded values denote exceedances in the Permit to Take Waters daily concentration limits.
3. The PWQO for Oil and Grease indicates that oil or petrochemicals should not be present in concentrations that: can be detected as a visible film, sheen or discolouration on the surface, can be detected by odour, can cause tainting of edible organisms, can form detectable deposits on shorelines and bottom sediments.
4. Results that are preceeded by "<" denote concentrations that are below the laboratory Reportable Detection Limit (RDL).

Table 1: Condition 6(2) McCarthy Pond Weekly Water Quality Results

	Unit	RDL	PWQO [1]	Daily Limit[2]	McCarthy Quarry										
Sample ID					**Pond**										
Date					03-Oct-19	10-Oct-19	17-Oct-19	24-Oct-19	31-Oct-19	07-Nov-19	14-Nov-19	21-Nov-19	28-Nov-19	05-Dec-19	12-Dec-19
pH	pH	n/a		6.0-9.5	8.11	8.09	7.98	8.03	7.6	7.72	7.94	7.68	7.82	7.72	7.61
Total Suspended Solids	mg/L	1		30	3	4	2	6	11	2	2	2	2	1	1
Total Oil and Grease	mg/L	0.5	Note 3	30	<0.5	<0.5	<0.5	1.6	<0.5	<0.5	1.4	<0.5	<0.5	<0.5	<0.5
Phenols (4AAP)	mg/L	<0.0010		0.04	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Notes:

1. Provincial Water Quality Objectives (PWQO); shaded cells denote PWQO exceedance; some PWQOs are dependent on other water quality parameters hence the range in guideline values, refer to PWQO notes.
2. Daily Concentration Limit; bolded values denote exceedances in the Permit to Take Waters daily concentration limits.
3. The PWQO for Oil and Grease indicates that oil or petrochemicals should not be present in concentrations that: can be detected as a visible film, sheen or discolouration on the surface, can be detected by odour, can cause tainting of edible organisms, can form detectable deposits on shorelines and bottom sediments.
4. Results that are preceeded by "<" denote concentrations that are below the laboratory Reportable Detection Limit (RDL).

Table 2: Condition 6(2) McCarthy Pond Monthly Water Quality Results

	Unit	RDL	PWQO [1]	Monthly Concentration Limit[2]	McCarthy Quarry													
Sample ID					Pond													
Date					November 2018	December 2018	January 2019	February 2019	March 2019	April 2019	May 2019	June 2019	July 2019	August 2019	September 2019	October 2019	November 2019	December 2019
Total Suspended Solids	mg/L	1		15	-	-	-	-	-	5.0	2.8	3.3	2.3	-	-	5.2	2.0	1.0
Total Oil and Grease	mg/L	0.5	Note 3	15	-	-	-	-	-	<0.5	0.8	0.8	0.6	-	-	0.7	0.7	<0.5
Phenols (4AAP)	mg/L	<0.0010		0.02	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	<0.001	<0.001	<0.001

Notes:

1. Provincial Water Quality Objectives (PWQO); shaded cells denote PWQO exceedance; some PWQOs are dependent on other water quality parameters hence the range in guideline values, refer to PWQO notes.
2. Monthyl Concentration Limit; bolded values denote exceedances in the Permit to Take Waters monthly concentration limits.
3. The PWQO for Oil and Grease indicates that oil or petrochemicals should not be present in concentrations that: can be detected as a visible film, sheen or discolouration on the surface, can be detected by odour, can cause tainting of edible organisms, can form detectable deposits on shorelines and bottom sediments.
4. Results that are preceeded by "<" denote concentrations that are below the laboratory Reportable Detection Limit (RDL).

Table 3: Condition 6(2) McCarthy Pond Water Quality Results

	Unit	Reportable Detection Limit (RDL)	PWQO [1]	Interim PWQO [2]	PTTW Effluent Limits	McCarthy Quarry
Sample ID						**Pond**
Date						**8-May-19**
Field Measured Parameters						
Conductivity	mS/cm					1302
pH	pH	n/a	6.5-8.5		6.0-9.5	7.94
Temperature	°C	n/a				14.9
Calculated Parameters						
Hardness (CaCO3)	mg/L	1.0				460
Inorganics						
Total Ammonia-N	mg/L	0.050				<0.050
Conductivity	umho/cm	1.0				1.43
Total Dissolved Solids	mg/L	10				910
Fluoride (F-)	mg/L	0.10				0.39
Total Kjeldahl Nitrogen (TKN)	mg/L	0.10				0.32
Dissolved Organic Carbon	mg/L	0.20				5.7
pH	pH	N/A	6.5-8.5		6.0-9.5	7.98
Phenols-4AAP	mg/L	0.0010	0.001		0.04	<0.0010
Total Phosphorus	mg/L	0.002		0.02[5b]		0.020
Total Suspended Solids	mg/L	10			30	<10
Dissolved Sulphate (SO4)	mg/L	1				200
Alkalinity (Total as CaCO3)	mg/L	1.0				210
Dissolved Chloride (Cl)	mg/L	1				200
Nitrite (N)	mg/L	0.010				0.050
Nitrate (N)	mg/L	0.10				1.94
Petroleum Hydrocarbons						
Total Oil & Grease	mg/L	0.50	Note 3		30	<0.50
Metals						
Total Arsenic (As)	ug/L	1	100	5		<1.0
Total Cadmium (Cd)	ug/L	0.1	0.2	0.1-0.5[5d]		<0.10
Dissolved Calcium (Ca)	mg/L	0.05				140
Total Calcium (Ca)	ug/L	200				140000
Total Chromium (Cr)	ug/L	5	1-89[5e]			<5.0
Total Copper (Cu)	ug/L	1	5	1-5[5f]		<1.0
Total Iron (Fe)	ug/L	100	300			280
Total Lead (Pb)	ug/L	0.5	5-25[5g]	1-5[5h]		<0.50
Dissolved Magnesium (Mg)	mg/L	0.05				29
Total Magnesium (Mg)	ug/L	50				30000
Total Manganese (Mn)	ug/L	2				54
Total Nickel (Ni)	ug/L	1	25			1.4
Dissolved Potassium (K)	mg/L	1				8.5
Total Potassium (K)	ug/L	200				8500
Dissolved Sodium (Na)	mg/L	0.5				130
Total Sodium (Na)	ug/L	100				130000
Total Zinc (Zn)	ug/L	5	30	20		<5.0

1. Provincial Water Quality Objectives (PWQO); shaded cells denote PWQO exceedance; some PWQOs are dependent on other water quality parameters hence the range in guideline values, refer to PWQO notes.

2. Interim Provincial Water Quality Objectives (Interim PWQO); *shaded cells and italics denote Interim PWQO exceedance* ; some PWQOs are dependent on other water quality parameters hence the range in guideline values, refer to PQWO notes.

3. The PWQO for Oil and Grease indicates that oil or petrochemicals should not be present in concentrations that: can be detected as a visible film, sheen or discolouration on the surface, can be detected by odour, can cause tainting of edible organisms, can form detectable deposits on shorelines and bottom sediments.

4. Results that are preceeded by "<" denote concentrations that are below the laboratory Reportable Detection Limit (RDL).

5a. Aluminum (Interim):

- At pH 4.5 to 5.5 the Interim PWQO is 15 ug/L based on inorganic monomeric aluminum measured in clay-free samples.
- At pH >5.5 to 6.5, no condition should be permitted which would increase the acid soluble inorganic aluminum concentration in clay-free samples to more than 10% above natural background concentrations for waters representative of that geological area of the Province that are unaffected by man-made inputs.
- At pH >6.5 to 9.0, the Interim PWQO is 75 ug/L based on total aluminum measured in clay-free samples.
- If natural background aluminum concentrations in water bodies unaffected by manmade inputs are greater than the numerical Interim PWQO (above), no condition is permitted that would increase the aluminum concentration in clay-free samples by more than 10% of the natural background level.

5b. Phosphorus (Interim):

- Current scientific evidence is insufficient to develop a firm Objective at this time.
- Accordingly, the following phosphorus concentrations should be considered as general guidelines which should be supplemented by site-specific studies:
(a) To avoid nuisance concentrations of algae in lakes, average total phosphorus concentrations for the ice-free period should not exceed 20 ug/L;
(b) A high level of protection against aesthetic deterioration will be provided by a total phosphorus concentration for the ice-free period of 10 ug/L or less. This should apply to

5c. Beryllium :

5d. Cadmium: (Interim)

5e. Chromium :

5f. Copper: (Interim)

5g. Lead :

5h. Lead: (Interim)

Table 4: Condition 6(2) SW1 Water Quality Results

	Unit	Reportable Detection Limit (RDL)	PWQO [1]	Interim PWQO [2]	PTTW Effluent Limits	McCarthy Quarry	
Sample ID						**SW1**	**SW1**
Date						**8-May-19**	**27-Nov-19**
Field Measured Parameters							
Conductivity	mS/cm					1323	1225
pH	pH	n/a	6.5-8.5		6.0-9.5	8.02	6.70
Temperature	°C	n/a				16.0	10.9
Calculated Parameters							
Anion Sum	me/L	N/A				9.82	6.31
Cation Sum	me/L	N/A				10.3	6.52
Hardness (CaCO3)	mg/L	1.0				460	510
Inorganics							
Total Ammonia-N	mg/L	0.050				<0.050	<0.050
Conductivity	umho/cm	1.0				1.43	1.24
Total Dissolved Solids	mg/L	10				850	815
Fluoride (F-)	mg/L	0.10				0.37	0.1
Total Kjeldahl Nitrogen (TKN)	mg/L	0.10				0.24	0.32
Dissolved Organic Carbon	mg/L	0.20				5.8	8
pH	pH	N/A	6.5-8.5		6.0-9.5	8.07	7.89
Phenols-4AAP	mg/L	0.0010			0.04	<0.0010	<0.0010
Total Phosphorus	mg/L	0.002		0.02[5b]		0.019	<0.02
Total Suspended Solids	mg/L	10			30	<10	<10
Dissolved Sulphate (SO4)	mg/L	1				200	240
Alkalinity (Total as CaCO3)	mg/L	1.0				210	200
Dissolved Chloride (Cl)	mg/L	1				200	140
Nitrite (N)	mg/L	0.010				0.056	<0.010
Nitrate (N)	mg/L	0.10				2.02	<0.10
Petroleum Hydrocarbons							
Total Oil & Grease	mg/L	0.50	Note 3		30	<0.50	<0.50
Metals							
Total Arsenic (As)	ug/L	1	100	5		<1.0	<1.0
Total Cadmium (Cd)	ug/L	0.1	0.2	0.1-0.5[5d]		<0.10	<0.10
Dissolved Calcium (Ca)	mg/L	0.05				130	180
Total Calcium (Ca)	ug/L	200				140000	180000
Total Chromium (Cr)	ug/L	5	1-89[5e]			<5.0	<5.0
Total Copper (Cu)	ug/L	1	5	1-5[5f]		<1.0	1.1
Total Iron (Fe)	ug/L	100	300			210	260
Total Lead (Pb)	ug/L	0.5	5-25[5g]	1-5[5h]		<0.50	<0.50
Dissolved Magnesium (Mg)	mg/L	0.05				30	13
Total Magnesium (Mg)	ug/L	50				31000	13000
Total Manganese (Mn)	ug/L	2				44	50
Total Nickel (Ni)	ug/L	1	25			1.4	<1.0
Dissolved Potassium (K)	mg/L	1				8.8	2.6
Total Potassium (K)	ug/L	200				8800	2600
Dissolved Sodium (Na)	mg/L	0.5				130	71
Total Sodium (Na)	ug/L	100				130000	71000
Total Zinc (Zn)	ug/L	5	30	20		<5.0	<5.0

1. Provincial Water Quality Objectives (PWQO); shaded cells denote PWQO exceedance; some PWQOs are dependent on other water quality parameters hence the range in guideline values, refer to PWQO notes.

2. Interim Provincial Water Quality Objectives (Interim PWQO); *shaded cells and italics denote Interim PWQO exceedance* ; some PWQOs are dependent on other water quality parameters hence the range in guideline values, refer to PQWO notes.

3. The PWQO for Oil and Grease indicates that oil or petrochemicals should not be present in concentrations that: can be detected as a visible film, sheen or discolouration on the surface, can be detected by odour, can cause tainting of edible organisms, can form detectable deposits on shorelines and bottom sediments.

4. Results that are preceeded by "<" denote concentrations that are below the laboratory Reportable Detection Limit (RDL).

5a. Aluminum (Interim):

- At pH 4.5 to 5.5 the Interim PWQO is 15 ug/L based on inorganic monomeric aluminum measured in clay-free samples.
- At pH >5.5 to 6.5, no condition should be permitted which would increase the acid soluble inorganic aluminum concentration in clay-free samples to more than 10% above natural background concentrations for waters representative of that geological area of the Province that are unaffected by man-made inputs.
- At pH >6.5 to 9.0, the Interim PWQO is 75 ug/L based on total aluminum measured in clay-free samples.
- If natural background aluminum concentrations in water bodies unaffected by manmade inputs are greater than the numerical Interim PWQO (above), no condition is permitted that would increase the aluminum concentration in clay-free samples by more than 10% of the natural background level.

5b. Phosphorus (Interim):

- Current scientific evidence is insufficient to develop a firm Objective at this time.
- Accordingly, the following phosphorus concentrations should be considered as general guidelines which should be supplemented by site-specific studies:

(a) To avoid nuisance concentrations of algae in lakes, average total phosphorus concentrations for the ice-free period should not exceed 20 ug/L;
(b) A high level of protection against aesthetic deterioration will be provided by a total phosphorus concentration for the ice-free period of 10 ug/L or less. This should apply to all lakes naturally below this value;
(c) Excessive plant growth in rivers and streams should be eliminated at a total phosphorus concentration below 30 ug/L.

5c. Beryllium :	If Hardness <75 mg/L (CaCO3), use 11 ug/L If Hardness >75 mg/L (CaCO3), use 1100 ug/L
5d. Cadmium: (Interim)	If Hardness 0-100 mg/L (CaCO3), then use 0.1 ug/L If Hardness >100 mg/L (CaCO3), then use 0.5 ug/L
5e. Chromium :	1 ug/L for hexavalent chromium (Cr VI) 8.9 ug/L for trivalent chromium (Cr III)
5f. Copper: (Interim)	If Hardness as CaCO3 (mg/L) is 0 - 20, then use 1 ug/L If Hardness as CaCO3 (mg/L) is >20, then use 5 ug/L
5g. Lead :	If Alkalinity as CaCO3 (mg/L) is < 20, use 5 ug/L If Alkalinity as CaCO3 (mg/L) is 20 to 40, use 10 ug/L If Alkalinity as CaCO3 (mg/L) is 40 to 80, use 20 ug/L If Alkalinity as CaCO3 (mg/L) is > 80, use 25 ug/L
5h. Lead: (Interim)	If Hardness as CaCO3 (mg/L) is < 30, then use 1 ug/L If Hardness as CaCO3 (mg/L) is 30 to 80, then use 3 ug/L If Hardness as CaCO3 (mg/L) is > 80, then use 5 ug/L

Table 5: Condition 6(2) SW2 Water Quality Results

	Unit	Reportable Detection Limit (RDL)	PWQO [1]	Interim PWQO [2]	PTTW Effluent Limits	McCarthy Quarry	
Sample ID						**SW2**	**SW2**
Date						**8-May-19**	**4-Oct-19**
Field Measured Parameters							
Conductivity	mS/cm					810	2762
pH	pH	n/a	6.5-8.5		6.0-9.5	7.38	6.94
Temperature	°C	n/a				17.1	11.3
Calculated Parameters							
Anion Sum	me/L	N/A				6.31	6.31
Cation Sum	me/L	N/A				6.52	6.52
Hardness (CaCO3)	mg/L	1.0				410	580
Inorganics							
Total Ammonia-N	mg/L	0.050				<0.050	<0.050
Conductivity	umho/cm	1.0				0.859	2.63
Total Dissolved Solids	mg/L	10				500	2060
Fluoride (F-)	mg/L	0.10				0.10	0.1
Total Kjeldahl Nitrogen (TKN)	mg/L	0.10				0.41	0.74
Dissolved Organic Carbon	mg/L	0.20				6.8	11
pH	pH	N/A	6.5-8.5		6.0-9.5	7.86	7.48
Phenols-4AAP	mg/L	0.0010	0.001		0.04	0.0015	0.0039
Total Phosphorus	mg/L	0.002		0.02[5b]		*0.022*	*0.066*
Total Suspended Solids	mg/L	10			30	<10	22
Dissolved Sulphate (SO4)	mg/L	1				47	940
Alkalinity (Total as CaCO3)	mg/L	1.0				350	330
Dissolved Chloride (Cl)	mg/L	1				39	200
Nitrite (N)	mg/L	0.010				<0.010	<0.010
Nitrate (N)	mg/L	0.10				<0.10	<0.10
Petroleum Hydrocarbons							
Total Oil & Grease	mg/L	0.50	Note 3		30	<0.50	<0.50
Metals							
Total Arsenic (As)	ug/L	1	100	5		<1.0	1.0
Total Cadmium (Cd)	ug/L	0.1	0.2	0.1-0.5[5d]		<0.10	0.11
Dissolved Calcium (Ca)	mg/L	0.05				140	480
Total Calcium (Ca)	ug/L	200				150000	480000
Total Chromium (Cr)	ug/L	5	1-89[5e]			<5.0	<5.0
Total Copper (Cu)	ug/L	1	5	1-5[5f]		<1.0	2.1
Total Iron (Fe)	ug/L	100	300			480	1400
Total Lead (Pb)	ug/L	0.5	5-25[5g]	1-5[5h]		<0.50	<0.50
Dissolved Magnesium (Mg)	mg/L	0.05				18	46
Total Magnesium (Mg)	ug/L	50				18000	43000
Total Manganese (Mn)	ug/L	2				95	1000
Total Nickel (Ni)	ug/L	1	25			<1.0	1.2
Dissolved Potassium (K)	mg/L	1				2.9	9.1
Total Potassium (K)	ug/L	200				3000	8500
Dissolved Sodium (Na)	mg/L	0.5				27	110
Total Sodium (Na)	ug/L	100				28000	110000
Total Zinc (Zn)	ug/L	5	30	20		<5.0	13

1. Provincial Water Quality Objectives (PWQO); shaded cells denote PWQO exceedance; some PWQOs are dependent on other water quality parameters hence the range in guideline values, refer to PWQO notes.

2. Interim Provincial Water Quality Objectives (Interim PWQO); *shaded cells and italics denote Interim PWQO exceedance* ; some PWQOs are dependent on other water quality parameters hence the range in guideline values, refer to PQWO notes.

3. The PWQO for Oil and Grease indicates that oil or petrochemicals should not be present in concentrations that: can be detected as a visible film, sheen or discolouration on the surface, can be detected by odour, can cause tainting of edible organisms, can form detectable deposits on shorelines and bottom sediments.

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- At pH >6.5 to 9.0, the Interim PWQO is 75 ug/L based on total aluminum measured in clay-free samples.
- If natural background aluminum concentrations in water bodies unaffected by manmade inputs are greater than the numerical Interim PWQO (above), no condition is permitted that would increase the aluminum concentration in clay-free samples by more than 10% of the natural background level.

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- Accordingly, the following phosphorus concentrations should be considered as general guidelines which should be supplemented by site-specific studies:

(a) To avoid nuisance concentrations of algae in lakes, average total phosphorus concentrations for the ice-free period should not exceed 20 ug/L;
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(c) Excessive plant growth in rivers and streams should be eliminated at a total phosphorus concentration below 30 ug/L.

5c. Beryllium :	If Hardness <75 mg/L (CaCO3), use 11 ug/L If Hardness >75 mg/L (CaCO3), use 1100 ug/L
5d. Cadmium: (Interim)	If Hardness 0-100 mg/L (CaCO3), then use 0.1 ug/L If Hardness >100 mg/L (CaCO3), then use 0.5 ug/L
5e. Chromium :	1 ug/L for hexavalent chromium (Cr VI) 8.9 ug/L for trivalent chromium (Cr III)
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5g. Lead :	If Alkalinity as CaCO3 (mg/L) is < 20, use 5 ug/L If Alkalinity as CaCO3 (mg/L) is 20 to 40, use 10 ug/L If Alkalinity as CaCO3 (mg/L) is 40 to 80, use 20 ug/L If Alkalinity as CaCO3 (mg/L) is > 80, use 25 ug/L
5h. Lead: (Interim)	If Hardness as CaCO3 (mg/L) is < 30, then use 1 ug/L If Hardness as CaCO3 (mg/L) is 30 to 80, then use 3 ug/L If Hardness as CaCO3 (mg/L) is > 80, then use 5 ug/L

Table 6: Lethality Monitoring at McCarthy Pond

	Unit	Mortality Limit	McCarthy Quarry
Sample ID			**Pond**
Date			**08-May-19**
Rainbow Trout	% Mortality Rate*	<50%	0
Daphnia Magna	% Mortality Rate*	<50%	0

Notes:

* Test results represent accute lethality (100% effluent) of toxicants to Daphnia Magna and Rainbow Trout

Table 7: 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**	**4,545**
1-Nov-18	10AM	12PM	7200	120	252,000	35	2,100
2-Nov-18	6:30AM	11AM	16200	270	567,000	35	2,100
3-Nov-18	NO PUMP		0	0	-	-	-
4-Nov-18	NO PUMP		0	0	-	-	-
5-Nov-18	NO PUMP		0	0	-	-	-
6-Nov-18	NO PUMP		0	0	-	-	-
7-Nov-18	NO PUMP		0	0	-	-	-
8-Nov-18	NO PUMP		0	0	-	-	-
9-Nov-18	6:30AM	12PM	19800	330	693,000	35	2,100
10-Nov-18	7:30AM	12PM	16200	270	567,000	35	2,100
11-Nov-18	6:30AM	12:30PM	21600	360	756,000	35	2,100
12-Nov-18	NO PUMP		0	0	-	-	-
13-Nov-18	NO PUMP		0	0	-	-	-
14-Nov-18	6:30AM	4PM	34200	570	1,197,000	35	2,100
15-Nov-18	6:30AM	12PM	19800	330	693,000	35	2,100
16-Nov-18	NO PUMP		0	0	-	-	-
17-Nov-18	NO PUMP		0	0	-	-	-
18-Nov-18	NO PUMP		0	0	-	-	-
19-Nov-18	NO PUMP		0	0	-	-	-
20-Nov-18	NO PUMP		0	0	-	-	-
21-Nov-18	6:30AM	4PM	34200	570	1,197,000	35	2,100
22-Nov-18	6:30AM	12PM	19800	330	693,000	35	2,100
23-Nov-18	6:30AM	1:30PM	25200	420	882,000	35	2,100
24-Nov-18	NO PUMP		0	0	-	-	-
25-Nov-18	NO PUMP		0	0	-	-	-
26-Nov-18	NO PUMP		0	0	-	-	-
27-Nov-18	NO PUMP		0	0	-	-	-
28-Nov-18	10AM	6PM	28800	480	1,008,000	35	2,100
29-Nov-18	6:30AM	12:30PM	21600	360	756,000	35	2,100
30-Nov-18	6:30AM	4PM	34200	570	1,197,000	35	2,100
1-Dec-18	NO PUMP		0	0	-	-	-
2-Dec-18	NO PUMP		0	0	-	-	-
3-Dec-18	NO PUMP		0	0	-	-	-
4-Dec-18	7AM	4PM	32400	540	1,134,000	35	2,100
5-Dec-18	7AM	4PM	32400	540	1,134,000	35	2,100
6-Dec-18	NO PUMP		0	0	-	-	-
7-Dec-18	7AM	4PM	32400	540	1,134,000	35	2,100
8-Dec-18	NO PUMP		0	0	-	-	-
9-Dec-18	NO PUMP		0	0	-	-	-
10-Dec-18	NO PUMP		0	0	-	-	-
11-Dec-18	NO PUMP		0	0	-	-	-
12-Dec-18	NO PUMP		0	0	-	-	-
13-Dec-18	NO PUMP		0	0	-	-	-

Table 7: 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**	**4,545**
14-Dec-18	NO PUMP		0	0	-	-	-
15-Dec-18	NO PUMP		0	0	-	-	-
16-Dec-18	NO PUMP		0	0	-	-	-
17-Dec-18	NO PUMP		0	0	-	-	-
18-Dec-18	6:30AM	3:30PM	32400	540	1,134,000	35	2,100
19-Dec-18	7AM	12PM	18000	300	630,000	35	2,100
20-Dec-18	7AM	4PM	32400	540	1,134,000	35	2,100
21-Dec-18	NO PUMP		0	0	-	-	-
22-Dec-18	NO PUMP		0	0	-	-	-
23-Dec-18	NO PUMP		0	0	-	-	-
24-Dec-18	NO PUMP		0	0	-	-	-
25-Dec-18	NO PUMP		0	0	-	-	-
26-Dec-18	NO PUMP		0	0	-	-	-
27-Dec-18	NO PUMP		0	0	-	-	-
28-Dec-18	NO PUMP		0	0	-	-	-
29-Dec-18	NO PUMP		0	0	-	-	-
30-Dec-18	NO PUMP		0	0	-	-	-
31-Dec-18	NO PUMP		0	0	-	-	-
1-Jan-19	NO PUMP		0	0	-	-	-
2-Jan-19	NO PUMP		0	0	-	-	-
3-Jan-19	NO PUMP		0	0	-	-	-
4-Jan-19	NO PUMP		0	0	-	-	-
5-Jan-19	NO PUMP		0	0	-	-	-
6-Jan-19	NO PUMP		0	0	-	-	-
7-Jan-19	NO PUMP		0	0	-	-	-
8-Jan-19	NO PUMP		0	0	-	-	-
9-Jan-19	NO PUMP		0	0	-	-	-
10-Jan-19	NO PUMP		0	0	-	-	-
11-Jan-19	NO PUMP		0	0	-	-	-
12-Jan-19	NO PUMP		0	0	-	-	-
13-Jan-19	NO PUMP		0	0	-	-	-
14-Jan-19	6:30AM	4:30PM	36000	600	1,260,000	35	2,100
15-Jan-19	NO PUMP		0	0	-	-	-
16-Jan-19	6:30AM	4:30 AM	36000	600	1,260,000	35	2,100
17-Jan-19	NO PUMP		0	0	-	-	-
18-Jan-19	NO PUMP		0	0	-	-	-
19-Jan-19	NO PUMP		0	0	-	-	-
20-Jan-19	NO PUMP		0	0	-	-	-
21-Jan-19	NO PUMP		0	0	-	-	-
22-Jan-19	7AM	5PM	36000	600	1,260,000	35	2,100
23-Jan-19	7AM	5PM	36000	600	1,260,000	35	2,100
24-Jan-19	7AM	5PM	36000	600	1,260,000	35	2,100
25-Jan-19	7AM	4PM	32400	540	1,134,000	35	2,100

Table 7: 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**	**4,545**
26-Jan-19	NO PUMP		0	0	-	-	-
27-Jan-19	NO PUMP		0	0	-	-	-
28-Jan-19	NO PUMP		0	0	-	-	-
29-Jan-19	7AM	5PM	36000	600	1,260,000	35	2,100
30-Jan-19	7AM	5PM	36000	600	1,260,000	35	2,100
31-Jan-19	7AM	5PM	36000	600	1,260,000	35	2,100
1-Feb-19	NO PUMP		0	0	-	-	-
2-Feb-19	NO PUMP		0	0	-	-	-
3-Feb-19	NO PUMP		0	0	-	-	-
4-Feb-19	NO PUMP		0	0	-	-	-
5-Feb-19	NO PUMP		0	0	-	-	-
6-Feb-19	7AM	5PM	36000	600	1,260,000	35	2,100
7-Feb-19	NO PUMP		0	0	-	-	-
8-Feb-19	NO PUMP		0	0	-	-	-
9-Feb-19	NO PUMP		0	0	-	-	-
10-Feb-19	NO PUMP		0	0	-	-	-
11-Feb-19	9AM	5PM	28800	480	1,008,000	35	2,100
12-Feb-19	NO PUMP		0	0	-	-	-
13-Feb-19	NO PUMP		0	0	-	-	-
14-Feb-19	8AM	5PM	32400	540	1,134,000	35	2,100
15-Feb-19	NO PUMP		0	0	-	-	-
16-Feb-19	NO PUMP		0	0	-	-	-
17-Feb-19	NO PUMP		0	0	-	-	-
18-Feb-19	NO PUMP		0	0	-	-	-
19-Feb-19	NO PUMP		0	0	-	-	-
20-Feb-19	7AM	5PM	36000	600	1,260,000	35	2,100
21-Feb-19	NO PUMP		0	0	-	-	-
22-Feb-19	7AM	3PM	28800	480	1,008,000	35	2,100
23-Feb-19	NO PUMP		0	0	-	-	-
24-Feb-19	NO PUMP		0	0	-	-	-
25-Feb-19	NO PUMP		0	0	-	-	-
26-Feb-19	NO PUMP		0	0	-	-	-
27-Feb-19	NO PUMP		0	0	-	-	-
28-Feb-19	NO PUMP		0	0	-	-	-
1-Mar-19	7AM	5PM	36000	600	1,260,000	35	2,100
2-Mar-19	7AM	5PM	36000	600	1,260,000	35	2,100
3-Mar-19	NO PUMP		0	0	-	-	-
4-Mar-19	7AM	5PM	36000	600	1,260,000	35	2,100
5-Mar-19	NO PUMP		0	0	-	-	-
6-Mar-19	NO PUMP		0	0	-	-	-
7-Mar-19	7AM	5PM	36000	600	1,260,000	35	2,100
8-Mar-19	7AM	4PM	32400	540	1,134,000	35	2,100
9-Mar-19	7AM	3PM	28800	480	1,008,000	35	2,100

Table 7: 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**	**4,545**
10-Mar-19	NO PUMP		0	0	-	-	-
11-Mar-19	7AM	5PM	36000	600	1,260,000	35	2,100
12-Mar-19	7AM	5PM	36000	600	1,260,000	35	2,100
13-Mar-19	7AM	5PM	36000	600	1,260,000	35	2,100
14-Mar-19	NO PUMP		0	0	-	-	-
15-Mar-19	7AM	5PM	36000	600	1,260,000	35	2,100
16-Mar-19	7AM	3PM	28800	480	1,008,000	35	2,100
17-Mar-19	NO PUMP		0	0	-	-	-
18-Mar-19	7AM	5PM	36000	600	1,260,000	35	2,100
19-Mar-19	7AM	5PM	36000	600	1,260,000	35	2,100
20-Mar-19	7AM	5PM	36000	600	1,260,000	35	2,100
21-Mar-19	7AM	5PM	36000	600	1,260,000	35	2,100
22-Mar-19	7AM	3PM	28800	480	1,008,000	35	2,100
23-Mar-19	NO PUMP		0	0	-	-	-
24-Mar-19	NO PUMP		0	0	-	-	-
25-Mar-19	7AM	4PM	32400	540	1,134,000	35	2,100
26-Mar-19	7AM	5PM	36000	600	1,260,000	35	2,100
27-Mar-19	7AM	5PM	36000	600	1,260,000	35	2,100
28-Mar-19	7AM	5PM	36000	600	1,260,000	35	2,100
29-Mar-19	7AM	5PM	36000	600	1,260,000	35	2,100
30-Mar-19	NO PUMP		0	0	-	-	-
31-Mar-19	NO PUMP		0	0	-	-	-
1-Apr-19	NO PUMP		0	0	-	-	-
2-Apr-19	NO PUMP		0	0	-	-	-
3-Apr-19	7AM	5PM	36000	600	1,260,000	35	2,100
4-Apr-19	7AM	5PM	36000	600	1,260,000	35	2,100
5-Apr-19	7AM	5PM	36000	600	1,260,000	35	2,100
6-Apr-19	7AM	5PM	36000	600	1,260,000	35	2,100
7-Apr-19	NO PUMP		0	0	-	-	-
8-Apr-19	NO PUMP		0	0	-	-	-
9-Apr-19	7AM	5PM	36000	600	1,260,000	35	2,100
10-Apr-19	NO PUMP		0	0	-	-	-
11-Apr-19	7AM	5PM	36000	600	1,260,000	35	2,100
12-Apr-19	7AM	5PM	36000	600	1,260,000	35	2,100
13-Apr-19	NO PUMP		0	0	-	-	-
14-Apr-19	NO PUMP		0	0	-	-	-
15-Apr-19	7AM	5PM	36000	600	1,260,000	35	2,100
16-Apr-19	7AM	5PM	36000	600	1,260,000	35	2,100
17-Apr-19	7AM	5PM	36000	600	1,260,000	35	2,100
18-Apr-19	7AM	5PM	36000	600	1,260,000	35	2,100
19-Apr-19	7AM	6PM	39600	660	1,386,000	35	2,100
20-Apr-19	7AM	5PM	36000	600	1,260,000	35	2,100
21-Apr-19	NO PUMP		0	0	-	-	-

Table 7: 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**	**4,545**
22-Apr-19	NO PUMP		0	0	-	-	-
23-Apr-19	7AM	5PM	36000	600	-	-	-
24-Apr-19	7AM	5PM	36000	600	1,260,000	35	2,100
25-Apr-19	7AM	5PM	36000	600	1,260,000	35	2,100
26-Apr-19	7AM	5PM	36000	600	1,260,000	35	2,100
27-Apr-19	7AM	4PM	32400	540	1,134,000	35	2,100
28-Apr-19	NO PUMP		0	0	-	-	-
29-Apr-19	7AM	5PM	36000	600	1,260,000	35	2,100
30-Apr-19	7AM	5PM	36000	600	1,260,000	35	2,100
1-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
2-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
3-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
4-May-19	NO PUMP		0	0	-	-	-
5-May-19	NO PUMP		0	0	-	-	-
6-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
7-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
8-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
9-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
10-May-19	7AM	3PM	28800	480	1,008,000	35	2,100
11-May-19	7AM	12PM	18000	300	630,000	35	2,100
12-May-19	NO PUMP		0	0	-	-	-
13-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
14-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
15-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
16-May-19	10AM	3PM	18000	300	630,000	35	2,100
17-May-19	7AM	1PM	21600	360	756,000	35	2,100
18-May-19	NO PUMP		0	0	-	-	-
19-May-19	NO PUMP		0	0	-	-	-
20-May-19	NO PUMP		0	0	-	-	-
21-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
22-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
23-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
24-May-19	7AM	2PM	25200	420	882,000	35	2,100
25-May-19	NO PUMP		0	0	-	-	-
26-May-19	NO PUMP		0	0	-	-	-
27-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
28-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
29-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
30-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
31-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
1-Jun-19	7AM	1PM	21600	360	756,000	35	2,100
2-Jun-19	NO PUMP		0	0	-	-	-
3-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100

Table 7: 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**	**4,545**
4-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
5-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
6-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
7-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
8-Jun-19	NO PUMP		0	0	-	-	-
9-Jun-19	NO PUMP		0	0	-	-	-
10-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
11-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
12-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
13-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
14-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
15-Jun-19	7AM	12PM	18000	300	630,000	35	2,100
16-Jun-19	NO PUMP		0	0	-	-	-
17-Jun-19	7AM	1PM	21600	360	756,000	35	2,100
18-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100

Table 7: 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**	**4,545**
19-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
20-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
21-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
22-Jun-19	7AM	1PM	21600	360	756,000	35	2,100
23-Jun-19	NO PUMP		0	0	-	-	-
24-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
25-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
26-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
27-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
28-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
29-Jun-19	7AM	2PM	25200	420	882,000	35	2,100
30-Jun-19	NO PUMP		0	0	-	-	-
1-Jul-19	NO PUMP		0	0	-	-	-
2-Jul-19	7AM	5PM	36000	600	1,260,000	35	2,100
3-Jul-19	NO PUMP		0	0	-	-	-
4-Jul-19	7AM	12PM	18000	300	630,000	35	2,100
5-Jul-19	12PM	5PM	18000	300	630,000	35	2,100
6-Jul-19	7AM	12PM	18000	300	630,000	35	2,100
7-Jul-19	NO PUMP		0	0	-	-	-
8-Jul-19	7AM	2PM	25200	420	882,000	35	2,100
9-Jul-19	7AM	5PM	36000	600	1,260,000	35	2,100
10-Jul-19	NO PUMP		0	0	-	-	-
11-Jul-19	NO PUMP		0	0	-	-	-
12-Jul-19	NO PUMP		0	0	-	-	-
13-Jul-19	7AM	12PM	18000	300	630,000	35	2,100
14-Jul-19	NO PUMP		0	0	-	-	-
15-Jul-19	1PM	5PM	14400	240	504,000	35	2,100
16-Jul-19	NO PUMP		0	0	-	-	-
17-Jul-19	NO PUMP		0	0	-	-	-
18-Jul-19	NO PUMP		0	0	-	-	-
19-Jul-19	7AM	12PM	18000	300	630,000	35	2,100
20-Jul-19	7AM	11AM	14400	240	504,000	35	2,100
21-Jul-19	NO PUMP		0	0	-	-	-
22-Jul-19	NO PUMP		0	0	-	-	-
23-Jul-19	NO PUMP		0	0	-	-	-
24-Jul-19	NO PUMP		0	0	-	-	-
25-Jul-19	NO PUMP		0	0	-	-	-
26-Jul-19	NO PUMP		0	0	-	-	-
27-Jul-19	NO PUMP		0	0	-	-	-
28-Jul-19	NO PUMP		0	0	-	-	-
29-Jul-19	NO PUMP		0	0	-	-	-
30-Jul-19	NO PUMP		0	0	-	-	-
31-Jul-19	NO PUMP		0	0	-	-	-

Table 7: 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**	**4,545**
1-Aug-19	NO PUMP		0	0	-	-	-
2-Aug-19	NO PUMP		0	0	-	-	-
3-Aug-19	NO PUMP		0	0	-	-	-
4-Aug-19	NO PUMP		0	0	-	-	-
5-Aug-19	NO PUMP		0	0	-	-	-
6-Aug-19	NO PUMP		0	0	-	-	-
7-Aug-19	NO PUMP		0	0	-	-	-
8-Aug-19	NO PUMP		0	0	-	-	-
9-Aug-19	NO PUMP		0	0	-	-	-
10-Aug-19	NO PUMP		0	0	-	-	-
11-Aug-19	NO PUMP		0	0	-	-	-
12-Aug-19	NO PUMP		0	0	-	-	-
13-Aug-19	NO PUMP		0	0	-	-	-
14-Aug-19	NO PUMP		0	0	-	-	-
15-Aug-19	NO PUMP		0	0	-	-	-
16-Aug-19	NO PUMP		0	0	-	-	-
17-Aug-19	NO PUMP		0	0	-	-	-
18-Aug-19	NO PUMP		0	0	-	-	-
19-Aug-19	NO PUMP		0	0	-	-	-
20-Aug-19	NO PUMP		0	0	-	-	-
21-Aug-19	NO PUMP		0	0	-	-	-
22-Aug-19	NO PUMP		0	0	-	-	-
23-Aug-19	NO PUMP		0	0	-	-	-
24-Aug-19	NO PUMP		0	0	-	-	-
25-Aug-19	NO PUMP		0	0	-	-	-
26-Aug-19	NO PUMP		0	0	-	-	-
27-Aug-19	NO PUMP		0	0	-	-	-
28-Aug-19	NO PUMP		0	0	-	-	-
29-Aug-19	NO PUMP		0	0	-	-	-
30-Aug-19	NO PUMP		0	0	-	-	-
31-Aug-19	NO PUMP		0	0	-	-	-
1-Sep-19	NO PUMP		0	0	-	-	-
2-Sep-19	NO PUMP		0	0	-	-	-
3-Sep-19	NO PUMP		0	0	-	-	-
4-Sep-19	NO PUMP		0	0	-	-	-
5-Sep-19	NO PUMP		0	0	-	-	-
6-Sep-19	NO PUMP		0	0	-	-	-
7-Sep-19	NO PUMP		0	0	-	-	-
8-Sep-19	NO PUMP		0	0	-	-	-
9-Sep-19	NO PUMP		0	0	-	-	-
10-Sep-19	NO PUMP		0	0	-	-	-
11-Sep-19	7AM	5PM	36000	600	720,000	20	1,200
12-Sep-19	NO PUMP		0	0	-	-	-

Table 7: 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**	**4,545**
13-Sep-19	NO PUMP		0	0	-	-	-
14-Sep-19	NO PUMP		0	0	-	-	-
15-Sep-19	NO PUMP		0	0	-	-	-
16-Sep-19	NO PUMP		0	0	-	-	-
17-Sep-19	NO PUMP		0	0	-	-	-
18-Sep-19	NO PUMP		0	0	-	-	-
19-Sep-19	NO PUMP		0	0	-	-	-
20-Sep-19	7AM	5PM	36000	600	720,000	20	1,200
21-Sep-19	NO PUMP		0	0	-	-	-
22-Sep-19	NO PUMP		0	0	-	-	-
23-Sep-19	NO PUMP		0	0	-	-	-
24-Sep-19	NO PUMP		0	0	-	-	-
25-Sep-19	NO PUMP		0	0	-	-	-
26-Sep-19	NO PUMP		0	0	-	-	-
27-Sep-19	NO PUMP		0	0	-	-	-
28-Sep-19	NO PUMP		0	0	-	-	-
29-Sep-19	NO PUMP		0	0	-	-	-
30-Sep-19	NO PUMP		0	0	-	-	-
1-Oct-19	NO PUMP		0	0	-	-	-
2-Oct-19	NO PUMP		0	0	-	-	-
3-Oct-19	7AM	5PM	36000	600	720,000	20	1,200
4-Oct-19	7AM	5PM	36000	600	720,000	20	1,200
5-Oct-19	NO PUMP		0	0	-	-	-
6-Oct-19	NO PUMP		0	0	-	-	-
7-Oct-19	7AM	5PM	36000	600	720,000	20	1,200
8-Oct-19	7AM	5PM	36000	600	720,000	20	1,200
9-Oct-19	7AM	5PM	36000	600	720,000	20	1,200
10-Oct-19	7AM	5PM	36000	600	720,000	20	1,200
11-Oct-19	7AM	5PM	36000	600	720,000	20	1,200
12-Oct-19	NO PUMP		0	0	-	-	-
13-Oct-19	NO PUMP		0	0	-	-	-
14-Oct-19	7AM	5PM	36000	600	720,000	20	1,200
15-Oct-19	7AM	5PM	36000	600	720,000	20	1,200
16-Oct-19	7AM	5PM	36000	600	720,000	20	1,200
17-Oct-19	7AM	5PM	36000	600	720,000	20	1,200
18-Oct-19	7AM	5PM	36000	600	720,000	20	1,200
19-Oct-19	NO PUMP		0	0	-	-	-
20-Oct-19	NO PUMP		0	0	-	-	-
21-Oct-19	7AM	5PM	36000	600	720,000	20	1,200
22-Oct-19	7AM	5PM	36000	600	720,000	20	1,200
23-Oct-19	7AM	5PM	36000	600	720,000	20	1,200
24-Oct-19	7AM	5PM	36000	600	720,000	20	1,200
25-Oct-19	7AM	5PM	36000	600	720,000	20	1,200

Table 7: 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**	**4,545**
26-Oct-19	NO PUMP		0	0	-	-	-
27-Oct-19	NO PUMP		0	0	-	-	-
28-Oct-19	7AM	5PM	36000	600	720,000	20	1,200
29-Oct-19	7AM	5PM	36000	600	720,000	20	1,200
30-Oct-19	7AM	5PM	36000	600	720,000	20	1,200
31-Oct-19	7AM	5PM	36000	600	720,000	20	1,200
1-Nov-19	7AM	5PM	36000	600	720,000	20	1,200
2-Nov-19	NO PUMP		0	0	-	-	-
3-Nov-19	NO PUMP		0	0	-	-	-
4-Nov-19	7AM	5PM	36000	600	720,000	20	1,200
5-Nov-19	7AM	5PM	36000	600	720,000	20	1,200
6-Nov-19	7AM	5PM	36000	600	720,000	20	1,200
7-Nov-19	7AM	5PM	36000	600	720,000	20	1,200
8-Nov-19	7AM	5PM	36000	600	720,000	20	1,200
9-Nov-19	NO PUMP		0	0	-	-	-
10-Nov-19	NO PUMP		0	0	-	-	-
11-Nov-19	7AM	5PM	36000	600	720,000	20	1,200
12-Nov-19	7AM	5PM	36000	600	720,000	20	1,200
13-Nov-19	7AM	5PM	36000	600	720,000	20	1,200
14-Nov-19	7AM	5PM	36000	600	720,000	20	1,200
15-Nov-19	7AM	5PM	36000	600	720,000	20	1,200
16-Nov-19	NO PUMP		0	0	-	-	-
17-Nov-19	NO PUMP		0	0	-	-	-
18-Nov-19	7AM	5PM	36000	600	720,000	20	1,200
19-Nov-19	7AM	5PM	36000	600	720,000	20	1,200
20-Nov-19	7AM	5PM	36000	600	720,000	20	1,200
21-Nov-19	7AM	5PM	36000	600	720,000	20	1,200
22-Nov-19	7AM	4PM	32400	540	648,000	20	1,200
23-Nov-19	NO PUMP		0	0	-	-	-
24-Nov-19	NO PUMP		0	0	-	-	-
25-Nov-19	7AM	5PM	36000	600	720,000	20	1,200
26-Nov-19	7AM	5PM	36000	600	720,000	20	1,200
27-Nov-19	7AM	5PM	36000	600	720,000	20	1,200
28-Nov-19	7AM	5PM	36000	600	720,000	20	1,200
29-Nov-19	7AM	3PM	28800	480	576,000	20	1,200
30-Nov-19	NO PUMP		0	0	-	-	-
1-Dec-19	NO PUMP		0	0	-	-	-
2-Dec-19	7AM	5PM	36000	600	720,000	20	1,200
3-Dec-19	7AM	5PM	36000	600	720,000	20	1,200
4-Dec-19	7AM	5PM	36000	600	720,000	20	1,200
5-Dec-19	7AM	5PM	36000	600	720,000	20	1,200
6-Dec-19	7AM	4PM	32400	540	648,000	20	1,200
7-Dec-19	NO PUMP		0	0	-	-	-

Table 7: 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**	**4,545**
8-Dec-19	NO PUMP		0	0	-	-	-
9-Dec-19	7AM	5PM	36000	600	720,000	20	1,200
10-Dec-19	7AM	5PM	36000	600	720,000	20	1,200
11-Dec-19	7AM	5PM	36000	600	720,000	20	1,200
12-Dec-19	7AM	5PM	36000	600	720,000	20	1,200
13-Dec-19	7AM	5PM	36000	600	720,000	20	1,200
14-Dec-19	NO PUMP		0	0	-	-	-
15-Dec-19	NO PUMP		0	0	-	-	-
16-Dec-19	7AM	5PM	36000	600	720,000	20	1,200
17-Dec-19	7AM	5PM	36000	600	720,000	20	1,200
18-Dec-19	7AM	5PM	36000	600	720,000	20	1,200
19-Dec-19	7AM	5PM	36000	600	720,000	20	1,200
20-Dec-19	7AM	5PM	36000	600	720,000	20	1,200
21-Dec-19	NO PUMP		0	0	-	-	-
22-Dec-19	NO PUMP		0	0	-	-	-
23-Dec-19	NO PUMP		0	0	-	-	-
24-Dec-19	NO PUMP		0	0	-	-	-
25-Dec-19	NO PUMP		0	0	-	-	-
26-Dec-19	NO PUMP		0	0	-	-	-
27-Dec-19	NO PUMP		0	0	-	-	-
28-Dec-19	NO PUMP		0	0	-	-	-
29-Dec-19	NO PUMP		0	0	-	-	-
30-Dec-19	NO PUMP		0	0	-	-	-
31-Dec-19	NO PUMP		0	0	-	-	-
			Totals		170,334,000		171

APPENDIX A

ECA No. 4731-987KM8

ECA No. 7737-BH6QEA

- AKossi
- GQ.

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 4731-987KM8
Issue Date: October 15, 2013

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

Site Location: McCarthy Quarry
Lot 1, Concession 1, Original Township of Mara
Lot 1, Concession 1
Ramara Township, County of Simcoe, L0K 1B0

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

a sewage works for the collection, transmission, treatment and disposal of quarry water effluent from an aggregate quarry consisting of the following:

- one (1) sump, measuring 20 metres long, 10 metres wide and 3 metres deep, located at the base of the quarry floor, equipped with two (2) submersible pumps each rated at 38 litres per second with a suction intake approximately one (1) metre above the bottom of the sump, discharging to a settling pond via a 203 millimetre diameter pipeline;

- one (1) horse-shoe shaped settling pond with an approximate volume of 14,000 cubic metres (at elevation 248.2 metres), with a Hickenbottom control structure equipped with a 150 millimetre diameter orifice plate, discharging to the roadside ditch along Concession Road 1 with ultimate discharge to the Talbot River via a private ditch;

- all other controls, electrical equipment, instrumentation, piping, pumps, valves and appurtenances essential for the proper operation of the aforementioned sewage works;

all in accordance with supporting documents listed in **Schedule A**.

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

"Approval" means this entire document and any schedules attached to it, and the application;

"Director" means a person appointed by the Minister pursuant to section 5 of the *EPA* for the purposes of Part II.1 of the *EPA;*

"District Manager" means the District Manager of the Barrie District Office of the Ministry;

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

"Ministry" means the ministry of the government of Ontario responsible for the *EPA* and *OWRA* and includes all officials, employees or other persons acting on its behalf;

"Owner" means QBJR Aggregates Inc.and its successors and assignees;

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

"Quarterly" means all or part of a period of three consecutive months beginning on the first day of January, April, July or October;

"Semi-annually" means all or part of a period of six months beginning on the first day of January or July;

"Weekly" means a period of seven days, starting on Sunday and ending on Saturday; and

"Works" means the sewage works described in the Owner's application, this *Approval* and in the supporting documentation referred to herein, to the extent approved by this *Approval* .

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

TERMS AND CONDITIONS

1. GENERAL CONDITION

(1) Except as otherwise provided by these Conditions, the *Owner* shall design, build, install, operate and maintain the *Works* in accordance with the description given in this *Approval* , the application for approval of the *Works* and the submitted supporting documents and plans and specifications as listed in this *Approval* .

(2) Where there is a conflict between a provision of any submitted document referred to in this *Approval* and the Conditions of this *Approval* , the Conditions in this *Approval* shall take precedence, and where there is a conflict between the listed submitted documents, the document bearing the most recent date shall prevail.

2. CHANGE OF OWNER

(1) The *Owner* shall notify the *District Manager* and the *Director* , in writing, of any of the following changes within **seven (7) days** of the change occurring:

(a) change of *Owner* or operating authority, or both;

(b) change of address of *Owner* or operating authority or address of new owner or operating authority;

(c) change of partners where the *Owner* or operating authority is or at any time becomes a partnership, and a copy of the most recent declaration filed under the *Partnerships Registration Act* ;

(d) change of name of the corporation where the *Owner* or operator is or at any time becomes a corporation, and a copy of the most current "Initial Notice or Notice of Change" (Form 1, 2 or 3 of O. Reg. 189, R.R.O. 1980, as amended from time to time), filed under the *Corporations Informations Act* shall be included in the notification to the *District Manager* ;

(2) In the event of any change in ownership of the *Works* , the *Owner* shall notify in writing the succeeding owner of the existence of this certificate, and a copy of such notice shall be forwarded to the *District Manager* .

(3) The *Owner* shall ensure that all communications made pursuant to this condition will refer to this Approval's number.

3. CHANGES IN PROCESSES OR PROCESS MATERIALS

The *Owner* shall give written notice to the *District Manager* of any plans to change the processes or process materials in the Owner's enterprise serviced by the *Works* where the change may significantly alter the quantity or quality of the influent to or effluent from the *Works* , and no such changes shall be made unless with the written concurrence or approval of the *District Manager* .

4. OPERATIONS MANUAL

(1) The *Owner* shall prepare an operations manual prior to the commencement of operation of the sewage *Works* , that includes, but not necessarily limited to, the following information:

(a) operating procedures for routine operation of the *Works* ;

(b) inspection programs, including frequency of inspection, for the *Works* and the methods or tests employed to detect when maintenance is necessary;

(c) repair and maintenance programs, including the frequency of repair and maintenance for the *Works* ;

(d) contingency plans and procedures for dealing with potential spill, bypasses and any other abnormal situations and for notifying the *District Manager* ; and

(e) complaint procedures for receiving and responding to public complaints.

(2) The *Owner* shall maintain the operations manual up to date through revisions undertaken from time to time and retain a copy at the location of the sewage works. Upon request, the *Owner* shall make the manual available for inspection and copying by Ministry personnel.

(3) A copy of the operations manual required by subsection (1) shall be provided to the *Director* no later than **three (3) months** prior to the commencement of operation of the sewage works.

5. EFFLUENT LIMITS

(1) The *Owner* shall design, construct and operate the *Works* such that the concentrations of the materials named below as effluent parameters are not exceeded in the effluent from the *Works* .

Table 1 - Effluent Limits

Effluent Parameter	Daily Concentration Limit (mg/L)	Monthly Average Concentration Limit (mg/L)
Column 1	Column 2	Column 3
Total Suspended Solids	30	15
Oil and Grease	30	15
Phenolics (4AAP)	0.04	0.02

(2) pH of the effluent maintained between 6.0 to 9.5, inclusive, at all times.

(3) The *Owner* shall ensure that the quarry water effluent shall be non-lethal to rainbow trout and *Daphnia magna* at all times.

(4) For the purposes of determining compliance with and enforcing subsection (1), exceedance of a daily concentration is deemed to have occurred when any daily single grab sample, analyzed for a parameter named
in Column 1 of Table 1, is greater than the corresponding daily concentration set in Column 2 of Table 1.

(5) For the purposes of determining compliance with and enforcing subsection (1), exceedance of a monthly average concentration is deemed to have occurred when the arithmetic mean concentration of all samples taken in a calendar month, analyzed for a parameter named in Column 1 of Table 1, is greater than the corresponding monthly average concentration set in Column 3 of Table 1.

(6) Non-compliance with respect to pH is deemed to have occurred when any single measurement is outside of the indicated range.

(7) For the purposes of determining compliance with and enforcing subsection (3), the effluent is deemed to be non-lethal if the test results, required pursuant to Condition 8, show mortality for no more than 50 percent of either test organism in each sample of undiluted effluent.

6. EFFLUENT - VISUAL OBSERVATIONS

Notwithstanding any other condition in this *Approval* , the *Owner* shall ensure that the effluent from the *Works* is essentially free of floating and settleable solids and does not contain oil or any other substance in amounts sufficient to create a visible film, sheen or foam on the receiving waters.

7. EFFLUENT MONITORING AND RECORDING

The *Owner* shall, upon commencement of operation of the sewage works, carry out the following sampling from the final effluent control point (i.e. the outfall of the settling pond which is approximately 150 metres north of Concession 1) at the commencement of effluent discharge and for the duration of the discharge period, as follows:

(1) All samples and measurements taken for the purposes of this *Approval* are to be taken at a time and in a location characteristic of the quality and quantity of the effluent stream over the time period being monitored.

(2) Samples shall be collected and analyzed at the following sampling point, at the sampling frequencies and using the sample type specified for each parameter listed:

Table 2 - Effluent Monitoring - (End of Pipe Discharge Point)

Effluent Parameter	Frequency	Sample Type
Total Suspended Solids	Weekly	Grab
Oil and Grease	Weekly	Grab
Phenolics (4AAP)	Weekly	Grab

(3) The *Owner* shall collect effluent samples at the following locations and analyze for the parameters listed in Table 3 at a frequency of once per week:

(a) Outfall of settling pond approximately 150 metres north of Concession 1(i.e. end of pipe discharge);

(b) Box culvert on Eldon-Ramara Townline approximately 260 metres north of intersection of Ramara Concession 1 and Eldon-Ramara Townline (i.e. upgradient of end of pipe discharge);

(c) 80 centimetre CSP located at Concession 1 Road on McCarthy property (i.e. downgradient of end of pipe discharge).

Table 3 - Effluent and Surface Water Monitoring	
Frequency	Weekly
Sample Type	Grab
Parameters	Total Suspended Solids, Copper, Lead, Nickel, Zinc, Arsenic, Oil and Grease, Phenolics (4AAP), Hardness (as CaCO3), Alkalinity(as CaCO3), Conductivity, pH, Fluoride, Chloride, Nitrate (N), Nitrite (N), Sulphate, Calcium, Magnesium, Sodium, Potassium, Ammonia (N), Dissolved Organic Carbon, Iron, Total Kjeldahl Nitrogen, Phosphorus (Total), Cadmium, Chromium, Manganese, Anion (Sum), Cation (Sum) and Total Dissolved Solids

(4) There shall be at least **four days** between successive sampling.

(5) The methods and protocols for sampling, analysis, and recording shall conform, in order of precedence, to the methods and protocols specified in the following:

(a) the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" (August 1994), ISBN 0-7778-1880-9, as amended from time to time by more recently published editions;

(b) the publication "Standard Methods for the Examination of Water and Wastewater" (17th edition) as amended from time to time by more recently published editions; and,

(c) in respect of any parameters not mentioned in (a) and (b), the written approval of the *District Manager* , shall be obtained prior to sampling.

(6) The measurement frequencies specified in subsection (2) in respect of any parameter are minimum requirements which may, **after 48 months** of monitoring in accordance with this Condition, be modified by the *District Manager* in writing from time to time.

(7) The measurement frequencies specified in subsection (3) in respect of any parameter shall be changed to semi-annually after one year of quarry operation.

(8) A continuous flow measuring device shall be installed and maintained to measure the flowrate of the effluent from the sewage works, with an accuracy to within plus or minus 15 per cent of the actual flowrate for the entire design range of the flow measuring device and the *Owner* shall measure, record and calculate the flowrate for each effluent stream on each day of sampling.

(9) The *Owner* shall retain for a minimum of **three (3) years** from the date of their creation, all records

and information related to or resulting from the monitoring activities required by this *Approval* .

8. LETHALITY MONITORING

(1) The *Owner* shall perform rainbow trout acute lethality test and *Daphnia magna* acute lethality test at least once a month on the quarry water effluent according to procedures published in Environment Canada publications entitled "Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout", dated July 1990 and "Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna* ", dated July 1990 and as updated from time to time.

(2) The acute lethality tests shall be carried out on a grab sample as a single concentration test using 100 per cent quarry water effluent.

(3) A minimum of two samples shall be tested for either test animal per each discharge period.

9. RECEIVER INSPECTION

The *Owner* shall, at least once per year, undertake a visual inspection of the downstream ditches for evidence of erosion and/or flooding and shall report the observations in the annual report.

10. REPORTING

(1) One week prior to the start up of the operation of the *Works* , the *Owner* shall notify the *District Manager* (in writing) of the pending start up date.

(2) The *Owner* shall report to the *District Manager* or designate, any exceedance of any parameter specified in Condition 5 orally, forthwith, and in writing within **seven (7) days** of the exceedance.

(3) In addition to the obligations under Part X of the *Environmental Protection Act* , the *Owner* shall, within **10 working days** of the occurrence of any spill, bypass or loss of any product, by product, intermediate product, oils, solvents, waste material or any other polluting substance into the environment, submit a full written report of the occurrence to the *District Manager* describing the cause and discovery of the spill or loss, clean-up and recovery measures taken, preventative measures to be taken and schedule of implementation.

(4) The *Owner* shall submit quarterly reports of the information obtained under Conditions 7 and 8 within **30 days** of the end of each quarter.

(5) The *Owner* shall prepare and submit a performance report to the *District Manager* on an annual basis within **sixty (60) days** following the end of the period being reported upon. The first such report shall cover the first annual period following the commencement of operation of the *Works* and subsequent reports shall be submitted to cover successive annual periods following thereafter. The reports shall contain, but shall not be limited to, the following information:

(a) a summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 5, including an overview of the success and adequacy of the sewage works;

(b) a description of any operating problems encountered and corrective actions taken;

(c) a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the sewage works;

(d) a summary of any effluent quality assurance or control measures undertaken in the reporting period; and

(e) a summary of the calibration and maintenance carried out on all effluent monitoring equipment.

Schedule A

Environmental Compliance Approval (ECA) supporting documents:

1. Application for Approval of Industrial Sewage Works submitted by Thomas S. McCarthy dated July 21, 2001 and revised January 25, 2002;

2. McCarthy Property - Certificate of Approval Application prepared by Dixon Hydrogeology Limited dated July 2001;

3. Revised Permit to Take Water - McCarthy Property prepared by Dixon Hydrogeology Limited dated April 11, 2002;

4. Letter and attachments dated January 25, 2002 from John Easton of Dixon Hydrogeology Limited to Mohamed Dhalla of the Ministry of the Environment;

5. Letter and attachments dated April 1, 2002 from Dave Hulme of Dave T. Hulme Enterprises Inc. to Stefanos Habtom of the Ministry of the Environment;

6. Letter dated April 10, 2002 from John Easton of Dixon Hydrogeology Limited to Stefanos Habtom of the Ministry of the Environment;

7. Environmental Review Amended Tribunal Decision: 02-214/02-217 and 03-188/03-189, dated May 25, 2006 - Trent Talbot River Property Owners Association, Marchand Lamarre and Jodi McIntosh v. Director, Ministry of the Environment; and

8. Notification of Change of Address/Ownership dated June 29, 2012, MOE Reference Number 3620-8VQPTZ acknowledging change in company address/ownership from Thomas S. McCarty, Rural Route No.1 Brechin, Ontario, L0K 1B0 to QBJR Aggregates Inc., 949 Wilson Ave., Toronto, Ontario, M3K 1G.

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

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

The Notice should also include:

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

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

This Notice must be served upon:

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

AND

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

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

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

DATED AT TORONTO this 15th day of October, 2013

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

Ontario

Ministry of the Environment, Conservation and Parks
Ministère de l'Environnement, de la Protection de la nature et des Parcs

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 7737-BH6QEA
Issue Date: October 22, 2019

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

Site Location: McCarthy Quarry
Lot 1, Concession 1,
Original Township of Mara
Township of Ramara
County of Simcoe
L0K 1B0

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

sewage works for the collection, transmission, treatment and disposal of stormwater and groundwater collecting within the confines of the Quarry, consisting of the following:

- one (1) sump, measuring 20 metres long, 10 metres wide and 3 metres deep, located at the base of the quarry floor, equipped with two (2) submersible pumps each rated at 38 litres per second with a suction intake approximately one (1) metre above the bottom of the sump, discharging to a settling pond via a 203 millimetre diameter pipeline; and

- one (1) horse-shoe shaped settling pond with an approximate volume of 14,000 cubic metres (at elevation 248.2 metres), with a Hickenbottom control structure equipped with a 150 millimetre diameter orifice plate, discharging to the roadside ditch along Concession Road 1 with ultimate discharge to the Talbot River via a private ditch.

all other controls, electrical equipment, instrumentation, piping, pumps, valves and appurtenances essential for the proper operation of the aforementioned sewage works.

all in accordance with supporting documents listed in **Schedule A**.

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

"Application" means the application for an environmental compliance approval submitted to the Ministry for approval by or on behalf of the Owner and dated August 8, 2019.

"Approval" means this environmental compliance approval, any schedules attached to it, and the Application;

"Director" means a person appointed by the Minister pursuant to section 5 of the EPA for the purposes of Part II.1 of the EPA;

"District Manager" means the District Manager of the appropriate local District Office of the Ministry, where the Works are geographically located;

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

"Ministry" means the ministry of the government of Ontario responsible for the EPA and OWRA and includes all officials, employees or other persons acting on its behalf;

"Owner" means QBJR Aggregates Inc., and includes its successors and assignees;

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

"Works" means the sewage works described in the Approval.

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

TERMS AND CONDITIONS

1. GENERAL CONDITION

(1) The Owner shall ensure that any person authorized to carry out work on or operate any aspect of the Works is notified of this Approval and the terms and conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

(2) Except as otherwise provided by these terms and conditions, the Owner shall design, build, install, operate and maintain the Works in accordance with this Approval.

(3) Where there is a conflict between a provision of this environmental compliance approval and any document submitted by the Owner, the conditions in this environmental compliance approval shall take precedence. Where there is a conflict between one or more of the documents submitted by the Owner, the Application shall take precedence

unless it is clear that the purpose of the document was to amend the Application

(4) Where there is a conflict between the documents listed in the Schedule A, and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.

(5) The terms and conditions of this Approval are severable. If any term and condition of this environmental compliance approval, or the application of any requirement of this environmental compliance approval to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this Approval shall not be affected thereby.

(6) The issuance of, and compliance with the conditions of, this Approval does not:

a) relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement, including, but not limited to, the obligation to obtain approval from the local conservation authority necessary to construct or operate the sewage Works; or

b) limit in any way the authority of the Ministry to require certain steps be taken to require the Owner to furnish any further information related to compliance with this Approval.

2. CHANGE OF OWNER

(1) The Owner shall notify the District Manager and the Director, in writing, of any of the following changes within **thirty (30) days** of the change occurring:

(a) change of address of Owner or operating authority;

(b) change of Owner or operating authority or both, including address of new Owner or operating authority, or both;

(c) change of partners where the Owner or operating authority is or at any time becomes a partnership, and a copy of the most recent declaration filed under the *Business Names Act, R.S.O. 1990, c. B.17* ; and

(d) change of name of the corporation where the Owner or operator is or at any time becomes a corporation, and a copy of the "Initial Return" or "Notice of Change" filed under the *Corporations Information Act, R.S.O. 1990, c. C.39* , shall be included in the notification to the District Manager.

(2) In the event of any change in ownership of the Works, the Owner shall notify in writing the succeeding owner of the existence of this Approval, and a copy of such notice shall be

forwarded to the District Manager.

(3) The Owner shall ensure that all communications made pursuant to this condition refer to the number at the top of this environmental compliance approval.

3. OPERATION AND MAINTENANCE

(1) The Owner shall prepare an operations manual of the Works that includes, but is not limited to, the following information:

(a) operating procedures for routine operation of the Works;

(b) inspection programs, including frequency of inspection, for the Works and the methods or tests to be employed to detect when maintenance is necessary;

(c) repair and maintenance programs, including the frequency of repair and maintenance for the Works;

(d) contingency plans and procedures for dealing with a potential spill, bypasses or any other abnormal situations, including notifying the District Manager of the situation; and

(e) procedures for receiving and responding to public complaints.

(2) The Owner shall ensure that the Works and related equipment and appurtenances which are installed or used to achieve compliance with this Approval are properly operated and maintained.

(3) The Owner shall inspect the sump, discharge pump and settling pond on a monthly basis and keep a log or record of the inspections at the Quarry.

(4) The Owner shall carry out on an as-needed basis, specific maintenance requirements like removing build-up, associated with the sump, pump and settling pond.

(5) The Owner shall, upon identification of a loss of oil and fuel, take immediate action to prevent the further occurrence of such loss and prevent the spill from entering into the sump and/or the settling pond.

(6) In furtherance of, but without limiting the generality of, the obligation imposed by subsection (2), the Owner shall ensure that equipment and material for the containment, clean-up and disposal of oil and fuel and materials contaminated with oil or fuel are kept on hand and in good repair for immediate use in the event of:

(a) loss of oil or fuel during refuelling or equipment maintenance;

(b) a spill within the meaning of Part X of the Environmental Protection Act; and/or

(c) the identification of an abnormal amount of oil or fuel in the sump and/or settling pond.

4. EFFLUENT LIMITS

(1) The Owner shall construct, operate and maintain the Works such that the concentrations of the materials named below as effluent parameters are not exceeded in the effluent from the Works.

Table 1 - Effluent Limits		
Effluent Parameter	**Daily Concentration** (milligrams per litre unless otherwise indicated)	**Monthly Average Concentration** (milligrams per litre unless otherwise indicated)
Column 1	Column 2	Column 3
Oil and Grease	30	15
Phenolics (4AAP)	0.04	0.02
Total Suspended Solids	30	15
pH of the effluent maintained between 6.0 to 9.5, inclusive, at all times		

(2) For the purposes of determining compliance with and enforcing subsection (1):

(a) non-compliance with respect to a Daily Concentration is deemed to have occurred when any single grab sample analyzed for a parameter named in Column 1 of subsection (1) is greater than the corresponding daily concentration set out in Column 2 of subsection (1);

(b) non-compliance with respect to an Monthly Average Concentration is deemed to have occurred when the arithmetic mean concentration of all samples taken in a month, analyzed for a parameter named in Column 1 of subsection (1) is greater than the corresponding monthly average concentration set out in Column 3 of subsection (1); and

(c) non-compliance with respect to pH is deemed to have occurred when any single measurement is outside of the indicated range.

5. EFFLUENT - VISUAL OBSERVATIONS

(1) Notwithstanding any other condition in this Approval, the Owner shall ensure that the effluent from the Works is essentially free of floating and settleable solids and does not contain oil or any other substance in amounts sufficient to create a visible film, sheen or foam on the receiving waters.

(2) Notwithstanding any other condition in this Approval, the Owner shall ensure that the

effluent from the Works shall not cause flooding or erosion to the downstream receiver and in particular Road flooding.

6. MONITORING AND RECORDING

The Owner shall, upon the Issuance of this Approval, carry out the following monitoring program:

(1) All samples and measurements taken for the purposes of this Approval are to be taken at a time and in a location characteristic of the quality and quantity of the effluent stream over the time period being monitored.

(2) Samples shall be collected and analyzed at the following sampling point, at the sampling frequencies and using the sample type specified for each parameter listed:

Table 2 - Effluent Monitoring	
Sample Point	Outfall of settling pond approximately 150 metres north of Concession 1 (i.e. end of pipe discharge).
Frequency	Weekly
Sample Type	Grab
Parameters	Oil and Grease, Phenolics (4AAP), and Total Suspended Solid (TSS).

Table 3 - Effluent and Surface Water Monitoring	
Sample Point	1. Outfall of settling pond approximately 150 metres north of Concession 1 (i.e. end of pipe discharge). 2. Box culvert on Eldon-Ramara Townline approximately 260 metres north of the intersection of Ramara Concession 1 and Eldon-Ramara Townline (i.e. upgradient of end of pipe discharge). 3. 80 centimetre CSP located at Concession 1 Road on McCarthy property (i.e. downgradient of end of pipe discharge).
Frequency	Semi-Annually during discharge event.
Sample Type	Grab
Parameters	Total Suspended Solids, Copper, Lead, Nickel, Zinc, Arsenic, Oil and Grease, Phenolics (4AAP), Hardness (as $CaCO_3$), Alkalinity(as $CaCO_3$), Conductivity, pH, Fluoride, Chloride, Nitrate (N), Nitrite (N), Sulphate, Calcium, Magnesium, Sodium, Potassium, Ammonia (N), Dissolved Organic Carbon, Iron, Total Kjeldahl Nitrogen, Phosphorus (Total), Cadmium, Chromium, Manganese, Anion (Sum), Cation (Sum) and Total Dissolved Solids.

(3) The methods and protocols for sampling, analysis and recording shall conform, in order of precedence, to the methods and protocols specified in the following:

(a) the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" (August 1994), ISBN 0-7778-1880-9, as amended from time to time by more recently published editions; and

(b) the publication "Standard Methods for the Examination of Water and Wastewater" (21st edition), as amended from time to time by more recently published editions.

(4) The Owner shall measure, record and calculate the discharge rate and volume from the Works on a daily basis during discharging period.

(5) The Owner shall retain for a minimum of **five (5) years** from the date of their creation, all records and information related to or resulting from the monitoring activities required by this Approval.

7. RECEIVER INSPECTION

(1) The Owner shall, at least once per year, undertake a visual inspection of the downstream ditches for evidence of erosion and/or flooding and shall report the observations in the annual report.

8. REPORTING

(1) The Owner shall report to the District Manager or designate, any exceedance of any parameter specified in condition 4 orally, forthwith, and in writing within **seven (7) days** of the exceedance.

(2) In addition to the obligations under Part X of the EPA, the Owner shall, within **ten (10) working days** of the occurrence of any reportable spill as defined in Ontario Regulation 675/98, bypass or loss of any product, by-product, intermediate product, oil, solvent, waste material or any other polluting substance into the environment, submit a full written report of the occurrence to the District Manager describing the cause and discovery of the spill or loss, clean-up and recovery measures taken, preventative measures to be taken and schedule of implementation.

(3) The Owner shall, upon request, make all manuals, plans, records, data, procedures and supporting documentation available to Ministry staff.

(4) The Owner shall submit quarterly reports of the information obtained under condition 6 within **30 days** of the end of each quarter.

(5) The Owner shall prepare, and submit to the District Manager, a **performance report**, on

an annual basis, on or before March 31st. The reports shall contain, but shall not be limited to, the following information:

(a) a summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in condition 4, including an overview of the success and adequacy of the sewage Works;

(b) a description of any operating problems encountered and corrective actions taken;

(c) a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the sewage works;

(d) a summary of any effluent quality assurance or control measures undertaken in the reporting period;

(e) any other information the District Manager requires from time to time.

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

1. Condition 1 is imposed to ensure that the Works are built and operated in the manner in which they were described for review and upon which approval was granted. This condition is also included to emphasize the precedence of Conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review. Condition 1.(6) is included to emphasize that the issuance of this Approval does not diminish any other statutory and regulatory obligations to which the Owner is subject in the construction, maintenance and operation of the Works. The Condition specifically highlights the need to obtain any necessary conservation authority approvals. The Condition also emphasizes the fact that this Approval doesn't limit the authority of the Ministry to require further information.

2. Condition 2 is included to ensure that the Ministry records are kept accurate and current with respect to approved Works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the works in compliance with it.

3. Condition 3 is included to ensure that a comprehensive operations manual governing all significant areas of operation, maintenance and repair is prepared, implemented and kept up-to-date by the Owner and made available to the Ministry. Such a manual is an integral part of the operation of the Works. Its compilation and use should assist the owner in staff training, in proper plant operation and in identifying and planning for contingencies during possible abnormal conditions. The manual will also act as a benchmark for Ministry staff when reviewing the Owner's operation of the Works. The condition is also included to ensure that the Works will be operated and maintained in a manner enabling compliance with the terms and conditions of this Approval, such that the environment is protected and deterioration, loss, injury or damage to

any person or property is minimised and/or prevented.

4. Conditions 4 and 5 are imposed to ensure that the effluent discharged from the Works to the environment meets the Ministry's effluent quality requirements thus minimizing environmental impact on the receiver.

5. Condition 6 is included to enable the Owner to evaluate and demonstrate the performance of the Works, on a continual basis, so that the Works are properly operated and maintained at a level which is consistent with the design objectives and effluent limits specified in the Approval and that the Works does not cause any impairment to the receiver.

6. Condition 7 is included in order to determine if the ongoing discharge of quarry water is having a negative impact on the downstream ditches so that abatement measures can be taken to prevent such occurrences.

7. Condition 8 is included to provide a performance record for future references, to ensure that the Ministry is made aware of problems as they arise, and to provide a compliance record for all the terms and conditions outlined in this Approval, so that the Ministry can work with the Owner in resolving any problems in a timely manner.

SCHEDULE 'A'

1. Environmental Compliance Approval Application for Industrial Sewage Works submitted by John Easton, P.Geo., Golder Associates Ltd., and signed by Mr. Anthony Rossi, Director Land Development & Government Relations, QBJR Aggregates Inc., dated August 8, 2019; and all supporting documentation and information.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). 4731-987KM8 issued on October 15, 2013.

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

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

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

The Notice should also include:

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

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

This Notice must be served upon:

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

AND

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

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

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

DATED AT TORONTO this 22nd day of October, 2019

Fariha Pannu.

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

AA/

c: District Manager, MECP Barrie District Office
John Easton, P.Geo., Golder Associates Ltd.

APPENDIX B

Permit To Take Water 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 C

Water Quality Results

Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 686266-05-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/04/30
Report #: R5690350
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9A5330
Received: 2019/04/23, 09:19

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2019/04/27	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/04/27	2019/04/27	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/04/24	2019/04/25	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/04/25	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/04/27	2019/04/27	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/04/25	2019/04/26	CAM SOP-00428	SM 23 2540D m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.

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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

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. #: 686266-05-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/04/30
Report #: R5690350
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9A5330
Received: 2019/04/23, 09:19

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: EGitej@maxxam.ca
Phone# (905)817-5829

==========

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 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 #: B9A5330
Report Date: 2019/04/30

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

RESULTS OF ANALYSES OF WATER

Maxxam ID		JMW850		
Sampling Date		2019/04/18		
COC Number		686266-05-01		
	UNITS	POND	RDL	QC Batch
Calculated Parameters				
Total Animal/Vegetable Oil and Grease	mg/L	<0.50	0.50	6082885
Inorganics				
pH	pH	8.02	N/A	6086231
Phenols-4AAP	mg/L	<0.0010	0.0010	6085185
Total Suspended Solids	mg/L	5	1	6087522
Petroleum Hydrocarbons				
Total Oil & Grease	mg/L	<0.50	0.50	6091839
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	6091843

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 #: B9A5330
Report Date: 2019/04/30

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

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	16.0°C

Results relate only to the items tested.

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 #: B9A5330
Report Date: 2019/04/30

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6085185	BMO	Matrix Spike	Phenols-4AAP	2019/04/25		99	%	80 - 120
6085185	BMO	Spiked Blank	Phenols-4AAP	2019/04/24		100	%	80 - 120
6085185	BMO	Method Blank	Phenols-4AAP	2019/04/24	<0.0010		mg/L	
6085185	BMO	RPD	Phenols-4AAP	2019/04/24	NC		%	20
6086231	GTO	Spiked Blank	pH	2019/04/25		100	%	98 - 103
6086231	GTO	RPD	pH	2019/04/25	0.13		%	N/A
6087522	MKX	QC Standard	Total Suspended Solids	2019/04/26		95	%	85 - 115
6087522	MKX	Method Blank	Total Suspended Solids	2019/04/26	<1		mg/L	
6087522	MKX	RPD	Total Suspended Solids	2019/04/26	3.5		%	25
6091839	SPK	Matrix Spike	Total Oil & Grease	2019/04/27		99	%	75 - 125
6091839	SPK	Spiked Blank	Total Oil & Grease	2019/04/27		96	%	85 - 115
6091839	SPK	RPD	Total Oil & Grease	2019/04/27	1.3		%	25
			Total Oil & Grease	2019/04/27	3.4		%	25
6091839	SPK	Method Blank	Total Oil & Grease	2019/04/27	<0.50		mg/L	
6091843	SPK	Matrix Spike	Total Oil & Grease Mineral/Synthetic	2019/04/27		93	%	75 - 125
6091843	SPK	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/04/27		95	%	85 - 115
6091843	SPK	RPD	Total Oil & Grease Mineral/Synthetic	2019/04/27	0.53		%	25
			Total Oil & Grease Mineral/Synthetic	2019/04/27	17		%	25
6091843	SPK	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/04/27	<0.50		mg/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.

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

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

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 (absolute difference <= 2x RDL).

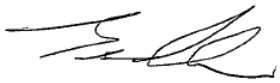
Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B9A5330
Report Date: 2019/04/30

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

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 Service Specialist

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site Location: McCarthy
Your C.O.C. #: 679278-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/05/03
Report #: R5695447
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9B0131
Received: 2019/04/26, 09:19

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2019/05/02	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/05/02	2019/05/02	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/04/27	2019/04/29	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/04/29	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/05/02	2019/05/02	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/04/27	2019/04/29	CAM SOP-00428	SM 23 2540D m

Remarks:

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Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.

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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

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Your Project #: 1407634
Site Location: McCarthy
Your C.O.C. #: 679278-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/05/03
Report #: R5695447
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9B0131
Received: 2019/04/26, 09:19

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: EGitej@maxxam.ca
Phone# (905)817-5829

==========

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Maxxam Job #: B9B0131
Report Date: 2019/05/03

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy
Sampler Initials: RT

RESULTS OF ANALYSES OF WATER

Maxxam ID			JNY535		
Sampling Date			2019/04/25 09:05		
COC Number			679278-01-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	<0.50	0.50	6089423
Inorganics					
pH	pH	**6.5:8.5**	7.87	N/A	6092057
Phenols-4AAP	mg/L	**0.001**	<0.0010	0.0010	6093098
Total Suspended Solids	mg/L	**-**	5	1	6091980
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	**-**	<0.50	0.50	6100142
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	<0.50	0.50	6100143

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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Maxxam Job #: B9B0131
Report Date: 2019/05/03

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy
Sampler Initials: RT

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	15.3°C

Results relate only to the items tested.

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Maxxam Job #: B9B0131
Report Date: 2019/05/03

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy
Sampler Initials: RT

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6091980	NB3	QC Standard	Total Suspended Solids	2019/04/29		97	%	85 - 115
6091980	NB3	Method Blank	Total Suspended Solids	2019/04/29	<1		mg/L	
6091980	NB3	RPD	Total Suspended Solids	2019/04/29	NC		%	25
6092057	GTO	Spiked Blank	pH	2019/04/29		100	%	98 - 103
6092057	GTO	RPD	pH	2019/04/29	0.33		%	N/A
6093098	BMO	Matrix Spike	Phenols-4AAP	2019/04/29		94	%	80 - 120
6093098	BMO	Spiked Blank	Phenols-4AAP	2019/04/29		96	%	80 - 120
6093098	BMO	Method Blank	Phenols-4AAP	2019/04/29	<0.0010		mg/L	
6093098	BMO	RPD	Phenols-4AAP	2019/04/29	NC		%	20
6100142	SPK	Spiked Blank	Total Oil & Grease	2019/05/02		96	%	85 - 115
6100142	SPK	RPD	Total Oil & Grease	2019/05/02	3.6		%	25
6100142	SPK	Method Blank	Total Oil & Grease	2019/05/02	<0.50		mg/L	
6100143	SPK	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/05/02		92	%	85 - 115
6100143	SPK	RPD	Total Oil & Grease Mineral/Synthetic	2019/05/02	3.2		%	25
6100143	SPK	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/05/02	<0.50		mg/L	

N/A = Not Applicable

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Maxxam Job #: B9B0131
Report Date: 2019/05/03

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy
Sampler Initials: RT

VALIDATION SIGNATURE PAGE

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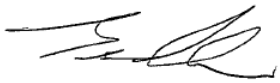

Brad Newman, Scientific Service Specialist

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: C#590331-11-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/05/10
Report #: R5705327
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9B7735
Received: 2019/05/03, 09:40

Sample Matrix: Air
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2019/05/08	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/05/08	2019/05/08	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/05/06	2019/05/07	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/05/07	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/05/08	2019/05/08	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/05/06	2019/05/07	CAM SOP-00428	SM 23 2540D m

Remarks:

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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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

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Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: C#590331-11-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/05/10
Report #: R5705327
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9B7735
Received: 2019/05/03, 09:40

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: EGitej@maxxam.ca
Phone# (905)817-5829
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Maxxam Job #: B9B7735
Report Date: 2019/05/10

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

RESULTS OF ANALYSES OF AIR

Maxxam ID		JPR036		
Sampling Date		2019/05/02 13:17		
COC Number		C#590331-11-01		
	UNITS	POND	RDL	QC Batch
Calculated Parameters				
Total Animal/Vegetable Oil and Grease	mg/L	<0.50	0.50	6104058
Inorganics				
pH	pH	8.01	N/A	6106202
Phenols-4AAP	mg/L	<0.0010	0.0010	6105336
Total Suspended Solids	mg/L	4	1	6105360
Petroleum Hydrocarbons				
Total Oil & Grease	mg/L	<0.50	0.50	6110253
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	6110256

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

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Maxxam Job #: B9B7735
Report Date: 2019/05/10

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

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	15.0°C

Results relate only to the items tested.

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Maxxam Job #: B9B7735
Report Date: 2019/05/10

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6105336	BMO	Matrix Spike	Phenols-4AAP	2019/05/07		93	%	80 - 120
6105336	BMO	Spiked Blank	Phenols-4AAP	2019/05/07		96	%	80 - 120
6105336	BMO	Method Blank	Phenols-4AAP	2019/05/07	<0.0010		mg/L	
6105336	BMO	RPD	Phenols-4AAP	2019/05/07	NC		%	20
6105360	MKX	QC Standard	Total Suspended Solids	2019/05/07		95	%	85 - 115
6105360	MKX	Method Blank	Total Suspended Solids	2019/05/07	<1		mg/L	
6105360	MKX	RPD	Total Suspended Solids	2019/05/07	NC		%	25
6106202	SAU	Spiked Blank	pH	2019/05/07		102	%	98 - 103
6106202	SAU	RPD	pH	2019/05/07	0.17		%	N/A
6110253	SPK	Spiked Blank	Total Oil & Grease	2019/05/08		100	%	85 - 115
6110253	SPK	RPD	Total Oil & Grease	2019/05/08	3.1		%	25
6110253	SPK	Method Blank	Total Oil & Grease	2019/05/08	<0.50		mg/L	
6110256	SPK	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/05/08		96	%	85 - 115
6110256	SPK	RPD	Total Oil & Grease Mineral/Synthetic	2019/05/08	3.7		%	25
6110256	SPK	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/05/08	<0.50		mg/L	

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Maxxam Job #: B9B7735
Report Date: 2019/05/10

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

VALIDATION SIGNATURE PAGE

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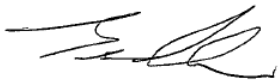

Brad Newman, Scientific Service Specialist

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site Location: McCarthy
Your C.O.C. #: 679275-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/05/17
Report #: R5715095
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9C5096
Received: 2019/05/10, 08:57

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2019/05/15	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/05/15	2019/05/15	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/05/13	2019/05/14	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/05/13	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/05/15	2019/05/15	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/05/11	2019/05/13	CAM SOP-00428	SM 23 2540D m

Remarks:

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Your Project #: 1407634
Site Location: McCarthy
Your C.O.C. #: 679275-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/05/17
Report #: R5715095
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9C5096
Received: 2019/05/10, 08:57

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: EGitej@maxxam.ca
Phone# (905)817-5829
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Maxxam Job #: B9C5096
Report Date: 2019/05/17

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy
Sampler Initials: KC

RESULTS OF ANALYSES OF WATER

Maxxam ID			JRH069		
Sampling Date			2019/05/09 15:12		
COC Number			679275-01-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	<0.50	0.50	6115318
Inorganics					
pH	pH	**6.5:8.5**	8.03	N/A	6119176
Phenols-4AAP	mg/L	**0.001**	<0.0010	0.0010	6118008
Total Suspended Solids	mg/L	**-**	3	1	6117316
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	**-**	<0.50	0.50	6122647
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	<0.50	0.50	6122664

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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Maxxam Job #: B9C5096
Report Date: 2019/05/17

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy
Sampler Initials: KC

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	16.0°C

Results relate only to the items tested.

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Maxxam Job #: B9C5096
Report Date: 2019/05/17

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy
Sampler Initials: KC

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6117316	MKX	QC Standard	Total Suspended Solids	2019/05/13		98	%	85 - 115
6117316	MKX	Method Blank	Total Suspended Solids	2019/05/13	<1		mg/L	
6117316	MKX	RPD	Total Suspended Solids	2019/05/13	11		%	25
6118008	BMO	Matrix Spike	Phenols-4AAP	2019/05/14		94	%	80 - 120
6118008	BMO	Spiked Blank	Phenols-4AAP	2019/05/13		96	%	80 - 120
6118008	BMO	Method Blank	Phenols-4AAP	2019/05/13	<0.0010		mg/L	
6118008	BMO	RPD	Phenols-4AAP	2019/05/14	NC (1)		%	20
6119176	GTO	Spiked Blank	pH	2019/05/14		100	%	98 - 103
6119176	GTO	RPD	pH	2019/05/14	0.030		%	N/A
6122647	FA	Spiked Blank	Total Oil & Grease	2019/05/15		94	%	85 - 115
6122647	FA	RPD	Total Oil & Grease	2019/05/15	2.6		%	25
6122647	FA	Method Blank	Total Oil & Grease	2019/05/15	<0.50		mg/L	
6122664	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/05/15		91	%	85 - 115
6122664	FA	RPD	Total Oil & Grease Mineral/Synthetic	2019/05/15	3.8		%	25
6122664	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/05/15	<0.50		mg/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.

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 (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 (absolute difference <= 2x RDL).

(1) Detection Limit was raised due to matrix interferences.

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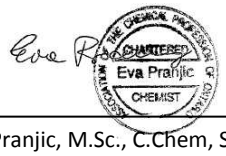
Maxxam Job #: B9C5096
Report Date: 2019/05/17

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy
Sampler Initials: KC

VALIDATION SIGNATURE PAGE

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



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

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site Location: McCarthy
Your C.O.C. #: 679280-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/05/24
Report #: R5724456
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9D2606
Received: 2019/05/17, 09:18

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2019/05/24	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/05/24	2019/05/24	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/05/18	2019/05/21	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/05/23	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/05/24	2019/05/24	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/05/22	2019/05/23	CAM SOP-00428	SM 23 2540D m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.

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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

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Your Project #: 1407634
Site Location: McCarthy
Your C.O.C. #: 679280-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/05/24
Report #: R5724456
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9D2606
Received: 2019/05/17, 09:18

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: EGitej@maxxam.ca
Phone# (905)817-5829

==========

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Maxxam Job #: B9D2606
Report Date: 2019/05/24

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy
Sampler Initials: SB

RESULTS OF ANALYSES OF WATER

Maxxam ID			JTA364		
Sampling Date			2019/05/16 13:20		
COC Number			679280-01-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	1.3	0.50	6127422
Inorganics					
pH	pH	**6.5:8.5**	7.93	N/A	6129742
Phenols-4AAP	mg/L	**0.001**	<0.0010	0.0010	6130911
Total Suspended Solids	mg/L	**-**	2	1	6133311
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	**-**	1.3	0.50	6138123
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	<0.50	0.50	6138131

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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Maxxam Job #: B9D2606
Report Date: 2019/05/24

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy
Sampler Initials: SB

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	16.0°C

Results relate only to the items tested.

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Maxxam Job #: B9D2606
Report Date: 2019/05/24

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy
Sampler Initials: SB

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6129742	GTO	Spiked Blank	pH	2019/05/21		100	%	98 - 103
6129742	GTO	RPD	pH	2019/05/21	0.47		%	N/A
6130911	BMO	Matrix Spike	Phenols-4AAP	2019/05/23		97	%	80 - 120
6130911	BMO	Spiked Blank	Phenols-4AAP	2019/05/23		101	%	80 - 120
6130911	BMO	Method Blank	Phenols-4AAP	2019/05/23	<0.0010		mg/L	
6130911	BMO	RPD	Phenols-4AAP	2019/05/23	NC		%	20
6133311	XH1	QC Standard	Total Suspended Solids	2019/05/23		97	%	85 - 115
6133311	XH1	Method Blank	Total Suspended Solids	2019/05/23	<1		mg/L	
6133311	XH1	RPD	Total Suspended Solids	2019/05/23	4.7		%	25
6138123	FA	Spiked Blank	Total Oil & Grease	2019/05/24		99	%	85 - 115
6138123	FA	RPD	Total Oil & Grease	2019/05/24	4.1		%	25
6138123	FA	Method Blank	Total Oil & Grease	2019/05/24	<0.50		mg/L	
6138131	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/05/24		95	%	85 - 115
6138131	FA	RPD	Total Oil & Grease Mineral/Synthetic	2019/05/24	3.2		%	25
6138131	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/05/24	<0.50		mg/L	

N/A = Not Applicable

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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 (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 (absolute difference <= 2x RDL).

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Maxxam Job #: B9D2606
Report Date: 2019/05/24

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy
Sampler Initials: SB

VALIDATION SIGNATURE PAGE

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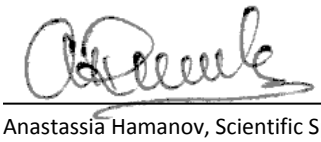

Anastassia Hamanov, Scientific Specialist

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site Location: McCarthy
Your C.O.C. #: 679279-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/05/30
Report #: R5732752
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9D9071
Received: 2019/05/24, 09:14

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2019/05/30	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/05/30	2019/05/30	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/05/25	2019/05/25	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/05/27	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/05/30	2019/05/30	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/05/27	2019/05/28	CAM SOP-00428	SM 23 2540D m

Remarks:

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Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

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Your Project #: 1407634
Site Location: McCarthy
Your C.O.C. #: 679279-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/05/30
Report #: R5732752
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9D9071
Received: 2019/05/24, 09:14

Encryption Key

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Ema Gitej, Senior Project Manager
Email: EGitej@maxxam.ca
Phone# (905)817-5829

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Maxxam Job #: B9D9071
Report Date: 2019/05/30

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy
Sampler Initials: SB

RESULTS OF ANALYSES OF WATER

Maxxam ID			JUM725		JUM725	
Sampling Date			2019/05/23 14:20		2019/05/23 14:20	
COC Number			679279-01-01		679279-01-01	
	UNITS	Criteria	POND	RDL	POND Lab-Dup	QC Batch
Calculated Parameters						
Total Animal/Vegetable Oil and Grease	mg/L	-	1.2	0.50	N/A	6138976
Inorganics						
pH	pH	**6.5:8.5**	7.99	N/A	8.05	6140695
Phenols-4AAP	mg/L	**0.001**	<0.0010	0.0010	N/A	6141759
Total Suspended Solids	mg/L	**-**	2	1	N/A	6141112
Petroleum Hydrocarbons						
Total Oil & Grease	mg/L	**-**	1.2	0.50	N/A	6149136
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	<0.50	0.50	N/A	6149145

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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Maxxam Job #: B9D9071
Report Date: 2019/05/30

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy
Sampler Initials: SB

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	16.0°C

Results relate only to the items tested.

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 #: B9D9071
Report Date: 2019/05/30

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy
Sampler Initials: SB

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6140695	NYS	Spiked Blank	pH	2019/05/25		102	%	98 - 103
6140695	NYS	RPD [JUM725-02]	pH	2019/05/25	0.73		%	N/A
6141112	NB3	QC Standard	Total Suspended Solids	2019/05/28		99	%	85 - 115
6141112	NB3	Method Blank	Total Suspended Solids	2019/05/28	<1		mg/L	
6141112	NB3	RPD	Total Suspended Solids	2019/05/28	0		%	25
6141759	BMO	Matrix Spike	Phenols-4AAP	2019/05/27		93	%	80 - 120
6141759	BMO	Spiked Blank	Phenols-4AAP	2019/05/27		94	%	80 - 120
6141759	BMO	Method Blank	Phenols-4AAP	2019/05/27	<0.0010		mg/L	
6141759	BMO	RPD	Phenols-4AAP	2019/05/27	NC		%	20
6149136	FA	Spiked Blank	Total Oil & Grease	2019/05/30		94	%	85 - 115
6149136	FA	RPD	Total Oil & Grease	2019/05/30	5.0		%	25
6149136	FA	Method Blank	Total Oil & Grease	2019/05/30	<0.50		mg/L	
6149145	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/05/30		92	%	85 - 115
6149145	FA	RPD	Total Oil & Grease Mineral/Synthetic	2019/05/30	3.2		%	25
6149145	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/05/30	<0.50		mg/L	

N/A = Not Applicable

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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 (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 (absolute difference <= 2x RDL).

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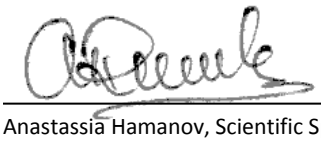
Maxxam Job #: B9D9071
Report Date: 2019/05/30

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy
Sampler Initials: SB

VALIDATION SIGNATURE PAGE

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



Anastassia Hamanov, Scientific Specialist

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Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 686266-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/06/07
Report #: R5743319
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9E6674
Received: 2019/05/31, 08:51

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2019/06/06	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/06/06	2019/06/06	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/06/01	2019/06/03	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/06/03	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/06/06	2019/06/06	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/06/01	2019/06/03	CAM SOP-00428	SM 23 2540D m

Remarks:

Bureau Veritas Laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by BV Labs are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

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Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 686266-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/06/07
Report #: R5743319
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9E6674
Received: 2019/05/31, 08:51

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: Ema.Gitej@bvlabs.com
Phone# (905)817-5829

==========

BV Labs 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.

BV Labs Job #: B9E6674
Report Date: 2019/06/07

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

RESULTS OF ANALYSES OF WATER

BV Labs ID			JWE236		
Sampling Date			2019/05/30 13:07		
COC Number			686266-01-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	<0.50	0.50	6151585
Inorganics					
pH	pH	**6.5:8.5**	7.95	N/A	6153857
Phenols-4AAP	mg/L	**0.001**	<0.0010	0.0010	6154480
Total Suspended Solids	mg/L	**-**	3	1	6153484
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	**-**	<0.50	0.50	6162041
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	<0.50	0.50	6162045

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: B9E6674
Report Date: 2019/06/07

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

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	16.7°C

Results relate only to the items tested.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: B9E6674
Report Date: 2019/06/07

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6153484	XH1	QC Standard	Total Suspended Solids	2019/06/03		95	%	85 - 115
6153484	XH1	Method Blank	Total Suspended Solids	2019/06/03	<1		mg/L	
6153484	XH1	RPD	Total Suspended Solids	2019/06/03	NC		%	25
6153857	GTO	Spiked Blank	pH	2019/06/03		100	%	98 - 103
6153857	GTO	RPD	pH	2019/06/03	0.056		%	N/A
6154480	BMO	Matrix Spike	Phenols-4AAP	2019/06/03		98	%	80 - 120
6154480	BMO	Spiked Blank	Phenols-4AAP	2019/06/03		95	%	80 - 120
6154480	BMO	Method Blank	Phenols-4AAP	2019/06/03	<0.0010		mg/L	
6154480	BMO	RPD	Phenols-4AAP	2019/06/03	NC		%	20
6162041	MA4	Spiked Blank	Total Oil & Grease	2019/06/06		97	%	85 - 115
6162041	MA4	RPD	Total Oil & Grease	2019/06/06	3.4		%	25
6162041	MA4	Method Blank	Total Oil & Grease	2019/06/06	<0.50		mg/L	
6162045	MA4	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/06/06		91	%	85 - 115
6162045	MA4	RPD	Total Oil & Grease Mineral/Synthetic	2019/06/06	5.3		%	25
6162045	MA4	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/06/06	<0.50		mg/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.

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 (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 (absolute difference <= 2x RDL).

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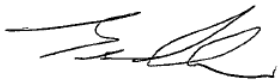
BV Labs Job #: B9E6674
Report Date: 2019/06/07

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

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 Service Specialist

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Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 686266-03-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/06/13
Report #: R5752402
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9F4678
Received: 2019/06/07, 09:02

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2019/06/12	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/06/12	2019/06/12	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/06/08	2019/06/10	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/06/10	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/06/12	2019/06/12	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/06/10	2019/06/11	CAM SOP-00428	SM 23 2540D m

Remarks:

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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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 686266-03-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/06/13
Report #: R5752402
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9F4678
Received: 2019/06/07, 09:02

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: Ema.Gitej@bvlabs.com
Phone# (905)817-5829

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BV Labs Job #: B9F4678
Report Date: 2019/06/13

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

RESULTS OF ANALYSES OF WATER

BV Labs ID			JXX391		
Sampling Date			2019/06/06 12:04		
COC Number			686266-03-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	<0.50	0.50	6165913
Inorganics					
pH	pH	**6.5:8.5**	7.79	N/A	6166520
Phenols-4AAP	mg/L	**0.001**	<0.0010	0.0010	6167307
Total Suspended Solids	mg/L	**-**	3	1	6168585
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	**-**	<0.50	0.50	6172452
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	<0.50	0.50	6172461

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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BV Labs Job #: B9F4678
Report Date: 2019/06/13

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

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	21.0°C

Results relate only to the items tested.

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BV Labs Job #: B9F4678
Report Date: 2019/06/13

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6166520	NYS	Spiked Blank	pH	2019/06/10		102	%	98 - 103
6166520	NYS	RPD	pH	2019/06/10	0.057		%	N/A
6167307	BMO	Matrix Spike	Phenols-4AAP	2019/06/10		97	%	80 - 120
6167307	BMO	Spiked Blank	Phenols-4AAP	2019/06/10		102	%	80 - 120
6167307	BMO	Method Blank	Phenols-4AAP	2019/06/10	<0.0010		mg/L	
6167307	BMO	RPD	Phenols-4AAP	2019/06/10	0		%	20
6168585	MKX	QC Standard	Total Suspended Solids	2019/06/11		100	%	85 - 115
6168585	MKX	Method Blank	Total Suspended Solids	2019/06/11	<1		mg/L	
6168585	MKX	RPD	Total Suspended Solids	2019/06/11	NC		%	25
6172452	MA4	Spiked Blank	Total Oil & Grease	2019/06/12		95	%	85 - 115
6172452	MA4	RPD	Total Oil & Grease	2019/06/12	2.6		%	25
6172452	MA4	Method Blank	Total Oil & Grease	2019/06/12	<0.50		mg/L	
6172461	MA4	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/06/12		92	%	85 - 115
6172461	MA4	RPD	Total Oil & Grease Mineral/Synthetic	2019/06/12	4.3		%	25
6172461	MA4	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/06/12	<0.50		mg/L	

N/A = Not Applicable

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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 (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 (absolute difference <= 2x RDL).

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BV Labs Job #: B9F4678
Report Date: 2019/06/13

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

VALIDATION SIGNATURE PAGE

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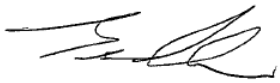

Brad Newman, Scientific Service Specialist

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Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 686266-02-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/06/20
Report #: R5763202
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9G2527
Received: 2019/06/14, 08:46

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2019/06/19	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/06/19	2019/06/19	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/06/15	2019/06/17	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/06/17	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/06/19	2019/06/19	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/06/15	2019/06/17	CAM SOP-00428	SM 23 2540D m

Remarks:

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Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 686266-02-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/06/20
Report #: R5763202
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9G2527
Received: 2019/06/14, 08:46

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: Ema.Gitej@bvlabs.com
Phone# (905)817-5829

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BV Labs Job #: B9G2527
Report Date: 2019/06/20

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

RESULTS OF ANALYSES OF WATER

BV Labs ID			JZQ920		
Sampling Date			2019/06/13 10:27		
COC Number			686266-02-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	<0.50	0.50	6177033
Inorganics					
pH	pH	**6.5:8.5**	7.75	N/A	6179021
Phenols-4AAP	mg/L	**0.001**	<0.0010	0.0010	6179945
Total Suspended Solids	mg/L	**-**	3	1	6179399
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	**-**	<0.50	0.50	6185105
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	<0.50	0.50	6185113

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: B9G2527
Report Date: 2019/06/20

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

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	16.0°C

Results relate only to the items tested.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: B9G2527
Report Date: 2019/06/20

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6179021	SAU	Spiked Blank	pH	2019/06/17		102	%	98 - 103
6179021	SAU	RPD	pH	2019/06/17	2.3		%	N/A
6179399	MKX	QC Standard	Total Suspended Solids	2019/06/17		101	%	85 - 115
6179399	MKX	Method Blank	Total Suspended Solids	2019/06/17	<1		mg/L	
6179399	MKX	RPD	Total Suspended Solids	2019/06/17	NC		%	25
6179945	BMO	Matrix Spike	Phenols-4AAP	2019/06/17		97	%	80 - 120
6179945	BMO	Spiked Blank	Phenols-4AAP	2019/06/17		98	%	80 - 120
6179945	BMO	Method Blank	Phenols-4AAP	2019/06/17	<0.0010		mg/L	
6179945	BMO	RPD	Phenols-4AAP	2019/06/17	0		%	20
6185105	MA4	Spiked Blank	Total Oil & Grease	2019/06/19		98	%	85 - 115
6185105	MA4	RPD	Total Oil & Grease	2019/06/19	3.1		%	25
6185105	MA4	Method Blank	Total Oil & Grease	2019/06/19	<0.50		mg/L	
6185113	MA4	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/06/19		96	%	85 - 115
6185113	MA4	RPD	Total Oil & Grease Mineral/Synthetic	2019/06/19	2.1		%	25
6185113	MA4	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/06/19	<0.50		mg/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.

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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 (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 (absolute difference <= 2x RDL).

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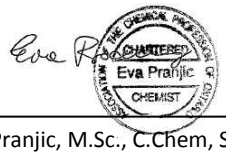
BV Labs Job #: B9G2527
Report Date: 2019/06/20

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

VALIDATION SIGNATURE PAGE

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



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

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Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 590331-05-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/06/27
Report #: R5774102
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9H0731
Received: 2019/06/21, 09:25

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2019/06/26	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/06/26	2019/06/26	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/06/22	2019/06/24	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/06/24	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/06/26	2019/06/26	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/06/22	2019/06/24	CAM SOP-00428	SM 23 2540D m

Remarks:

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Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 590331-05-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/06/27
Report #: R5774102
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9H0731
Received: 2019/06/21, 09:25

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: Ema.Gitej@bvlabs.com
Phone# (905)817-5829

==========

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BV Labs Job #: B9H0731
Report Date: 2019/06/27

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

RESULTS OF ANALYSES OF WATER

BV Labs ID		KBO215		
Sampling Date		2019/06/20 10:34		
COC Number		590331-05-01		
	UNITS	POND	RDL	QC Batch
Calculated Parameters				
Total Animal/Vegetable Oil and Grease	mg/L	<0.50	0.50	6191391
Inorganics				
pH	pH	7.78	N/A	6192425
Phenols-4AAP	mg/L	<0.0010	0.0010	6192818
Total Suspended Solids	mg/L	3	1	6192349
Petroleum Hydrocarbons				
Total Oil & Grease	mg/L	<0.50	0.50	6197677
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	6197682

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

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BV Labs Job #: B9H0731
Report Date: 2019/06/27

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

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	21.0°C

Results relate only to the items tested.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: B9H0731
Report Date: 2019/06/27

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6192349	XH1	QC Standard	Total Suspended Solids	2019/06/24		96	%	85 - 115
6192349	XH1	Method Blank	Total Suspended Solids	2019/06/24	<1		mg/L	
6192349	XH1	RPD	Total Suspended Solids	2019/06/24	NC		%	25
6192425	SAU	Spiked Blank	pH	2019/06/24		102	%	98 - 103
6192425	SAU	RPD	pH	2019/06/24	0.30		%	N/A
6192818	LHA	Matrix Spike	Phenols-4AAP	2019/06/24		94	%	80 - 120
6192818	LHA	Spiked Blank	Phenols-4AAP	2019/06/24		96	%	80 - 120
6192818	LHA	Method Blank	Phenols-4AAP	2019/06/24	<0.0010		mg/L	
6192818	LHA	RPD	Phenols-4AAP	2019/06/24	5.7		%	20
6197677	MA4	Spiked Blank	Total Oil & Grease	2019/06/26		99	%	85 - 115
6197677	MA4	RPD	Total Oil & Grease	2019/06/26	4.1		%	25
6197677	MA4	Method Blank	Total Oil & Grease	2019/06/26	<0.50		mg/L	
6197682	MA4	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/06/26		97	%	85 - 115
6197682	MA4	RPD	Total Oil & Grease Mineral/Synthetic	2019/06/26	3.2		%	25
6197682	MA4	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/06/26	<0.50		mg/L	

N/A = Not Applicable

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

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

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 (absolute difference <= 2x RDL).

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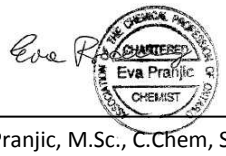
BV Labs Job #: B9H0731
Report Date: 2019/06/27

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

VALIDATION SIGNATURE PAGE

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



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

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Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 686266-04-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/07/05
Report #: R5784803
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9H8263
Received: 2019/06/28, 09:16

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2019/07/05	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/07/05	2019/07/05	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/06/29	2019/07/02	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/07/04	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/07/05	2019/07/05	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/06/29	2019/07/02	CAM SOP-00428	SM 23 2540D m

Remarks:

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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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 686266-04-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/07/05
Report #: R5784803
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9H8263
Received: 2019/06/28, 09:16

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: Ema.Gitej@bvlabs.com
Phone# (905)817-5829

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BV Labs Job #: B9H8263
Report Date: 2019/07/05

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

RESULTS OF ANALYSES OF WATER

BV Labs ID			KDG804		
Sampling Date			2019/06/27 12:00		
COC Number			686266-04-01		
	UNITS	Criteria	S90331 POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	1.8	0.50	6203083
Inorganics					
pH	pH	**6.5:8.5**	7.92	N/A	6204213
Phenols-4AAP	mg/L	**0.001**	<0.0010	0.0010	6206068
Total Suspended Solids	mg/L	**-**	4	1	6204964
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	**-**	1.8	0.50	6212433
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	<0.50	0.50	6212434

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: B9H8263
Report Date: 2019/07/05

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

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	21.3°C

Results relate only to the items tested.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: B9H8263
Report Date: 2019/07/05

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6204213	SAU	Spiked Blank	pH	2019/07/02		102	%	98 - 103
6204213	SAU	RPD	pH	2019/07/02	0.0075		%	N/A
6204964	MKX	QC Standard	Total Suspended Solids	2019/07/02		100	%	85 - 115
6204964	MKX	Method Blank	Total Suspended Solids	2019/07/02	<1		mg/L	
6204964	MKX	RPD	Total Suspended Solids	2019/07/02	2.3		%	25
6206068	BMO	Matrix Spike	Phenols-4AAP	2019/07/04		99	%	80 - 120
6206068	BMO	Spiked Blank	Phenols-4AAP	2019/07/04		97	%	80 - 120
6206068	BMO	Method Blank	Phenols-4AAP	2019/07/04	<0.0010		mg/L	
6206068	BMO	RPD	Phenols-4AAP	2019/07/04	NC		%	20
6212433	FA	Spiked Blank	Total Oil & Grease	2019/07/05		96	%	85 - 115
6212433	FA	RPD	Total Oil & Grease	2019/07/05	4.1		%	25
6212433	FA	Method Blank	Total Oil & Grease	2019/07/05	<0.50		mg/L	
6212434	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/07/05		93	%	85 - 115
6212434	FA	RPD	Total Oil & Grease Mineral/Synthetic	2019/07/05	3.2		%	25
6212434	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/07/05	<0.50		mg/L	

N/A = Not Applicable

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BV Labs Job #: B9H8263
Report Date: 2019/07/05

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

VALIDATION SIGNATURE PAGE

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Brad Newman, Scientific Service Specialist

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Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 670789-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/07/10
Report #: R5791375
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9I4497
Received: 2019/07/05, 08:46

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2019/07/10	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/07/10	2019/07/10	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/07/06	2019/07/08	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/07/08	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/07/10	2019/07/10	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/07/09	2019/07/10	CAM SOP-00428	SM 23 2540D m

Remarks:

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Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 670789-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/07/10
Report #: R5791375
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9I4497
Received: 2019/07/05, 08:46

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: Ema.Gitej@bvlabs.com
Phone# (905)817-5829

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BV Labs Job #: B9I4497
Report Date: 2019/07/10

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

RESULTS OF ANALYSES OF WATER

BV Labs ID			KEO496		
Sampling Date			2019/07/04 12:07		
COC Number			670789-01-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	0.90	0.50	6212663
Inorganics					
pH	pH	**6.5:8.5**	7.94	N/A	6215259
Phenols-4AAP	mg/L	**0.001**	<0.0010	0.0010	6215908
Total Suspended Solids	mg/L	**-**	2	1	6219303
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	**-**	0.90	0.50	6220063
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	<0.50	0.50	6220076

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: B9I4497
Report Date: 2019/07/10

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

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	27.0°C

Results relate only to the items tested.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: B9I4497
Report Date: 2019/07/10

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6215259	SAU	Spiked Blank	pH	2019/07/08		101	%	98 - 103
6215259	SAU	RPD	pH	2019/07/08	0.083		%	N/A
6215908	BMO	Matrix Spike	Phenols-4AAP	2019/07/08		97	%	80 - 120
6215908	BMO	Spiked Blank	Phenols-4AAP	2019/07/08		101	%	80 - 120
6215908	BMO	Method Blank	Phenols-4AAP	2019/07/08	<0.0010		mg/L	
6215908	BMO	RPD	Phenols-4AAP	2019/07/08	NC		%	20
6219303	XH1	QC Standard	Total Suspended Solids	2019/07/10		95	%	85 - 115
6219303	XH1	Method Blank	Total Suspended Solids	2019/07/10	<1		mg/L	
6219303	XH1	RPD	Total Suspended Solids	2019/07/10	NC		%	25
6220063	FA	Spiked Blank	Total Oil & Grease	2019/07/10		95	%	85 - 115
6220063	FA	RPD	Total Oil & Grease	2019/07/10	3.9		%	25
6220063	FA	Method Blank	Total Oil & Grease	2019/07/10	<0.50		mg/L	
6220076	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/07/10		91	%	85 - 115
6220076	FA	RPD	Total Oil & Grease Mineral/Synthetic	2019/07/10	3.8		%	25
6220076	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/07/10	<0.50		mg/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.

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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 (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 (absolute difference <= 2x RDL).

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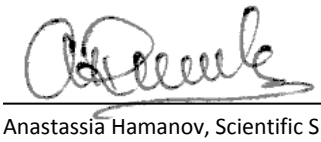
BV Labs Job #: B9I4497
Report Date: 2019/07/10

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

VALIDATION SIGNATURE PAGE

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



Anastassia Hamanov, Scientific Specialist

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Your Project #: 1407634
Site Location: McCarthy
Your C.O.C. #: 679277-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/07/18
Report #: R5803362
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9J1789
Received: 2019/07/12, 09:21

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2019/07/17	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/07/17	2019/07/17	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/07/12	2019/07/15	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/07/15	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/07/17	2019/07/17	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/07/13	2019/07/15	CAM SOP-00428	SM 23 2540D m

Remarks:

Bureau Veritas Laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by BV Labs are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by BV Labs, unless otherwise agreed in writing. BV Labs is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Your Project #: 1407634
Site Location: McCarthy
Your C.O.C. #: 679277-01-01

Attention: Dawn Hoyle/Jamie Bonany

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121 Commerce Park Drive
Unit L
Barrie, ON
CANADA L4N 8X1

Report Date: 2019/07/18
Report #: R5803362
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9J1789
Received: 2019/07/12, 09:21

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: Ema.Gitej@bvlabs.com
Phone# (905)817-5829

==========

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BV Labs Job #: B9J1789
Report Date: 2019/07/18

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy
Sampler Initials: GW

RESULTS OF ANALYSES OF WATER

BV Labs ID			KGD770		KGD770	
Sampling Date			2019/07/11 14:10		2019/07/11 14:10	
COC Number			679277-01-01		679277-01-01	
	UNITS	Criteria	POND	RDL	POND Lab-Dup	QC Batch
Calculated Parameters						
Total Animal/Vegetable Oil and Grease	mg/L	-	<0.50	0.50	N/A	6224684
Inorganics						
pH	pH	**6.5:8.5**	8.09	N/A	8.09	6226495
Phenols-4AAP	mg/L	**0.001**	<0.0010	0.0010	N/A	6228398
Total Suspended Solids	mg/L	**-**	2	1	N/A	6226878
Petroleum Hydrocarbons						
Total Oil & Grease	mg/L	**-**	<0.50	0.50	N/A	6232114
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	<0.50	0.50	N/A	6232115

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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BV Labs Job #: B9J1789
Report Date: 2019/07/18

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy
Sampler Initials: GW

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	23.3°C

Results relate only to the items tested.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: B9J1789
Report Date: 2019/07/18

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy
Sampler Initials: GW

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6226495	SAU	Spiked Blank	pH	2019/07/15		102	%	98 - 103
6226495	SAU	RPD [KGD770-03]	pH	2019/07/15	0.043		%	N/A
6226878	NB3	QC Standard	Total Suspended Solids	2019/07/15		99	%	85 - 115
6226878	NB3	Method Blank	Total Suspended Solids	2019/07/15	<1		mg/L	
6226878	NB3	RPD	Total Suspended Solids	2019/07/15	8.7		%	25
6228398	LHA	Matrix Spike	Phenols-4AAP	2019/07/15		99	%	80 - 120
6228398	LHA	Spiked Blank	Phenols-4AAP	2019/07/15		100	%	80 - 120
6228398	LHA	Method Blank	Phenols-4AAP	2019/07/15	<0.0010		mg/L	
6228398	LHA	RPD	Phenols-4AAP	2019/07/15	NC		%	20
6232114	SPK	Spiked Blank	Total Oil & Grease	2019/07/17		100	%	85 - 115
6232114	SPK	RPD	Total Oil & Grease	2019/07/17	2.0		%	25
6232114	SPK	Method Blank	Total Oil & Grease	2019/07/17	<0.50		mg/L	
6232115	SPK	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/07/17		93	%	85 - 115
6232115	SPK	RPD	Total Oil & Grease Mineral/Synthetic	2019/07/17	2.1		%	25
6232115	SPK	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/07/17	<0.50		mg/L	

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BV Labs Job #: B9J1789
Report Date: 2019/07/18

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy
Sampler Initials: GW

VALIDATION SIGNATURE PAGE

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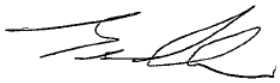

Brad Newman, Scientific Service Specialist

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Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 724340-03-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/07/31
Report #: R5821681
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9K6589
Received: 2019/07/26, 09:13

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2019/07/31	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/07/31	2019/07/31	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/07/26	2019/07/29	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/07/29	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/07/31	2019/07/31	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/07/27	2019/07/29	CAM SOP-00428	SM 23 2540D m

Remarks:

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Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 724340-03-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/07/31
Report #: R5821681
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9K6589
Received: 2019/07/26, 09:13

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: Ema.Gitej@bvlabs.com
Phone# (905)817-5829

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BV Labs Job #: B9K6589
Report Date: 2019/07/31

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

RESULTS OF ANALYSES OF WATER

BV Labs ID			KJF743		
Sampling Date			2019/07/25 13:38		
COC Number			724340-03-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	<0.50	0.50	6249352
Inorganics					
pH	pH	**6.5:8.5**	8.32	N/A	6250065
Phenols-4AAP	mg/L	**0.001**	<0.0010	0.0010	6252125
Total Suspended Solids	mg/L	**-**	3	1	6250928
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	**-**	<0.50	0.50	6256631
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	<0.50	0.50	6256632

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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BV Labs Job #: B9K6589
Report Date: 2019/07/31

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

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	23.0°C

Results relate only to the items tested.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: B9K6589
Report Date: 2019/07/31

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6250065	NYS	Spiked Blank	pH	2019/07/29		102	%	98 - 103
6250065	NYS	RPD	pH	2019/07/29	0.25		%	N/A
6250928	NB3	QC Standard	Total Suspended Solids	2019/07/29		100	%	85 - 115
6250928	NB3	Method Blank	Total Suspended Solids	2019/07/29	<1		mg/L	
6250928	NB3	RPD	Total Suspended Solids	2019/07/29	0		%	25
6252125	BMO	Matrix Spike	Phenols-4AAP	2019/07/29		103	%	80 - 120
6252125	BMO	Spiked Blank	Phenols-4AAP	2019/07/29		102	%	80 - 120
6252125	BMO	Method Blank	Phenols-4AAP	2019/07/29	<0.0010		mg/L	
6252125	BMO	RPD	Phenols-4AAP	2019/07/29	0		%	20
6256631	SPK	Spiked Blank	Total Oil & Grease	2019/07/31		94	%	85 - 115
6256631	SPK	RPD	Total Oil & Grease	2019/07/31	2.4		%	25
6256631	SPK	Method Blank	Total Oil & Grease	2019/07/31	<0.50		mg/L	
6256632	SPK	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/07/31		91	%	85 - 115
6256632	SPK	RPD	Total Oil & Grease Mineral/Synthetic	2019/07/31	3.8		%	25
6256632	SPK	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/07/31	<0.50		mg/L	

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BV Labs Job #: B9K6589
Report Date: 2019/07/31

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

VALIDATION SIGNATURE PAGE

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Cristina Carriere

Cristina Carriere, Senior Scientific Specialist

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site Location: MCCCARTHY
Your C.O.C. #: 715650-01-01

Attention: Jamie Bonany

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

Report Date: 2019/05/17
Report #: R5715097
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9C5330
Received: 2019/05/10, 08:51

Sample Matrix: Water
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	3	N/A	2019/05/14	CAM SOP-00448	SM 23 2320 B m
Chloride by Automated Colourimetry	3	N/A	2019/05/14	CAM SOP-00463	SM 4500-Cl E m
Conductivity	3	N/A	2019/05/14	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	3	N/A	2019/05/14	CAM SOP-00446	SM 23 5310 B m
Fluoride	3	2019/05/13	2019/05/14	CAM SOP-00449	SM 23 4500-F C m
Hardness (calculated as CaCO3)	3	N/A	2019/05/15	CAM SOP 00102/00408/00447	SM 2340 B
Lab Filtered Metals by ICPMS	3	2019/05/14	2019/05/15	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS	3	N/A	2019/05/14	CAM SOP-00447	EPA 6020B m
Anion and Cation Sum	3	N/A	2019/05/15		
Total Ammonia-N	2	N/A	2019/05/14	CAM SOP-00441	EPA GS I-2522-90 m
Total Ammonia-N	1	N/A	2019/05/15	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	3	N/A	2019/05/14	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Total Oil and Grease	3	2019/05/16	2019/05/16	CAM SOP-00326	EPA1664B m,SM5520A m
pH	3	2019/05/13	2019/05/14	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	3	N/A	2019/05/13	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	3	N/A	2019/05/14	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids	3	2019/05/13	2019/05/14	CAM SOP-00428	SM 23 2540C m
Total Kjeldahl Nitrogen in Water	3	2019/05/14	2019/05/15	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	3	2019/05/14	2019/05/15	CAM SOP-00407	SM 23 4500 P B H m
Total Suspended Solids	3	2019/05/13	2019/05/14	CAM SOP-00428	SM 23 2540D m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

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 Location: MCCCARTHY
Your C.O.C. #: 715650-01-01

Attention: Jamie Bonany

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

Report Date: 2019/05/17
Report #: R5715097
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9C5330
Received: 2019/05/10, 08:51

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.

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.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: EGitej@maxxam.ca
Phone# (905)817-5829
==========
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 #: B9C5330
Report Date: 2019/05/17

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCCARTHY
Sampler Initials: SDP

RESULTS OF ANALYSES OF WATER

Maxxam ID			JRI757		JRI758			JRI758		
Sampling Date			2019/05/08 03:45		2019/05/08 03:35			2019/05/08 03:35		
COC Number			715650-01-01		715650-01-01			715650-01-01		
	UNITS	Criteria	POND	QC Batch	SW1	RDL	QC Batch	SW1 Lab-Dup	RDL	QC Batch
Calculated Parameters										
Anion Sum	me/L	-	14.1	6115808	14.0	N/A	6115808			
Cation Sum	me/L	-	14.9	6115808	15.1	N/A	6115808			
Hardness (CaCO3)	mg/L	-	460	6115619	460	1.0	6115619			
Inorganics										
Total Ammonia-N	mg/L	-	<0.050	6119255	<0.050	0.050	6119298			
Conductivity	mS/cm	-	1.43	6118641	1.43	0.001	6118641			
Total Dissolved Solids	mg/L	-	910	6119345	850	10	6119345			
Fluoride (F-)	mg/L	-	0.39	6118642	0.37	0.10	6118642			
Total Kjeldahl Nitrogen (TKN)	mg/L	-	0.32	6120923	0.24	0.10	6120923	0.23	0.10	6120923
Dissolved Organic Carbon	mg/L	-	5.7	6118252	5.8	0.50	6118252			
pH	pH	6.5:8.5	7.98	6118644	8.07		6118644			
Phenols-4AAP	mg/L	0.001	<0.0010	6117996	<0.0010	0.0010	6117996			
Total Phosphorus	mg/L	0.01	**0.020**	6121215	**0.019**	0.004	6121215			
Total Suspended Solids	mg/L	-	<10	6118217	<10	10	6118217			
Dissolved Sulphate (SO4)	mg/L	-	200	6119202	200	1.0	6119202	200	1.0	6119202
Alkalinity (Total as CaCO3)	mg/L	-	210	6118631	210	1.0	6118631			
Dissolved Chloride (Cl-)	mg/L	-	200	6119195	200	2.0	6119195	190	2.0	6119195
Nitrite (N)	mg/L	-	0.050	6118458	0.056	0.010	6118458			
Nitrate (N)	mg/L	-	1.94	6118458	2.02	0.10	6118458			
Nitrate + Nitrite (N)	mg/L	-	1.99	6118458	2.08	0.10	6118458			
Petroleum Hydrocarbons										
Total Oil & Grease	mg/L	-	<0.50	6124650	<0.50	0.50	6124650			

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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Maxxam Job #: B9C5330
Report Date: 2019/05/17

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCCARTHY
Sampler Initials: SDP

RESULTS OF ANALYSES OF WATER

Maxxam ID			JRI759		
Sampling Date			2019/05/08 03:30		
COC Number			715650-01-01		
	UNITS	Criteria	SW2	RDL	QC Batch
Calculated Parameters					
Anion Sum	me/L	-	9.14	N/A	6115808
Cation Sum	me/L	-	9.53	N/A	6115808
Hardness (CaCO3)	mg/L	-	410	1.0	6115619
Inorganics					
Total Ammonia-N	mg/L	-	<0.050	0.050	6119416
Conductivity	mS/cm	-	0.859	0.001	6118641
Total Dissolved Solids	mg/L	-	500	10	6119345
Fluoride (F-)	mg/L	-	0.10	0.10	6118642
Total Kjeldahl Nitrogen (TKN)	mg/L	-	0.41	0.10	6120923
Dissolved Organic Carbon	mg/L	-	6.8	0.50	6118252
pH	pH	6.5:8.5	7.86		6118644
Phenols-4AAP	mg/L	0.001	**0.0015**	0.0010	6117996
Total Phosphorus	mg/L	0.01	**0.022**	0.004	6121215
Total Suspended Solids	mg/L	-	<10	10	6118217
Dissolved Sulphate (SO4)	mg/L	-	47	1.0	6119202
Alkalinity (Total as CaCO3)	mg/L	-	350	1.0	6118631
Dissolved Chloride (Cl-)	mg/L	-	39	1.0	6119195
Nitrite (N)	mg/L	-	<0.010	0.010	6118458
Nitrate (N)	mg/L	-	<0.10	0.10	6118458
Nitrate + Nitrite (N)	mg/L	-	<0.10	0.10	6118458
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	-	<0.50	0.50	6124650

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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Maxxam Job #: B9C5330
Report Date: 2019/05/17

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCCARTHY
Sampler Initials: SDP

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID			JRI757	JRI758	JRI759			JRI759		
Sampling Date			2019/05/08 03:45	2019/05/08 03:35	2019/05/08 03:30			2019/05/08 03:30		
COC Number			715650-01-01	715650-01-01	715650-01-01			715650-01-01		
	UNITS	Criteria	POND	SW1	SW2	RDL	QC Batch	SW2 Lab-Dup	RDL	QC Batch
Metals										
Total Arsenic (As)	ug/L	100	<1.0	<1.0	<1.0	1.0	6118977			
Total Cadmium (Cd)	ug/L	0.2	<0.10	<0.10	<0.10	0.10	6118977			
Dissolved Calcium (Ca)	ug/L	-	140000	130000	140000	200	6120458	150000	200	6120458
Total Calcium (Ca)	ug/L	-	140000	140000	150000	200	6118977			
Total Chromium (Cr)	ug/L	-	<5.0	<5.0	<5.0	5.0	6118977			
Total Copper (Cu)	ug/L	5	<1.0	<1.0	<1.0	1.0	6118977			
Total Iron (Fe)	ug/L	300	280	210	**480**	100	6118977			
Total Lead (Pb)	ug/L	5	<0.50	<0.50	<0.50	0.50	6118977			
Dissolved Magnesium (Mg)	ug/L	-	29000	30000	18000	50	6120458	18000	50	6120458
Total Magnesium (Mg)	ug/L	-	30000	31000	18000	50	6118977			
Total Manganese (Mn)	ug/L	-	54	44	95	2.0	6118977			
Total Nickel (Ni)	ug/L	25	1.4	1.4	<1.0	1.0	6118977			
Dissolved Potassium (K)	ug/L	-	8500	8800	2900	200	6120458	3100	200	6120458
Total Potassium (K)	ug/L	-	8500	8800	3000	200	6118977			
Dissolved Sodium (Na)	ug/L	-	130000	130000	27000	100	6120458	29000	100	6120458
Total Sodium (Na)	ug/L	-	130000	130000	28000	100	6118977			
Total Zinc (Zn)	ug/L	30	<5.0	<5.0	<5.0	5.0	6118977			

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999

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Maxxam Job #: B9C5330
Report Date: 2019/05/17

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCCARTHY
Sampler Initials: SDP

TEST SUMMARY

Maxxam ID: JRI757
Sample ID: POND
Matrix: Water

Collected: 2019/05/08
Shipped:
Received: 2019/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6118631	N/A	2019/05/14	Surinder Rai
Chloride by Automated Colourimetry	KONE	6119195	N/A	2019/05/14	Alina Dobreanu
Conductivity	AT	6118641	N/A	2019/05/14	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6118252	N/A	2019/05/14	Mandeep Kaur
Fluoride	ISE	6118642	2019/05/13	2019/05/14	Surinder Rai
Hardness (calculated as CaCO3)		6115619	N/A	2019/05/15	Automated Statchk
Lab Filtered Metals by ICPMS	ICP/MS	6120458	2019/05/14	2019/05/15	Arefa Dabhad
Total Metals Analysis by ICPMS	ICP/MS	6118977	N/A	2019/05/14	Arefa Dabhad
Anion and Cation Sum	CALC	6115808	N/A	2019/05/15	Automated Statchk
Total Ammonia-N	LACH/NH4	6119255	N/A	2019/05/14	Chandra Nandlal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6118458	N/A	2019/05/14	Chandra Nandlal
Total Oil and Grease	BAL	6124650	2019/05/16	2019/05/16	Mansoor Ahmed
pH	AT	6118644	2019/05/13	2019/05/14	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6117996	N/A	2019/05/13	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	6119202	N/A	2019/05/14	Alina Dobreanu
Total Dissolved Solids	BAL	6119345	2019/05/13	2019/05/14	Nilam Borole
Total Kjeldahl Nitrogen in Water	SKAL	6120923	2019/05/14	2019/05/15	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6121215	2019/05/14	2019/05/15	Louise Harding
Total Suspended Solids	BAL	6118217	2019/05/13	2019/05/14	Mandeep Kaur

Maxxam ID: JRI758
Sample ID: SW1
Matrix: Water

Collected: 2019/05/08
Shipped:
Received: 2019/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6118631	N/A	2019/05/14	Surinder Rai
Chloride by Automated Colourimetry	KONE	6119195	N/A	2019/05/14	Alina Dobreanu
Conductivity	AT	6118641	N/A	2019/05/14	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6118252	N/A	2019/05/14	Mandeep Kaur
Fluoride	ISE	6118642	2019/05/13	2019/05/14	Surinder Rai
Hardness (calculated as CaCO3)		6115619	N/A	2019/05/15	Automated Statchk
Lab Filtered Metals by ICPMS	ICP/MS	6120458	2019/05/14	2019/05/15	Arefa Dabhad
Total Metals Analysis by ICPMS	ICP/MS	6118977	N/A	2019/05/14	Arefa Dabhad
Anion and Cation Sum	CALC	6115808	N/A	2019/05/15	Automated Statchk
Total Ammonia-N	LACH/NH4	6119298	N/A	2019/05/15	Chandra Nandlal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6118458	N/A	2019/05/14	Chandra Nandlal
Total Oil and Grease	BAL	6124650	2019/05/16	2019/05/16	Mansoor Ahmed
pH	AT	6118644	2019/05/13	2019/05/14	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6117996	N/A	2019/05/13	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	6119202	N/A	2019/05/14	Alina Dobreanu
Total Dissolved Solids	BAL	6119345	2019/05/13	2019/05/14	Nilam Borole
Total Kjeldahl Nitrogen in Water	SKAL	6120923	2019/05/14	2019/05/15	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6121215	2019/05/14	2019/05/15	Louise Harding
Total Suspended Solids	BAL	6118217	2019/05/13	2019/05/14	Mandeep Kaur

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Maxxam Job #: B9C5330
Report Date: 2019/05/17

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCCARTHY
Sampler Initials: SDP

TEST SUMMARY

Maxxam ID: JRI758 Dup
Sample ID: SW1
Matrix: Water

Collected: 2019/05/08
Shipped:
Received: 2019/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	6119195	N/A	2019/05/14	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6119202	N/A	2019/05/14	Alina Dobreanu
Total Kjeldahl Nitrogen in Water	SKAL	6120923	2019/05/14	2019/05/15	Shivani Shivani

Maxxam ID: JRI759
Sample ID: SW2
Matrix: Water

Collected: 2019/05/08
Shipped:
Received: 2019/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6118631	N/A	2019/05/14	Surinder Rai
Chloride by Automated Colourimetry	KONE	6119195	N/A	2019/05/14	Alina Dobreanu
Conductivity	AT	6118641	N/A	2019/05/14	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6118252	N/A	2019/05/14	Mandeep Kaur
Fluoride	ISE	6118642	2019/05/13	2019/05/14	Surinder Rai
Hardness (calculated as CaCO3)		6115619	N/A	2019/05/15	Automated Statchk
Lab Filtered Metals by ICPMS	ICP/MS	6120458	2019/05/14	2019/05/15	Arefa Dabhad
Total Metals Analysis by ICPMS	ICP/MS	6118977	N/A	2019/05/14	Arefa Dabhad
Anion and Cation Sum	CALC	6115808	N/A	2019/05/15	Automated Statchk
Total Ammonia-N	LACH/NH4	6119416	N/A	2019/05/14	Chandra Nandlal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6118458	N/A	2019/05/14	Chandra Nandlal
Total Oil and Grease	BAL	6124650	2019/05/16	2019/05/16	Mansoor Ahmed
pH	AT	6118644	2019/05/13	2019/05/14	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6117996	N/A	2019/05/13	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	6119202	N/A	2019/05/14	Alina Dobreanu
Total Dissolved Solids	BAL	6119345	2019/05/13	2019/05/14	Nilam Borole
Total Kjeldahl Nitrogen in Water	SKAL	6120923	2019/05/14	2019/05/15	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6121215	2019/05/14	2019/05/15	Louise Harding
Total Suspended Solids	BAL	6118217	2019/05/13	2019/05/14	Mandeep Kaur

Maxxam ID: JRI759 Dup
Sample ID: SW2
Matrix: Water

Collected: 2019/05/08
Shipped:
Received: 2019/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Lab Filtered Metals by ICPMS	ICP/MS	6120458	2019/05/14	2019/05/15	Arefa Dabhad

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Maxxam Job #: B9C5330
Report Date: 2019/05/17

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCCARTHY
Sampler Initials: SDP

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	6.7°C
Package 2	8.0°C
Package 3	8.0°C

Results relate only to the items tested.

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Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B9C5330
Report Date: 2019/05/17

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCCARTHY
Sampler Initials: SDP

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6117996	BMO	Matrix Spike	Phenols-4AAP	2019/05/13		96	%	80 - 120
6117996	BMO	Spiked Blank	Phenols-4AAP	2019/05/13		96	%	80 - 120
6117996	BMO	Method Blank	Phenols-4AAP	2019/05/13	<0.0010		mg/L	
6117996	BMO	RPD	Phenols-4AAP	2019/05/13	NC		%	20
6118217	MKX	QC Standard	Total Suspended Solids	2019/05/14		96	%	85 - 115
6118217	MKX	Method Blank	Total Suspended Solids	2019/05/14	<10		mg/L	
6118217	MKX	RPD	Total Suspended Solids	2019/05/14	6.7		%	25
6118252	KRM	Matrix Spike	Dissolved Organic Carbon	2019/05/14		91	%	80 - 120
6118252	KRM	Spiked Blank	Dissolved Organic Carbon	2019/05/14		94	%	80 - 120
6118252	KRM	Method Blank	Dissolved Organic Carbon	2019/05/14	<0.50		mg/L	
6118252	KRM	RPD	Dissolved Organic Carbon	2019/05/14	1.3		%	20
6118458	C_N	Matrix Spike	Nitrite (N)	2019/05/14		107	%	80 - 120
			Nitrate (N)	2019/05/14		104	%	80 - 120
6118458	C_N	Spiked Blank	Nitrite (N)	2019/05/14		103	%	80 - 120
			Nitrate (N)	2019/05/14		104	%	80 - 120
6118458	C_N	Method Blank	Nitrite (N)	2019/05/14	<0.010		mg/L	
			Nitrate (N)	2019/05/14	<0.10		mg/L	
6118458	C_N	RPD	Nitrite (N)	2019/05/14	NC		%	20
			Nitrate (N)	2019/05/14	NC		%	20
6118631	SAU	Spiked Blank	Alkalinity (Total as CaCO3)	2019/05/14		96	%	85 - 115
6118631	SAU	Method Blank	Alkalinity (Total as CaCO3)	2019/05/14	<1.0		mg/L	
6118631	SAU	RPD	Alkalinity (Total as CaCO3)	2019/05/14	0.47		%	20
6118641	SAU	Spiked Blank	Conductivity	2019/05/14		100	%	85 - 115
6118641	SAU	Method Blank	Conductivity	2019/05/14	<0.001		mS/cm	
6118641	SAU	RPD	Conductivity	2019/05/14	0.55		%	25
6118642	SAU	Matrix Spike	Fluoride (F-)	2019/05/14		105	%	80 - 120
6118642	SAU	Spiked Blank	Fluoride (F-)	2019/05/14		101	%	80 - 120
6118642	SAU	Method Blank	Fluoride (F-)	2019/05/14	<0.10		mg/L	
6118642	SAU	RPD	Fluoride (F-)	2019/05/14	0.94		%	20
6118644	SAU	Spiked Blank	pH	2019/05/14		102	%	98 - 103
6118644	SAU	RPD	pH	2019/05/14	0.16		%	N/A
6118977	ADA	Matrix Spike	Total Arsenic (As)	2019/05/14		102	%	80 - 120
			Total Cadmium (Cd)	2019/05/14		100	%	80 - 120
			Total Calcium (Ca)	2019/05/14		NC	%	80 - 120
			Total Chromium (Cr)	2019/05/14		97	%	80 - 120
			Total Copper (Cu)	2019/05/14		102	%	80 - 120
			Total Iron (Fe)	2019/05/14		101	%	80 - 120
			Total Lead (Pb)	2019/05/14		95	%	80 - 120
			Total Magnesium (Mg)	2019/05/14		99	%	80 - 120
			Total Manganese (Mn)	2019/05/14		98	%	80 - 120
			Total Nickel (Ni)	2019/05/14		97	%	80 - 120
			Total Potassium (K)	2019/05/14		102	%	80 - 120
			Total Sodium (Na)	2019/05/14		NC	%	80 - 120
			Total Zinc (Zn)	2019/05/14		101	%	80 - 120
6118977	ADA	Spiked Blank	Total Arsenic (As)	2019/05/14		100	%	80 - 120
			Total Cadmium (Cd)	2019/05/14		100	%	80 - 120
			Total Calcium (Ca)	2019/05/14		103	%	80 - 120
			Total Chromium (Cr)	2019/05/14		97	%	80 - 120
			Total Copper (Cu)	2019/05/14		99	%	80 - 120
			Total Iron (Fe)	2019/05/14		99	%	80 - 120
			Total Lead (Pb)	2019/05/14		96	%	80 - 120
			Total Magnesium (Mg)	2019/05/14		99	%	80 - 120
			Total Manganese (Mn)	2019/05/14		97	%	80 - 120

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

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Nickel (Ni)	2019/05/14		97	%	80 - 120
			Total Potassium (K)	2019/05/14		100	%	80 - 120
			Total Sodium (Na)	2019/05/14		99	%	80 - 120
			Total Zinc (Zn)	2019/05/14		100	%	80 - 120
6118977	ADA	Method Blank	Total Arsenic (As)	2019/05/14	<1.0		ug/L	
			Total Cadmium (Cd)	2019/05/14	<0.10		ug/L	
			Total Calcium (Ca)	2019/05/14	<200		ug/L	
			Total Chromium (Cr)	2019/05/14	<5.0		ug/L	
			Total Copper (Cu)	2019/05/14	<1.0		ug/L	
			Total Iron (Fe)	2019/05/14	<100		ug/L	
			Total Lead (Pb)	2019/05/14	<0.50		ug/L	
			Total Magnesium (Mg)	2019/05/14	<50		ug/L	
			Total Manganese (Mn)	2019/05/14	<2.0		ug/L	
			Total Nickel (Ni)	2019/05/14	<1.0		ug/L	
			Total Potassium (K)	2019/05/14	<200		ug/L	
			Total Sodium (Na)	2019/05/14	<100		ug/L	
			Total Zinc (Zn)	2019/05/14	<5.0		ug/L	
6118977	ADA	RPD	Total Manganese (Mn)	2019/05/14	6.8		%	20
			Total Zinc (Zn)	2019/05/14	3.9		%	20
6119195	ADB	Matrix Spike [JRI758-02]	Dissolved Chloride (Cl-)	2019/05/14		NC	%	80 - 120
6119195	ADB	Spiked Blank	Dissolved Chloride (Cl-)	2019/05/14		102	%	80 - 120
6119195	ADB	Method Blank	Dissolved Chloride (Cl-)	2019/05/14	<1.0		mg/L	
6119195	ADB	RPD [JRI758-02]	Dissolved Chloride (Cl-)	2019/05/14	1.3		%	20
6119202	ADB	Matrix Spike [JRI758-02]	Dissolved Sulphate (SO4)	2019/05/14		NC	%	75 - 125
6119202	ADB	Spiked Blank	Dissolved Sulphate (SO4)	2019/05/14		103	%	80 - 120
6119202	ADB	Method Blank	Dissolved Sulphate (SO4)	2019/05/14	<1.0		mg/L	
6119202	ADB	RPD [JRI758-02]	Dissolved Sulphate (SO4)	2019/05/14	0.26		%	20
6119255	C_N	Matrix Spike	Total Ammonia-N	2019/05/14		89	%	75 - 125
6119255	C_N	Spiked Blank	Total Ammonia-N	2019/05/14		100	%	80 - 120
6119255	C_N	Method Blank	Total Ammonia-N	2019/05/14	<0.050		mg/L	
6119255	C_N	RPD	Total Ammonia-N	2019/05/14	0.45		%	20
6119298	C_N	Matrix Spike	Total Ammonia-N	2019/05/15		99	%	75 - 125
6119298	C_N	Spiked Blank	Total Ammonia-N	2019/05/15		100	%	80 - 120
6119298	C_N	Method Blank	Total Ammonia-N	2019/05/15	<0.050		mg/L	
6119298	C_N	RPD	Total Ammonia-N	2019/05/15	0.45		%	20
6119345	NB3	QC Standard	Total Dissolved Solids	2019/05/14		95	%	90 - 110
6119345	NB3	Method Blank	Total Dissolved Solids	2019/05/14	<10		mg/L	
6119345	NB3	RPD	Total Dissolved Solids	2019/05/14	NC		%	25
6119416	C_N	Matrix Spike	Total Ammonia-N	2019/05/14		95	%	75 - 125
6119416	C_N	Spiked Blank	Total Ammonia-N	2019/05/14		97	%	80 - 120
6119416	C_N	Method Blank	Total Ammonia-N	2019/05/14	<0.050		mg/L	
6119416	C_N	RPD	Total Ammonia-N	2019/05/14	NC		%	20
6120458	ADA	Matrix Spike [JRI759-02]	Dissolved Calcium (Ca)	2019/05/15		NC	%	80 - 120
			Dissolved Magnesium (Mg)	2019/05/15		107	%	80 - 120
			Dissolved Potassium (K)	2019/05/15		112	%	80 - 120
			Dissolved Sodium (Na)	2019/05/15		NC	%	80 - 120
6120458	ADA	Spiked Blank	Dissolved Calcium (Ca)	2019/05/15		99	%	80 - 120
			Dissolved Magnesium (Mg)	2019/05/15		101	%	80 - 120
			Dissolved Potassium (K)	2019/05/15		101	%	80 - 120
			Dissolved Sodium (Na)	2019/05/15		100	%	80 - 120
6120458	ADA	Method Blank	Dissolved Calcium (Ca)	2019/05/15	<200		ug/L	
			Dissolved Magnesium (Mg)	2019/05/15	<50		ug/L	
			Dissolved Potassium (K)	2019/05/15	<200		ug/L	

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Maxxam Job #: B9C5330
Report Date: 2019/05/17

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCCARTHY
Sampler Initials: SDP

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Sodium (Na)	2019/05/15	<100		ug/L	
6120458	ADA	RPD [JRI759-02]	Dissolved Calcium (Ca)	2019/05/15	8.9		%	20
			Dissolved Magnesium (Mg)	2019/05/15	4.6		%	20
			Dissolved Potassium (K)	2019/05/15	8.2		%	20
			Dissolved Sodium (Na)	2019/05/15	8.5		%	20
6120923	SSV	Matrix Spike [JRI758-06]	Total Kjeldahl Nitrogen (TKN)	2019/05/15		99	%	80 - 120
6120923	SSV	QC Standard	Total Kjeldahl Nitrogen (TKN)	2019/05/15		96	%	80 - 120
6120923	SSV	Spiked Blank	Total Kjeldahl Nitrogen (TKN)	2019/05/15		97	%	80 - 120
6120923	SSV	Method Blank	Total Kjeldahl Nitrogen (TKN)	2019/05/15	<0.10		mg/L	
6120923	SSV	RPD [JRI758-06]	Total Kjeldahl Nitrogen (TKN)	2019/05/15	4.3		%	20
6121215	LHA	Matrix Spike	Total Phosphorus	2019/05/15		120	%	80 - 120
6121215	LHA	QC Standard	Total Phosphorus	2019/05/15		108	%	80 - 120
6121215	LHA	Spiked Blank	Total Phosphorus	2019/05/15		110	%	80 - 120
6121215	LHA	Method Blank	Total Phosphorus	2019/05/15	<0.004		mg/L	
6121215	LHA	RPD	Total Phosphorus	2019/05/15	1.0		%	20
6124650	MA4	Spiked Blank	Total Oil & Grease	2019/05/16		98	%	85 - 115
6124650	MA4	RPD	Total Oil & Grease	2019/05/16	3.4		%	25
6124650	MA4	Method Blank	Total Oil & Grease	2019/05/16	<0.50		mg/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.

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 spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 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 (absolute difference <= 2x RDL).

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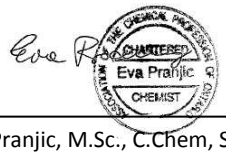
Maxxam Job #: B9C5330
Report Date: 2019/05/17

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCCARTHY
Sampler Initials: SDP

VALIDATION SIGNATURE PAGE

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



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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Maxxam Job #: B9C5330
Report Date: 2019/05/17

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCCARTHY
Sampler Initials: SDP

Exceedence Summary Table – Prov. Water Quality Obj.

Result Exceedences

Sample ID	Maxxam ID	Parameter	Criteria	Result	DL	Units
POND	JRI757-06	Total Phosphorus	0.01	0.020	0.004	mg/L
SW1	JRI758-06	Total Phosphorus	0.01	0.019	0.004	mg/L
SW2	JRI759-04	Total Iron (Fe)	300	480	100	ug/L
SW2	JRI759-07	Phenols-4AAP	0.001	0.0015	0.0010	mg/L
SW2	JRI759-06	Total Phosphorus	0.01	0.022	0.004	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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AGAT Laboratories

9770 ROUTE TRANSCANADIENNE
ST. LAURENT, QUEBEC
CANADA H4S 1V9
TEL (514)337-1000
FAX (514)333-3046
http://www.agatlabs.com

CLIENT NAME: **GOLDER ASSOCIATES LTD.**
121 COMMERCE PARK DRIVE, UNIT L
BARRIE, ON L4N8X1
(705) 722-4492

ATTENTION TO: **Scott Patrick**

PROJECT: **1407634**

AGAT WORK ORDER: **19M465644**

ECOTOX ANALYSIS REVIEWED BY: **Virginie Bérubé, biologiste**

DATE REPORTED: **2019-06-01**

VERSION*: **1**

PAGES (INCLUDING COVER): **5**

Should you require any information regarding this analysis please contact your client services representative at (514) 337-1000

*NOTES

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

AGAT Laboratories

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ST. LAURENT, QUEBEC
CANADA H4S 1V9
TEL (514)337-1000
FAX (514)333-3046
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 19M465644

PROJECT: 1407634

CLIENT NAME: GOLDER ASSOCIATES LTD.

ATTENTION TO: Scott Patrick

SAMPLED BY:

SAMPLING SITE:

Daphnia Lethality (D.magna) single concentration-48h

DATE RECEIVED: 2019-05-10

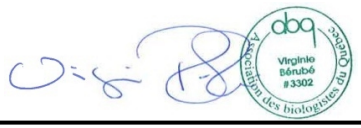
DATE REPORTED: 2019-06-01

				SAMPLE TYPE:	Wastewater
				DATE SAMPLED:	2019-05-08
Parameter	Unit	G / S	RDL	184923	
Mortality 100% v/v	% mortality-48h			0	
Acute Lethality				PASS	

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

184923 Refer to the annex for analysis details.
Acute lethality: PASS (mortality: 50% or less)
Acute lethality: FAIL (mortality: more than 50%)

Certified By:



AGAT Laboratories

9770 ROUTE TRANSCANADIENNE
ST. LAURENT, QUEBEC
CANADA H4S 1V9
TEL (514)337-1000
FAX (514)333-3046
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 19M465644

PROJECT: 1407634

CLIENT NAME: GOLDER ASSOCIATES LTD.

ATTENTION TO: Scott Patrick

SAMPLED BY:

SAMPLING SITE:

Rainbow Trout Lethality (O. mykiss) single concentration-96h

DATE RECEIVED: 2019-05-10

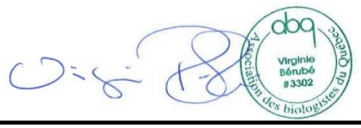
DATE REPORTED: 2019-06-01

				SAMPLE TYPE:	Wastewater
				DATE SAMPLED:	2019-05-08
Parameter	Unit	G / S	RDL	184923	
Mortality 100% v/v	% mortality-96h			0	
Acute Lethality				PASS	

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

184923 Refer to the annex for analysis details.
Acute lethality: PASS (mortality: 50% or less)
Acute lethality: FAIL (mortality: more than 50%)

Certified By:



AGAT Laboratories
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CANADA H4S 1V9
TEL (514)337-1000
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http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD.

AGAT WORK ORDER: 19M465644

PROJECT: 1407634

ATTENTION TO: Scott Patrick

SAMPLED BY:

SAMPLING SITE:

PARAMETER	DATE PREPARED	DATE ANALYZED	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
ECOTOX Analysis					
Mortality 100% v/v					
Acute Lethality					
Mortality 100% v/v			ECO-152-20000F	EPS1/RM/13	
Acute Lethality					

AGAT Laboratories

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

Chain of Custody Record

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

Laboratory Use Only

Work Order #: 19W465644

Cooler Quantity: 1 Cooler/Bowse

Arrival Temperatures: 11°

Custody Seal Intact: ☐Yes ☐No ☒N/A

Notes:

Report Information:

Company: Golder Associates

Contact: SCOTT PATRICK

Address: 121 Commerce Park Drive Unit L, Barrie, ON, L4N 8X1

Phone: 705-722-4492 Fax:

Reports to be sent to:

1. Email: Jamie_Barany@golder.com
2. Email:

Regulatory Requirements:

☐ No Regulatory Requirement

(Please check all applicable boxes)

☐ Regulation 153/04 — Table (Indicate One): ☐Ind/Com ☐Res/Park ☐Agriculture

Soil Texture (Check One): ☐Coarse ☐Fine

☐ Sewer Use: ☐Sanitary ☐Storm — Region (Indicate One)

☐ MISA

☐ Regulation 558

☐ CCME

☒ Prov. Water Quality Objectives (PWQO)

☐ Other (Indicate One)

Is this submission for a Record of Site Condition? ☐ Yes ☒ No

Report Guideline on Certificate of Analysis: ☒ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT: ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply): ☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT

**TAT is exclusive of weekends and statutory holidays*

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

Project Information:

Project: 1407634

Site Location: McCarthy (Brechin)

Sampled By: SDP

AGAT Quote #: 60738 PO:

Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☒ No ☐

Company:

Contact:

Address:

Email:

Sample Matrix Legend

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

Analysis columns: Field Filtered - Metals, Hg, CrVI (Y/N); O. Reg 153: Metals and Inorganics; ☐ All Metals ☐ 153 Metals (excl. Hydrides); ☐ Hydride Metals ☐ 153 Metals (incl. Hydrides); ORPs: ☐ B-HWS ☐ Cl ☐ CN; ☐ Cr^{6+} ☐ EC ☐ FOC ☐ Hg; ☐ pH ☐ SAR; Full Metals Scan; Regulation/Custom Metals; Nutrients: ☐ TP ☐ NH_3 ☐ TKN; ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2; Volatiles: ☐ VOC ☐ BTEX ☐ THM; PHCs F1 - F4; ABNs; PAHs; PCBs: ☐ Total ☐ Aroclors; Organochlorine Pesticides; TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs; Sewer Use; Single Depthing; Single Chart

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Y/N	Single Depthing	Single Chart
POND	8-May-19	4:00	1	SW			X	X

Samples Relinquished By (Print Name and Sign)	Date	Time	Samples Received By (Print Name and Sign)	Date	Time
SCOTT PATRICK [signature]	9-May-19	12:30pm	[signature]	10.05.19	9:20

Page 1 of 1

Nº: T 084766

Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 728212-05-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/10/11
Report #: R5917499
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9R9161
Received: 2019/10/04, 09:17

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2019/10/10	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/10/10	2019/10/10	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/10/08	2019/10/09	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/10/09	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/10/10	2019/10/10	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/10/09	2019/10/09	CAM SOP-00428	SM 23 2540D m

Remarks:

Bureau Veritas Laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by BV Labs are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by BV Labs, unless otherwise agreed in writing. BV Labs is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

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Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 728212-05-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/10/11
Report #: R5917499
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9R9161
Received: 2019/10/04, 09:17

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: Ema.Gitej@bvlabs.com
Phone# (905)817-5829
==========
This report has been generated and distributed using a secure automated process.
BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

BV Labs Job #: B9R9161
Report Date: 2019/10/11

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

RESULTS OF ANALYSES OF WATER

BV Labs ID		KYO548		
Sampling Date		2019/10/03 12:22		
COC Number		728212-05-01		
	UNITS	POND	RDL	QC Batch
Calculated Parameters				
Total Animal/Vegetable Oil and Grease	mg/L	<0.50	0.50	6374984
Inorganics				
pH	pH	8.11	N/A	6376310
Phenols-4AAP	mg/L	<0.0010	0.0010	6377357
Total Suspended Solids	mg/L	3	1	6377266
Petroleum Hydrocarbons				
Total Oil & Grease	mg/L	<0.50	0.50	6380619
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	6380620

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

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BV Labs Job #: B9R9161
Report Date: 2019/10/11

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

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	16.0°C

Results relate only to the items tested.

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BV Labs Job #: B9R9161
Report Date: 2019/10/11

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6376310	SAU	Spiked Blank	pH	2019/10/09		102	%	98 - 103
6376310	SAU	RPD	pH	2019/10/09	0.17		%	N/A
6377266	MJ1	QC Standard	Total Suspended Solids	2019/10/09		95	%	85 - 115
6377266	MJ1	Method Blank	Total Suspended Solids	2019/10/09	<1		mg/L	
6377266	MJ1	RPD	Total Suspended Solids	2019/10/09	6.9		%	25
6377357	RSN	Matrix Spike	Phenols-4AAP	2019/10/09		98	%	80 - 120
6377357	RSN	Spiked Blank	Phenols-4AAP	2019/10/09		98	%	80 - 120
6377357	RSN	Method Blank	Phenols-4AAP	2019/10/09	<0.0010		mg/L	
6377357	RSN	RPD	Phenols-4AAP	2019/10/09	NC		%	20
6380619	GSG	Spiked Blank	Total Oil & Grease	2019/10/10		98	%	85 - 115
6380619	GSG	RPD	Total Oil & Grease	2019/10/10	1.5		%	25
6380619	GSG	Method Blank	Total Oil & Grease	2019/10/10	<0.50		mg/L	
6380620	GSG	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/10/10		94	%	85 - 115
6380620	GSG	RPD	Total Oil & Grease Mineral/Synthetic	2019/10/10	3.2		%	25
6380620	GSG	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/10/10	<0.50		mg/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.

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 (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 (absolute difference <= 2x RDL).

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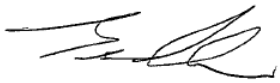
BV Labs Job #: B9R9161
Report Date: 2019/10/11

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

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 Service Specialist

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Your Project #: 1407634
Site#: MCCARTHY
Site Location: MCCARTHY
Your C.O.C. #: 740182-04-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/10/19
Report #: R5927648
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9S7045
Received: 2019/10/11, 09:02

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2019/10/19	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/10/19	2019/10/19	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/10/12	2019/10/15	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/10/15	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/10/19	2019/10/19	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/10/15	2019/10/16	CAM SOP-00428	SM 23 2540D m

Remarks:

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Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

Your Project #: 1407634
Site#: MCCARTHY
Site Location: MCCARTHY
Your C.O.C. #: 740182-04-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/10/19
Report #: R5927648
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9S7045
Received: 2019/10/11, 09:02

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: Ema.Gitej@bvlabs.com
Phone# (905)817-5829
==========
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BV Labs Job #: B9S7045
Report Date: 2019/10/19

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

RESULTS OF ANALYSES OF WATER

BV Labs ID			LAG637		
Sampling Date			2019/10/10 12:36		
COC Number			740182-04-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	<0.50	0.50	6384944
Inorganics					
pH	pH	**6.5:8.5**	8.09	N/A	6385165
Phenols-4AAP	mg/L	**0.001**	<0.0010	0.0010	6386205
Total Suspended Solids	mg/L	**-**	4	1	6387473
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	**-**	<0.50	0.50	6395607
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	<0.50	0.50	6395608

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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BV Labs Job #: B9S7045
Report Date: 2019/10/19

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

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	18.7°C

Results relate only to the items tested.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: B9S7045
Report Date: 2019/10/19

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6385165	SAU	Spiked Blank	pH	2019/10/15		103	%	98 - 103
6385165	SAU	RPD	pH	2019/10/15	0.094		%	N/A
6386205	BMO	Matrix Spike	Phenols-4AAP	2019/10/15		98	%	80 - 120
6386205	BMO	Spiked Blank	Phenols-4AAP	2019/10/15		97	%	80 - 120
6386205	BMO	Method Blank	Phenols-4AAP	2019/10/15	<0.0010		mg/L	
6386205	BMO	RPD	Phenols-4AAP	2019/10/15	NC		%	20
6387473	MKX	QC Standard	Total Suspended Solids	2019/10/16		101	%	85 - 115
6387473	MKX	Method Blank	Total Suspended Solids	2019/10/16	<1		mg/L	
6387473	MKX	RPD	Total Suspended Solids	2019/10/16	11		%	25
6395607	SPK	Spiked Blank	Total Oil & Grease	2019/10/19		96	%	85 - 115
6395607	SPK	RPD	Total Oil & Grease	2019/10/19	5.1		%	25
6395607	SPK	Method Blank	Total Oil & Grease	2019/10/19	<0.50		mg/L	
6395608	SPK	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/10/19		93	%	85 - 115
6395608	SPK	RPD	Total Oil & Grease Mineral/Synthetic	2019/10/19	3.7		%	25
6395608	SPK	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/10/19	<0.50		mg/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.

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 (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 (absolute difference <= 2x RDL).

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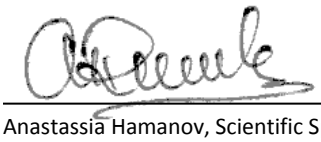
BV Labs Job #: B9S7045
Report Date: 2019/10/19

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

VALIDATION SIGNATURE PAGE

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



Anastassia Hamanov, Scientific Specialist

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Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 740182-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/10/25
Report #: R5936786
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9T3152
Received: 2019/10/18, 10:12

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2019/10/25	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/10/25	2019/10/25	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/10/19	2019/10/21	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/10/21	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/10/25	2019/10/25	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/10/22	2019/10/23	CAM SOP-00428	SM 23 2540D m

Remarks:

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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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

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Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 740182-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/10/25
Report #: R5936786
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9T3152
Received: 2019/10/18, 10:12

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: Ema.Gitej@bvlabs.com
Phone# (905)817-5829

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BV Labs Job #: B9T3152
Report Date: 2019/10/25

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

RESULTS OF ANALYSES OF WATER

BV Labs ID			LBO815		
Sampling Date			2019/10/17 11:15		
COC Number			740182-01-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	<0.50	0.50	6394751
Inorganics					
pH	pH	**6.5:8.5**	7.98	N/A	6395797
Phenols-4AAP	mg/L	**0.001**	<0.0010	0.0010	6396487
Total Suspended Solids	mg/L	**-**	2	1	6399270
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	**-**	<0.50	0.50	6406974
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	<0.50	0.50	6406975

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: B9T3152
Report Date: 2019/10/25

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

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	15.0°C

Results relate only to the items tested.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: B9T3152
Report Date: 2019/10/25

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6395797	SAU	Spiked Blank	pH	2019/10/21		102	%	98 - 103
6395797	SAU	RPD	pH	2019/10/21	0.64		%	N/A
6396487	BMO	Matrix Spike	Phenols-4AAP	2019/10/21		99	%	80 - 120
6396487	BMO	Spiked Blank	Phenols-4AAP	2019/10/21		98	%	80 - 120
6396487	BMO	Method Blank	Phenols-4AAP	2019/10/21	<0.0010		mg/L	
6396487	BMO	RPD	Phenols-4AAP	2019/10/21	0		%	20
6399270	SDE	QC Standard	Total Suspended Solids	2019/10/23		95	%	85 - 115
6399270	SDE	Method Blank	Total Suspended Solids	2019/10/23	<1		mg/L	
6399270	SDE	RPD	Total Suspended Solids	2019/10/23	11		%	25
6406974	SPK	Spiked Blank	Total Oil & Grease	2019/10/25		97	%	85 - 115
6406974	SPK	RPD	Total Oil & Grease	2019/10/25	2.3		%	25
6406974	SPK	Method Blank	Total Oil & Grease	2019/10/25	<0.50		mg/L	
6406975	SPK	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/10/25		97	%	85 - 115
6406975	SPK	RPD	Total Oil & Grease Mineral/Synthetic	2019/10/25	2.1		%	25
6406975	SPK	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/10/25	<0.50		mg/L	

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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.

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BV Labs Job #: B9T3152
Report Date: 2019/10/25

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

VALIDATION SIGNATURE PAGE

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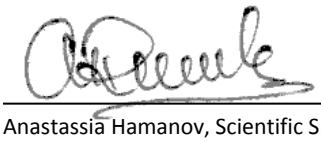

Anastassia Hamanov, Scientific Specialist

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Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 728212-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/11/01
Report #: R5947715
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9U0519
Received: 2019/10/25, 09:24

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2019/11/01	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/11/01	2019/11/01	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/10/26	2019/10/28	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/10/29	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/11/01	2019/11/01	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/10/29	2019/10/30	CAM SOP-00428	SM 23 2540D m

Remarks:

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* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 728212-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/11/01
Report #: R5947715
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9U0519
Received: 2019/10/25, 09:24

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: Ema.Gitej@bvlabs.com
Phone# (905)817-5829
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BV Labs Job #: B9U0519
Report Date: 2019/11/01

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

RESULTS OF ANALYSES OF WATER

BV Labs ID			LDC845	LDC845		
Sampling Date			2019/10/24 13:05	2019/10/24 13:05		
COC Number			728212-01-01	728212-01-01		
	UNITS	Criteria	Pond	Pond Lab-Dup	RDL	QC Batch
Calculated Parameters						
Total Animal/Vegetable Oil and Grease	mg/L	-	1.6	N/A	0.50	6406335
Inorganics						
pH	pH	**6.5:8.5**	8.03	N/A	N/A	6407756
Phenols-4AAP	mg/L	**0.001**	<0.0010	N/A	0.0010	6411725
Total Suspended Solids	mg/L	**-**	6	6	1	6413373
Petroleum Hydrocarbons						
Total Oil & Grease	mg/L	**-**	1.6	N/A	0.50	6419102
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	<0.50	N/A	0.50	6419109

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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BV Labs Job #: B9U0519
Report Date: 2019/11/01

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	16.7°C

Results relate only to the items tested.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: B9U0519
Report Date: 2019/11/01

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6407756	SAU	Spiked Blank	pH	2019/10/28		102	%	98 - 103
6407756	SAU	RPD	pH	2019/10/28	0.022		%	N/A
6411725	BMO	Matrix Spike	Phenols-4AAP	2019/10/29		103	%	80 - 120
6411725	BMO	Spiked Blank	Phenols-4AAP	2019/10/29		101	%	80 - 120
6411725	BMO	Method Blank	Phenols-4AAP	2019/10/29	<0.0010		mg/L	
6411725	BMO	RPD	Phenols-4AAP	2019/10/29	NC		%	20
6413373	JS7	QC Standard	Total Suspended Solids	2019/10/30		95	%	85 - 115
6413373	JS7	Method Blank	Total Suspended Solids	2019/10/30	<1		mg/L	
6413373	JS7	RPD [LDC845-02]	Total Suspended Solids	2019/10/30	10		%	25
6419102	FA	Spiked Blank	Total Oil & Grease	2019/11/01		99	%	85 - 115
6419102	FA	RPD	Total Oil & Grease	2019/11/01	4.1		%	25
6419102	FA	Method Blank	Total Oil & Grease	2019/11/01	<0.50		mg/L	
6419109	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/11/01		95	%	85 - 115
6419109	FA	RPD	Total Oil & Grease Mineral/Synthetic	2019/11/01	3.8		%	25
6419109	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/11/01	<0.50		mg/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.

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 (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 (absolute difference <= 2x RDL).

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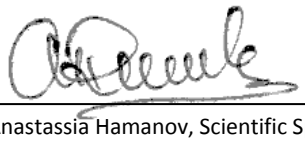
BV Labs Job #: B9U0519
Report Date: 2019/11/01

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

VALIDATION SIGNATURE PAGE

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



Anastassia Hamanov, Scientific Specialist

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Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 740182-03-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/11/07
Report #: R5955137
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9U7759
Received: 2019/11/01, 09:20

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2019/11/06	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/11/06	2019/11/06	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/11/04	2019/11/05	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/11/04	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/11/06	2019/11/06	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/11/04	2019/11/05	CAM SOP-00428	SM 23 2540D m

Remarks:

Bureau Veritas Laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by BV Labs are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by BV Labs, unless otherwise agreed in writing. BV Labs is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 740182-03-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/11/07
Report #: R5955137
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9U7759
Received: 2019/11/01, 09:20

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: Ema.Gitej@bvlabs.com
Phone# (905)817-5829
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BV Labs Job #: B9U7759
Report Date: 2019/11/07

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

RESULTS OF ANALYSES OF WATER

BV Labs ID			LES825		
Sampling Date			2019/10/31 11:29		
COC Number			740182-03-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	<0.50	0.50	6421547
Inorganics					
pH	pH	**6.5:8.5**	7.60	N/A	6423505
Phenols-4AAP	mg/L	**0.001**	<0.0010	0.0010	6422396
Total Suspended Solids	mg/L	**-**	11	1	6421971
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	**-**	<0.50	0.50	6427800
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	<0.50	0.50	6427801

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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BV Labs Job #: B9U7759
Report Date: 2019/11/07

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

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	14.7°C

Results relate only to the items tested.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: B9U7759
Report Date: 2019/11/07

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6421971	XH1	QC Standard	Total Suspended Solids	2019/11/05		97	%	85 - 115
6421971	XH1	Method Blank	Total Suspended Solids	2019/11/05	<1		mg/L	
6421971	XH1	RPD	Total Suspended Solids	2019/11/05	19		%	25
6422396	BMO	Matrix Spike	Phenols-4AAP	2019/11/04		96	%	80 - 120
6422396	BMO	Spiked Blank	Phenols-4AAP	2019/11/04		96	%	80 - 120
6422396	BMO	Method Blank	Phenols-4AAP	2019/11/04	<0.0010		mg/L	
6422396	BMO	RPD	Phenols-4AAP	2019/11/04	NC		%	20
6423505	SAU	Spiked Blank	pH	2019/11/05		102	%	98 - 103
6423505	SAU	RPD	pH	2019/11/05	0.034		%	N/A
6427800	GSG	Spiked Blank	Total Oil & Grease	2019/11/06		97	%	85 - 115
6427800	GSG	RPD	Total Oil & Grease	2019/11/06	1.3		%	25
6427800	GSG	Method Blank	Total Oil & Grease	2019/11/06	<0.50		mg/L	
6427801	GSG	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/11/06		96	%	85 - 115
6427801	GSG	RPD	Total Oil & Grease Mineral/Synthetic	2019/11/06	2.6		%	25
6427801	GSG	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/11/06	<0.50		mg/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.

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 (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 (absolute difference <= 2x RDL).

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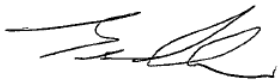
BV Labs Job #: B9U7759
Report Date: 2019/11/07

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

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 Service Specialist

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Your Project #: 1407634
Your C.O.C. #: 740179-01-01

Attention: Jamie Bonany

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

Report Date: 2019/10/15
Report #: R5920821
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9S0294
Received: 2019/10/05, 10:15

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	1	N/A	2019/10/08	CAM SOP-00448	SM 23 2320 B m
Chloride by Automated Colourimetry	1	N/A	2019/10/08	CAM SOP-00463	SM 23 4500-Cl E m
Conductivity	1	N/A	2019/10/08	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	1	N/A	2019/10/08	CAM SOP-00446	SM 23 5310 B m
Fluoride	1	2019/10/07	2019/10/08	CAM SOP-00449	SM 23 4500-F C m
Hardness (calculated as CaCO3)	1	N/A	2019/10/10	CAM SOP 00102/00408/00447	SM 2340 B
Lab Filtered Metals by ICPMS	1	2019/10/07	2019/10/09	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS	1	N/A	2019/10/10	CAM SOP-00447	EPA 6020B m
Anion and Cation Sum	1	N/A	2019/10/10		
Total Ammonia-N	1	N/A	2019/10/09	CAM SOP-00441	USGS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	1	N/A	2019/10/08	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Total Oil and Grease	1	2019/10/12	2019/10/12	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/10/07	2019/10/08	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/10/09	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	1	N/A	2019/10/08	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids	1	2019/10/09	2019/10/10	CAM SOP-00428	SM 23 2540C m
Total Kjeldahl Nitrogen in Water	1	2019/10/08	2019/10/09	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	1	2019/10/09	2019/10/09	CAM SOP-00407	SM 23 4500 P B H m
Total Suspended Solids	1	2019/10/09	2019/10/10	CAM SOP-00428	SM 23 2540D m

Remarks:

Bureau Veritas Laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by BV Labs are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Your Project #: 1407634
Your C.O.C. #: 740179-01-01

Attention: Jamie Bonany

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

Report Date: 2019/10/15
Report #: R5920821
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9S0294
Received: 2019/10/05, 10:15

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by BV Labs, unless otherwise agreed in writing. BV Labs is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
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.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: Ema.Gitej@bvlabs.com
Phone# (905)817-5829
==========
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BV Labs Job #: B9S0294
Report Date: 2019/10/15

Golder Associates Ltd
Client Project #: 1407634
Sampler Initials: CD

RESULTS OF ANALYSES OF WATER

BV Labs ID			KYV058			KYV058		
Sampling Date			2019/10/04 11:30			2019/10/04 11:30		
COC Number			740179-01-01			740179-01-01		
	UNITS	Criteria	SW2	RDL	QC Batch	SW2 Lab-Dup	RDL	QC Batch
Calculated Parameters								
Anion Sum	me/L	-	31.6	N/A	6371870			
Cation Sum	me/L	-	32.7	N/A	6371870			
Hardness (CaCO3)	mg/L	-	1400	1.0	6371868			
Inorganics								
Total Ammonia-N	mg/L	-	<0.050	0.050	6375987			
Conductivity	mS/cm	-	2.63	0.001	6373841	2.60	0.001	6373841
Total Dissolved Solids	mg/L	-	2060	10	6378913			
Fluoride (F-)	mg/L	-	0.10	0.10	6373833	<0.10	0.10	6373833
Total Kjeldahl Nitrogen (TKN)	mg/L	-	0.74	0.10	6376036			
Dissolved Organic Carbon	mg/L	-	11	0.50	6373258			
pH	pH	6.5:8.5	7.48		6373836	7.46		6373836
Phenols-4AAP	mg/L	0.001	**0.0039**	0.0010	6375129			
Total Phosphorus	mg/L	0.01	**0.066**	0.020	6377546			
Total Suspended Solids	mg/L	-	22	10	6377929			
Dissolved Sulphate (SO4)	mg/L	-	940	5.0	6375077			
Alkalinity (Total as CaCO3)	mg/L	-	330	1.0	6373827	330	1.0	6373827
Dissolved Chloride (Cl-)	mg/L	-	200	2.0	6375075			
Nitrite (N)	mg/L	-	<0.010	0.010	6372394			
Nitrate (N)	mg/L	-	<0.10	0.10	6372394			
Nitrate + Nitrite (N)	mg/L	-	<0.10	0.10	6372394			
Petroleum Hydrocarbons								
Total Oil & Grease	mg/L	-	<0.50	0.50	6385066			

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: B9S0294
Report Date: 2019/10/15

Golder Associates Ltd
Client Project #: 1407634
Sampler Initials: CD

ELEMENTS BY ICP/MS (WATER)

BV Labs ID		KYV058		
Sampling Date		2019/10/04 11:30		
COC Number		740179-01-01		
	UNITS	SW2	RDL	QC Batch
Metals				
Dissolved Calcium (Ca)	ug/L	480000	200	6373868
Dissolved Magnesium (Mg)	ug/L	46000	50	6373868
Dissolved Potassium (K)	ug/L	9100	200	6373868
Dissolved Sodium (Na)	ug/L	110000	100	6373868

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: B9S0294
Report Date: 2019/10/15

Golder Associates Ltd
Client Project #: 1407634
Sampler Initials: CD

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID			KYV058		
Sampling Date			2019/10/04 11:30		
COC Number			740179-01-01		
	UNITS	Criteria	SW2	RDL	QC Batch
Metals					
Total Arsenic (As)	ug/L	100	<1.0	1.0	6376096
Total Cadmium (Cd)	ug/L	0.2	0.11	0.10	6376096
Total Calcium (Ca)	ug/L	-	480000	200	6376096
Total Chromium (Cr)	ug/L	-	<5.0	5.0	6376096
Total Copper (Cu)	ug/L	5	2.1	1.0	6376096
Total Iron (Fe)	ug/L	300	**1400**	100	6376096
Total Lead (Pb)	ug/L	5	<0.50	0.50	6376096
Total Magnesium (Mg)	ug/L	-	43000	50	6376096
Total Manganese (Mn)	ug/L	-	1000	2.0	6376096
Total Nickel (Ni)	ug/L	25	1.2	1.0	6376096
Total Potassium (K)	ug/L	-	8500	200	6376096
Total Sodium (Na)	ug/L	-	110000	100	6376096
Total Zinc (Zn)	ug/L	30	13	5.0	6376096

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999

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BV Labs Job #: B9S0294
Report Date: 2019/10/15

Golder Associates Ltd
Client Project #: 1407634
Sampler Initials: CD

TEST SUMMARY

BV Labs ID: KYV058
Sample ID: SW2
Matrix: Water

Collected: 2019/10/04
Shipped:
Received: 2019/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6373827	N/A	2019/10/08	Surinder Rai
Chloride by Automated Colourimetry	KONE	6375075	N/A	2019/10/08	Deonarine Ramnarine
Conductivity	AT	6373841	N/A	2019/10/08	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6373258	N/A	2019/10/08	Mandeep Kaur
Fluoride	ISE	6373833	2019/10/07	2019/10/08	Surinder Rai
Hardness (calculated as CaCO3)		6371868	N/A	2019/10/10	Automated Statchk
Lab Filtered Metals by ICPMS	ICP/MS	6373868	2019/10/07	2019/10/09	Prempal Bhatti
Total Metals Analysis by ICPMS	ICP/MS	6376096	N/A	2019/10/10	Arefa Dabhad
Anion and Cation Sum	CALC	6371870	N/A	2019/10/10	Automated Statchk
Total Ammonia-N	LACH/NH4	6375987	N/A	2019/10/09	Mazin Wakai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6372394	N/A	2019/10/08	Chandra Nandlal
Total Oil and Grease	BAL	6385066	2019/10/12	2019/10/12	Sukhhardey Pal Singh Khangura
pH	AT	6373836	2019/10/07	2019/10/08	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6375129	N/A	2019/10/09	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	6375077	N/A	2019/10/08	Alina Dobreanu
Total Dissolved Solids	BAL	6378913	2019/10/09	2019/10/10	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6376036	2019/10/08	2019/10/09	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6377546	2019/10/09	2019/10/09	Shivani Shivani
Total Suspended Solids	BAL	6377929	2019/10/09	2019/10/10	Mandeep Kaur

BV Labs ID: KYV058 Dup
Sample ID: SW2
Matrix: Water

Collected: 2019/10/04
Shipped:
Received: 2019/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6373827	N/A	2019/10/08	Surinder Rai
Conductivity	AT	6373841	N/A	2019/10/08	Surinder Rai
Fluoride	ISE	6373833	2019/10/07	2019/10/08	Surinder Rai
pH	AT	6373836	2019/10/07	2019/10/08	Surinder Rai

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BV Labs Job #: B9S0294
Report Date: 2019/10/15

Golder Associates Ltd
Client Project #: 1407634
Sampler Initials: CD

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	6.7°C
Package 2	7.3°C

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
6372394	C_N	Matrix Spike	Nitrite (N)	2019/10/08		104	%	80 - 120
			Nitrate (N)	2019/10/08		95	%	80 - 120
6372394	C_N	Spiked Blank	Nitrite (N)	2019/10/08		107	%	80 - 120
			Nitrate (N)	2019/10/08		95	%	80 - 120
6372394	C_N	Method Blank	Nitrite (N)	2019/10/08	<0.010		mg/L	
			Nitrate (N)	2019/10/08	<0.10		mg/L	
6372394	C_N	RPD	Nitrite (N)	2019/10/08	1.6		%	20
			Nitrate (N)	2019/10/08	NC		%	20
6373258	KRM	Matrix Spike	Dissolved Organic Carbon	2019/10/08		93	%	80 - 120
6373258	KRM	Spiked Blank	Dissolved Organic Carbon	2019/10/08		98	%	80 - 120
6373258	KRM	Method Blank	Dissolved Organic Carbon	2019/10/08	<0.50		mg/L	
6373258	KRM	RPD	Dissolved Organic Carbon	2019/10/08	3.5		%	20
6373827	SAU	Spiked Blank	Alkalinity (Total as CaCO3)	2019/10/08		94	%	85 - 115
6373827	SAU	Method Blank	Alkalinity (Total as CaCO3)	2019/10/08	<1.0		mg/L	
6373827	SAU	RPD [KYV058-03]	Alkalinity (Total as CaCO3)	2019/10/08	0.83		%	20
6373833	SAU	Matrix Spike [KYV058-03]	Fluoride (F-)	2019/10/08		93	%	80 - 120
6373833	SAU	Spiked Blank	Fluoride (F-)	2019/10/08		100	%	80 - 120
6373833	SAU	Method Blank	Fluoride (F-)	2019/10/08	<0.10		mg/L	
6373833	SAU	RPD [KYV058-03]	Fluoride (F-)	2019/10/08	3.5		%	20
6373836	SAU	Spiked Blank	pH	2019/10/08		102	%	98 - 103
6373836	SAU	RPD [KYV058-03]	pH	2019/10/08	0.33		%	N/A
6373841	SAU	Spiked Blank	Conductivity	2019/10/08		100	%	85 - 115
6373841	SAU	Method Blank	Conductivity	2019/10/08	<0.001		mS/cm	
6373841	SAU	RPD [KYV058-03]	Conductivity	2019/10/08	1.2		%	25
6373868	PBA	Matrix Spike	Dissolved Calcium (Ca)	2019/10/09		102	%	80 - 120
			Dissolved Magnesium (Mg)	2019/10/09		103	%	80 - 120
			Dissolved Potassium (K)	2019/10/09		101	%	80 - 120
			Dissolved Sodium (Na)	2019/10/09		100	%	80 - 120
6373868	PBA	Spiked Blank	Dissolved Calcium (Ca)	2019/10/09		98	%	80 - 120
			Dissolved Magnesium (Mg)	2019/10/09		100	%	80 - 120
			Dissolved Potassium (K)	2019/10/09		98	%	80 - 120
			Dissolved Sodium (Na)	2019/10/09		96	%	80 - 120
6373868	PBA	Method Blank	Dissolved Calcium (Ca)	2019/10/09	<200		ug/L	
			Dissolved Magnesium (Mg)	2019/10/09	<50		ug/L	
			Dissolved Potassium (K)	2019/10/09	<200		ug/L	
			Dissolved Sodium (Na)	2019/10/09	<100		ug/L	
6373868	PBA	RPD	Dissolved Calcium (Ca)	2019/10/09	1.3		%	20
			Dissolved Magnesium (Mg)	2019/10/09	0.55		%	20
			Dissolved Potassium (K)	2019/10/09	NC		%	20
			Dissolved Sodium (Na)	2019/10/09	0.0095		%	20
6375075	DRM	Matrix Spike	Dissolved Chloride (Cl-)	2019/10/08		113	%	80 - 120
6375075	DRM	Spiked Blank	Dissolved Chloride (Cl-)	2019/10/08		102	%	80 - 120
6375075	DRM	Method Blank	Dissolved Chloride (Cl-)	2019/10/08	<1.0		mg/L	
6375075	DRM	RPD	Dissolved Chloride (Cl-)	2019/10/08	NC		%	20
6375077	ADB	Matrix Spike	Dissolved Sulphate (SO4)	2019/10/08		111	%	75 - 125
6375077	ADB	Spiked Blank	Dissolved Sulphate (SO4)	2019/10/08		105	%	80 - 120
6375077	ADB	Method Blank	Dissolved Sulphate (SO4)	2019/10/08	<1.0		mg/L	
6375077	ADB	RPD	Dissolved Sulphate (SO4)	2019/10/08	0.19		%	20
6375129	BMO	Matrix Spike	Phenols-4AAP	2019/10/09		93	%	80 - 120
6375129	BMO	Spiked Blank	Phenols-4AAP	2019/10/08		91	%	80 - 120
6375129	BMO	Method Blank	Phenols-4AAP	2019/10/08	<0.0010		mg/L	
6375129	BMO	RPD	Phenols-4AAP	2019/10/09	NC		%	20

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6375987	MT4	Matrix Spike	Total Ammonia-N	2019/10/09		100	%	75 - 125
6375987	MT4	Spiked Blank	Total Ammonia-N	2019/10/09		101	%	80 - 120
6375987	MT4	Method Blank	Total Ammonia-N	2019/10/09	<0.050		mg/L	
6375987	MT4	RPD	Total Ammonia-N	2019/10/09	7.3		%	20
6376036	RTY	Matrix Spike	Total Kjeldahl Nitrogen (TKN)	2019/10/09		103	%	80 - 120
6376036	RTY	QC Standard	Total Kjeldahl Nitrogen (TKN)	2019/10/09		100	%	80 - 120
6376036	RTY	Spiked Blank	Total Kjeldahl Nitrogen (TKN)	2019/10/09		100	%	80 - 120
6376036	RTY	Method Blank	Total Kjeldahl Nitrogen (TKN)	2019/10/09	<0.10		mg/L	
6376036	RTY	RPD	Total Kjeldahl Nitrogen (TKN)	2019/10/09	0.44		%	20
6376096	ADA	Matrix Spike	Total Arsenic (As)	2019/10/10		98	%	80 - 120
			Total Cadmium (Cd)	2019/10/10		97	%	80 - 120
			Total Calcium (Ca)	2019/10/10		NC	%	80 - 120
			Total Chromium (Cr)	2019/10/10		94	%	80 - 120
			Total Copper (Cu)	2019/10/10		94	%	80 - 120
			Total Iron (Fe)	2019/10/10		91	%	80 - 120
			Total Lead (Pb)	2019/10/10		91	%	80 - 120
			Total Magnesium (Mg)	2019/10/10		87	%	80 - 120
			Total Manganese (Mn)	2019/10/10		NC	%	80 - 120
			Total Nickel (Ni)	2019/10/10		92	%	80 - 120
			Total Potassium (K)	2019/10/10		97	%	80 - 120
			Total Sodium (Na)	2019/10/10		NC	%	80 - 120
			Total Zinc (Zn)	2019/10/10		94	%	80 - 120
6376096	ADA	Spiked Blank	Total Arsenic (As)	2019/10/10		96	%	80 - 120
			Total Cadmium (Cd)	2019/10/10		97	%	80 - 120
			Total Calcium (Ca)	2019/10/10		99	%	80 - 120
			Total Chromium (Cr)	2019/10/10		95	%	80 - 120
			Total Copper (Cu)	2019/10/10		96	%	80 - 120
			Total Iron (Fe)	2019/10/10		93	%	80 - 120
			Total Lead (Pb)	2019/10/10		93	%	80 - 120
			Total Magnesium (Mg)	2019/10/10		95	%	80 - 120
			Total Manganese (Mn)	2019/10/10		95	%	80 - 120
			Total Nickel (Ni)	2019/10/10		95	%	80 - 120
			Total Potassium (K)	2019/10/10		95	%	80 - 120
			Total Sodium (Na)	2019/10/10		95	%	80 - 120
			Total Zinc (Zn)	2019/10/10		96	%	80 - 120
6376096	ADA	Method Blank	Total Arsenic (As)	2019/10/10	<1.0		ug/L	
			Total Cadmium (Cd)	2019/10/10	<0.10		ug/L	
			Total Calcium (Ca)	2019/10/10	<200		ug/L	
			Total Chromium (Cr)	2019/10/10	<5.0		ug/L	
			Total Copper (Cu)	2019/10/10	<1.0		ug/L	
			Total Iron (Fe)	2019/10/10	<100		ug/L	
			Total Lead (Pb)	2019/10/10	<0.50		ug/L	
			Total Magnesium (Mg)	2019/10/10	<50		ug/L	
			Total Manganese (Mn)	2019/10/10	<2.0		ug/L	
			Total Nickel (Ni)	2019/10/10	<1.0		ug/L	
			Total Potassium (K)	2019/10/10	<200		ug/L	
			Total Sodium (Na)	2019/10/10	<100		ug/L	
			Total Zinc (Zn)	2019/10/10	<5.0		ug/L	
6376096	ADA	RPD	Total Calcium (Ca)	2019/10/10	2.0		%	20
			Total Iron (Fe)	2019/10/10	0.59		%	20
			Total Magnesium (Mg)	2019/10/10	1.2		%	20
6377546	SSV	Matrix Spike	Total Phosphorus	2019/10/09		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
6377546	SSV	QC Standard	Total Phosphorus	2019/10/09		99	%	80 - 120
6377546	SSV	Spiked Blank	Total Phosphorus	2019/10/09		100	%	80 - 120
6377546	SSV	Method Blank	Total Phosphorus	2019/10/09	<0.020		mg/L	
6377546	SSV	RPD	Total Phosphorus	2019/10/09	NC		%	20
6377929	MKX	QC Standard	Total Suspended Solids	2019/10/10		99	%	85 - 115
6377929	MKX	Method Blank	Total Suspended Solids	2019/10/10	<10		mg/L	
6377929	MKX	RPD	Total Suspended Solids	2019/10/10	0		%	25
6378913	SDE	QC Standard	Total Dissolved Solids	2019/10/10		100	%	90 - 110
6378913	SDE	Method Blank	Total Dissolved Solids	2019/10/10	<10		mg/L	
6378913	SDE	RPD	Total Dissolved Solids	2019/10/10	1.6		%	25
6385066	SPK	Spiked Blank	Total Oil & Grease	2019/10/12		98	%	85 - 115
6385066	SPK	RPD	Total Oil & Grease	2019/10/12	1.8		%	25
6385066	SPK	Method Blank	Total Oil & Grease	2019/10/12	<0.50		mg/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.

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 spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 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 (absolute difference <= 2x RDL).

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BV Labs Job #: B9S0294
Report Date: 2019/10/15

Golder Associates Ltd
Client Project #: 1407634
Sampler Initials: CD

VALIDATION SIGNATURE PAGE

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

Anastassia Hamanov, Scientific Specialist

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

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.

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Exceedence Summary Table – Prov. Water Quality Obj.

Result Exceedences

Sample ID	BV Labs ID	Parameter	Criteria	Result	DL	Units
SW2	KYV058-06	Total Iron (Fe)	300	1400	100	ug/L
SW2	KYV058-07	Phenols-4AAP	0.001	0.0039	0.0010	mg/L
SW2	KYV058-04	Total Phosphorus	0.01	0.066	0.020	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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Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 728212-02-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/11/14
Report #: R5964463
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9V5188
Received: 2019/11/08, 08:51

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Animal and Vegetable Oil and Grease	1	N/A	2019/11/13	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/11/13	2019/11/13	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/11/11	2019/11/12	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/11/12	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/11/13	2019/11/13	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/11/11	2019/11/12	CAM SOP-00428	SM 23 2540D m

Remarks:

Bureau Veritas Laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by BV Labs are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by BV Labs, unless otherwise agreed in writing. BV Labs is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 728212-02-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/11/14
Report #: R5964463
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9V5188
Received: 2019/11/08, 08:51

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: Ema.Gitej@bvlabs.com
Phone# (905)817-5829

==========

This report has been generated and distributed using a secure automated process.
BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

BV Labs Job #: B9V5188
Report Date: 2019/11/14

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

RESULTS OF ANALYSES OF WATER

BV Labs ID			LGI578	LGI578		
Sampling Date			2019/11/07 15:02	2019/11/07 15:02		
COC Number			728212-02-01	728212-02-01		
	UNITS	Criteria	POND	POND Lab-Dup	RDL	QC Batch
Calculated Parameters						
Total Animal/Vegetable Oil and Grease	mg/L	-	<0.50	N/A	0.50	6434707
Inorganics						
pH	pH	**6.5:8.5**	7.72	N/A	N/A	6436598
Phenols-4AAP	mg/L	**0.001**	<0.0010	N/A	0.0010	6436904
Total Suspended Solids	mg/L	**-**	2	2	1	6436803
Petroleum Hydrocarbons						
Total Oil & Grease	mg/L	**-**	<0.50	N/A	0.50	6439814
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	<0.50	N/A	0.50	6439815

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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BV Labs Job #: B9V5188
Report Date: 2019/11/14

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

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	11.7°C

Results relate only to the items tested.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: B9V5188
Report Date: 2019/11/14

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6436598	SAU	Spiked Blank	pH	2019/11/12		102	%	98 - 103
6436598	SAU	RPD	pH	2019/11/12	1.1		%	N/A
6436803	SDE	QC Standard	Total Suspended Solids	2019/11/12		96	%	85 - 115
6436803	SDE	Method Blank	Total Suspended Solids	2019/11/12	<1		mg/L	
6436803	SDE	RPD [LGI578-02]	Total Suspended Solids	2019/11/12	11		%	25
6436904	BMO	Matrix Spike	Phenols-4AAP	2019/11/12		97	%	80 - 120
6436904	BMO	Spiked Blank	Phenols-4AAP	2019/11/12		96	%	80 - 120
6436904	BMO	Method Blank	Phenols-4AAP	2019/11/12	<0.0010		mg/L	
6436904	BMO	RPD	Phenols-4AAP	2019/11/12	NC		%	20
6439814	GSG	Spiked Blank	Total Oil & Grease	2019/11/13		97	%	85 - 115
6439814	GSG	RPD	Total Oil & Grease	2019/11/13	2.6		%	25
6439814	GSG	Method Blank	Total Oil & Grease	2019/11/13	<0.50		mg/L	
6439815	GSG	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/11/13		96	%	85 - 115
6439815	GSG	RPD	Total Oil & Grease Mineral/Synthetic	2019/11/13	2.6		%	25
6439815	GSG	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/11/13	<0.50		mg/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.

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 (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 (absolute difference <= 2x RDL).

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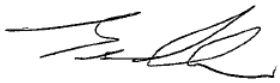
BV Labs Job #: B9V5188
Report Date: 2019/11/14

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

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 Service Specialist

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Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 734802-05-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/11/25
Report #: R5979919
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9W3864
Received: 2019/11/18, 08:20

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Animal and Vegetable Oil and Grease	1	N/A	2019/11/25	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/11/25	2019/11/25	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/11/22	2019/11/22	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/11/22	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/11/25	2019/11/25	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/11/22	2019/11/25	CAM SOP-00428	SM 23 2540D m

Remarks:

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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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

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Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 734802-05-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/11/25
Report #: R5979919
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9W3864
Received: 2019/11/18, 08:20

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: Ema.Gitej@bvlabs.com
Phone# (905)817-5829

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BV Labs Job #: B9W3864
Report Date: 2019/11/25

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

RESULTS OF ANALYSES OF WATER

BV Labs ID			LIG055		
Sampling Date			2019/11/14		
COC Number			734802-05-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	1.4	0.50	6455290
Inorganics					
pH	pH	**6.5:8.5**	7.94	N/A	6456740
Phenols-4AAP	mg/L	**0.001**	<0.0010	0.0010	6457701
Total Suspended Solids	mg/L	**-**	2	1	6458121
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	**-**	1.4	0.50	6460702
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	<0.50	0.50	6460711

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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BV Labs Job #: B9W3864
Report Date: 2019/11/25

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

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	14.7°C

Results relate only to the items tested.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: B9W3864
Report Date: 2019/11/25

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6456740	NYS	Spiked Blank	pH	2019/11/22		102	%	98 - 103
6456740	NYS	RPD	pH	2019/11/22	0.70		%	N/A
6457701	BMO	Matrix Spike	Phenols-4AAP	2019/11/22		101	%	80 - 120
6457701	BMO	Spiked Blank	Phenols-4AAP	2019/11/22		100	%	80 - 120
6457701	BMO	Method Blank	Phenols-4AAP	2019/11/22	<0.0010		mg/L	
6457701	BMO	RPD	Phenols-4AAP	2019/11/22	3.1		%	20
6458121	MKX	QC Standard	Total Suspended Solids	2019/11/25		98	%	85 - 115
6458121	MKX	Method Blank	Total Suspended Solids	2019/11/25	<1		mg/L	
6458121	MKX	RPD	Total Suspended Solids	2019/11/25	15		%	25
6460702	FA	Matrix Spike	Total Oil & Grease	2019/11/25		89	%	75 - 125
6460702	FA	Spiked Blank	Total Oil & Grease	2019/11/25		98	%	85 - 115
6460702	FA	RPD	Total Oil & Grease	2019/11/25	2.3		%	25
			Total Oil & Grease	2019/11/25	0.79		%	25
6460702	FA	Method Blank	Total Oil & Grease	2019/11/25	<0.50		mg/L	
6460711	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/11/25		94	%	85 - 115
6460711	FA	RPD	Total Oil & Grease Mineral/Synthetic	2019/11/25	2.7		%	25
6460711	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/11/25	<0.50		mg/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.

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

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BV Labs Job #: B9W3864
Report Date: 2019/11/25

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

VALIDATION SIGNATURE PAGE

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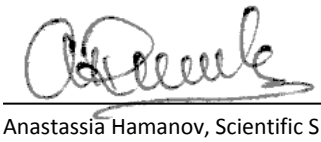

Anastassia Hamanov, Scientific Specialist

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Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 734802-06-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/11/28
Report #: R5983500
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9W9963
Received: 2019/11/22, 09:18

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Animal and Vegetable Oil and Grease	1	N/A	2019/11/27	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/11/27	2019/11/27	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/11/23	2019/11/25	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/11/26	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/11/27	2019/11/27	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/11/25	2019/11/26	CAM SOP-00428	SM 23 2540D m

Remarks:

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Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 734802-06-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/11/28
Report #: R5983500
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9W9963
Received: 2019/11/22, 09:18

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Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: Ema.Gitej@bvlabs.com
Phone# (905)817-5829
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BV Labs Job #: B9W9963
Report Date: 2019/11/28

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

RESULTS OF ANALYSES OF WATER

BV Labs ID		LJP005	LJP005		
Sampling Date		2019/11/21 12:26	2019/11/21 12:26		
COC Number		734802-06-01	734802-06-01		
	UNITS	POND	POND Lab-Dup	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	<0.50	N/A	0.50	6457444
Inorganics					
pH	pH	7.68	N/A	N/A	6460029
Phenols-4AAP	mg/L	<0.0010	<0.0010	0.0010	6461892
Total Suspended Solids	mg/L	2	N/A	1	6461291
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	<0.50	N/A	0.50	6466931
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	N/A	0.50	6466933

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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BV Labs Job #: B9W9963
Report Date: 2019/11/28

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

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	11.3°C

Results relate only to the items tested.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: B9W9963
Report Date: 2019/11/28

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6460029	SAU	Spiked Blank	pH	2019/11/25		102	%	98 - 103
6460029	SAU	RPD	pH	2019/11/25	0.15		%	N/A
6461291	MKX	QC Standard	Total Suspended Solids	2019/11/26		95	%	85 - 115
6461291	MKX	Method Blank	Total Suspended Solids	2019/11/26	<1		mg/L	
6461291	MKX	RPD	Total Suspended Solids	2019/11/26	13		%	25
6461892	LHA	Matrix Spike [LJP005-04]	Phenols-4AAP	2019/11/26		96	%	80 - 120
6461892	LHA	Spiked Blank	Phenols-4AAP	2019/11/26		95	%	80 - 120
6461892	LHA	Method Blank	Phenols-4AAP	2019/11/26	<0.0010		mg/L	
6461892	LHA	RPD [LJP005-04]	Phenols-4AAP	2019/11/26	NC		%	20
6466931	KK4	Spiked Blank	Total Oil & Grease	2019/11/27		99	%	85 - 115
6466931	KK4	RPD	Total Oil & Grease	2019/11/27	3.1		%	25
6466931	KK4	Method Blank	Total Oil & Grease	2019/11/27	<0.50		mg/L	
6466933	KK4	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/11/27		95	%	85 - 115
6466933	KK4	RPD	Total Oil & Grease Mineral/Synthetic	2019/11/27	3.8		%	25
6466933	KK4	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/11/27	<0.50		mg/L	

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

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 (absolute difference <= 2x RDL).

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BV Labs Job #: B9W9963
Report Date: 2019/11/28

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

VALIDATION SIGNATURE PAGE

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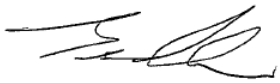

Brad Newman, Scientific Service Specialist

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Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 734802-02-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/12/06
Report #: R5994337
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9X7220
Received: 2019/11/29, 09:03

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Animal and Vegetable Oil and Grease	1	N/A	2019/12/06	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/12/05	2019/12/05	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/11/30	2019/12/02	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/12/02	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/12/05	2019/12/05	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/12/03	2019/12/04	CAM SOP-00428	SM 23 2540D m

Remarks:

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(1) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 734802-02-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/12/06
Report #: R5994337
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9X7220
Received: 2019/11/29, 09:03

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: Ema.Gitej@bvlabs.com
Phone# (905)817-5829
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BV Labs Job #: B9X7220
Report Date: 2019/12/06

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

RESULTS OF ANALYSES OF WATER

BV Labs ID			LLE888		
Sampling Date			2019/11/28 12:57		
COC Number			734802-02-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	<0.50	0.50	6470375
Inorganics					
pH	pH	**6.5:8.5**	7.82	N/A	6472399
Phenols-4AAP	mg/L	**0.001**	<0.0010	0.0010	6473092
Total Suspended Solids	mg/L	**-**	2	1	6475687
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	**-**	<0.50	0.50	6480137
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	<0.50	0.50	6480139

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: B9X7220
Report Date: 2019/12/06

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

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	11.0°C

Results relate only to the items tested.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: B9X7220
Report Date: 2019/12/06

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6472399	SAU	Spiked Blank	pH	2019/12/02		102	%	98 - 103
6472399	SAU	RPD	pH	2019/12/02	0.38		%	N/A
6473092	BMO	Matrix Spike	Phenols-4AAP	2019/12/02		97	%	80 - 120
6473092	BMO	Spiked Blank	Phenols-4AAP	2019/12/02		94	%	80 - 120
6473092	BMO	Method Blank	Phenols-4AAP	2019/12/02	<0.0010		mg/L	
6473092	BMO	RPD	Phenols-4AAP	2019/12/02	NC		%	20
6475687	MJ1	QC Standard	Total Suspended Solids	2019/12/04		98	%	85 - 115
6475687	MJ1	Method Blank	Total Suspended Solids	2019/12/04	<1		mg/L	
6475687	MJ1	RPD	Total Suspended Solids	2019/12/04	NC		%	25
6480137	SPK	Spiked Blank	Total Oil & Grease	2019/12/05		94	%	85 - 115
6480137	SPK	RPD	Total Oil & Grease	2019/12/05	4.7		%	25
6480137	SPK	Method Blank	Total Oil & Grease	2019/12/05	<0.50		mg/L	
6480139	SPK	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/12/05		92	%	85 - 115
6480139	SPK	RPD	Total Oil & Grease Mineral/Synthetic	2019/12/05	3.2		%	25
6480139	SPK	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/12/05	<0.50		mg/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.

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 (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 (absolute difference <= 2x RDL).

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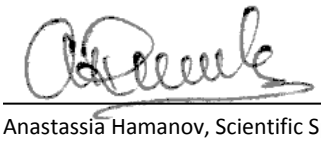
BV Labs Job #: B9X7220
Report Date: 2019/12/06

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

VALIDATION SIGNATURE PAGE

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



Anastassia Hamanov, Scientific Specialist

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Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 724340-06-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/12/11
Report #: R6000149
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9Y4503
Received: 2019/12/05, 08:56

Sample Matrix: Surface Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Animal and Vegetable Oil and Grease	1	N/A	2019/12/10	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/12/10	2019/12/10	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/12/07	2019/12/09	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/12/09	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/12/10	2019/12/10	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/12/07	2019/12/09	CAM SOP-00428	SM 23 2540D m

Remarks:

Bureau Veritas Laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by BV Labs are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

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Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 724340-06-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/12/11
Report #: R6000149
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9Y4503
Received: 2019/12/05, 08:56

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: Ema.Gitej@bvlabs.com
Phone# (905)817-5829
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BV Labs Job #: B9Y4503
Report Date: 2019/12/11

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

RESULTS OF ANALYSES OF SURFACE WATER

BV Labs ID			LMU993		
Sampling Date			2019/12/05 15:19		
COC Number			724340-06-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	<0.50	0.50	6483067
Inorganics					
pH	pH	**6.5:8.5**	7.72	N/A	6484190
Phenols-4AAP	mg/L	**0.001**	<0.0010	0.0010	6485741
Total Suspended Solids	mg/L	**-**	1	1	6485024
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	**-**	<0.50	0.50	6488373
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	<0.50	0.50	6488376

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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BV Labs Job #: B9Y4503
Report Date: 2019/12/11

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	10.0°C

Results relate only to the items tested.

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BV Labs Job #: B9Y4503
Report Date: 2019/12/11

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6484190	SAU	Spiked Blank	pH	2019/12/09		102	%	98 - 103
6484190	SAU	RPD	pH	2019/12/09	0.16		%	N/A
6485024	XH1	QC Standard	Total Suspended Solids	2019/12/09		95	%	85 - 115
6485024	XH1	Method Blank	Total Suspended Solids	2019/12/09	<1		mg/L	
6485024	XH1	RPD	Total Suspended Solids	2019/12/09	NC		%	25
6485741	BMO	Matrix Spike	Phenols-4AAP	2019/12/09		98	%	80 - 120
6485741	BMO	Spiked Blank	Phenols-4AAP	2019/12/09		97	%	80 - 120
6485741	BMO	Method Blank	Phenols-4AAP	2019/12/09	<0.0010		mg/L	
6485741	BMO	RPD	Phenols-4AAP	2019/12/09	NC		%	20
6488373	GSG	Spiked Blank	Total Oil & Grease	2019/12/10		99	%	85 - 115
6488373	GSG	RPD	Total Oil & Grease	2019/12/10	2.1		%	25
6488373	GSG	Method Blank	Total Oil & Grease	2019/12/10	<0.50		mg/L	
6488376	GSG	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/12/10		97	%	85 - 115
6488376	GSG	RPD	Total Oil & Grease Mineral/Synthetic	2019/12/10	3.7		%	25
6488376	GSG	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/12/10	<0.50		mg/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.

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 (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 (absolute difference <= 2x RDL).

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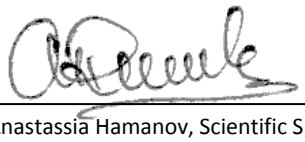
BV Labs Job #: B9Y4503
Report Date: 2019/12/11

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

VALIDATION SIGNATURE PAGE

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



Anastassia Hamanov, Scientific Specialist

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Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 740182-02-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/12/19
Report #: R6011926
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9Z1986
Received: 2019/12/13, 09:14

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Animal and Vegetable Oil and Grease	1	N/A	2019/12/18	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/12/18	2019/12/18	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/12/14	2019/12/16	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/12/16	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/12/18	2019/12/18	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/12/14	2019/12/16	CAM SOP-00428	SM 23 2540D m

Remarks:

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Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 740182-02-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/12/19
Report #: R6011926
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9Z1986
Received: 2019/12/13, 09:14

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: Ema.Gitej@bvlabs.com
Phone# (905)817-5829
==========
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BV Labs Job #: B9Z1986
Report Date: 2019/12/19

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

RESULTS OF ANALYSES OF WATER

BV Labs ID			LOL352		
Sampling Date			2019/12/12 10:17		
COC Number			740182-02-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	<0.50	0.50	6496257
Inorganics					
pH	pH	**6.5:8.5**	7.61	N/A	6498027
Phenols-4AAP	mg/L	**0.001**	<0.0010	0.0010	6498658
Total Suspended Solids	mg/L	**-**	1	1	6498033
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	**-**	<0.50	0.50	6503931
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	<0.50	0.50	6503933

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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BV Labs Job #: B9Z1986
Report Date: 2019/12/19

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

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	11.7°C

Results relate only to the items tested.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: B9Z1986
Report Date: 2019/12/19

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6498027	SAU	Spiked Blank	pH	2019/12/16		102	%	98 - 103
6498027	SAU	RPD	pH	2019/12/16	0.19		%	N/A
6498033	MKX	QC Standard	Total Suspended Solids	2019/12/16		99	%	85 - 115
6498033	MKX	Method Blank	Total Suspended Solids	2019/12/16	<1		mg/L	
6498033	MKX	RPD	Total Suspended Solids	2019/12/16	9.2		%	25
6498658	BMO	Matrix Spike	Phenols-4AAP	2019/12/16		100	%	80 - 120
6498658	BMO	Spiked Blank	Phenols-4AAP	2019/12/16		103	%	80 - 120
6498658	BMO	Method Blank	Phenols-4AAP	2019/12/16	<0.0010		mg/L	
6498658	BMO	RPD	Phenols-4AAP	2019/12/16	NC		%	20
6503931	GSG	Spiked Blank	Total Oil & Grease	2019/12/18		98	%	85 - 115
6503931	GSG	RPD	Total Oil & Grease	2019/12/18	1.3		%	25
6503931	GSG	Method Blank	Total Oil & Grease	2019/12/18	<0.50		mg/L	
6503933	GSG	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/12/18		97	%	85 - 115
6503933	GSG	RPD	Total Oil & Grease Mineral/Synthetic	2019/12/18	3.2		%	25
6503933	GSG	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/12/18	<0.50		mg/L	

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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 (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 (absolute difference <= 2x RDL).

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BV Labs Job #: B9Z1986
Report Date: 2019/12/19

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

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 Service Specialist

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Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 734802-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2020/01/16
Report #: R6038875
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C007448
Received: 2020/01/10, 09:10

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Animal and Vegetable Oil and Grease	1	N/A	2020/01/14	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2020/01/14	2020/01/14	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2020/01/14	2020/01/14	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2020/01/15	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2020/01/14	2020/01/14	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2020/01/14	2020/01/15	CAM SOP-00428	SM 23 2540D m

Remarks:

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BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by BV Labs, unless otherwise agreed in writing. BV Labs is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 734802-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2020/01/16
Report #: R6038875
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C007448
Received: 2020/01/10, 09:10

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: Ema.Gitej@bvlabs.com
Phone# (905)817-5829
==========
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BV Labs Job #: C007448
Report Date: 2020/01/16

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

RESULTS OF ANALYSES OF WATER

BV Labs ID			LSZ226		
Sampling Date			2020/01/09 15:33		
COC Number			734802-01-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	<0.50	0.50	6536712
Inorganics					
pH	pH	**6.5:8.5**	7.53	N/A	6537089
Phenols-4AAP	mg/L	**0.001**	<0.0010	0.0010	6538704
Total Suspended Solids	mg/L	**-**	2	1	6538343
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	**-**	<0.50	0.50	6537149
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	<0.50	0.50	6537150

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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BV Labs Job #: C007448
Report Date: 2020/01/16

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

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	11.0°C

Sample LSZ226 [POND] : Analysis completed as per client request.

Results relate only to the items tested.

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BV Labs Job #: C007448
Report Date: 2020/01/16

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6537089	KAD	Spiked Blank	pH	2020/01/14		101	%	98 - 103
6537089	KAD	RPD	pH	2020/01/14	0.12		%	N/A
6537149	GSG	Spiked Blank	Total Oil & Grease	2020/01/14		98	%	85 - 115
6537149	GSG	RPD	Total Oil & Grease	2020/01/14	1.8		%	25
6537149	GSG	Method Blank	Total Oil & Grease	2020/01/14	<0.50		mg/L	
6537150	GSG	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2020/01/14		95	%	85 - 115
6537150	GSG	RPD	Total Oil & Grease Mineral/Synthetic	2020/01/14	3.8		%	25
6537150	GSG	Method Blank	Total Oil & Grease Mineral/Synthetic	2020/01/14	<0.50		mg/L	
6538343	SDE	QC Standard	Total Suspended Solids	2020/01/15		98	%	85 - 115
6538343	SDE	Method Blank	Total Suspended Solids	2020/01/15	<1		mg/L	
6538343	SDE	RPD	Total Suspended Solids	2020/01/15	13		%	25
6538704	BMO	Matrix Spike	Phenols-4AAP	2020/01/15		97	%	80 - 120
6538704	BMO	Spiked Blank	Phenols-4AAP	2020/01/15		99	%	80 - 120
6538704	BMO	Method Blank	Phenols-4AAP	2020/01/15	<0.0010		mg/L	
6538704	BMO	RPD	Phenols-4AAP	2020/01/15	0		%	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.

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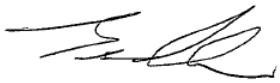
BV Labs Job #: C007448
Report Date: 2020/01/16

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

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 Service Specialist

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Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 747806-01-01

Attention: Jamie Bonany

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

Report Date: 2019/12/05
Report #: R5992491
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9X5890
Received: 2019/11/28, 09:16

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity	1	N/A	2019/11/29	CAM SOP-00448	SM 23 2320 B m
Chloride by Automated Colourimetry	1	N/A	2019/12/02	CAM SOP-00463	SM 23 4500-Cl E m
Conductivity	1	N/A	2019/11/29	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	1	N/A	2019/11/29	CAM SOP-00446	SM 23 5310 B m
Fluoride	1	2019/11/28	2019/11/29	CAM SOP-00449	SM 23 4500-F C m
Hardness (calculated as CaCO3)	1	N/A	2019/12/04	CAM SOP 00102/00408/00447	SM 2340 B
Lab Filtered Metals by ICPMS	1	2019/11/30	2019/12/03	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS	1	N/A	2019/12/02	CAM SOP-00447	EPA 6020B m
Anion and Cation Sum	1	N/A	2019/12/04		
Total Ammonia-N	1	N/A	2019/12/03	CAM SOP-00441	USGS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	1	N/A	2019/11/29	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Total Oil and Grease	1	2019/12/04	2019/12/04	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/11/28	2019/11/29	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/12/02	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	1	N/A	2019/12/02	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids	1	2019/11/30	2019/12/03	CAM SOP-00428	SM 23 2540C m
Total Kjeldahl Nitrogen in Water	1	2019/11/29	2019/12/03	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	1	2019/12/02	2019/12/02	CAM SOP-00407	SM 23 4500 P B H m
Total Suspended Solids	1	2019/11/29	2019/12/02	CAM SOP-00428	SM 23 2540D m

Remarks:

Bureau Veritas Laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by BV Labs are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 747806-01-01

Attention: Jamie Bonany

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

Report Date: 2019/12/05
Report #: R5992491
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9X5890
Received: 2019/11/28, 09:16

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Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
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.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: Ema.Gitej@bvlabs.com
Phone# (905)817-5829
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BV Labs Job #: B9X5890
Report Date: 2019/12/05

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

RESULTS OF ANALYSES OF WATER

BV Labs ID			LKX802			LKX802		
Sampling Date			2019/11/27 10:15			2019/11/27 10:15		
COC Number			747806-01-01			747806-01-01		
	UNITS	Criteria	SW1	RDL	QC Batch	SW1 Lab-Dup	RDL	QC Batch
Calculated Parameters								
Anion Sum	me/L	-	12.8	N/A	6469415			
Cation Sum	me/L	-	13.3	N/A	6469415			
Hardness (CaCO3)	mg/L	-	510	1.0	6468353			
Inorganics								
Total Ammonia-N	mg/L	-	<0.050	0.050	6471248			
Conductivity	mS/cm	-	1.24	0.001	6469402	1.24	0.001	6469402
Total Dissolved Solids	mg/L	-	815	10	6472495			
Fluoride (F-)	mg/L	-	0.10	0.10	6469652	<0.10	0.10	6469652
Total Kjeldahl Nitrogen (TKN)	mg/L	-	0.32	0.10	6471379			
Dissolved Organic Carbon	mg/L	-	7.5	0.50	6470425			
pH	pH	6.5:8.5	7.89		6469653	7.89		6469653
Phenols-4AAP	mg/L	0.001	<0.0010	0.0010	6473087	<0.0010	0.0010	6473087
Total Phosphorus	mg/L	0.01	**<0.020 (1)**	0.020	6473524			
Total Suspended Solids	mg/L	-	<10	10	6471536			
Dissolved Sulphate (SO4)	mg/L	-	240	1.0	6472383			
Alkalinity (Total as CaCO3)	mg/L	-	200	1.0	6469649	200	1.0	6469649
Dissolved Chloride (Cl-)	mg/L	-	140	1.0	6472381			
Nitrite (N)	mg/L	-	<0.010	0.010	6469216			
Nitrate (N)	mg/L	-	<0.10	0.10	6469216			
Nitrate + Nitrite (N)	mg/L	-	<0.10	0.10	6469216			
Petroleum Hydrocarbons								
Total Oil & Grease	mg/L	-	<0.50	0.50	6477732			

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable
(1) RDL exceeds criteria

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BV Labs Job #: B9X5890
Report Date: 2019/12/05

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

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID			LKX802		
Sampling Date			2019/11/27 10:15		
COC Number			747806-01-01		
	UNITS	Criteria	SW1	RDL	QC Batch
Metals					
Total Aluminum (Al)	ug/L	-	96	5.0	6473169
Total Antimony (Sb)	ug/L	20	<0.50	0.50	6473169
Total Arsenic (As)	ug/L	100	<1.0	1.0	6473169
Total Barium (Ba)	ug/L	-	49	2.0	6473169
Total Beryllium (Be)	ug/L	11	<0.50	0.50	6473169
Total Bismuth (Bi)	ug/L	-	<1.0	1.0	6473169
Total Boron (B)	ug/L	200	68	10	6473169
Total Cadmium (Cd)	ug/L	0.2	<0.10	0.10	6473169
Dissolved Calcium (Ca)	ug/L	-	180000	200	6472379
Total Calcium (Ca)	ug/L	-	180000	200	6473169
Total Chromium (Cr)	ug/L	-	<5.0	5.0	6473169
Total Cobalt (Co)	ug/L	0.9	<0.50	0.50	6473169
Total Copper (Cu)	ug/L	5	1.1	1.0	6473169
Total Iron (Fe)	ug/L	300	260	100	6475269
Total Lead (Pb)	ug/L	5	<0.50	0.50	6473169
Total Lithium (Li)	ug/L	-	9.4	5.0	6473169
Dissolved Magnesium (Mg)	ug/L	-	13000	50	6472379
Total Magnesium (Mg)	ug/L	-	13000	50	6473169
Total Manganese (Mn)	ug/L	-	50	2.0	6473169
Total Molybdenum (Mo)	ug/L	40	<0.50	0.50	6473169
Total Nickel (Ni)	ug/L	25	<1.0	1.0	6473169
Dissolved Potassium (K)	ug/L	-	2600	200	6472379
Total Potassium (K)	ug/L	-	2400	200	6473169
Total Selenium (Se)	ug/L	100	<2.0	2.0	6473169
Total Silicon (Si)	ug/L	-	2400	50	6473169
Total Silver (Ag)	ug/L	0.1	<0.10	0.10	6473169
Dissolved Sodium (Na)	ug/L	-	71000	100	6472379
Total Sodium (Na)	ug/L	-	71000	100	6473169
Total Strontium (Sr)	ug/L	-	560	1.0	6473169

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999

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BV Labs Job #: B9X5890
Report Date: 2019/12/05

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

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID			LKX802		
Sampling Date			2019/11/27 10:15		
COC Number			747806-01-01		
	UNITS	Criteria	SW1	RDL	QC Batch
Total Tellurium (Te)	ug/L	-	<1.0	1.0	6473169
Total Thallium (Tl)	ug/L	0.3	<0.050	0.050	6473169
Total Tin (Sn)	ug/L	-	<1.0	1.0	6473169
Total Titanium (Ti)	ug/L	-	7.0	5.0	6473169
Total Tungsten (W)	ug/L	30	<1.0	1.0	6473169
Total Uranium (U)	ug/L	5	2.0	0.10	6473169
Total Vanadium (V)	ug/L	6	1.4	0.50	6473169
Total Zinc (Zn)	ug/L	30	<5.0	5.0	6473169
Total Zirconium (Zr)	ug/L	4	<1.0	1.0	6473169

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999

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BV Labs Job #: B9X5890
Report Date: 2019/12/05

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

TEST SUMMARY

BV Labs ID: LKX802
Sample ID: SW1
Matrix: Water

Collected: 2019/11/27
Shipped:
Received: 2019/11/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6469649	N/A	2019/11/29	Surinder Rai
Chloride by Automated Colourimetry	KONE	6472381	N/A	2019/12/02	Deonarine Ramnarine
Conductivity	AT	6469402	N/A	2019/11/29	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6470425	N/A	2019/11/29	Mandeep Kaur
Fluoride	ISE	6469652	2019/11/28	2019/11/29	Surinder Rai
Hardness (calculated as CaCO3)		6468353	N/A	2019/12/04	Automated Statchk
Lab Filtered Metals by ICPMS	ICP/MS	6472379	2019/11/30	2019/12/03	Arefa Dabhad
Total Metals Analysis by ICPMS	ICP/MS	6473169	N/A	2019/12/02	Matthew Ritenburg
Anion and Cation Sum	CALC	6469415	N/A	2019/12/04	Automated Statchk
Total Ammonia-N	LACH/NH4	6471248	N/A	2019/12/03	Mazin Wakai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6469216	N/A	2019/11/29	Chandra Nandlal
Total Oil and Grease	BAL	6477732	2019/12/04	2019/12/04	Sukhhardey Pal Singh Khangura
pH	AT	6469653	2019/11/28	2019/11/29	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6473087	N/A	2019/12/02	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	6472383	N/A	2019/12/02	Deonarine Ramnarine
Total Dissolved Solids	BAL	6472495	2019/11/30	2019/12/03	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6471379	2019/11/29	2019/12/03	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6473524	2019/12/02	2019/12/02	Shivani Shivani
Total Suspended Solids	BAL	6471536	2019/11/29	2019/12/02	Xinyue (Sarah) Hou

BV Labs ID: LKX802 Dup
Sample ID: SW1
Matrix: Water

Collected: 2019/11/27
Shipped:
Received: 2019/11/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6469649	N/A	2019/11/29	Surinder Rai
Conductivity	AT	6469402	N/A	2019/11/29	Surinder Rai
Fluoride	ISE	6469652	2019/11/28	2019/11/29	Surinder Rai
pH	AT	6469653	2019/11/28	2019/11/29	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6473087	N/A	2019/12/02	Bramdeo Motiram

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BV Labs Job #: B9X5890
Report Date: 2019/12/05

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

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	6.7°C

Sample LKX802, Total Metals Analysis by ICPMS: Test repeated.

Results relate only to the items tested.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6469216	C_N	Matrix Spike	Nitrite (N)	2019/11/29		116	%	80 - 120
			Nitrate (N)	2019/11/29		107	%	80 - 120
6469216	C_N	Spiked Blank	Nitrite (N)	2019/11/29		111	%	80 - 120
			Nitrate (N)	2019/11/29		97	%	80 - 120
6469216	C_N	Method Blank	Nitrite (N)	2019/11/29	<0.010		mg/L	
			Nitrate (N)	2019/11/29	<0.10		mg/L	
6469216	C_N	RPD	Nitrite (N)	2019/11/29	NC		%	20
			Nitrate (N)	2019/11/29	0.26		%	20
6469402	SAU	Spiked Blank	Conductivity	2019/11/29		101	%	85 - 115
6469402	SAU	Method Blank	Conductivity	2019/11/29	<0.001		mS/cm	
6469402	SAU	RPD [LKX802-02]	Conductivity	2019/11/29	0.25		%	25
6469649	SAU	Spiked Blank	Alkalinity (Total as CaCO3)	2019/11/29		98	%	85 - 115
6469649	SAU	Method Blank	Alkalinity (Total as CaCO3)	2019/11/29	<1.0		mg/L	
6469649	SAU	RPD [LKX802-02]	Alkalinity (Total as CaCO3)	2019/11/29	0.97		%	20
6469652	SAU	Matrix Spike [LKX802-02]	Fluoride (F-)	2019/11/29		104	%	80 - 120
6469652	SAU	Spiked Blank	Fluoride (F-)	2019/11/29		99	%	80 - 120
6469652	SAU	Method Blank	Fluoride (F-)	2019/11/29	<0.10		mg/L	
6469652	SAU	RPD [LKX802-02]	Fluoride (F-)	2019/11/29	3.5		%	20
6469653	SAU	Spiked Blank	pH	2019/11/29		102	%	98 - 103
6469653	SAU	RPD [LKX802-02]	pH	2019/11/29	0.049		%	N/A
6470425	KRM	Matrix Spike	Dissolved Organic Carbon	2019/11/29		100	%	80 - 120
6470425	KRM	Spiked Blank	Dissolved Organic Carbon	2019/11/29		102	%	80 - 120
6470425	KRM	Method Blank	Dissolved Organic Carbon	2019/11/29	<0.50		mg/L	
6470425	KRM	RPD	Dissolved Organic Carbon	2019/11/29	0.51		%	20
6471248	MT4	Matrix Spike	Total Ammonia-N	2019/12/03		102	%	75 - 125
6471248	MT4	Spiked Blank	Total Ammonia-N	2019/12/03		100	%	80 - 120
6471248	MT4	Method Blank	Total Ammonia-N	2019/12/03	<0.050		mg/L	
6471248	MT4	RPD	Total Ammonia-N	2019/12/03	NC		%	20
6471379	RTY	Matrix Spike	Total Kjeldahl Nitrogen (TKN)	2019/12/03		102	%	80 - 120
6471379	RTY	QC Standard	Total Kjeldahl Nitrogen (TKN)	2019/12/03		105	%	80 - 120
6471379	RTY	Spiked Blank	Total Kjeldahl Nitrogen (TKN)	2019/12/03		100	%	80 - 120
6471379	RTY	Method Blank	Total Kjeldahl Nitrogen (TKN)	2019/12/03	<0.10		mg/L	
6471379	RTY	RPD	Total Kjeldahl Nitrogen (TKN)	2019/12/03	NC		%	20
6471536	XH1	QC Standard	Total Suspended Solids	2019/12/02		97	%	85 - 115
6471536	XH1	Method Blank	Total Suspended Solids	2019/12/02	<10		mg/L	
6471536	XH1	RPD	Total Suspended Solids	2019/12/02	0.60		%	25
6472379	ADA	Matrix Spike	Dissolved Calcium (Ca)	2019/12/03		NC	%	80 - 120
			Dissolved Magnesium (Mg)	2019/12/03		NC	%	80 - 120
			Dissolved Potassium (K)	2019/12/03		97	%	80 - 120
			Dissolved Sodium (Na)	2019/12/03		NC	%	80 - 120
6472379	ADA	Spiked Blank	Dissolved Calcium (Ca)	2019/12/03		100	%	80 - 120
			Dissolved Magnesium (Mg)	2019/12/03		96	%	80 - 120
			Dissolved Potassium (K)	2019/12/03		98	%	80 - 120
			Dissolved Sodium (Na)	2019/12/03		92	%	80 - 120
6472379	ADA	Method Blank	Dissolved Calcium (Ca)	2019/12/03	<200		ug/L	
			Dissolved Magnesium (Mg)	2019/12/03	<50		ug/L	
			Dissolved Potassium (K)	2019/12/03	<200		ug/L	
			Dissolved Sodium (Na)	2019/12/03	<100		ug/L	
6472379	ADA	RPD	Dissolved Calcium (Ca)	2019/12/03	2.1		%	20
			Dissolved Magnesium (Mg)	2019/12/03	2.1		%	20
			Dissolved Potassium (K)	2019/12/03	1.4		%	20

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Sodium (Na)	2019/12/03	0.66		%	20
6472381	DRM	Matrix Spike	Dissolved Chloride (Cl-)	2019/12/02		NC	%	80 - 120
6472381	DRM	Spiked Blank	Dissolved Chloride (Cl-)	2019/12/02		105	%	80 - 120
6472381	DRM	Method Blank	Dissolved Chloride (Cl-)	2019/12/02	<1.0		mg/L	
6472381	DRM	RPD	Dissolved Chloride (Cl-)	2019/12/02	0.49		%	20
6472383	DRM	Matrix Spike	Dissolved Sulphate (SO4)	2019/12/02		106	%	75 - 125
6472383	DRM	Spiked Blank	Dissolved Sulphate (SO4)	2019/12/02		99	%	80 - 120
6472383	DRM	Method Blank	Dissolved Sulphate (SO4)	2019/12/02	<1.0		mg/L	
6472383	DRM	RPD	Dissolved Sulphate (SO4)	2019/12/02	0.66		%	20
6472495	XH1	QC Standard	Total Dissolved Solids	2019/12/03		100	%	90 - 110
6472495	XH1	Method Blank	Total Dissolved Solids	2019/12/03	<10		mg/L	
6472495	XH1	RPD	Total Dissolved Solids	2019/12/03	1.2		%	25
6473087	BMO	Matrix Spike [LKX802-07]	Phenols-4AAP	2019/12/02		97	%	80 - 120
6473087	BMO	Spiked Blank	Phenols-4AAP	2019/12/02		96	%	80 - 120
6473087	BMO	Method Blank	Phenols-4AAP	2019/12/02	<0.0010		mg/L	
6473087	BMO	RPD [LKX802-07]	Phenols-4AAP	2019/12/02	NC		%	20
6473169	MRG	Matrix Spike	Total Aluminum (Al)	2019/12/02		120	%	80 - 120
			Total Antimony (Sb)	2019/12/02		102	%	80 - 120
			Total Arsenic (As)	2019/12/02		103	%	80 - 120
			Total Barium (Ba)	2019/12/02		97	%	80 - 120
			Total Beryllium (Be)	2019/12/02		102	%	80 - 120
			Total Bismuth (Bi)	2019/12/02		82	%	80 - 120
			Total Boron (B)	2019/12/02		94	%	80 - 120
			Total Cadmium (Cd)	2019/12/02		98	%	80 - 120
			Total Calcium (Ca)	2019/12/02		NC	%	80 - 120
			Total Chromium (Cr)	2019/12/02		97	%	80 - 120
			Total Cobalt (Co)	2019/12/02		97	%	80 - 120
			Total Copper (Cu)	2019/12/02		99	%	80 - 120
			Total Lead (Pb)	2019/12/02		91	%	80 - 120
			Total Lithium (Li)	2019/12/02		100	%	80 - 120
			Total Magnesium (Mg)	2019/12/02		96	%	80 - 120
			Total Manganese (Mn)	2019/12/02		NC	%	80 - 120
			Total Molybdenum (Mo)	2019/12/02		101	%	80 - 120
			Total Nickel (Ni)	2019/12/02		95	%	80 - 120
			Total Potassium (K)	2019/12/02		98	%	80 - 120
			Total Selenium (Se)	2019/12/02		102	%	80 - 120
			Total Silicon (Si)	2019/12/02		99	%	80 - 120
			Total Silver (Ag)	2019/12/02		95	%	80 - 120
			Total Sodium (Na)	2019/12/02		NC	%	80 - 120
			Total Strontium (Sr)	2019/12/02		96	%	80 - 120
			Total Tellurium (Te)	2019/12/02		101	%	80 - 120
			Total Thallium (Tl)	2019/12/02		90	%	80 - 120
			Total Tin (Sn)	2019/12/02		99	%	80 - 120
			Total Titanium (Ti)	2019/12/02		99	%	80 - 120
			Total Tungsten (W)	2019/12/02		97	%	80 - 120
			Total Uranium (U)	2019/12/02		86	%	80 - 120
			Total Vanadium (V)	2019/12/02		101	%	80 - 120
			Total Zinc (Zn)	2019/12/02		100	%	80 - 120
			Total Zirconium (Zr)	2019/12/02		101	%	80 - 120
6473169	MRG	Spiked Blank	Total Aluminum (Al)	2019/12/02		99	%	80 - 120
			Total Antimony (Sb)	2019/12/02		101	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Arsenic (As)	2019/12/02		102	%	80 - 120
			Total Barium (Ba)	2019/12/02		98	%	80 - 120
			Total Beryllium (Be)	2019/12/02		102	%	80 - 120
			Total Bismuth (Bi)	2019/12/02		85	%	80 - 120
			Total Boron (B)	2019/12/02		97	%	80 - 120
			Total Cadmium (Cd)	2019/12/02		100	%	80 - 120
			Total Calcium (Ca)	2019/12/02		101	%	80 - 120
			Total Chromium (Cr)	2019/12/02		98	%	80 - 120
			Total Cobalt (Co)	2019/12/02		98	%	80 - 120
			Total Copper (Cu)	2019/12/02		100	%	80 - 120
			Total Lead (Pb)	2019/12/02		95	%	80 - 120
			Total Lithium (Li)	2019/12/02		102	%	80 - 120
			Total Magnesium (Mg)	2019/12/02		97	%	80 - 120
			Total Manganese (Mn)	2019/12/02		98	%	80 - 120
			Total Molybdenum (Mo)	2019/12/02		100	%	80 - 120
			Total Nickel (Ni)	2019/12/02		98	%	80 - 120
			Total Potassium (K)	2019/12/02		98	%	80 - 120
			Total Selenium (Se)	2019/12/02		104	%	80 - 120
			Total Silicon (Si)	2019/12/02		99	%	80 - 120
			Total Silver (Ag)	2019/12/02		97	%	80 - 120
			Total Sodium (Na)	2019/12/02		96	%	80 - 120
			Total Strontium (Sr)	2019/12/02		96	%	80 - 120
			Total Tellurium (Te)	2019/12/02		103	%	80 - 120
			Total Thallium (Tl)	2019/12/02		93	%	80 - 120
			Total Tin (Sn)	2019/12/02		97	%	80 - 120
			Total Titanium (Ti)	2019/12/02		98	%	80 - 120
			Total Tungsten (W)	2019/12/02		98	%	80 - 120
			Total Uranium (U)	2019/12/02		86	%	80 - 120
			Total Vanadium (V)	2019/12/02		99	%	80 - 120
			Total Zinc (Zn)	2019/12/02		103	%	80 - 120
			Total Zirconium (Zr)	2019/12/02		101	%	80 - 120
6473169	MRG	Method Blank	Total Aluminum (Al)	2019/12/02	<5.0		ug/L	
			Total Antimony (Sb)	2019/12/02	<0.50		ug/L	
			Total Arsenic (As)	2019/12/02	<1.0		ug/L	
			Total Barium (Ba)	2019/12/02	<2.0		ug/L	
			Total Beryllium (Be)	2019/12/02	<0.50		ug/L	
			Total Bismuth (Bi)	2019/12/02	<1.0		ug/L	
			Total Boron (B)	2019/12/02	<10		ug/L	
			Total Cadmium (Cd)	2019/12/02	<0.10		ug/L	
			Total Calcium (Ca)	2019/12/02	<200		ug/L	
			Total Chromium (Cr)	2019/12/02	<5.0		ug/L	
			Total Cobalt (Co)	2019/12/02	<0.50		ug/L	
			Total Copper (Cu)	2019/12/02	<1.0		ug/L	
			Total Lead (Pb)	2019/12/02	<0.50		ug/L	
			Total Lithium (Li)	2019/12/02	<5.0		ug/L	
			Total Magnesium (Mg)	2019/12/02	<50		ug/L	
			Total Manganese (Mn)	2019/12/02	2.6, RDL=2.0		ug/L	
			Total Molybdenum (Mo)	2019/12/02	<0.50		ug/L	
			Total Nickel (Ni)	2019/12/02	<1.0		ug/L	
			Total Potassium (K)	2019/12/02	<200		ug/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Selenium (Se)	2019/12/02	<2.0		ug/L	
			Total Silicon (Si)	2019/12/02	<50		ug/L	
			Total Silver (Ag)	2019/12/02	<0.10		ug/L	
			Total Sodium (Na)	2019/12/02	<100		ug/L	
			Total Strontium (Sr)	2019/12/02	<1.0		ug/L	
			Total Tellurium (Te)	2019/12/02	<1.0		ug/L	
			Total Thallium (Tl)	2019/12/02	<0.050		ug/L	
			Total Tin (Sn)	2019/12/02	<1.0		ug/L	
			Total Titanium (Ti)	2019/12/02	<5.0		ug/L	
			Total Tungsten (W)	2019/12/02	<1.0		ug/L	
			Total Uranium (U)	2019/12/02	<0.10		ug/L	
			Total Vanadium (V)	2019/12/02	<0.50		ug/L	
			Total Zinc (Zn)	2019/12/02	<5.0		ug/L	
			Total Zirconium (Zr)	2019/12/02	<1.0		ug/L	
6473169	MRG	RPD	Total Boron (B)	2019/12/02	1.3		%	20
			Total Calcium (Ca)	2019/12/02	2.1		%	20
			Total Magnesium (Mg)	2019/12/02	3.4		%	20
			Total Potassium (K)	2019/12/02	2.5		%	20
			Total Sodium (Na)	2019/12/02	3.2		%	20
			Total Zinc (Zn)	2019/12/02	2.2		%	20
6473524	SSV	Matrix Spike	Total Phosphorus	2019/12/02		91	%	80 - 120
6473524	SSV	QC Standard	Total Phosphorus	2019/12/02		93	%	80 - 120
6473524	SSV	Spiked Blank	Total Phosphorus	2019/12/02		92	%	80 - 120
6473524	SSV	Method Blank	Total Phosphorus	2019/12/02	<0.020		mg/L	
6473524	SSV	RPD	Total Phosphorus	2019/12/02	0.23		%	20
6475269	PBA	Matrix Spike	Total Iron (Fe)	2019/12/03		102	%	80 - 120
6475269	PBA	Spiked Blank	Total Iron (Fe)	2019/12/03		98	%	80 - 120
6475269	PBA	Method Blank	Total Iron (Fe)	2019/12/03	<100		ug/L	
6475269	PBA	RPD	Total Iron (Fe)	2019/12/03	3.2		%	20
6477732	SPK	Spiked Blank	Total Oil & Grease	2019/12/04		97	%	85 - 115
6477732	SPK	RPD	Total Oil & Grease	2019/12/04	1.8		%	25
6477732	SPK	Method Blank	Total Oil & Grease	2019/12/04	<0.50		mg/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.

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 spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 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 (absolute difference <= 2x RDL).

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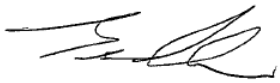
BV Labs Job #: B9X5890
Report Date: 2019/12/05

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

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 Service Specialist

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.

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BV Labs Job #: B9X5890
Report Date: 2019/12/05

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

Exceedence Summary Table – Prov. Water Quality Obj.

Detection Limit Exceedences

Sample ID	BV Labs ID	Parameter	Criteria	Result	DL	Units
SW1	LKX802-05	Total Phosphorus	0.01	<0.020	0.020	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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